



United States  
Department of  
Agriculture



United States  
Department  
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Natural  
Resources  
Conservation  
Service



National Park  
Service

# Soil Survey of Pictured Rocks National Lakeshore, Michigan





# How To Use This Soil Survey

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This publication consists of text, tables, and maps. The text includes descriptions of detailed soil map units and provides an explanation of the information presented in the tables. It also includes a glossary of terms used in the text and tables and a list of references.

The detailed soil maps can be useful in planning the use and management of small areas. To find information about your area of interest, locate that area on the map sheet. Note the map unit symbols that are in that area. Go to the Contents, which lists the map units by symbol and name and shows where each map unit is described.

The Contents shows which table has data on a specific land use for each detailed soil map unit. Also see the Contents for sections of this publication that may address your specific needs.

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## National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

The soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, the maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

## Literature Citation

The correct citation for this survey is as follows:

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## Cover Caption

The area surrounding Miners Castle in Pictured Rocks National Lakeshore is mapped Trout Bay-Gongeau-Shingleton-Rock outcrop complex, 1 to 70 percent slopes. Trout Bay, Shingleton, and Gongeau soils are all shallow soils associated with the Munising sandstone that caps this prominent geologic feature of the park. (Image accessed Feb 26, 2013, at [http://en.wikipedia.org/wiki/File:Miners\\_Castle,\\_Pictured\\_Rocks\\_National\\_Lakeshore.jpg](http://en.wikipedia.org/wiki/File:Miners_Castle,_Pictured_Rocks_National_Lakeshore.jpg). Licensed under Creative Commons Attribution 2.0 generic. Some rights reserved.)

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# Preface

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This soil survey was developed in conjunction with the National Park Service's Soil Inventory and Monitoring Program and is intended to serve as the official source document for soils occurring within Pictured Rocks National Lakeshore, Michigan.

This soil survey contains information that affects current and future land use planning in the park. It contains predictions of soil behavior for selected land uses. The survey highlights soil limitations, actions needed to overcome the limitations, and the impact of selected land uses on the environment. It is designed to meet the needs of the National Park Service and its partners to better understand the properties of the soils in the park and the effects of these properties on various natural ecological characteristics. This knowledge can help the National Park Service and its partners to understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each map unit is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the park office for Pictured Rocks National Lakeshore.



# Soil Survey of Pictured Rocks National Lakeshore, Michigan

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United States Department of Agriculture, Natural Resources Conservation Service, and United States Department of the Interior, National Park Service

## How This Survey Was Made

This survey was made in conjunction with the National Park Service's Soil Inventory and Monitoring Program to provide information about the soils and miscellaneous areas within Pictured Rocks National Lakeshore.

The soil survey data was clipped from the NRCS county-based soil survey of Alger County, Michigan. The soil survey was mapped at the scale of 1:24000 and was correlated in September 2007. The data for this document was extracted in January 2013. There are 111 different map units mapped in the park and 514 map unit components.

Sections of this report were reviewed by State-based staff of NRCS and by soils faculty at the University of California, Davis.

The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they delineated the boundaries of these bodies on digital imagery and identified each as a specific map unit.

# Detailed Soil Map Units

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The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the park. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name

of a soil phase commonly indicates a feature that affects use or management. For example, Deer Park sand, 0 to 10 percent slopes, is a phase of the Deer Park series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Rhody-Towes complex, 0 to 4 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Dawson, Greenwood, and Loxley soils is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Water is an example.

For some map units, component percentages do not add up to 100 percent due to the vintage of the data. In older soil surveys, components of minor extent were not assigned a component percentage.

Table 1 lists each map unit in the park, its major and minor components, and the percentage of each component in the unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

## **1455241—Deer Park sand, 0 to 10 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Deer Park and similar soils: 90 percent

Dissimilar minor components: 10 percent

### **Description of the Deer Park Soil**

#### **Taxonomic Classification**

Mixed, frigid Spodic Udipsamments

#### **Setting**

*Landform:* Beach ridges

*Slope range:* 0 to 10 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

*Soil moisture class:* Udic

#### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Beach sand and/or eolian sands

*Restrictive feature(s):* None within a depth of 60 inches

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*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sedge, hairgrass, trailing arbutus, wintergreen, Canada mayflower, brackenfern, lowbush blueberry, and blueberry

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
A—2 to 3 inches; sand  
E—3 to 10 inches; sand  
Bs—10 to 21 inches; sand  
C—21 to 80 inches; sand

### **Minor Components**

#### **Croswell soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Meets hydric soil criteria:* No

#### **Kinross soils**

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

## **1455242—Deer Park sand, 10 to 25 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,200 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Deer Park and similar soils: 95 percent  
Dissimilar minor components: 5 percent

### Description of the Deer Park Soil

#### **Taxonomic Classification**

Mixed, frigid Spodic Udipsamments

#### **Setting**

*Landform:* Beach ridges

*Slope range:* 10 to 25 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

*Soil moisture class:* Udic

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Beach sand and/or eolian sands

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.7 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### **Vegetation**

*Existing plants:* Sedge, hairgrass, trailing arbutus, wintergreen, Canada mayflower, brackenfern, lowbush blueberry, and blueberry

#### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

A—2 to 3 inches; sand

E—3 to 10 inches; sand

Bs—10 to 21 inches; sand

C—21 to 80 inches; sand

### Minor Components

#### **Kinross soils**

*Percent of map unit:* 3 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

#### **Croswell soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Meets hydric soil criteria:* No

## 1455243—Deer Park sand, 25 to 60 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### Map Unit Composition

Deer Park and similar soils: 98 percent

Dissimilar minor components: 2 percent

### Description of the Deer Park Soil

#### Taxonomic Classification

Mixed, frigid Spodic Udipsamments

#### Setting

*Landform:* Dunes

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Side slope, nose slope, head slope, interfluvium, crest, and base slope

*Slope range:* 25 to 60 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

*Soil moisture class:* Udic

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Beach sand and/or eolian sands

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.7 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sedge, hairgrass, trailing arbutus, wintergreen, Canada mayflower, brackenfern, lowbush blueberry, and blueberry

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
A—2 to 3 inches; sand  
E—3 to 10 inches; sand  
Bs—10 to 21 inches; sand  
C—21 to 80 inches; sand

**Minor Components**

**Kinross soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Geomorphic position (two-dimensional):* Toeslope  
*Geomorphic position (three-dimensional):* Base slope and talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

**1455244—Rubicon sand, 0 to 6 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Rubicon and similar soils: 90 percent  
Dissimilar minor components: 10 percent

**Description of the Rubicon Soil**

**Taxonomic Classification**

Sandy, mixed, frigid Entic Haplorthods

**Setting**

*Landform:* Outwash plains  
*Landform position (three-dimensional):* Rise  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Depth to water table:* More than 72 inches  
*Drainage class:* Excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.0 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Rare clubmoss, sedge, eastern teaberry, western brackenfern, cowwheat, sweet fern, lowbush blueberry, and beaked hazelnut

### **Typical Profile**

Oi—0 to 2 inches; moderately decomposed plant material  
E—2 to 7 inches; sand  
Bs—7 to 32 inches; sand  
BC—32 to 40 inches; sand  
C—40 to 80 inches; sand

## **Minor Components**

### **Au Gres soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

### **Kinross soils**

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

## **1455245—Rubicon sand, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Rubicon and similar soils: 95 percent  
Dissimilar minor components: 5 percent

### Description of the Rubicon Soil

#### Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

#### Setting

*Landform:* Outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Head slope, interfluvium, base slope, side slope, crest, and nose slope

*Slope range:* 6 to 15 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.0 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Rare clubmoss, sedge, eastern teaberry, western brackenfern, cowwheat, sweet fern, lowbush blueberry, and beaked hazelnut

#### Typical Profile

O<sub>i</sub>—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; sand

B<sub>s</sub>—7 to 32 inches; sand

BC—32 to 40 inches; sand

C—40 to 80 inches; sand

### Minor Components

#### Kinross soils

*Percent of map unit:* 3 percent

*Landform:* Depressions

*Geomorphic position (two-dimensional):* Toeslope

*Geomorphic position (three-dimensional):* Base slope and tal

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* Yes

#### **Au Gres soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Geomorphic position (two-dimensional):* Foothlope and toeslope

*Geomorphic position (three-dimensional):* Base slope and side slope

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Meets hydric soil criteria:* No

## **1455246—Rubicon sand, 15 to 35 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Rubicon and similar soils: 95 percent

Dissimilar minor components: 5 percent

### **Description of the Rubicon Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid Entic Haplorthods

#### **Setting**

*Landform:* Outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope, foothslope, and toeslope

*Landform position (three-dimensional):* Crest, base slope, side slope, interfluve, head slope, and nose slope

*Slope range:* 15 to 35 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.0 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Rare clubmoss, sedge, eastern teaberry, western brackenfern, cownheat, sweet fern, lowbush blueberry, and beaked hazelnut

### **Typical Profile**

Oi—0 to 2 inches; moderately decomposed plant material  
E—2 to 7 inches; sand  
Bs—7 to 32 inches; sand  
BC—32 to 40 inches; sand  
C—40 to 80 inches; sand

### **Minor Components**

#### **Kinross soils**

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Geomorphic position (two-dimensional):* Toeslope  
*Geomorphic position (three-dimensional):* Base slope and talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

## **1455247—Kalkaska sand, 0 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Kalkaska and similar soils: 94 percent  
Dissimilar minor components: 6 percent

### **Description of the Kalkaska Soil**

#### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Outwash plains  
*Landform position (three-dimensional):* Rise  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, wild lily of the valley, hairy Solomon's seal, elderberry, and American starflower

**Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

**Minor Components**

**Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

**Finch soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

**Paquin soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

**1455248—Kalkaska sand, 6 to 15 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Kalkaska and similar soils: 96 percent

Dissimilar minor components: 4 percent

**Description of the Kalkaska Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Head slope, interfluve, crest, base slope, side slope, and nose slope

*Slope range:* 6 to 15 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, wild lily of the valley, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Minor Components**

### **Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Geomorphic position (two-dimensional):* Toeslope  
*Geomorphic position (three-dimensional):* Base slope and talus  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

### **Wallace soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains  
*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope  
*Geomorphic position (three-dimensional):* Head slope, nose slope, crest, interfluvium, base slope, and side slope  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Meets hydric soil criteria:* No

## **1455249—Kalkaska sand, 15 to 35 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Kalkaska and similar soils: 100 percent

### Description of the Kalkaska Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Nose slope, side slope, base slope, crest, interfluvium, and head slope

*Slope range:* 15 to 35 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, wild lily of the valley, hairy Solomon's seal, elderberry, and American starflower

#### Typical Profile

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

## 1455250—Croswell sand, 0 to 3 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### Map Unit Composition

Croswell and similar soils: 92 percent

Dissimilar minor components: 8 percent

### Description of the Croswell Soil

#### Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

#### Setting

*Landform:* Outwash plains

*Slope range:* 0 to 3 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* About 24 inches (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.8 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Starflower, trailing arbutus, twinflower, eastern teaberry, pin cherry, brackenfern, blueberry, cowwheat, serviceberry, beaked hazelnut, and sweet fern

#### Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; sand

Bs—6 to 15 inches; sand

BC—15 to 22 inches; sand

C—22 to 80 inches; sand

### Minor Components

#### **Au Gres soils**

*Percent of map unit:* 6 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

#### **Kinross soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

## **1455251—Paquin sand, 0 to 3 percent slopes**

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Paquin and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### Description of the Paquin Soil

#### **Taxonomic Classification**

Sandy, isotic, frigid, shallow, ortstein Typic Durorthods

#### **Setting**

*Landform position (three-dimensional):* Rise  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* Ortstein at a depth of 10 to 16 inches  
*Frequency of flooding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of ponding:* None  
*Depth to water table:* About 24 inches (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 1.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Spinulose woodfern, wild sarsaparilla, red maple, red elderberry, goldthread, shining clubmoss, Canada beadruby, bunchberry dogwood, American starflower, and partridgeberry

### **Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material  
E—2 to 12 inches; sand  
Bhs—12 to 14 inches; sand  
Bhsm—14 to 17 inches; sand  
Bsm—17 to 27 inches; sand  
BC—27 to 34 inches; sand  
C—34 to 80 inches; sand

## **Minor Components**

### **Finch soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

### **Garlic soils**

*Percent of map unit:* 3 percent  
*Landform:* Pitted outwash plains and disintegration moraines  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

### **Kinross soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear

*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

## **1455252—Au Gres sand, 0 to 3 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Au Gres and similar soils: 92 percent  
Dissimilar minor components: 8 percent

### **Description of the Au Gres Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid Typic Endoaquods

#### **Setting**

*Landform:* Outwash plains  
*Landform position (three-dimensional):* Rise  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 6.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

#### **Vegetation**

*Existing plants:* Bunchberry dogwood, sedge, lowbush blueberry, western brackenfern, goldthread, Canada mayflower, American starflower, and eastern teaberry

#### **Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; sand  
Bs—7 to 17 inches; sand  
BC—17 to 28 inches; sand  
C—28 to 80 inches; sand

#### Minor Components

##### Croswell soils

*Percent of map unit:* 4 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

##### Deford soils

*Percent of map unit:* 4 percent  
*Landform:* Depressions  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

## 1455253—Kinross muck

#### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

#### Map Unit Composition

Kinross and similar soils: 92 percent  
Dissimilar minor components: 8 percent

#### Description of the Kinross Soil

##### Taxonomic Classification

Sandy, mixed, frigid Typic Endoaquods

##### Setting

*Landform:* Depressions  
*Landform position (three-dimensional):* Talf  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

##### Properties and Qualities

*Runoff:* Negligible  
*Parent material:* Outwash  
*Restrictive feature(s):* None within a depth of 60 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* A/D

### **Vegetation**

*Existing plants:* Blueberry, goldthread, speckled alder, black spruce, sedge, bunchberry  
dogwood, and leatherleaf

### **Typical Profile**

Oa—0 to 3 inches; muck  
Eg—3 to 14 inches; sand  
Bhs—14 to 22 inches; sand  
Bs—22 to 35 inches; sand  
C—35 to 80 inches; sand

## **Minor Components**

### **Dawson soils**

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Geomorphic position (three-dimensional):* Dip  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

### **Au Gres soils**

*Percent of map unit:* 3 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

## **1455254—Deford muck**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains  
and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### Map Unit Composition

Deford and similar soils: 92 percent

Dissimilar minor components: 8 percent

### Description of the Deford Soil

#### Taxonomic Classification

Mixed, frigid Typic Psammaquents

#### Setting

*Landform:* Depressions

*Landform position (three-dimensional):* Talf

*Slope range:* 0 to 2 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* A/D

#### Vegetation

*Existing plants:* Sedge, sphagnum moss, ostrich fern, spinulose woodfern, bunchberry  
dogwood, speckled alder, willow, blueflag iris, mint, and dewberry

#### Typical Profile

Oa—0 to 4 inches; muck

C—4 to 80 inches; fine sand

### Minor Components

#### Au Gres soils

*Percent of map unit:* 5 percent

*Landform:* Outwash plains

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**Croswell soils**

*Percent of map unit:* 3 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**1455255—Ingalls sand, 0 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Ingalls and similar soils: 90 percent  
Dissimilar minor components: 10 percent

**Description of the Ingalls Soil**

**Taxonomic Classification**

Sandy over loamy, mixed, active, frigid Typic Endoaquods

**Setting**

*Landform position (three-dimensional):* Rise  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Glaciofluvial deposits over glaciolacustrine deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very high (about 13.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* C

### **Vegetation**

*Existing plants:* Blueberry, bunchberry dogwood, sphagnum moss, yellow beadlily, woodsorrel, goldthread, starflower, brackenfern, Canada mayflower, and spinulose shield fern

### **Typical Profile**

Oa—0 to 4 inches; highly decomposed plant material  
A—4 to 5 inches; sand  
E—5 to 14 inches; sand  
Bhs—14 to 16 inches; sand  
Bw—16 to 35 inches; sand  
2C—35 to 80 inches; stratified silt loam and stratified silt

### **Minor Components**

#### **Charlevoix soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

#### **Ensley soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

#### **Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Geomorphic position (two-dimensional):* Toeslope  
*Geomorphic position (three-dimensional):* Base slope and talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

#### **Munising, calcareous substratum soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

## 1455257—Munising-Yalmer complex, 1 to 6 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Munising and similar soils: 55 percent

Yalmer and similar soils: 30 percent

Dissimilar minor components: 15 percent

### Description of the Munising Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

#### Setting

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

*Soil moisture class:* Udic

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Loamy lodgement till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 2e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, partridgeberry, false Solomon's seal, honeysuckle, and sugar maple

#### Typical Profile

Oe—0 to 1 inch; highly decomposed plant material

A—1 to 2 inches; fine sandy loam

E—2 to 10 inches; loamy sand

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Bhs—10 to 14 inches; fine sandy loam  
Bs—14 to 22 inches; fine sandy loam  
B/Ex—22 to 49 inches; sandy loam  
Bt—49 to 63 inches; fine sandy loam  
C—63 to 80 inches; fine sandy loam

### Description of the Yalmer Soil

#### Taxonomic Classification

Sandy, mixed, frigid Alfic Oxyaquic Fragiorthods

#### Setting

*Landform:* Ground moraines

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy outwash over loamy till

*Restrictive feature(s):* Fragipan at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 2e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Spinulose shield fern, shining clubmoss, Canada mayflower, twisted stalk, starflower, violet, American beech, and sugar maple

#### Typical Profile

Oe—0 to 1 inch; highly decomposed plant material

A—1 to 3 inches; sand

E—3 to 8 inches; loamy sand

Bhs—8 to 11 inches; sand

Bs—11 to 24 inches; fine sand

2E/Bx—24 to 40 inches; fine sandy loam and loamy fine sand

2Bt—40 to 66 inches; fine sandy loam

2C—66 to 80 inches; fine sandy loam

### Minor Components

#### Frohling soils

*Percent of map unit:* 5 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 8 to 18 percent

*Meets hydric soil criteria:* No

**Gay soils**

*Percent of map unit:* 4 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

**Skanee soils**

*Percent of map unit:* 3 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

**Garlic soils**

*Percent of map unit:* 1 percent  
*Landform:* Pitted outwash plains and disintegration moraines  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Meets hydric soil criteria:* No

**1455262—Ensley muck**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Ensley and similar soils: 90 percent  
Dissimilar minor components: 10 percent

**Description of the Ensley Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquents

**Setting**

*Landform:* Ground moraines  
*Landform position (three-dimensional):* Talf  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Lodgement till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 15

*Available water capacity:* Very high (about 13.4 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* B/D

### **Vegetation**

*Existing plants:* Naked miterwort, sedge, horsetail, starflower, bunchberry dogwood, oakfern, spinulose woodfern, American fly honeysuckle, Canada mayflower, bedstraw, small enchanter's nightshade, common ladyfern, sensitive fern, jewelweed, and American red raspberry

### **Typical Profile**

Oa—0 to 5 inches; muck

A—5 to 7 inches; mucky loam

Bw—7 to 19 inches; fine sandy loam

2C—19 to 80 inches; gravelly fine sandy loam

### **Minor Components**

#### **Cathro soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Dip

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* Yes

#### **Deford soils**

*Percent of map unit:* 3 percent

*Landform:* Depressions

*Geomorphic position (three-dimensional):* Talf

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* Yes

#### **Charlevoix soils**

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**Shoepac soils**

*Percent of map unit:* 2 percent  
*Landform:* Recessional moraines and ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 4 percent  
*Meets hydric soil criteria:* No

**1455263—Munising-Yalmer-Frohling complex, calcareous substratum, 1 to 6 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Munising, calcareous substratum and similar soils: 40 percent  
Yalmer, calcareous substratum and similar soils: 30 percent  
Frohling, calcareous substratum and similar soils: 20 percent  
Dissimilar minor components: 10 percent

**Description of the Munising, Calcareous Substratum Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

**Setting**

*Landform:* Ground moraines  
*Landform position (three-dimensional):* Rise  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Eolian deposits over lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Low (about 3.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Sugar maple, sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, Canada yew, oakfern, and interrupted fern

### **Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material  
E—1 to 3 inches; fine sandy loam  
Bhs—3 to 6 inches; fine sandy loam  
Bs—6 to 23 inches; fine sandy loam  
2E/Bx—23 to 38 inches; fine sandy loam and loamy sand  
2B/Ex—38 to 50 inches; loamy sand and fine sandy loam  
2BC—50 to 63 inches; gravelly fine sandy loam  
2C—63 to 80 inches; gravelly fine sandy loam

## **Description of the Yalmer, Calcareous Substratum Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid Alfic Oxyaquic Fragiorhods

### **Setting**

*Landform:* Ground moraines  
*Landform position (three-dimensional):* Rise  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Outwash over lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Very low (about 2.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Sweet cicely, Canada yew, rattlesnake fern, spinulose shield fern, bedstraw, Canada mayflower, twisted stalk, and Canadian white violet

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material  
A—1 to 2 inches; loamy sand  
E—2 to 5 inches; sand  
Bhs—5 to 16 inches; loamy sand  
Bs—16 to 28 inches; gravelly loamy sand  
2E/Bx—28 to 36 inches; loamy sand  
2B/Ex—36 to 62 inches; fine sandy loam  
3C—62 to 80 inches; gravelly fine sandy loam

**Description of the Frohling, Calcareous Substratum Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Fragiorthods

**Setting**

*Landform:* Ground moraines  
*Landform position (three-dimensional):* Rise  
*Slope range:* 4 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low  
*Parent material:* Eolian deposits over lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Low (about 4.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Canada yew, bedstraw, twisted stalk, Canadian white violet, Canada mayflower, spinulose shield fern, rattlesnake fern, and sweet cicely

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 5 inches; fine sandy loam  
Bs—5 to 24 inches; fine sandy loam  
B/Ex—24 to 73 inches; loamy fine sand  
3C—73 to 80 inches; gravelly fine sandy loam

### Minor Components

#### **Ensley soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Talf

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* Yes

#### **Greylock soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

#### **Cookson soils**

*Percent of map unit:* 2 percent

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

#### **Escanaba soils**

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

## **1455266—Grand Sable fine sand, 1 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Grand Sable and similar soils: 90 percent

Dissimilar minor components: 10 percent

### Description of the Grand Sable Soil

#### Taxonomic Classification

Sandy over loamy, aniso, isotic, nonacid, frigid Typic Udorthents

#### Setting

*Landform:* Kame terraces

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy eolian deposits over sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.3 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 2e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Rattlesnake fern, twisted stalk, shining clubmoss, spinulose shield fern, Canadian white violet, and sweet cicely

#### Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; fine sand

C—4 to 30 inches; loamy fine sand

2Eb—30 to 32 inches; loamy sand

2Bsb—32 to 43 inches; sand

2BCb—43 to 55 inches; sand

2Cb—55 to 80 inches; sand

### Minor Components

#### Cusino soils

*Percent of map unit:* 2 percent

*Landform:* Kame terraces, outwash plains, and disintegration moraines

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Meets hydric soil criteria:* No

#### Deerton soils

*Percent of map unit:* 2 percent

*Landform:* Bedrock benches

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

**McMaster soils**

*Percent of map unit:* 2 percent  
*Landform:* Nearly level recessional moraines  
*Representative aspect:* North  
*Slope range:* 0 to 4 percent  
*Meets hydric soil criteria:* No

**Shelldrake soils**

*Percent of map unit:* 2 percent  
*Landform:* Beach ridges  
*Representative aspect:* North  
*Slope range:* 0 to 8 percent  
*Meets hydric soil criteria:* No

**Towes soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock terraces in glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 0 to 4 percent  
*Meets hydric soil criteria:* No

**1455267—Grand Sable fine sand, 15 to 35 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Grand Sable and similar soils: 98 percent  
Dissimilar minor components: 2 percent

**Description of the Grand Sable Soil**

**Taxonomic Classification**

Sandy over loamy, aniso, isotic, nonacid, frigid Typic Udorthents

**Setting**

*Landform:* Kame terraces  
*Slope range:* 15 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low  
*Parent material:* Sandy eolian deposits over sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.3 LEP)

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 6.3 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Rattlesnake fern, twisted stalk, shining clubmoss, spinulose shield fern, Canadian white violet, and sweet cicely

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
A—1 to 4 inches; fine sand  
C—4 to 30 inches; loamy fine sand  
2Eb—30 to 32 inches; loamy sand  
2Bsb—32 to 43 inches; sand  
2BCb—43 to 55 inches; sand  
2Cb—55 to 80 inches; sand

### **Minor Components**

#### **Deerton soils**

*Percent of map unit:* 1 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 15 to 35 percent  
*Meets hydric soil criteria:* No

#### **Halfaday soils**

*Percent of map unit:* 1 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

## **1455268—Rhody-Towes complex, 0 to 4 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Rhody and similar soils: 60 percent  
Towes and similar soils: 30 percent  
Dissimilar minor components: 10 percent

### Description of the Rhody Soil

#### Taxonomic Classification

Coarse-silty over sandy or sandy-skeletal, mixed, active, frigid Typic Endoaquolls

#### Setting

*Slope range:* 0 to 2 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Silty eolian deposits over sandy outwash

*Restrictive feature(s):* Paralithic bedrock at a depth of 20 to 40 inches; lithic bedrock at a depth of 20 to 50 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.7 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

#### Vegetation

*Existing plants:* Bunchberry dogwood, horsetail, dewberry, spinulose shield fern, naked miterwort, and sedge

#### Typical Profile

A—0 to 19 inches; mucky silt loam

2C—19 to 36 inches; gravelly sand

3Cr—36 to 41 inches; weathered bedrock

3R—41 to 80 inches; unweathered bedrock

### Description of the Towes Soil

#### Taxonomic Classification

Coarse-silty over sandy or sandy-skeletal, mixed, active, frigid Typic Endoaquolls

#### Setting

*Landform:* Bedrock terraces in glacial drainage channels

*Slope range:* 0 to 4 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Silty eolian deposits over sandy outwash

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Restrictive feature(s)*: Paralithic bedrock at a depth of 20 to 30 inches; lithic bedrock at a depth of 20 to 45 inches

*Frequency of flooding*: None

*Frequency of ponding*: None

*Water table (depth, kind)*: About 6 inches, perched (see table 19)

*Drainage class*: Somewhat poorly drained

*Shrink-swell potential*: Low (about 0.5 LEP)

*Salinity maximum*: Not saline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent (maximum weight percentage)*: 0

*Available water capacity*: Low (about 4.8 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 3w

*Meets hydric soil criteria*: No

*Hydrologic soil group*: C

### **Vegetation**

*Existing plants*: Oakfern, red elderberry, spinulose shield fern, horsetail, twisted stalk, and violet

### **Typical Profile**

A—0 to 19 inches; silt loam

2Bw—19 to 22 inches; sand

2C—22 to 26 inches; sand

3Cr—26 to 37 inches; weathered bedrock

3R—37 to 80 inches; unweathered bedrock

## **Minor Components**

### **Nykanen soils**

*Percent of map unit*: 3 percent

*Landform*: Bedrock terraces in glacial drainage channels

*Representative aspect*: North

*Slope range*: 1 to 6 percent

*Meets hydric soil criteria*: No

### **Trout Bay soils**

*Percent of map unit*: 3 percent

*Landform*: Drainageways in depressions in glacial drainage channels

*Representative aspect*: North

*Slope range*: 0 to 4 percent

*Meets hydric soil criteria*: Yes

### **Au Train soils**

*Percent of map unit*: 2 percent

*Landform*: Bedrock-controlled moraines

*Representative aspect*: North

*Slope range*: 1 to 8 percent

*Meets hydric soil criteria*: No

### **Deerton soils**

*Percent of map unit*: 2 percent

*Landform*: Bedrock benches

*Representative aspect*: North

*Slope range*: 1 to 6 percent

*Meets hydric soil criteria*: No

## **1455269—Waiska cobbly loamy sand, 0 to 6 percent slopes, very stony**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Waiska, very stony and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### **Description of the Waiska, Very Stony Soil**

#### **Taxonomic Classification**

Sandy-skeletal, mixed, frigid Typic Haplorthods

#### **Setting**

*Slope range:* 0 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy and gravelly outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.7 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

#### **Vegetation**

*Existing plants:* Sedge, spinulose shield fern, common ladyfern, twisted stalk, bedstraw, hairy Solomon's seal, violet, and wild lily of the valley

#### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
E—1 to 4 inches; cobbly loamy sand  
Bhs—4 to 8 inches; gravelly sand  
Bs—8 to 18 inches; very gravelly sand  
C—18 to 80 inches; very gravelly sand

### Minor Components

#### **Cusino soils**

*Percent of map unit:* 3 percent

*Landform:* Kame terraces, outwash plains, and disintegration moraines

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Meets hydric soil criteria:* No

#### **Paavola soils**

*Percent of map unit:* 3 percent

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Meets hydric soil criteria:* No

#### **Deford soils**

*Percent of map unit:* 2 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

#### **Kalkaska soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Meets hydric soil criteria:* No

## **1455273—Deerton-Au Train complex, 1 to 15 percent slopes**

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Deerton and similar soils: 55 percent

Au Train and similar soils: 30 percent

Dissimilar minor components: 15 percent

### Description of the Deerton Soil

#### **Taxonomic Classification**

Sandy, mixed, frigid Typic Haplorthods

#### **Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 4 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits over sandy residuum

*Restrictive feature(s):* Paralithic bedrock at a depth of 20 to 40 inches; lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Shining clubmoss, spinulose shield fern, Canada mayflower, American starflower, ground pine, American beech, twisted stalk, and sugar maple

### **Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material

E—1 to 9 inches; sand

Bhs—9 to 10 inches; loamy sand

Bs—10 to 25 inches; sand

2Cr—25 to 39 inches; weathered bedrock

2R—39 to 80 inches; unweathered bedrock

## **Description of the Au Train Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid, shallow Oxyaquic Haplorthods

### **Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits and/or sandy residuum

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 1.8 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Starflower, partridgeberry, Canada mayflower, ground pine, shining clubmoss, and spinulose shield fern

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 9 inches; coarse sand

Bhs—9 to 14 inches; coarse sand

2Cr—14 to 32 inches; weathered bedrock

2R—32 to 80 inches; unweathered bedrock

**Minor Components**

**Abbaye soils**

*Percent of map unit:* 5 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

**Jeske soils**

*Percent of map unit:* 5 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* No

**Gongeau soils**

*Percent of map unit:* 3 percent

*Landform:* Drainageways in depressions on bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Trout Bay soils**

*Percent of map unit:* 2 percent

*Landform:* Drainageways in depressions in glacial drainage channels

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* Yes

**1455274—Deerton-Au Train complex, 6 to 35 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Deerton and similar soils: 55 percent  
Au Train and similar soils: 30 percent  
Dissimilar minor components: 15 percent

### Description of the Deerton Soil

#### Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

#### Setting

*Landform:* Bedrock-controlled moraines

*Slope range:* 6 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Sandy glaciofluvial deposits over sandy residuum

*Restrictive feature(s):* Lithic or paralithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.6 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Shining clubmoss, spinulose shield fern, Canada mayflower, American starflower, ground pine, American beech, twisted stalk, and sugar maple

#### Typical Profile

Oa—0 to 1 inch; highly decomposed plant material

E—1 to 9 inches; sand

Bhs—9 to 10 inches; loamy sand

Bs—10 to 25 inches; sand

2Cr—25 to 39 inches; weathered bedrock

2R—39 to 80 inches; unweathered bedrock

### Description of the Au Train Soil

#### Taxonomic Classification

Sandy, isotic, frigid, shallow Oxyaquic Haplorthods

#### Setting

*Landform:* Bedrock-controlled moraines

*Slope range:* 6 to 18 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits and/or sandy residuum

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 1.8 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Starflower, partridgeberry, Canada mayflower, ground pine, shining clubmoss, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 9 inches; coarse sand

Bhs—9 to 14 inches; coarse sand

2Cr—14 to 32 inches; weathered bedrock

2R—32 to 80 inches; unweathered bedrock

## **Minor Components**

### **Abbaye soils**

*Percent of map unit:* 4 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

### **Gongeau soils**

*Percent of map unit:* 4 percent

*Landform:* Drainageways in depressions on bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

### **Jeske soils**

*Percent of map unit:* 4 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 10 percent

*Meets hydric soil criteria:* No

### **Trout Bay soils**

*Percent of map unit:* 3 percent

*Landform:* Drainageways in depressions in glacial drainage channels

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* Yes

## **1455276—Cookson fine sandy loam, 1 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Cookson and similar soils: 90 percent

Dissimilar minor components: 10 percent

### **Description of the Cookson Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

#### **Setting**

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Coarse-loamy till

*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 2.2 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 8

*Available water capacity:* Moderate (about 7.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### **Vegetation**

*Existing plants:* Canadian white violet, wild leek, wild lily of the valley, spinulose woodfern, sweet cicely, sedge, downy yellow violet, twistedstalk, and trillium

#### **Typical Profile**

Oi—0 to 3 inches; slightly decomposed plant material

E—3 to 7 inches; fine sandy loam

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Bhs—7 to 11 inches; fine sandy loam  
Bs—11 to 16 inches; sandy loam  
2E'—16 to 21 inches; fine sandy loam  
2Bt—21 to 31 inches; fine sandy loam  
2BC—31 to 36 inches; fine sandy loam  
3R—36 to 80 inches; bedrock

### Minor Components

#### Chatham soils

*Percent of map unit:* 5 percent  
*Landform:* Glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

#### Trenary soils

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines and recessional moraines  
*Representative aspect:* North  
*Slope range:* 2 to 6 percent  
*Meets hydric soil criteria:* No

#### Reade soils

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 4 percent  
*Meets hydric soil criteria:* No

## 1455277—Nahma-Ruse complex

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Nahma and similar soils: 50 percent  
Ruse and similar soils: 40 percent  
Dissimilar minor components: 10 percent

### Description of the Nahma Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, nonacid, frigid Histic Humaquepts

#### Setting

*Landform:* Depressions on ground moraines  
*Slope range:* 0 to 1 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Loamy lodgement till  
*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Water table (depth, kind):* At the soil surface, perched (see table 19)  
*Drainage class:* Very poorly drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 20  
*Available water capacity:* Moderate (about 6.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Sedge, miterwort, wild lily of the valley, sphagnum moss, American starflower, northern dewberry, goldthread, and bunchberry dogwood

**Typical Profile**

Oa—0 to 11 inches; muck  
A—11 to 14 inches; mucky loam  
Bg—14 to 17 inches; loam  
Bw—17 to 19 inches; loam  
2C—19 to 24 inches; gravelly fine sandy loam  
3R—24 to 80 inches; bedrock

**Description of the Ruse Soil**

**Taxonomic Classification**

Loamy, mixed, active, frigid Lithic Endoaquolls

**Setting**

*Landform:* Ground moraines  
*Slope range:* 0 to 2 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 4 to 20 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Water table (depth, kind):* At the soil surface, perched (see table 19)  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 5  
*Available water capacity:* Very low (about 2.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7w*

*Meets hydric soil criteria: Yes*

*Hydrologic soil group: D*

**Vegetation**

*Existing plants: Sedge, bunchberry dogwood, goldthread, wild lily of the valley, miterwort, northern dewberry, sphagnum moss, and American starflower*

**Typical Profile**

A—0 to 7 inches; mucky silt loam

Bg—7 to 11 inches; fine sandy loam

Bw—11 to 15 inches; fine sandy loam

2R—15 to 80 inches; bedrock

**Minor Components**

**Chippeny soils**

*Percent of map unit: 5 percent*

*Landform: Glacial drainage channels and depressions on ground moraines*

*Representative aspect: North*

*Slope range: 0 to 1 percent*

*Meets hydric soil criteria: Yes*

**Ensign soils**

*Percent of map unit: 3 percent*

*Landform: Ground moraines*

*Representative aspect: North*

*Slope range: 0 to 3 percent*

*Meets hydric soil criteria: No*

**Nykanen soils**

*Percent of map unit: 2 percent*

*Landform: Bedrock terraces in glacial drainage channels*

*Representative aspect: North*

*Slope range: 1 to 6 percent*

*Meets hydric soil criteria: No*

**1455278—Summerville fine sandy loam, 1 to 6 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA): 94B—Michigan Eastern Upper Peninsula Sandy Drift*

*Elevation: 570 to 1,390 feet*

*Mean annual precipitation: 28 to 33 inches*

*Mean annual air temperature: 39 to 43 degrees F*

*Frost-free period: 90 to 155 days*

**Map Unit Composition**

Summerville and similar soils: 85 percent

Dissimilar minor components: 15 percent

**Description of the Summerville Soil**

**Taxonomic Classification**

Loamy, mixed, active, frigid Lithic Eutrudepts

**Setting**

*Landform:* Ground moraines  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 10 to 20 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Sedge, rattlesnake fern, twisted stalk, trillium, sweet cicely, and maidenhair fern

**Typical Profile**

A—0 to 3 inches; fine sandy loam  
Bw—3 to 13 inches; fine sandy loam  
2R—13 to 80 inches; unweathered bedrock

**Minor Components**

**Longrie soils**

*Percent of map unit:* 4 percent  
*Landform:* Kame terraces in glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

**Ensign soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**Ruse soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

**Traunik soils**

*Percent of map unit:* 3 percent  
*Landform:* Recessional moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

**Namur soils**

*Percent of map unit:* 2 percent  
*Landform:* Glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* No

**1455281—Carbondale, Lupton, and Tawas soils**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Carbondale and similar soils: 30 percent  
Lupton and similar soils: 30 percent  
Tawas and similar soils: 30 percent  
Dissimilar minor components: 10 percent

**Description of the Carbondale Soil**

**Taxonomic Classification**

Euic, frigid Hemic Haplosaprists

**Setting**

*Landform:* Depressions  
*Landform position (three-dimensional):* Dip  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Herbaceous organic material  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very high (about 36.1 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Sedge, yellow beadlily, bunchberry dogwood, goldthread, spinulose woodfern, horsetail, sphagnum moss, twinflower, Canada mayflower, naked miterwort, sensitive fern, cinnamon fern, woodsorrel, northern dewberry, American starflower, bog rosemary, violet, marsh marigold, Bog Labrador tea, and royal fern

### **Typical Profile**

Oa—0 to 38 inches; muck

Oe—38 to 80 inches; mucky peat

## **Description of the Lupton Soil**

### **Taxonomic Classification**

Euic, frigid Typic Haplosaprists

### **Setting**

*Landform:* Depressions

*Landform position (three-dimensional):* Dip

*Slope range:* 0 to 1 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

*Soil moisture class:* Aquic

### **Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Woody organic material

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Very poorly drained

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very high (about 32.8 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* A/D

### **Vegetation**

*Existing plants:* Sedge, yellow beadlily, bunchberry dogwood, goldthread, spinulose woodfern, horsetail, sphagnum moss, twinflower, Canada mayflower, naked miterwort, sensitive fern, cinnamon fern, woodsorrel, northern dewberry, American starflower, and violet

**Typical Profile**

Oi—0 to 4 inches; peat

Oa—4 to 80 inches; muck

**Description of the Tawas Soil**

**Taxonomic Classification**

Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists

**Setting**

*Landform:* Depressions on outwash plains

*Landform position (three-dimensional):* Dip

*Slope range:* 0 to 2 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Woody organic material over glacial drift

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Very poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very high (about 14.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Bog rosemary, marsh marigold, sedge, yellow beadlily, bunchberry dogwood, goldthread, spinulose woodfern, horsetail, sphagnum moss, twinflower, Canada mayflower, naked miterwort, sensitive fern, cinnamon fern, royal fern, woodsorrel, northern dewberry, American starflower, and violet

**Typical Profile**

Oa—0 to 26 inches; muck

C—26 to 80 inches; sand

**Minor Components**

**Deford soils**

*Percent of map unit:* 5 percent

*Landform:* Depressions

*Geomorphic position (three-dimensional):* Talf

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* Yes

**Paquin soils**

*Percent of map unit:* 4 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**Kalkaska soils**

*Percent of map unit:* 1 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**1455282—Dawson, Greenwood, and Loxley soils**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Dawson and similar soils: 30 percent  
Greenwood and similar soils: 30 percent  
Loxley and similar soils: 30 percent  
Dissimilar minor components: 10 percent

**Description of the Dawson Soil**

**Taxonomic Classification**

Sandy or sandy-skeletal, mixed, dysic, frigid Terric Haplosaprists

**Setting**

*Landform:* Bogs  
*Landform position (three-dimensional):* Dip  
*Slope range:* 0 to 1 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Herbaceous organic material over sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very high (about 21.1 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Sedge, Bog Labrador tea, leatherleaf, sphagnum moss, goldthread, bog rosemary, blueberry, and cottongrass

### **Typical Profile**

Oi—0 to 10 inches; peat  
Oa1—10 to 19 inches; mucky peat  
Oa2—19 to 38 inches; muck  
C—38 to 80 inches; fine sand

## **Description of the Greenwood Soil**

### **Taxonomic Classification**

Dysic, frigid Typic Haplohemists

### **Setting**

*Landform:* Bogs  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Dip  
*Slope range:* 0 to 1 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid  
*Soil moisture class:* Aquic

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Acidic herbaceous organic material  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very high (about 38.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* A/D

**Vegetation**

*Existing plants:* Sedge, Bog Labrador tea, leatherleaf, sphagnum moss, goldthread, bog rosemary, blueberry, and cottongrass

**Typical Profile**

Oe—0 to 65 inches; mucky peat  
Oa—65 to 80 inches; muck

**Description of the Loxley Soil**

**Taxonomic Classification**

Dysic, frigid Typic Haplosaprists

**Setting**

*Landform:* Bogs  
*Landform position (three-dimensional):* Dip  
*Slope range:* 0 to 1 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Herbaceous organic material  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very high (about 33.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Sedge, Bog Labrador tea, leatherleaf, sphagnum moss, goldthread, bog rosemary, blueberry, and cottongrass

**Typical Profile**

Oi—0 to 8 inches; peat  
Oa—8 to 80 inches; muck

**Minor Components**

**Spot soils**

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear

*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

**Finch soils**

*Percent of map unit:* 4 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**Paquin soils**

*Percent of map unit:* 1 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

## **1455283—Chippeny-Nahma mucks**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Chippeny and similar soils: 55 percent  
Nahma and similar soils: 30 percent  
Dissimilar minor components: 15 percent

### **Description of the Chippeny Soil**

#### **Taxonomic Classification**

Euic, frigid Lithic Haplosaprists

#### **Setting**

*Landform:* Glacial drainage channels and depressions on ground moraines  
*Slope range:* 0 to 1 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Woody organic material  
*Restrictive feature(s):* Lithic bedrock at a depth of 16 to 51 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Very poorly drained

*Shrink-swell potential:* Moderate (about 4.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 10

*Available water capacity:* High (about 9.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* B/D

### **Vegetation**

*Existing plants:* Speckled alder, sedge, bunchberry dogwood, Canada mayflower, goldthread, twinflower, woodsorrel, naked miterwort, dewberry, sphagnum moss, snowberry, and bedstraw

### **Typical Profile**

Oa—0 to 20 inches; muck

Cg—20 to 28 inches; silty clay loam

2R—28 to 80 inches; bedrock

## **Description of the Nahma Soil**

### **Taxonomic Classification**

Coarse-loamy, mixed, active, nonacid, frigid Histic Humaquepts

### **Setting**

*Landform:* Glacial drainage channels and depressions on ground moraines

*Slope range:* 0 to 1 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Woody organic material over loamy lodgment till

*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Very poorly drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 20

*Available water capacity:* Moderate (about 6.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Sedge, miterwort, wild lily of the valley, sphagnum moss, American starflower, northern dewberry, goldthread, and bunchberry dogwood

**Typical Profile**

Oa—0 to 11 inches; muck  
A—11 to 14 inches; mucky loam  
Bg—14 to 17 inches; loam  
Bw—17 to 19 inches; loam  
2C—19 to 24 inches; gravelly fine sandy loam  
3R—24 to 80 inches; bedrock

**Minor Components**

**Carbondale soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

**Ruse soils**

*Percent of map unit:* 5 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

**Ensign soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**Nykanen soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock terraces in glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

**1455284—Histosols and Aquents, ponded**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Histosols and similar soils: 50 percent  
Aquents and similar soils: 50 percent

**Description of the Histosols**

**Taxonomic Classification**

Histosols

**Setting**

*Landform:* Marshes  
*Slope range:* 0 to 2 percent  
*Representative aspect:* North  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Organic material  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

**Description of the Aquents**

**Taxonomic Classification**

Aquents

**Setting**

*Landform:* Marshes  
*Representative aspect:* North  
*Soil temperature regime:* Frigid  
*Soil moisture class:* Peraquic

**Properties and Qualities**

*Runoff:* Negligible  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

**1455285—Pits, sand and gravel**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

#### **Map Unit Composition**

Pits: 100 percent

#### **Description of Pits**

This map unit consists of open excavations from which soil and commonly underlying material have been removed, exposing either rock or other material, such as sand.

### **1455289—Jeske-Gongeau-Deerton complex, bedrock terrace, 1 to 20 percent slopes**

#### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

#### **Map Unit Composition**

Jeske, bedrock terrace and similar soils: 45 percent  
Gongeau, bedrock terrace and similar soils: 25 percent  
Deerton, bedrock terrace and similar soils: 20 percent  
Dissimilar minor components: 10 percent

#### **Description of the Jeske, Bedrock Terrace Soil**

##### **Taxonomic Classification**

Siliceous, acid, frigid, shallow Typic Psammaquents

##### **Setting**

*Landform:* Bedrock-controlled moraines  
*Slope range:* 1 to 10 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

##### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Sandy glaciofluvial deposits and/or sandy residuum  
*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 23 inches; lithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* At the soil surface, perched (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.3 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Spinulose shield fern, sugar maple, Canada mayflower, American starflower, shining clubmoss, goldthread, sphagnum moss, sedge, yellow beadlily, ground pine, and woodsorrel

### **Typical Profile**

Oa—0 to 3 inches; highly decomposed plant material

C—3 to 21 inches; sand

2Cr—21 to 31 inches; weathered bedrock

2R—31 to 80 inches; unweathered bedrock

## **Description of the Gongeau, Bedrock Terrace Soil**

### **Taxonomic Classification**

Siliceous, acid, frigid, shallow Typic Psammaquents

### **Setting**

*Landform:* Bedrock terraces in glacial drainage channels

*Slope range:* 1 to 3 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Bunchberry dogwood, sphagnum moss, shining clubmoss, spinulose shield fern, woodsorrel, goldthread, hairy Solomon's seal, Canada mayflower, sedge, and American starflower

### **Typical Profile**

Oa—0 to 5 inches; muck

A—5 to 7 inches; mucky loamy sand

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

C—7 to 18 inches; sand  
2Cr—18 to 29 inches; weathered bedrock  
2R—29 to 80 inches; unweathered bedrock

### Description of the Deerton, Bedrock Terrace Soil

#### Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

#### Setting

*Landform:* Bedrock terraces in glacial drainage channels

*Slope range:* 6 to 20 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits over sandy residuum

*Restrictive feature(s):* Lithic or paralithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.6 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Shining clubmoss, spinulose shield fern, Canada mayflower, American starflower, ground pine, American beech, twisted stalk, and sugar maple

#### Typical Profile

Oa—0 to 1 inch; highly decomposed plant material

E—1 to 9 inches; sand

Bhs—9 to 10 inches; loamy sand

Bs—10 to 25 inches; sand

2Cr—25 to 39 inches; weathered bedrock

2R—39 to 80 inches; unweathered bedrock

### Minor Components

#### Au Train soils

*Percent of map unit:* 5 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

#### Abbaye soils

*Percent of map unit:* 3 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

**Trout Bay soils**

*Percent of map unit:* 2 percent

*Landform:* Drainageways in depressions in glacial drainage channels

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* Yes

**1455290—Jeske-Gongeau-Deerton complex, bedrock terrace, 1 to 45 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Jeske, bedrock terrace and similar soils: 45 percent

Gongeau, bedrock terrace and similar soils: 25 percent

Deerton, bedrock terrace and similar soils: 20 percent

Dissimilar minor components: 10 percent

**Description of the Jeske, Bedrock Terrace Soil**

**Taxonomic Classification**

Siliceous, acid, frigid, shallow Typic Psammaquents

**Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 10 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits and/or sandy residuum

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 23 inches; lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Somewhat poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Spinulose shield fern, Canada mayflower, American starflower, shining clubmoss, goldthread, sphagnum moss, sedge, yellow beadlily, ground pine, and woodsorrel

**Typical Profile**

Oa—0 to 3 inches; highly decomposed plant material

C—3 to 21 inches; sand

2Cr—21 to 31 inches; weathered bedrock

2R—31 to 80 inches; unweathered bedrock

**Description of the Gongeau, Bedrock Terrace Soil**

**Taxonomic Classification**

Siliceous, acid, frigid, shallow Typic Psammaquents

**Setting**

*Slope range:* 1 to 8 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Bunchberry dogwood, sphagnum moss, shining clubmoss, spinulose shield fern, woodsorrel, goldthread, hairy Solomon's seal, Canada mayflower, sedge, and American starflower

**Typical Profile**

Oa—0 to 5 inches; muck

A—5 to 7 inches; mucky loamy sand

C—7 to 18 inches; sand

2Cr—18 to 29 inches; weathered bedrock

2R—29 to 80 inches; unweathered bedrock

### Description of the Deerton, Bedrock Terrace Soil

#### Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

#### Setting

*Landform:* Bedrock benches

*Slope range:* 6 to 45 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Sandy glaciofluvial deposits over sandy residuum

*Restrictive feature(s):* Lithic or paralithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.6 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Shining clubmoss, spinulose shield fern, Canada mayflower, American starflower, ground pine, American beech, twisted stalk, and sugar maple

#### Typical Profile

Oa—0 to 1 inch; highly decomposed plant material

E—1 to 9 inches; sand

Bhs—9 to 10 inches; loamy sand

Bs—10 to 25 inches; sand

2Cr—25 to 39 inches; weathered bedrock

2R—39 to 80 inches; unweathered bedrock

### Minor Components

#### Au Train soils

*Percent of map unit:* 5 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

#### Abbaye soils

*Percent of map unit:* 3 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

**Trout Bay soils**

*Percent of map unit:* 2 percent

*Landform:* Drainageways in depressions in glacial drainage channels

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* Yes

**1455291—Ruse-Ensign-Nykanen complex, bedrock terrace, 1 to 20 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Ruse, bedrock terrace and similar soils: 40 percent

Ensign, bedrock terrace and similar soils: 30 percent

Nykanen, bedrock terrace and similar soils: 20 percent

Dissimilar minor components: 10 percent

**Description of the Ruse, Bedrock Terrace Soil**

**Taxonomic Classification**

Loamy, mixed, active, frigid Lithic Endoaquolls

**Setting**

*Landform:* Bedrock terraces in glacial drainage channels

*Slope range:* 1 to 4 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Loamy outwash

*Restrictive feature(s):* Lithic or paralithic bedrock at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 5

*Available water capacity:* Very low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

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*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Jewelweed, common ladyfern, wild leek, sedge, sweet cicely, and yellow marsh marigold

### **Typical Profile**

Ap—0 to 10 inches; mucky silt loam

AC—10 to 13 inches; silt loam

2Cr—13 to 19 inches; weathered bedrock

2R—19 to 80 inches; unweathered bedrock

## **Description of the Ensign, Bedrock Terrace Soil**

### **Taxonomic Classification**

Loamy, mixed, superactive, frigid Lithic Eutrudepts

### **Setting**

*Landform:* Bedrock terraces in glacial drainage channels

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Loamy outwash

*Restrictive feature(s):* Paralithic or lithic bedrock at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 6 inches, perched (see table 19)

*Drainage class:* Somewhat poorly drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3w

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Common ladyfern, sedge, jewelweed, bunchberry dogwood, sweet cicely, and wild leek

### **Typical Profile**

Ap—0 to 10 inches; very fine sandy loam

BA—10 to 14 inches; very fine sandy loam

2Cr—14 to 18 inches; weathered bedrock

2R—18 to 80 inches; unweathered bedrock

## **Description of the Nykanen, Bedrock Terrace Soil**

### **Taxonomic Classification**

Coarse-loamy, isotic, frigid Oxyaquic Eutrudepts

**Setting**

*Landform:* Bedrock terraces in glacial drainage channels

*Slope range:* 6 to 20 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Medium

*Parent material:* Loamy outwash

*Restrictive feature(s):* Lithic bedrock at a depth of 10 to 32 inches; paralithic bedrock at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Wild leek, common ladyfern, horsetail, maidenhair fern, smooth yellow violet, sweet cicely, false Solomon's seal, sedge, and spinulose shield fern

**Typical Profile**

A—0 to 4 inches; very fine sandy loam

BA—4 to 14 inches; very fine sandy loam

2Cr—14 to 25 inches; weathered bedrock

2R—25 to 80 inches; unweathered bedrock

**Minor Components**

**Chippeny soils**

*Percent of map unit:* 4 percent

*Landform:* Glacial drainage channels and depressions on ground moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Eben, stony soils**

*Percent of map unit:* 3 percent

*Landform:* Glacial drainage channels

*Representative aspect:* North

*Slope range:* 6 to 20 percent

*Meets hydric soil criteria:* No

**Summerville soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Representative aspect:* North  
*Slope range:* 6 to 20 percent  
*Meets hydric soil criteria:* No

## **1455292—Ruse-Ensign-Nykanen complex, bedrock terrace, 1 to 45 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Ruse, bedrock terrace and similar soils: 40 percent  
Ensign, bedrock terrace and similar soils: 30 percent  
Nykanen, bedrock terrace and similar soils: 20 percent  
Dissimilar minor components: 10 percent

### **Description of the Ruse, Bedrock Terrace Soil**

#### **Taxonomic Classification**

Loamy, mixed, active, frigid Lithic Endoaquolls

#### **Setting**

*Landform:* Bedrock terraces in glacial drainage channels  
*Slope range:* 1 to 4 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low  
*Parent material:* Loamy outwash  
*Restrictive feature(s):* Paralithic or lithic bedrock at a depth of 10 to 20 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* At the soil surface, perched (see table 19)  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 5  
*Available water capacity:* Very low (about 2.7 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

#### **Vegetation**

*Existing plants:* Jewelweed, common ladyfern, wild leek, sedge, sweet cicely, and yellow marsh marigold

**Typical Profile**

Ap—0 to 10 inches; mucky silt loam  
AC—10 to 13 inches; silt loam  
2Cr—13 to 19 inches; weathered bedrock  
2R—19 to 80 inches; unweathered bedrock

**Description of the Ensign, Bedrock Terrace Soil**

**Taxonomic Classification**

Loamy, mixed, superactive, frigid Lithic Eutrudepts

**Setting**

*Landform:* Bedrock terraces in glacial drainage channels  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low  
*Parent material:* Loamy outwash  
*Restrictive feature(s):* Lithic or paralithic bedrock at a depth of 10 to 20 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 6 inches, perched (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* D

**Vegetation**

*Existing plants:* Common ladyfern, sedge, jewelweed, bunchberry dogwood, sweet cicely, and wild leek

**Typical Profile**

Ap—0 to 10 inches; very fine sandy loam  
BA—10 to 14 inches; very fine sandy loam  
2Cr—14 to 18 inches; weathered bedrock  
2R—18 to 80 inches; unweathered bedrock

**Description of the Nykanen, Bedrock Terrace Soil**

**Taxonomic Classification**

Coarse-loamy, isotic, frigid Oxyaquic Eutrudepts

**Setting**

*Landform:* Bedrock terraces in glacial drainage channels  
*Slope range:* 6 to 45 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

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### Properties and Qualities

*Runoff:* Medium

*Parent material:* Loamy outwash

*Restrictive feature(s):* Lithic bedrock at a depth of 10 to 32 inches; paralithic bedrock at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.4 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

### Vegetation

*Existing plants:* Maidenhair fern, wild leek, common ladyfern, sedge, spinulose shield fern, horsetail, sweet cicely, false Solomon's seal, and smooth yellow violet

### Typical Profile

A—0 to 4 inches; very fine sandy loam

BA—4 to 14 inches; very fine sandy loam

2Cr—14 to 25 inches; weathered bedrock

2R—25 to 80 inches; unweathered bedrock

## Minor Components

### Namur soils

*Percent of map unit:* 3 percent

*Landform:* Glacial drainage channels

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* No

### Summerville soils

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 6 to 45 percent

*Meets hydric soil criteria:* No

### Chippeny soils

*Percent of map unit:* 2 percent

*Landform:* Glacial drainage channels and depressions on ground moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

### Deerton soils

*Percent of map unit:* 2 percent

*Landform:* Bedrock benches

*Representative aspect:* North  
*Slope range:* 6 to 45 percent  
*Meets hydric soil criteria:* No

## **1455295—Evert-Sturgeon silt loams, 0 to 2 percent slopes, frequently flooded**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,945 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 45 degrees F  
*Frost-free period:* 70 to 155 days

### **Map Unit Composition**

Evert and similar soils: 70 percent  
Sturgeon and similar soils: 20 percent  
Dissimilar minor components: 10 percent

### **Description of the Evert Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid Fluvaquentic Endoaquolls

#### **Setting**

*Landform:* Flood plains  
*Slope range:* 0 to 1 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Alluvium  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* Frequent  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 6.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

#### **Vegetation**

*Existing plants:* Beaked hazelnut, other perennial grasses, sedge, goldenrod, meadow-rue, sensitive fern, wild mint, Canada thistle, blueflag iris, stinging nettle, and jewelweed

**Typical Profile**

A1—0 to 10 inches; silt loam  
A2—10 to 18 inches; loamy fine sand  
C—18 to 80 inches; sand

**Description of the Sturgeon Soil**

**Taxonomic Classification**

Coarse-silty over sandy or sandy-skeletal, mixed, superactive, nonacid, frigid Aquic Udifluvents

**Setting**

*Landform:* Flood plains  
*Slope range:* 0 to 2 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low  
*Parent material:* Alluvium  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* Frequent  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* C

**Vegetation**

*Existing plants:* Sedge, Canada thistle, beaked hazelnut, blueflag iris, wild mint, sensitive fern, other perennial grasses, jewelweed, meadow-rue, spinulose shield fern, horsetail, and sweet coltsfoot

**Typical Profile**

A—0 to 6 inches; silt loam  
Bw—6 to 16 inches; silt loam  
2C—16 to 80 inches; fine sand

**Minor Components**

**Pelkie soils**

*Percent of map unit:* 5 percent  
*Representative aspect:* North  
*Slope range:* 0 to 4 percent  
*Meets hydric soil criteria:* No

**Tawas soils**

*Percent of map unit:* 5 percent  
*Landform:* Drainageways on moraines, depressions on moraines, depressions on outwash plains, and drainageways on outwash plains

*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

## **1455296—Deerton-Tokiahok-Trout Bay complex, 8 to 35 percent slopes, dissected**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Deerton, dissected and similar soils: 40 percent  
Tokiahok, dissected and similar soils: 30 percent  
Trout Bay, dissected and similar soils: 15 percent  
Dissimilar minor components: 15 percent

### **Description of the Deerton, Dissected Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid Typic Haplorthods

#### **Setting**

*Landform:* Bedrock-controlled moraines  
*Slope range:* 8 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low  
*Parent material:* Sandy glaciofluvial deposits over sandy residuum  
*Restrictive feature(s):* Lithic or paralithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

#### **Vegetation**

*Existing plants:* Shining clubmoss, spinulose shield fern, Canada mayflower, American starflower, ground pine, American beech, twisted stalk, and sugar maple

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material  
E—1 to 9 inches; sand  
Bhs—9 to 10 inches; loamy sand  
Bs—10 to 25 inches; sand  
2Cr—25 to 39 inches; weathered bedrock  
2R—39 to 80 inches; unweathered bedrock

**Description of the Tokiahok, Dissected Soil**

**Taxonomic Classification**

Sandy, mixed, frigid Alfic Fragiorthods

**Setting**

*Landform:* Bedrock-controlled moraines  
*Slope range:* 8 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low  
*Parent material:* Sandy outwash over loamy till  
*Restrictive feature(s):* Fragipan at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 3.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sedge, spinulose shield fern, hairy Solomon's seal, Canada mayflower, twisted stalk, starflower, downy yellow violet, and red elderberry

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 11 inches; loamy fine sand  
Bhs—11 to 15 inches; loamy fine sand  
Bs—15 to 24 inches; loamy fine sand  
2B/Ex—24 to 59 inches; sandy loam  
2C—59 to 80 inches; sandy loam

**Description of the Trout Bay, Dissected Soil**

**Taxonomic Classification**

Euic, frigid Lithic Haplosaprists

**Setting**

*Landform:* Drainageways on bedrock-controlled moraines  
*Slope range:* 8 to 25 percent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low  
*Parent material:* Herbaceous organic material and/or woody organic material  
*Restrictive feature(s):* Paralithic bedrock at a depth of 16 to 50 inches; lithic bedrock at a depth of 17 to 51 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* At the soil surface, perched (see table 19)  
*Drainage class:* Very poorly drained  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Spinulose shield fern, gooseberry, sedge, jewelweed, and oakfern

### **Typical Profile**

Oa—0 to 19 inches; muck  
2Cr—19 to 34 inches; weathered bedrock  
2R—34 to 80 inches; unweathered bedrock

## **Minor Components**

### **Au Train soils**

*Percent of map unit:* 3 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 6 to 18 percent  
*Meets hydric soil criteria:* No

### **Frohling soils**

*Percent of map unit:* 3 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 8 to 35 percent  
*Meets hydric soil criteria:* No

### **Gongeau soils**

*Percent of map unit:* 3 percent  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* Yes

### **Abbaye soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* No

**Jeske soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 1 to 10 percent  
*Meets hydric soil criteria:* No

**Munising soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* No

**1455298—Garlic-Blue Lake-Voelker complex, 1 to 12 percent slopes, dissected**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Garlic, dissected and similar soils: 40 percent  
Blue Lake, dissected and similar soils: 30 percent  
Voelker, dissected and similar soils: 20 percent  
Dissimilar minor components: 10 percent

**Description of the Garlic, Dissected Soil**

**Taxonomic Classification**

Sandy, mixed, frigid, ortstein Typic Haplorthods

**Setting**

*Landform:* Dissected disintegration moraines  
*Slope range:* 1 to 12 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, twisted stalk, American starflower, ground pine, yellow beadlily, and bunchberry dogwood

### **Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

## **Description of the Blue Lake, Dissected Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

### **Setting**

*Landform:* Dissected disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, side slope, and crest

*Slope range:* 1 to 12 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy supraglacial till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; sand

Bhs—7 to 9 inches; loamy sand

Bs—9 to 27 inches; loamy sand

E and Bt—27 to 80 inches; loamy sand

**Description of the Voelker, Dissected Soil**

**Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Durorthods

**Setting**

*Landform:* Dissected disintegration moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits over loamy lacustrine deposits

*Restrictive feature(s):* Ortstein at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 1.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Spinulose shield fern, elderberry, Canada mayflower, twisted stalk, starflower, and hairy Solomon's seal

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 5 inches; fine sand

E—5 to 11 inches; fine sand

Bhs—11 to 15 inches; fine sand

Bhsm—15 to 31 inches; fine sand

2E/B—31 to 39 inches; very fine sandy loam and loamy very fine sand

2C—39 to 80 inches; stratified fine sand to loamy very fine sand to silt loam

**Minor Components**

**Fence soils**

*Percent of map unit:* 3 percent

*Landform:* Lake plains

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

**Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

**Munising soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* No

**Paquin soils**

*Percent of map unit:* 2 percent  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**Steuben soils**

*Percent of map unit:* 1 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 1 to 15 percent  
*Meets hydric soil criteria:* No

**1455299—Garlic-Blue Lake-Voelker complex, 8 to 35 percent slopes, dissected**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Garlic, dissected and similar soils: 40 percent  
Blue Lake, dissected and similar soils: 30 percent  
Voelker, dissected and similar soils: 20 percent  
Dissimilar minor components: 10 percent

**Description of the Garlic, Dissected Soil**

**Taxonomic Classification**

Sandy, mixed, frigid, ortstein Typic Haplorthods

**Setting**

*Landform:* Disintegration moraines  
*Slope range:* 8 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* American starflower, sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, and twisted stalk

**Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

**Description of the Blue Lake, Dissected Soil**

**Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

**Setting**

*Landform:* Disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, side slope, and crest

*Slope range:* 8 to 35 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy supraglacial till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum:* Not saline

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; sand

Bhs—7 to 9 inches; loamy sand

Bs—9 to 27 inches; loamy sand

E and Bt—27 to 80 inches; loamy sand

## **Description of the Voelker, Dissected Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Durorthods

### **Setting**

*Landform:* Disintegration moraines

*Slope range:* 8 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy glaciofluvial deposits over loamy lacustrine deposits

*Restrictive feature(s):* Ortstein at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 1.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Spinulose shield fern, elderberry, Canada mayflower, twisted stalk, starflower, and hairy Solomon's seal

### **Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 5 inches; fine sand

E—5 to 11 inches; fine sand

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Bhs—11 to 15 inches; fine sand

Bhsm—15 to 31 inches; fine sand

2E/B—31 to 39 inches; very fine sandy loam and loamy very fine sand

2C—39 to 80 inches; stratified fine sand to loamy very fine sand to silt loam

### Minor Components

#### Fence soils

*Percent of map unit:* 3 percent

*Landform:* Lake plains

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

#### Steuben soils

*Percent of map unit:* 3 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 8 to 35 percent

*Meets hydric soil criteria:* No

#### Alcona soils

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 8 to 35 percent

*Meets hydric soil criteria:* No

#### Deford soils

*Percent of map unit:* 2 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

## 1455300—Garlic-Blue Lake-Voelker complex, 15 to 60 percent slopes, dissected

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 45 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Garlic, dissected and similar soils: 40 percent

Blue Lake, dissected and similar soils: 30 percent

Voelker, dissected and similar soils: 20 percent

Dissimilar minor components: 10 percent

### Description of the Garlic, Dissected Soil

#### Taxonomic Classification

Sandy, mixed, frigid, ortstein Typic Haplorthods

**Setting**

*Landform:* Disintegration moraines

*Slope range:* 15 to 60 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* American starflower, sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, and twisted stalk

**Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

**Description of the Blue Lake, Dissected Soil**

**Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

**Setting**

*Landform:* Disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, side slope, and crest

*Slope range:* 15 to 60 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy supraglacial till

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Restrictive feature(s)*: None within a depth of 60 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Depth to water table*: More than 72 inches  
*Drainage class*: Well drained  
*Shrink-swell potential*: Low (about 0.1 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 0  
*Available water capacity*: Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 7e  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: A

### **Vegetation**

*Existing plants*: Canada mayflower, starflower, sedge, spinulose shield fern, brackenfern, shining clubmoss, sugar maple, ground pine, and twisted stalk

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 7 inches; sand  
Bhs—7 to 9 inches; loamy sand  
Bs—9 to 27 inches; loamy sand  
E and Bt—27 to 80 inches; loamy sand

## **Description of the Voelker, Dissected Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Durorthods

### **Setting**

*Landform*: Disintegration moraines  
*Slope range*: 15 to 60 percent  
*Representative aspect*: North  
*Soil temperature class*: Frigid  
*Soil temperature regime*: Frigid

### **Properties and Qualities**

*Runoff*: Low  
*Parent material*: Sandy glaciofluvial deposits over loamy lacustrine deposits  
*Restrictive feature(s)*: Ortstein at a depth of 10 to 20 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Depth to water table*: More than 72 inches  
*Drainage class*: Well drained  
*Shrink-swell potential*: Low (about 0.5 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 0  
*Available water capacity*: Very low (about 1.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 7e  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: B

**Vegetation**

*Existing plants:* Spinulose shield fern, elderberry, Canada mayflower, twisted stalk, starflower, and hairy Solomon's seal

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 5 inches; fine sand

E—5 to 11 inches; fine sand

Bhs—11 to 15 inches; fine sand

Bhsm—15 to 31 inches; fine sand

2E/B—31 to 39 inches; very fine sandy loam and loamy very fine sand

2C—39 to 80 inches; stratified fine sand to loamy very fine sand to silt loam

**Minor Components**

**Steuben soils**

*Percent of map unit:* 4 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 15 to 60 percent

*Meets hydric soil criteria:* No

**Sporley soils**

*Percent of map unit:* 3 percent

*Representative aspect:* North

*Slope range:* 8 to 35 percent

*Meets hydric soil criteria:* No

**Deford soils**

*Percent of map unit:* 2 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

**Paquin soils**

*Percent of map unit:* 1 percent

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

**1455302—Garlic-Blue Lake-Voelker complex, 6 to 15 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Garlic and similar soils: 40 percent

Blue Lake and similar soils: 30 percent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Voelker and similar soils: 20 percent  
Dissimilar minor components: 10 percent

### Description of the Garlic Soil

#### Taxonomic Classification

Sandy, mixed, frigid, ortstein Typic Haplorthods

#### Setting

*Landform:* Disintegration moraines

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, twisted stalk, American starflower, ground pine, yellow beadlily, and bunchberry dogwood

#### Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

### Description of the Blue Lake Soil

#### Taxonomic Classification

Sandy, mixed, frigid Lamellic Haplorthods

#### Setting

*Landform:* Disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, crest, side slope, rise, and talf

*Slope range:* 6 to 15 percent

*Down-slope shape:* Concave and convex

*Across-slope shape:* Linear and convex

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Sandy supraglacial till  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 7 inches; sand  
Bhs—7 to 9 inches; loamy sand  
Bs—9 to 27 inches; loamy sand  
E and Bt—27 to 80 inches; loamy sand

## **Description of the Voelker Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Durorthods

### **Setting**

*Landform:* Disintegration moraines  
*Slope range:* 6 to 15 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Sandy glaciofluvial deposits over loamy lacustrine deposits  
*Restrictive feature(s):* Ortstein at a depth of 10 to 20 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 1.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Spinulose shield fern, elderberry, Canada mayflower, twisted stalk, starflower, and hairy Solomon's seal

### **Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 5 inches; fine sand

E—5 to 11 inches; fine sand

Bhs—11 to 15 inches; fine sand

Bhsm—15 to 31 inches; fine sand

2E/B—31 to 39 inches; very fine sandy loam and loamy very fine sand

2C—39 to 80 inches; stratified fine sand to loamy very fine sand to silt loam

## **Minor Components**

### **Alcona soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Meets hydric soil criteria:* No

### **McMillan soils**

*Percent of map unit:* 3 percent

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Meets hydric soil criteria:* No

### **Deford soils**

*Percent of map unit:* 2 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

### **Paquin soils**

*Percent of map unit:* 2 percent

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

## **1455304—Cathro-Ensley mucks**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### Map Unit Composition

Cathro and similar soils: 55 percent

Ensley and similar soils: 35 percent

Dissimilar minor components: 10 percent

### Description of the Cathro Soil

#### Taxonomic Classification

Loamy, mixed, euic, frigid Terric Haplosaprists

#### Setting

*Landform:* Ground moraines

*Slope range:* 0 to 1 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Woody organic material over lodgement till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Very poorly drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 20

*Available water capacity:* Very high (about 18.1 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* A/D

#### Vegetation

*Existing plants:* Common ladyfern, naked miterwort, sphagnum moss, woodsorrel, goldthread, bedstraw, rattlesnake fern, American starflower, sedge, spinulose woodfern, and northern dewberry

#### Typical Profile

Oa—0 to 34 inches; muck

C—34 to 80 inches; gravelly fine sandy loam

### Description of the Ensley Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquents

#### Setting

*Landform:* Ground moraines

*Slope range:* 0 to 1 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Lodgement till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 15

*Available water capacity:* Very high (about 13.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* B/D

**Vegetation**

*Existing plants:* Naked miterwort, sedge, horsetail, starflower, bunchberry dogwood, oakfern, spinulose woodfern, American fly honeysuckle, Canada mayflower, bedstraw, small enchanter's nightshade, common ladyfern, sensitive fern, jewelweed, and American red raspberry

**Typical Profile**

Oa—0 to 5 inches; muck

A—5 to 7 inches; mucky loam

Bw—7 to 19 inches; fine sandy loam

2C—19 to 80 inches; gravelly fine sandy loam

**Minor Components**

**Charlevoix soils**

*Percent of map unit:* 4 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

**Nahma soils**

*Percent of map unit:* 2 percent

*Landform:* Depressions on ground moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Shoepac soils**

*Percent of map unit:* 2 percent

*Landform:* Recessional moraines and ground moraines

*Representative aspect:* North

*Slope range:* 1 to 4 percent

*Meets hydric soil criteria:* No

**Trenary soils**

*Percent of map unit:* 2 percent

*Landform:* Ground moraines and recessional moraines

*Representative aspect:* North

*Slope range:* 2 to 6 percent  
*Meets hydric soil criteria:* No

## **1455305—Tawas-Deford mucks**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Tawas and similar soils: 70 percent  
Deford and similar soils: 20 percent  
Dissimilar minor components: 10 percent

### **Description of the Tawas Soil**

#### **Taxonomic Classification**

Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists

#### **Setting**

*Landform:* Drainageways on moraines, depressions on moraines, depressions on outwash plains, and drainageways on outwash plains  
*Slope range:* 0 to 1 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Negligible  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very high (about 14.7 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* A/D

#### **Vegetation**

*Existing plants:* Goldthread, spinulose woodfern, horsetail, twinflower, Canada mayflower, naked miterwort, sensitive fern, cinnamon fern, royal fern, woodsorrel, northern dewberry, sphagnum moss, and American starflower

#### **Typical Profile**

Oa—0 to 26 inches; muck  
C—26 to 80 inches; sand

### Description of the Deford Soil

#### Taxonomic Classification

Mixed, frigid Typic Psammaquents

#### Setting

*Landform:* Drainageways on outwash plains, depressions on moraines, depressions on outwash plains, and drainageways on moraines

*Slope range:* 0 to 1 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* A/D

#### Vegetation

*Existing plants:* Sedge, bunchberry dogwood, goldthread, eastern teaberry, Canada mayflower, western brackenfern, American starflower, oakfern, long beech fern, and shining clubmoss

#### Typical Profile

Oa—0 to 4 inches; muck

C—4 to 80 inches; fine sand

### Minor Components

#### Au Gres soils

*Percent of map unit:* 5 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

#### Halfaday soils

*Percent of map unit:* 3 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

#### Kalkaska soils

*Percent of map unit:* 2 percent

*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Meets hydric soil criteria:* No

## **1455308—Fence very fine sandy loam, 1 to 12 percent slopes, dissected**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 590 to 1,965 feet  
*Mean annual precipitation:* 30 to 40 inches  
*Mean annual air temperature:* 37 to 43 degrees F  
*Frost-free period:* 80 to 140 days

### **Map Unit Composition**

Fence, dissected and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### **Description of the Fence, Dissected Soil**

#### **Taxonomic Classification**

Coarse-silty, mixed, superactive, frigid Alfic Oxyaquic Haplorthods

#### **Setting**

*Landform:* Lake plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope  
*Landform position (three-dimensional):* Interfluve, side slope, and base slope  
*Slope range:* 1 to 12 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid  
*Soil moisture class:* Udic

#### **Properties and Qualities**

*Runoff:* Medium  
*Parent material:* Stratified loamy glaciolacustrine deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 18 inches (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very high (about 14.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Ladyfern, rattlesnake fern, sedge, spinulose woodfern, bedstraw, hairy Solomon's seal, elderberry, false Solomon's seal, twisted stalk, Canada mayflower, and violet

**Typical Profile**

A—0 to 3 inches; very fine sandy loam

E—3 to 7 inches; very fine sandy loam

Bhs—7 to 11 inches; very fine sandy loam

Bs—11 to 19 inches; very fine sandy loam

B/E—19 to 42 inches; silt loam

2C—42 to 80 inches; stratified very fine sand to loamy very fine sand to very fine sandy loam to silty clay loam to silt loam

**Minor Components**

**Shag soils**

*Percent of map unit:* 4 percent

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Sporley, dissected soils**

*Percent of map unit:* 4 percent

*Landform:* Lake plains

*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Geomorphic position (three-dimensional):* Interfluve, side slope, and base slope

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Meets hydric soil criteria:* No

**Spear soils**

*Percent of map unit:* 2 percent

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

**1455310—Rousseau-Dawson complex, 0 to 15 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Rousseau and similar soils: 50 percent

Dawson and similar soils: 45 percent

Dissimilar minor components: 5 percent

### Description of the Rousseau Soil

#### Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

#### Setting

*Landform:* Beach ridges

*Slope range:* 2 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Eolian deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Clubmoss, wintergreen, lowbush blueberry, and western brackenfern

#### Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; fine sand

Bs—4 to 20 inches; fine sand

BC—20 to 33 inches; fine sand

C1—33 to 66 inches; fine sand

C2—66 to 80 inches; sand

### Description of the Dawson Soil

#### Taxonomic Classification

Sandy or sandy-skeletal, mixed, dysic, frigid Terric Haplosaprists

#### Setting

*Landform:* Swales

*Slope range:* 0 to 1 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Herbaceous organic material over sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Very poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very high (about 21.1 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 8w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Sedge, Bog Labrador tea, leatherleaf, sphagnum moss, goldthread, bog rosemary, blueberry, and cottongrass

### **Typical Profile**

Oi—0 to 10 inches; peat  
Oa1—10 to 19 inches; mucky peat  
Oa2—19 to 38 inches; muck  
C—38 to 80 inches; fine sand

### **Minor Components**

#### **Au Gres soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

## **1455318—Munising, calcareous substratum-Ensley complex, 0 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Munising, calcareous substratum and similar soils: 65 percent  
Ensley and similar soils: 25 percent  
Dissimilar minor components: 10 percent

### **Description of the Munising, Calcareous Substratum Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

**Setting**

*Landform:* Ground moraines  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Eolian deposits over lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Low (about 3.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Oakfern, interrupted fern, sugar maple, sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, and Canada yew

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material  
E—1 to 3 inches; fine sandy loam  
Bhs—3 to 6 inches; fine sandy loam  
Bs—6 to 23 inches; fine sandy loam  
2E/Bx—23 to 38 inches; fine sandy loam and loamy sand  
2B/Ex—38 to 50 inches; loamy sand and fine sandy loam  
2BC—50 to 63 inches; gravelly fine sandy loam  
2C—63 to 80 inches; gravelly fine sandy loam

**Description of the Ensley Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquents

**Setting**

*Landform:* Ground moraines  
*Slope range:* 0 to 1 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Lodgement till  
*Restrictive feature(s):* None within a depth of 60 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 15  
*Available water capacity:* Very high (about 13.4 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* B/D

### **Vegetation**

*Existing plants:* Naked miterwort, sedge, horsetail, starflower, bunchberry dogwood, oakfern, spinulose woodfern, American fly honeysuckle, Canada mayflower, bedstraw, small enchanter's nightshade, common ladyfern, sensitive fern, jewelweed, and American red raspberry

### **Typical Profile**

Oa—0 to 5 inches; muck  
A—5 to 7 inches; mucky loam  
Bw—7 to 19 inches; fine sandy loam  
2C—19 to 80 inches; gravelly fine sandy loam

## **Minor Components**

### **Frohling, calcareous substratum soils**

*Percent of map unit:* 4 percent  
*Representative aspect:* North  
*Slope range:* 4 to 6 percent  
*Meets hydric soil criteria:* No

### **Charlevoix soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

### **Escanaba soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

### **Steuben soils**

*Percent of map unit:* 2 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

## 1455319—Munising-Yalmer complex, 1 to 12 percent slopes, dissected, very stony

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 590 to 1,965 feet

*Mean annual precipitation:* 30 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 140 days

### Map Unit Composition

Munising, dissected, very stony and similar soils: 50 percent

Yalmer, dissected, very stony and similar soils: 35 percent

Dissimilar minor components: 15 percent

### Description of the Munising, Dissected, Very Stony Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

#### Setting

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

*Soil moisture class:* Udic

#### Properties and Qualities

*Runoff:* Medium

*Parent material:* Loamy lodgement till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, partridgeberry, false Solomon's seal, honeysuckle, and sugar maple

#### Typical Profile

Oe—0 to 1 inch; highly decomposed plant material

A—1 to 2 inches; fine sandy loam

E—2 to 10 inches; loamy sand

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Bhs—10 to 14 inches; fine sandy loam  
Bs—14 to 22 inches; fine sandy loam  
B/Ex—22 to 49 inches; sandy loam  
Bt—49 to 63 inches; fine sandy loam  
C—63 to 80 inches; fine sandy loam

### Description of the Yalmer, Dissected, Very Stony Soil

#### Taxonomic Classification

Sandy, mixed, frigid Alfic Oxyaquic Fragiorthods

#### Setting

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Sandy outwash over loamy till

*Restrictive feature(s):* Fragipan at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Spinulose shield fern, shining clubmoss, Canada mayflower, twisted stalk, starflower, violet, American beech, and sugar maple

#### Typical Profile

Oe—0 to 1 inch; highly decomposed plant material

A—1 to 3 inches; loamy sand

E—3 to 8 inches; loamy sand

Bhs—8 to 11 inches; sand

Bs—11 to 24 inches; fine sand

2E/Bx—24 to 40 inches; fine sandy loam and loamy fine sand

2Bt—40 to 66 inches; fine sandy loam

2C—66 to 80 inches; fine sandy loam

#### Minor Components

#### Frohling soils

*Percent of map unit:* 6 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 8 to 18 percent

*Meets hydric soil criteria:* No

**Gay soils**

*Percent of map unit:* 3 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

**Abbaye soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* No

**Paavola soils**

*Percent of map unit:* 2 percent  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Meets hydric soil criteria:* No

**Skanee soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**1455320—Munising-Skanee complex, 0 to 6 percent slopes, stony**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 590 to 1,965 feet  
*Mean annual precipitation:* 30 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 140 days

**Map Unit Composition**

Munising, stony and similar soils: 60 percent  
Skanee, stony and similar soils: 30 percent  
Dissimilar minor components: 10 percent

**Description of the Munising, Stony Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

**Setting**

*Landform:* Bedrock-controlled moraines  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid  
*Soil moisture class:* Udic

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Loamy lodgement till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, partridgeberry, false Solomon's seal, honeysuckle, and sugar maple

**Typical Profile**

Oe—0 to 1 inch; highly decomposed plant material

A—1 to 2 inches; sandy loam

E—2 to 10 inches; loamy sand

Bhs—10 to 14 inches; fine sandy loam

Bs—14 to 22 inches; fine sandy loam

B/Ex—22 to 49 inches; sandy loam

Bt—49 to 63 inches; fine sandy loam

C—63 to 80 inches; fine sandy loam

**Description of the Skanee, Stony Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Argic Fragiaquods

**Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 0 to 3 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Loamy till

*Restrictive feature(s):* Fragipan at a depth of 12 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 6 inches, perched (see table 19)

*Drainage class:* Somewhat poorly drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* C

### **Vegetation**

*Existing plants:* Sedge, spinulose shield fern, shining clubmoss, yellow beadlily, Canada mayflower, wild sarsaparilla, bunchberry dogwood, eastern teaberry, hairy Solomon's seal, woodsorrel, starflower, and goldthread

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 8 inches; fine sandy loam  
Bhs—8 to 14 inches; fine sandy loam  
E/Bx—14 to 31 inches; fine sandy loam  
Bt—31 to 42 inches; sandy clay loam  
C—42 to 80 inches; sandy loam

### **Minor Components**

#### **Frohling soils**

*Percent of map unit:* 5 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 8 to 18 percent  
*Meets hydric soil criteria:* No

#### **Gay soils**

*Percent of map unit:* 3 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

#### **Abbaye soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

## **1455324—Zeba-Jacobsville complex, 0 to 3 percent slopes, very stony**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 590 to 1,965 feet  
*Mean annual precipitation:* 30 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 140 days

### Map Unit Composition

Zeba, very stony and similar soils: 55 percent  
Jacobsville, very stony and similar soils: 30 percent  
Dissimilar minor components: 13 percent

### Description of the Zeba, Very Stony Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Argic Endoaquods

#### Setting

*Landform*: Flats on bedrock-controlled moraines

*Slope range*: 0 to 3 percent

*Representative aspect*: North

*Soil temperature class*: Frigid

*Soil temperature regime*: Frigid

#### Properties and Qualities

*Runoff*: Very low

*Parent material*: Loamy lodgment till

*Restrictive feature(s)*: Lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding*: None

*Frequency of ponding*: None

*Water table (depth, kind)*: About 6 inches, perched (see table 19)

*Drainage class*: Somewhat poorly drained

*Shrink-swell potential*: Low (about 0.5 LEP)

*Salinity maximum*: Not saline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent (maximum weight percentage)*: 0

*Available water capacity*: Low (about 4.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 3s

*Meets hydric soil criteria*: No

*Hydrologic soil group*: C

#### Vegetation

*Existing plants*: Hairgrass, sedge, yellow beadlily, bunchberry dogwood, wild sarsaparilla, Canada mayflower, woodsorrel, eastern teaberry, shining clubmoss, and brackenfern

#### Typical Profile

A—0 to 2 inches; cobbly fine sandy loam

E—2 to 5 inches; cobbly fine sandy loam

Bs—5 to 13 inches; cobbly fine sandy loam

B/E—13 to 33 inches; sandy loam

2R—33 to 80 inches; unweathered bedrock

### Description of the Jacobsville, Very Stony Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquepts

#### Setting

*Landform*: Depressions on bedrock-controlled moraines

*Slope range*: 0 to 1 percent

*Representative aspect*: North

*Soil temperature class*: Frigid

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Soil temperature regime:* Frigid

*Soil moisture class:* Aquic

### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Loamy lodgment till

*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 39 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.1 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Sphagnum moss, woodsorrel, Canada mayflower, horsetail, goldthread, bunchberry dogwood, yellow beadlily, sedge, snowberry, speckled alder, willow, and northern dewberry

### **Typical Profile**

Oa—0 to 5 inches; muck

Eg—5 to 9 inches; sandy loam

Bw—9 to 23 inches; sandy loam

C—23 to 36 inches; sandy loam

2R—36 to 80 inches; unweathered bedrock

## **Minor Components**

### **Chocolay soils**

*Percent of map unit:* 3 percent

*Landform:* Bedrock benches

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

### **Skandia soils**

*Percent of map unit:* 3 percent

*Landform:* Drainageways on bedrock-controlled moraines and depressions on bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

### **Skanee soils**

*Percent of map unit:* 3 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

**Gay soils**

*Percent of map unit:* 2 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Paavola soils**

*Percent of map unit:* 2 percent

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Meets hydric soil criteria:* No

**1455326—Munising-Abbaye fine sandy loams, 1 to 12 percent slopes, dissected, stony**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 590 to 1,965 feet

*Mean annual precipitation:* 30 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 140 days

**Map Unit Composition**

Munising, dissected, stony and similar soils: 50 percent

Abbaye, dissected, stony and similar soils: 35 percent

Dissimilar minor components: 15 percent

**Description of the Munising, Dissected, Stony Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

**Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

*Soil moisture class:* Udic

**Properties and Qualities**

*Runoff:* Medium

*Parent material:* Loamy lodgement till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, partridgeberry, false Solomon's seal, honeysuckle, and sugar maple

**Typical Profile**

Oe—0 to 1 inch; highly decomposed plant material

A—1 to 2 inches; fine sandy loam

E—2 to 10 inches; loamy sand

Bhs—10 to 14 inches; fine sandy loam

Bs—14 to 22 inches; fine sandy loam

B/Ex—22 to 49 inches; sandy loam

Bt—49 to 63 inches; fine sandy loam

C—63 to 80 inches; fine sandy loam

**Description of the Abbaye, Dissected, Stony Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods

**Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Medium

*Parent material:* Lodgement till

*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Spinulose shield fern, Canada mayflower, partridgeberry, red elderberry, hairy Solomon's seal, starflower, violet, and sugar maple

**Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 4 inches; fine sandy loam

E—4 to 13 inches; loamy sand  
Bs—13 to 25 inches; sandy loam  
B/E—25 to 32 inches; sandy loam and loamy sand  
2R—32 to 80 inches; unweathered bedrock

#### Minor Components

##### Frohling soils

*Percent of map unit:* 5 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 8 to 18 percent  
*Meets hydric soil criteria:* No

##### Jacobsville soils

*Percent of map unit:* 3 percent  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

##### Zeba soils

*Percent of map unit:* 3 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

##### Skanee soils

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

##### Yalmer soils

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* No

## 1455327—Paquin-Finch sands, 0 to 6 percent slopes

#### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

#### Map Unit Composition

Paquin and similar soils: 55 percent  
Finch and similar soils: 45 percent

### Description of the Paquin Soil

#### Taxonomic Classification

Sandy, isotic, frigid, shallow, ortstein Typic Durorthods

#### Setting

*Landform position (three-dimensional):* Rise

*Slope range:* 0 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* Ortstein at a depth of 10 to 16 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* About 24 inches (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 1.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Spinulose woodfern, wild sarsaparilla, red maple, red elderberry, goldthread, shining clubmoss, Canada beadruby, bunchberry dogwood, American starflower, and partridgeberry

#### Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 12 inches; sand

Bhs—12 to 14 inches; sand

Bhsm—14 to 17 inches; sand

Bsm—17 to 27 inches; sand

BC—27 to 34 inches; sand

C—34 to 80 inches; sand

### Description of the Finch Soil

#### Taxonomic Classification

Sandy, mixed, frigid, shallow, ortstein Typic Duraquods

#### Setting

*Landform:* Outwash plains

*Landform position (three-dimensional):* Rise

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Outwash  
*Restrictive feature(s):* Ortstein at a depth of 7 to 13 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 1.4 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* C

### **Vegetation**

*Existing plants:* Wild sarsaparilla, sedge, yellow beadlily, bunchberry dogwood, goldthread, eastern teaberry, shining clubmoss, Canada mayflower, blueberry, woodsorrel, brackenfern, and American starflower

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
E—1 to 11 inches; sand  
Bsm—11 to 42 inches; sand  
C—42 to 80 inches; fine sand

## **1455339—Croswell-Kinross complex, 0 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Croswell and similar soils: 50 percent  
Kinross and similar soils: 40 percent  
Dissimilar minor components: 10 percent

### **Description of the Croswell Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid Oxyaquic Haplorthods

#### **Setting**

*Landform:* Beach ridges

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Slope range:* 0 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Beach sand and/or sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 24 inches (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.8 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Starflower, trailing arbutus, twinflower, eastern teaberry, pin cherry, brackenfern, blueberry, cowwheat, serviceberry, beaked hazelnut, and sweet fern

### **Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material  
E—2 to 6 inches; sand  
Bs—6 to 15 inches; sand  
BC—15 to 22 inches; sand  
C—22 to 80 inches; sand

## **Description of the Kinross Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid Typic Endoaquods

### **Setting**

*Landform:* Swales  
*Landform position (two-dimensional):* Footslope and toeslope  
*Landform position (three-dimensional):* Talf  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Depth to water table:* At the soil surface  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* A/D

### **Vegetation**

*Existing plants:* Goldthread, black spruce, blueberry, speckled alder, sedge, leatherleaf, and bunchberry dogwood

### **Typical Profile**

Oa—0 to 3 inches; muck  
Eg—3 to 14 inches; sand  
Bhs—14 to 22 inches; sand  
Bs—22 to 35 inches; sand  
C—35 to 80 inches; sand

## **Minor Components**

### **Greenwood soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Dip  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

### **Deer Park soils**

*Percent of map unit:* 4 percent  
*Landform:* Beach ridges  
*Geomorphic position (two-dimensional):* Summit, shoulder, and backslope  
*Geomorphic position (three-dimensional):* Side slope, nose slope, head slope, interfluvial, crest, and base slope  
*Representative aspect:* North  
*Slope range:* 0 to 10 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Meets hydric soil criteria:* No

### **Au Gres soils**

*Percent of map unit:* 1 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

## **1455340—Frohling-Tokiahok complex, 8 to 35 percent slopes, dissected, stony**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Frohling, dissected, stony and similar soils: 60 percent

Tokiahok, dissected, stony and similar soils: 30 percent

Dissimilar minor components: 10 percent

### **Description of the Frohling, Dissected, Stony Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Fragiorthods

#### **Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 8 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Medium

*Parent material:* Loamy till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### **Vegetation**

*Existing plants:* Sedge, spinulose shield fern, Canada mayflower, shining clubmoss, twisted stalk, starflower, and sugar maple

#### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; fine sandy loam

E—2 to 7 inches; fine sandy loam

Bhs—7 to 9 inches; fine sandy loam

Bs—9 to 16 inches; fine sandy loam

E/Bx—16 to 34 inches; loamy fine sand

B/Ex—34 to 80 inches; fine sandy loam

### **Description of the Tokiahok, Dissected, Stony Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid Alfic Fragiorthods

#### **Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 8 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy outwash over loamy till

*Restrictive feature(s):* Fragipan at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 3.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### **Vegetation**

*Existing plants:* Sedge, spinulose shield fern, hairy Solomon's seal, Canada mayflower, twisted stalk, starflower, downy yellow violet, red elderberry, and sugar maple

#### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 11 inches; loamy fine sand

Bhs—11 to 15 inches; loamy fine sand

Bs—15 to 24 inches; loamy fine sand

2B/Ex—24 to 59 inches; sandy loam

2C—59 to 80 inches; sandy loam

### **Minor Components**

#### **Munising soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

#### **Abbaye soils**

*Percent of map unit:* 2 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

**Gay soils**

*Percent of map unit:* 2 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Kalkaska soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 15 to 35 percent

*Meets hydric soil criteria:* No

**Garlic, dissected soils**

*Percent of map unit:* 1 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 8 to 35 percent

*Meets hydric soil criteria:* No

**1455341—McMaster cobbly sandy loam, 0 to 4 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

**Map Unit Composition**

McMaster and similar soils: 90 percent

Dissimilar minor components: 10 percent

**Description of the McMaster Soil**

**Taxonomic Classification**

Sandy-skeletal, mixed, frigid Oxyaquic Haplorthods

**Setting**

*Landform:* Nearly level recessional moraines

*Slope range:* 0 to 4 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Loamy drift over calcareous gravelly outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Depth to water table:* About 24 inches (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 13  
*Available water capacity:* Low (about 3.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Rattlesnake fern, sugar maple, bloodroot, sweet cicely, leatherwood, spinulose woodfern, and Canada mayflower

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
A—2 to 4 inches; cobbly sandy loam  
E—4 to 8 inches; cobbly loamy sand  
Bhs—8 to 11 inches; cobbly sandy loam  
2Bs—11 to 24 inches; very gravelly loamy sand  
2BC—24 to 39 inches; very gravelly coarse sand  
2C—39 to 80 inches; extremely gravelly coarse sand

## **Minor Components**

### **Traunik soils**

*Percent of map unit:* 7 percent  
*Landform:* Recessional moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

### **Davies soils**

*Percent of map unit:* 2 percent  
*Landform:* Kame terraces in glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

### **Halfaday soils**

*Percent of map unit:* 1 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

## **1455344—Reade silt loam, 0 to 4 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Reade and similar soils: 85 percent  
Dissimilar minor components: 15 percent

### Description of the Reade Soil

#### Taxonomic Classification

Coarse-loamy, mixed, superactive, frigid Aqualfic Haplorthods

#### Setting

*Landform:* Ground moraines  
*Slope range:* 0 to 4 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low  
*Parent material:* Loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.3 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Hairy Solomon's seal, sedge, rattlesnake fern, twisted stalk, trillium, and sweet cicely

#### Typical Profile

Oa—0 to 4 inches; highly decomposed plant material  
E—4 to 7 inches; silt loam  
Bhs—7 to 9 inches; loam  
Bs—9 to 15 inches; fine sandy loam  
2B/E—15 to 20 inches; fine sandy loam  
2BC—20 to 28 inches; gravelly fine sandy loam  
3R—28 to 80 inches; unweathered bedrock

### Minor Components

#### Cookson soils

*Percent of map unit:* 4 percent  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

**Shoepac soils**

*Percent of map unit:* 4 percent

*Landform:* Recessional moraines and ground moraines

*Representative aspect:* North

*Slope range:* 1 to 4 percent

*Meets hydric soil criteria:* No

**Nahma soils**

*Percent of map unit:* 3 percent

*Landform:* Depressions on ground moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Kiva soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

**Summerville soils**

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

**1455353—Charlevoix-Ensley complex, 0 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Charlevoix and similar soils: 55 percent

Ensley and similar soils: 30 percent

Dissimilar minor components: 15 percent

**Description of the Charlevoix Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, semiactive, frigid Argic Endoaquods

**Setting**

*Landform:* Ground moraines

*Landform position (three-dimensional):* Rise

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Eolian deposits over lodgement till  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 15  
*Available water capacity:* Very high (about 13.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* C

### **Vegetation**

*Existing plants:* Bunchberry dogwood, goldthread, woodsorrel, spinulose woodfern, shining clubmoss, Canada mayflower, starflower, yellow beadlelily, American fly honeysuckle, twisted stalk, sedge, and sphagnum moss

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 5 inches; silt loam  
Bhs—5 to 7 inches; silt loam  
Bs—7 to 12 inches; silt loam  
2E/B—12 to 16 inches; fine sandy loam and loamy fine sand  
2B/E—16 to 27 inches; cobbly loamy fine sand and cobbly fine sandy loam  
2C—27 to 80 inches; cobbly fine sandy loam

## **Description of the Ensley Soil**

### **Taxonomic Classification**

Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquents

### **Setting**

*Landform:* Ground moraines  
*Landform position (three-dimensional):* Talf  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Lodgement till  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Depth to water table:* At the soil surface  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 15  
*Available water capacity:* Very high (about 13.4 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* B/D

### **Vegetation**

*Existing plants:* Naked miterwort, sedge, horsetail, starflower, bunchberry dogwood, oakfern, spinulose woodfern, American fly honeysuckle, Canada mayflower, bedstraw, small enchanter's nightshade, common ladyfern, sensitive fern, jewelweed, and American red raspberry

### **Typical Profile**

Oa—0 to 5 inches; muck  
A—5 to 7 inches; mucky loam  
Bw—7 to 19 inches; fine sandy loam  
2C—19 to 80 inches; gravelly fine sandy loam

## **Minor Components**

### **Cathro soils**

*Percent of map unit:* 5 percent  
*Landform:* Ground moraines  
*Geomorphic position (three-dimensional):* Dip  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

### **Shoepac soils**

*Percent of map unit:* 5 percent  
*Landform:* Recessional moraines and ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 4 percent  
*Meets hydric soil criteria:* No

### **Trenary soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 2 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

### **Traunik soils**

*Percent of map unit:* 2 percent  
*Landform:* Recessional moraines  
*Representative aspect:* North

*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

## **1455359—Munising-Abbaye fine sandy loams, 1 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 590 to 1,965 feet  
*Mean annual precipitation:* 30 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 140 days

### **Map Unit Composition**

Munising and similar soils: 55 percent  
Abbaye and similar soils: 35 percent  
Dissimilar minor components: 10 percent

### **Description of the Munising Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

#### **Setting**

*Landform:* Bedrock-controlled moraines  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid  
*Soil moisture class:* Udic

#### **Properties and Qualities**

*Runoff:* Low  
*Parent material:* Loamy lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

#### **Vegetation**

*Existing plants:* Sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, partridgeberry, false Solomon's seal, and honeysuckle

### **Typical Profile**

Oe—0 to 1 inch; highly decomposed plant material  
A—1 to 2 inches; fine sandy loam  
E—2 to 10 inches; loamy sand  
Bhs—10 to 14 inches; fine sandy loam  
Bs—14 to 22 inches; fine sandy loam  
B/Ex—22 to 49 inches; sandy loam  
Bt—49 to 63 inches; fine sandy loam  
C—63 to 80 inches; fine sandy loam

### **Description of the Abbaye Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods

#### **Setting**

*Landform:* Bedrock-controlled ground moraines

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Lodgement till

*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### **Vegetation**

*Existing plants:* Spinulose shield fern, Canada mayflower, partridgeberry, red elderberry, hairy Solomon's seal, starflower, violet, and sugar maple

### **Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material  
A—2 to 4 inches; fine sandy loam  
E—4 to 13 inches; loamy sand  
Bs—13 to 25 inches; sandy loam  
B/E—25 to 32 inches; sandy loam and loamy sand  
2R—32 to 80 inches; unweathered bedrock

### **Minor Components**

#### **Jacobsville soils**

*Percent of map unit:* 3 percent

*Representative aspect:* North

*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

**Skaneec soils**

*Percent of map unit:* 3 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**Frohling soils**

*Percent of map unit:* 2 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 8 to 18 percent  
*Meets hydric soil criteria:* No

**Zeba soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

## **1455360—Kalkaska-Blue Lake complex, 1 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Kalkaska and similar soils: 60 percent  
Blue Lake and similar soils: 30 percent  
Dissimilar minor components: 10 percent

### **Description of the Kalkaska Soil**

#### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

#### **Setting**

*Landform:* Outwash plains  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Description of the Blue Lake Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

### **Setting**

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope  
*Landform position (three-dimensional):* Base slope, side slope, and crest  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3s

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; sand

Bhs—7 to 9 inches; loamy sand

Bs—9 to 27 inches; loamy sand

E and Bt—27 to 80 inches; loamy sand

### **Minor Components**

#### **Dillingham soils**

*Percent of map unit:* 6 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

#### **Halfaday soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

#### **Steuben soils**

*Percent of map unit:* 2 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

## **1455361—Kalkaska-Blue Lake complex, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Kalkaska and similar soils: 55 percent

Blue Lake and similar soils: 35 percent

Dissimilar minor components: 10 percent

### **Description of the Kalkaska Soil**

#### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Outwash plains  
*Slope range:* 6 to 15 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

**Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

**Description of the Blue Lake Soil**

**Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

**Setting**

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope  
*Landform position (three-dimensional):* Base slope, side slope, and crest  
*Slope range:* 6 to 15 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 7 inches; sand  
Bhs—7 to 9 inches; loamy sand  
Bs—9 to 27 inches; loamy sand  
E and Bt—27 to 80 inches; loamy sand

## **Minor Components**

### **Dillingham soils**

*Percent of map unit:* 6 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Meets hydric soil criteria:* No

### **Halfaday soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

### **Steuben soils**

*Percent of map unit:* 2 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Meets hydric soil criteria:* No

## **1455362—Kalkaska-Blue Lake complex, 15 to 35 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Kalkaska and similar soils: 55 percent

Blue Lake and similar soils: 35 percent

Dissimilar minor components: 10 percent

### Description of the Kalkaska Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Outwash plains

*Slope range:* 15 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

#### Typical Profile

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

### Description of the Blue Lake Soil

#### Taxonomic Classification

Sandy, mixed, frigid Lamellic Haplorthods

#### Setting

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, side slope, and crest

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Slope range:* 15 to 35 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 7 inches; sand  
Bhs—7 to 9 inches; loamy sand  
Bs—9 to 27 inches; loamy sand  
E and Bt—27 to 80 inches; loamy sand

### **Minor Components**

#### **Dillingham soils**

*Percent of map unit:* 5 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 15 to 35 percent  
*Meets hydric soil criteria:* No

#### **Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

#### **Steuben soils**

*Percent of map unit:* 2 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 15 to 35 percent  
*Meets hydric soil criteria:* No

**Tawas soils**

*Percent of map unit:* 1 percent

*Landform:* Drainageways on moraines, depressions on moraines, depressions on outwash plains, drainageways on outwash plains

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**1455363—Jeske-Au Train-Gongeau complex, 0 to 8 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Jeske and similar soils: 40 percent

Au Train and similar soils: 30 percent

Gongeau and similar soils: 20 percent

Dissimilar minor components: 10 percent

**Description of the Jeske Soil**

**Taxonomic Classification**

Siliceous, acid, frigid, shallow Typic Psammaquents

**Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 0 to 2 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits and/or sandy residuum

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 23 inches; lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Somewhat poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Spinulose shield fern, Canada mayflower, American starflower, shining clubmoss, goldthread, sphagnum moss, sedge, yellow beadlily, ground pine, and woodsorrel

### **Typical Profile**

Oa—0 to 3 inches; highly decomposed plant material

C—3 to 21 inches; sand

2Cr—21 to 31 inches; weathered bedrock

2R—31 to 80 inches; unweathered bedrock

## **Description of the Au Train Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid, shallow Oxyaquic Haplorthods

### **Setting**

*Landform:* Bedrock-controlled moraines

*Slope range:* 1 to 8 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits and/or sandy residuum

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 1.8 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Starflower, partridgeberry, Canada mayflower, ground pine, shining clubmoss, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 9 inches; coarse sand

Bhs—9 to 14 inches; coarse sand

2Cr—14 to 32 inches; weathered bedrock

2R—32 to 80 inches; unweathered bedrock

### Description of the Gongeau Soil

#### Taxonomic Classification

Siliceous, acid, frigid, shallow Typic Psammaquents

#### Setting

*Landform:* Drainageways in depressions on bedrock-controlled moraines

*Slope range:* 0 to 1 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

#### Vegetation

*Existing plants:* Bunchberry dogwood, sphagnum moss, shining clubmoss, spinulose shield fern, woodsorrel, goldthread, hairy Solomon's seal, Canada mayflower, sedge, and American starflower

#### Typical Profile

Oa—0 to 5 inches; muck

A—5 to 7 inches; mucky loamy sand

C—7 to 18 inches; sand

2Cr—18 to 29 inches; weathered bedrock

2R—29 to 80 inches; unweathered bedrock

### Minor Components

#### Deerton soils

*Percent of map unit:* 8 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 4 to 15 percent

*Meets hydric soil criteria:* No

#### Trout Bay soils

*Percent of map unit:* 2 percent

*Landform:* Drainageways in depressions in glacial drainage channels

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* Yes

## 1455365—Cusino loamy sand, 1 to 6 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Cusino and similar soils: 95 percent

Dissimilar minor components: 5 percent

### Description of the Cusino Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Kame terraces

*Landform position (three-dimensional):* Rise

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Sandy and gravelly outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.8 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sedge, twisted stalk, starflower, shining clubmoss, honeysuckle, spinulose shield fern, trout lily, and wild lily of the valley

#### Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 8 inches; loamy sand

Bhs—8 to 10 inches; loamy sand

Bs—10 to 17 inches; sand  
C—17 to 80 inches; stratified gravelly sand to sand

#### Minor Components

##### Waiska soils

*Percent of map unit:* 5 percent  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

## 1455366—Cusino loamy sand, 6 to 15 percent slopes

#### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

#### Map Unit Composition

Cusino and similar soils: 95 percent  
Dissimilar minor components: 5 percent

#### Description of the Cusino Soil

##### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

##### Setting

*Landform:* Kame terraces  
*Slope range:* 6 to 15 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

##### Properties and Qualities

*Runoff:* Very low  
*Parent material:* Sandy and gravelly outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.8 inches)

##### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sedge, twisted stalk, starflower, shining clubmoss, honeysuckle, spinulose shield fern, trout lily, and wild lily of the valley

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 8 inches; loamy sand

Bhs—8 to 10 inches; loamy sand

Bs—10 to 17 inches; sand

C—17 to 80 inches; stratified gravelly sand to sand

**Minor Components**

**Waiska soils**

*Percent of map unit:* 5 percent

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Meets hydric soil criteria:* No

**1455367—Kalkaska-Cusino complex, 1 to 6 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Kalkaska and similar soils: 50 percent

Cusino and similar soils: 45 percent

Dissimilar minor components: 5 percent

**Description of the Kalkaska Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Kame terraces, outwash plains, and disintegration moraines

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Description of the Cusino Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

### **Setting**

*Landform:* Kame terraces, outwash plains, and disintegration moraines  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy and gravelly outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.8 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 8 inches; loamy sand  
Bhs—8 to 10 inches; loamy sand  
Bs—10 to 17 inches; sand  
C—17 to 80 inches; stratified gravelly sand to sand

#### Minor Components

##### Waiska soils

*Percent of map unit:* 5 percent  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Meets hydric soil criteria:* No

## 1455368—Kalkaska-Cusino complex, 6 to 15 percent slopes

#### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

#### Map Unit Composition

Kalkaska and similar soils: 50 percent  
Cusino and similar soils: 45 percent  
Dissimilar minor components: 5 percent

#### Description of the Kalkaska Soil

##### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

##### Setting

*Landform:* Kame terraces, outwash plains, and disintegration moraines  
*Slope range:* 6 to 15 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

##### Properties and Qualities

*Runoff:* Very low  
*Parent material:* Sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

**Typical Profile**

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

**Description of the Cusino Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Kame terraces

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy and gravelly outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.8 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sedge, twisted stalk, starflower, shining clubmoss, American fly honeysuckle, spinulose shield fern, trout lily, and wild lily of the valley

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 8 inches; loamy sand

Bhs—8 to 10 inches; loamy sand

Bs—10 to 17 inches; sand

C—17 to 80 inches; stratified gravelly sand to sand

### Minor Components

#### Waiska soils

*Percent of map unit:* 5 percent  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Meets hydric soil criteria:* No

## 1455369—Kalkaska-Cusino complex, 15 to 35 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 4 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### Map Unit Composition

Kalkaska and similar soils: 50 percent  
Cusino and similar soils: 40 percent  
Dissimilar minor components: 10 percent

### Description of the Kalkaska Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Kame terraces, outwash plains, and disintegration moraines  
*Slope range:* 15 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low  
*Parent material:* Sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

**Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

**Description of the Cusino Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Kame terraces, outwash plains, and disintegration moraines  
*Slope range:* 15 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low  
*Parent material:* Sandy and gravelly outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.8 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sedge, twisted stalk, starflower, shining clubmoss, spinulose shield fern, trout lily, wild lily of the valley, and American fly honeysuckle

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 8 inches; loamy sand  
Bhs—8 to 10 inches; loamy sand  
Bs—10 to 17 inches; sand  
C—17 to 80 inches; stratified gravelly sand to sand

**Minor Components**

**Waiska soils**

*Percent of map unit:* 5 percent  
*Representative aspect:* North

*Slope range:* 15 to 35 percent

*Meets hydric soil criteria:* No

**Deford soils**

*Percent of map unit:* 2 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

**Wallace soils**

*Percent of map unit:* 2 percent

*Landform:* Beach ridges

*Representative aspect:* North

*Slope range:* 15 to 35 percent

*Meets hydric soil criteria:* No

**Tawas soils**

*Percent of map unit:* 1 percent

*Landform:* Drainageways on moraines, depressions on moraines, depressions on  
outwash plains, and drainageways on outwash plains

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

## **1455370—Kalkaska-Cusino complex, 35 to 70 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains  
and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 4 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Kalkaska and similar soils: 50 percent

Cusino and similar soils: 35 percent

Dissimilar minor components: 15 percent

### **Description of the Kalkaska Soil**

#### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

#### **Setting**

*Landform:* Kame terraces, outwash plains, and disintegration moraines

*Slope range:* 35 to 70 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy outwash

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Restrictive feature(s)*: None within a depth of 60 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Depth to water table*: More than 72 inches  
*Drainage class*: Somewhat excessively drained  
*Shrink-swell potential*: Low (about 0.0 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 0  
*Available water capacity*: Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 7s  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: A

### **Vegetation**

*Existing plants*: Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Description of the Cusino Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

### **Setting**

*Landform*: Kame terraces, outwash plains, and disintegration moraines  
*Slope range*: 35 to 70 percent  
*Representative aspect*: North  
*Soil temperature class*: Frigid  
*Soil temperature regime*: Frigid

### **Properties and Qualities**

*Runoff*: Low  
*Parent material*: Sandy and gravelly outwash  
*Restrictive feature(s)*: None within a depth of 60 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Depth to water table*: More than 72 inches  
*Drainage class*: Somewhat excessively drained  
*Shrink-swell potential*: Low (about 0.0 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 0  
*Available water capacity*: Low (about 4.8 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 7s  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: A

**Vegetation**

*Existing plants:* Sedge, twisted stalk, starflower, shining clubmoss, spinulose shield fern, trout lily, wild lily of the valley, and American fly honeysuckle

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 8 inches; loamy sand

Bhs—8 to 10 inches; loamy sand

Bs—10 to 17 inches; sand

C—17 to 80 inches; stratified gravelly sand to sand

**Minor Components**

**Waiska soils**

*Percent of map unit:* 7 percent

*Representative aspect:* North

*Slope range:* 35 to 70 percent

*Meets hydric soil criteria:* No

**Wallace soils**

*Percent of map unit:* 5 percent

*Landform:* Beach ridges

*Representative aspect:* North

*Slope range:* 35 to 70 percent

*Meets hydric soil criteria:* No

**Deford soils**

*Percent of map unit:* 2 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

**Tawas soils**

*Percent of map unit:* 1 percent

*Landform:* Drainageways on moraines, depressions on moraines, depressions on outwash plains, and drainageways on outwash plains

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**1455371—Halfaday sand, 0 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Halfaday and similar soils: 90 percent

Dissimilar minor components: 10 percent

### Description of the Halfaday Soil

#### Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

#### Setting

*Landform:* Outwash plains

*Landform position (three-dimensional):* Rise

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* About 24 inches (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Woodsorrel, shining clubmoss, elderberry, starflower, Canada mayflower, and spinulose shield fern

#### Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 10 inches; sand

Bs—10 to 35 inches; sand

C—35 to 80 inches; sand

#### Minor Components

##### Au Gres soils

*Percent of map unit:* 5 percent

*Landform:* Outwash plains

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

##### Kalkaska soils

*Percent of map unit:* 5 percent

*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

## **1455372—Shell Drake sand, 0 to 8 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Shell Drake and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### **Description of the Shell Drake Soil**

#### **Taxonomic Classification**

Frigid, uncoated Typic Quartzipsamments

#### **Setting**

*Landform:* Beach ridges  
*Slope range:* 0 to 8 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Beach sand  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 6.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Lowbush blueberry, hairgrass, spinulose shield fern, twinflower, starflower, wild lily of the valley, shining clubmoss, wintergreen, goldthread, blueberry, woodsorrel, brackenfern, and sedge

**Typical Profile**

Oe—0 to 1 inch; slightly decomposed plant material  
Oa—1 to 3 inches; highly decomposed plant material  
A—3 to 4 inches; sand  
C—4 to 80 inches; sand

**Minor Components**

**Wurtsmith soils**

*Percent of map unit:* 5 percent  
*Landform:* Beach ridges  
*Representative aspect:* North  
*Slope range:* 1 to 4 percent  
*Meets hydric soil criteria:* No

**Meehan soils**

*Percent of map unit:* 3 percent  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* No

**Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

**1455380—Trout Bay-Gongeau-Shingleton-Rock outcrop complex, 1 to 70 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Trout Bay and similar soils: 30 percent  
Gongeau and similar soils: 25 percent  
Shingleton and similar soils: 20 percent  
Rock outcrop: 15 percent  
Dissimilar minor components: 10 percent

**Description of the Trout Bay Soil**

**Taxonomic Classification**

Euic, frigid Lithic Haplosaprists

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

### **Setting**

*Landform:* Sandstone benches

*Slope range:* 1 to 25 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Herbaceous organic material and/or woody organic material

*Restrictive feature(s):* Paralithic bedrock at a depth of 16 to 50 inches; lithic bedrock at a depth of 17 to 51 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Very poorly drained

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 7.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Spinulose shield fern, gooseberry, sedge, jewelweed, and oakfern

### **Typical Profile**

Oa—0 to 19 inches; muck

2Cr—19 to 34 inches; weathered bedrock

2R—34 to 80 inches; unweathered bedrock

## **Description of the Gongeau Soil**

### **Taxonomic Classification**

Siliceous, acid, frigid, shallow Typic Psammaquents

### **Setting**

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Bunchberry dogwood, sphagnum moss, shining clubmoss, spinulose shield fern, woodsorrel, goldthread, hairy Solomon's seal, Canada mayflower, sedge, and American starflower

### **Typical Profile**

Oa—0 to 5 inches; muck

A—5 to 7 inches; mucky loamy sand

C—7 to 18 inches; sand

2Cr—18 to 29 inches; weathered bedrock

2R—29 to 80 inches; unweathered bedrock

## **Description of the Shingleton Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid Lithic Haplorthods

### **Setting**

*Landform:* Kame terraces

*Slope range:* 25 to 70 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy outwash

*Restrictive feature(s):* Lithic bedrock at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 0.9 inch)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Red elderberry, spinulose shield fern, twisted stalk, sweet cicely, wild leek, and Canadian white violet

### **Typical Profile**

A—0 to 1 inch; loamy sand

E—1 to 7 inches; loamy sand

Bhs—7 to 8 inches; loamy sand

Bs—8 to 11 inches; loamy sand  
2R—11 to 80 inches; unweathered bedrock

#### Description of Rock Outcrop

This component consists of exposed areas of bedrock that have either been exposed through glacial scouring or, along the Lake Superior shoreline, exposed due to shoreline erosion by wind, water, and ice.

#### Minor Components

##### Ruse soils

*Percent of map unit:* 5 percent  
*Landform:* Bedrock terraces in glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 1 to 4 percent  
*Meets hydric soil criteria:* Yes

##### Nahma soils

*Percent of map unit:* 3 percent  
*Landform:* Depressions on ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

##### Nykanen soils

*Percent of map unit:* 2 percent  
*Landform:* Bedrock terraces in glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

## 1455382—Kalkaska sand, 0 to 6 percent slopes, severely burned

#### Map Unit Setting

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

#### Map Unit Composition

Kalkaska, severely burned and similar soils: 95 percent  
Dissimilar minor components: 5 percent

#### Description of the Kalkaska, Severely Burned Soil

##### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

##### Setting

*Landform:* Outwash plains  
*Slope range:* 0 to 6 percent  
*Representative aspect:* North

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sedge, greygreen reindeer lichen, hairgrass, trailing arbutus, eastern teaberry, brackenfern, and lowbush blueberry

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

### **Minor Components**

#### **Kinross soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

## **1455383—Kalkaska sand, 6 to 15 percent slopes, severely burned**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Kalkaska, severely burned and similar soils: 95 percent

Dissimilar minor components: 5 percent

### Description of the Kalkaska, Severely Burned Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Outwash plains

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sedge, greygreen reindeer lichen, hairgrass, trailing arbutus, eastern teaberry, brackenfern, and lowbush blueberry

#### Typical Profile

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

### Minor Components

#### Kinross soils

*Percent of map unit:* 5 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

## 1455386—Trout Bay-Lupton-Gongeau complex, 0 to 6 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Trout Bay and similar soils: 40 percent

Lupton and similar soils: 30 percent

Gongeau and similar soils: 20 percent

Dissimilar minor components: 10 percent

### Description of the Trout Bay Soil

#### Taxonomic Classification

Euic, frigid Lithic Haplosaprists

#### Setting

*Landform:* Drainageways in depressions in glacial drainage channels

*Slope range:* 0 to 4 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Herbaceous organic material and/or woody organic material

*Restrictive feature(s):* Paralithic bedrock at a depth of 16 to 50 inches; lithic bedrock at a depth of 17 to 51 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Water table (depth, kind):* At the soil surface, perched (see table 19)

*Drainage class:* Very poorly drained

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 7.6 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

#### Vegetation

*Existing plants:* Naked miterwort, bedstraw, sphagnum moss, northern dewberry, bunchberry dogwood, and sedge

#### Typical Profile

Oa—0 to 19 inches; muck

2Cr—19 to 34 inches; weathered bedrock

2R—34 to 80 inches; unweathered bedrock

### Description of the Lupton Soil

#### Taxonomic Classification

Euic, frigid Typic Haplosaprists

#### Setting

*Landform:* Drainageways in depressions in glacial drainage channels

*Slope range:* 0 to 2 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Woody organic material

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Very poorly drained

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very high (about 32.8 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* D

#### Vegetation

*Existing plants:* Woodsorrel, northern dewberry, sphagnum moss, American starflower, violet, sedge, bunchberry dogwood, bedstraw, naked miterwort, and northern dewberry

#### Typical Profile

Oi—0 to 4 inches; peat

Oa—4 to 80 inches; muck

### Description of the Gongeau Soil

#### Taxonomic Classification

Siliceous, acid, frigid, shallow Typic Psammaquents

#### Setting

*Landform:* Drainageways in depressions in glacial drainage channels

*Slope range:* 0 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* Paralithic bedrock at a depth of 10 to 20 inches; lithic bedrock at a depth of 20 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Water table (depth, kind):* At the soil surface, perched (see table 19)

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Bunchberry dogwood, sphagnum moss, shining clubmoss, spinulose shield fern, woodsorrel, goldthread, hairy Solomon's seal, Canada mayflower, sedge, and American starflower

### **Typical Profile**

Oa—0 to 5 inches; muck  
A—5 to 7 inches; mucky loamy sand  
C—7 to 18 inches; sand  
2Cr—18 to 29 inches; weathered bedrock  
2R—29 to 80 inches; unweathered bedrock

### **Minor Components**

#### **Jeske soils**

*Percent of map unit:* 4 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* No

#### **Au Train soils**

*Percent of map unit:* 3 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 1 to 8 percent  
*Meets hydric soil criteria:* No

#### **Ruse soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

## **1455387—Garlic sand, 0 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Garlic and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### Description of the Garlic Soil

#### Taxonomic Classification

Sandy, mixed, frigid, ortstein Typic Haplorthods

#### Setting

*Landform*: Pitted outwash plains and disintegration moraines

*Landform position (three-dimensional)*: Rise

*Slope range*: 0 to 6 percent

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Representative aspect*: North

*Soil temperature class*: Frigid

*Soil temperature regime*: Frigid

#### Properties and Qualities

*Runoff*: Very low

*Parent material*: Outwash

*Restrictive feature(s)*: None within a depth of 60 inches

*Frequency of flooding*: None

*Frequency of ponding*: None

*Depth to water table*: More than 72 inches

*Drainage class*: Well drained

*Shrink-swell potential*: Low (about 0.0 LEP)

*Salinity maximum*: Not saline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent (maximum weight percentage)*: 0

*Available water capacity*: Moderate (about 6.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 4s

*Meets hydric soil criteria*: No

*Hydrologic soil group*: A

#### Vegetation

*Existing plants*: Sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, twisted stalk, American starflower, ground pine, yellow beadlily, and bunchberry dogwood

#### Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

### Minor Components

#### Finch soils

*Percent of map unit*: 5 percent

*Landform*: Outwash plains

*Geomorphic position (three-dimensional)*: Rise

*Representative aspect*: North

*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**Okeefe soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Meets hydric soil criteria:* No

## **1455388—Garlic sand, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Garlic and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### **Description of the Garlic Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid, ortstein Typic Haplorthods

#### **Setting**

*Landform:* Disintegration moraines and pitted outwash plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope  
*Landform position (three-dimensional):* Nose slope, head slope, interfluvium, base slope, side slope, and crest  
*Slope range:* 6 to 15 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, twisted stalk, American starflower, ground pine, yellow beadlily, and bunchberry dogwood

### **Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

## **Minor Components**

### **Finch soils**

*Percent of map unit:* 5 percent

*Landform:* Outwash plains

*Geomorphic position (two-dimensional):* Footslope and toeslope

*Geomorphic position (three-dimensional):* Side slope and base slope

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

### **Okeefe soils**

*Percent of map unit:* 5 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Meets hydric soil criteria:* No

## **1455389—Garlic sand, 15 to 35 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Garlic and similar soils: 90 percent

Dissimilar minor components: 10 percent

### Description of the Garlic Soil

#### Taxonomic Classification

Sandy, mixed, frigid, ortstein Typic Haplorthods

#### Setting

*Landform*: Disintegration moraines and pitted outwash plains

*Landform position (two-dimensional)*: Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional)*: Nose slope, head slope, interfluvium, base slope, side slope, and crest

*Slope range*: 15 to 35 percent

*Down-slope shape*: Linear and convex

*Across-slope shape*: Convex and concave

*Representative aspect*: North

*Soil temperature class*: Frigid

*Soil temperature regime*: Frigid

#### Properties and Qualities

*Runoff*: Low

*Parent material*: Sandy glaciofluvial deposits

*Restrictive feature(s)*: None within a depth of 60 inches

*Frequency of flooding*: None

*Frequency of ponding*: None

*Depth to water table*: More than 72 inches

*Drainage class*: Well drained

*Shrink-swell potential*: Low (about 0.0 LEP)

*Salinity maximum*: Not saline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent (maximum weight percentage)*: 0

*Available water capacity*: Moderate (about 6.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Meets hydric soil criteria*: No

*Hydrologic soil group*: A

#### Vegetation

*Existing plants*: Sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, twisted stalk, and American starflower

#### Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

#### Minor Components

##### Finch soils

*Percent of map unit*: 5 percent

*Landform*: Outwash plains

*Geomorphic position (two-dimensional)*: Footslope and toeslope

*Geomorphic position (three-dimensional)*: Base slope

*Representative aspect*: North

*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**Kinross soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Geomorphic position (two-dimensional):* Toeslope  
*Geomorphic position (three-dimensional):* Base slope and talus  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

**1455390—Escanaba-Greylock complex, 1 to 6 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Escanaba and similar soils: 50 percent  
Greylock and similar soils: 40 percent  
Dissimilar minor components: 10 percent

**Description of the Escanaba Soil**

**Taxonomic Classification**

Sandy over loamy, mixed, superactive, frigid Alfic Haplorthods

**Setting**

*Landform:* Ground moraines  
*Landform position (three-dimensional):* Rise  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy glaciofluvial deposits over loamy lodgement till  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Shrink-swell potential*: Low (about 2.0 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 20  
*Available water capacity*: High (about 10.2 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 3s  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: A

### **Vegetation**

*Existing plants*: Rattlesnake fern, spinulose shield fern, sweet cicely, twisted stalk, trillium, Canadian white violet, and bedstraw

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
A—1 to 3 inches; sand  
E—3 to 6 inches; loamy fine sand  
Bs—6 to 26 inches; loamy fine sand  
2E/B—26 to 35 inches; fine sandy loam  
2Bt—35 to 42 inches; fine sandy loam  
2C—42 to 80 inches; gravelly fine sandy loam

## **Description of the Greylock Soil**

### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

### **Setting**

*Landform*: Ground moraines  
*Landform position (three-dimensional)*: Rise  
*Slope range*: 1 to 6 percent  
*Down-slope shape*: Linear  
*Across-slope shape*: Linear  
*Representative aspect*: North  
*Soil temperature class*: Frigid  
*Soil temperature regime*: Frigid

### **Properties and Qualities**

*Runoff*: Low  
*Parent material*: Loamy lodgement till  
*Restrictive feature(s)*: None within a depth of 60 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Depth to water table*: More than 72 inches  
*Drainage class*: Well drained  
*Shrink-swell potential*: Low (about 1.0 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 20  
*Available water capacity*: High (about 10.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 2e  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: B

### **Vegetation**

*Existing plants:* Canadian white violet, trillium, spinulose shield fern, twisted stalk, rattlesnake fern, and sweet cicely

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 6 inches; fine sandy loam

E—6 to 7 inches; sandy loam

Bhs—7 to 9 inches; sandy loam

Bs—9 to 19 inches; sandy loam

E/B—19 to 26 inches; sandy loam

B/E—26 to 34 inches; sandy loam

C—34 to 80 inches; sandy loam

### **Minor Components**

#### **Kalkaska soils**

*Percent of map unit:* 3 percent

*Landform:* Outwash plains

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

#### **Munising, calcareous substratum soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

#### **Blue Lake soils**

*Percent of map unit:* 2 percent

*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Geomorphic position (three-dimensional):* Base slope, side slope, and crest

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Meets hydric soil criteria:* No

#### **Charlevoix soils**

*Percent of map unit:* 1 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

#### **Cookson soils**

*Percent of map unit:* 1 percent

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

## **1455391—Escanaba-Greylock complex, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Escanaba and similar soils: 50 percent

Greylock and similar soils: 40 percent

Dissimilar minor components: 10 percent

### **Description of the Escanaba Soil**

#### **Taxonomic Classification**

Sandy over loamy, mixed, superactive, frigid Alfic Haplorthods

#### **Setting**

*Landform:* Ground moraines

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy outwash over loamy lodgement till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 2.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 20

*Available water capacity:* High (about 10.2 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Rattlesnake fern, spinulose shield fern, sweet cicely, twisted stalk, trillium, Canadian white violet, and bedstraw

**Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; sand

E—3 to 6 inches; loamy fine sand

Bs—6 to 26 inches; loamy fine sand

2E/B—26 to 35 inches; fine sandy loam

2Bt—35 to 42 inches; fine sandy loam

2C—42 to 80 inches; gravelly fine sandy loam

**Description of the Greylock Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

**Setting**

*Landform:* Ground moraines

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Medium

*Parent material:* Loamy lodgement till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 20

*Available water capacity:* High (about 10.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Canadian white violet, trillium, spinulose shield fern, twisted stalk, rattlesnake fern, and sweet cicely

**Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 6 inches; fine sandy loam

E—6 to 7 inches; sandy loam

Bhs—7 to 9 inches; sandy loam

Bs—9 to 19 inches; sandy loam

E/B—19 to 26 inches; sandy loam

B/E—26 to 34 inches; sandy loam

C—34 to 80 inches; sandy loam

### Minor Components

#### **Kalkaska soils**

*Percent of map unit:* 3 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Meets hydric soil criteria:* No

#### **Munising, calcareous substratum soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 1 to 12 percent

*Meets hydric soil criteria:* No

#### **Blue Lake soils**

*Percent of map unit:* 2 percent

*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Geomorphic position (three-dimensional):* Base slope, side slope, and crest

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Meets hydric soil criteria:* No

#### **Charlevoix soils**

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

## **1455392—Escanaba-Greylock complex, 15 to 35 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Escanaba and similar soils: 50 percent

Greylock and similar soils: 40 percent

Dissimilar minor components: 10 percent

### **Description of the Escanaba Soil**

#### **Taxonomic Classification**

Sandy over loamy, mixed, superactive, frigid Alfic Haplorthods

#### **Setting**

*Landform:* Ground moraines

*Slope range:* 15 to 35 percent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Medium  
*Parent material:* Sandy outwash over loamy lodgement till  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 2.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 20  
*Available water capacity:* High (about 10.2 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Rattlesnake fern, spinulose shield fern, sweet cicely, twisted stalk, trillium, Canadian white violet, and bedstraw

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
A—1 to 3 inches; sand  
E—3 to 6 inches; loamy fine sand  
Bs—6 to 26 inches; loamy fine sand  
2E/B—26 to 35 inches; fine sandy loam  
2Bt—35 to 42 inches; fine sandy loam  
2C—42 to 80 inches; gravelly fine sandy loam

## **Description of the Greylock Soil**

### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

### **Setting**

*Landform:* Ground moraines  
*Slope range:* 15 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* High  
*Parent material:* Loamy lodgement till  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 20  
*Available water capacity:* High (about 10.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Canadian white violet, trillium, spinulose shield fern, twisted stalk, rattlesnake fern, and sweet cicely

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
A—1 to 6 inches; fine sandy loam  
E—6 to 7 inches; sandy loam  
Bhs—7 to 9 inches; sandy loam  
Bs—9 to 19 inches; sandy loam  
E/B—19 to 26 inches; sandy loam  
B/E—26 to 34 inches; sandy loam  
C—34 to 80 inches; sandy loam

### **Minor Components**

#### **Cusino soils**

*Percent of map unit:* 5 percent  
*Landform:* Kame terraces, outwash plains, and disintegration moraines  
*Representative aspect:* North  
*Slope range:* 15 to 35 percent  
*Meets hydric soil criteria:* No

#### **Blue Lake soils**

*Percent of map unit:* 3 percent  
*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope  
*Geomorphic position (three-dimensional):* Base slope, side slope, and crest  
*Representative aspect:* North  
*Slope range:* 15 to 35 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Meets hydric soil criteria:* No

#### **Kalkaska soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 15 to 35 percent  
*Meets hydric soil criteria:* No

## **1455395—Greylock fine sandy loam, 1 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Greylock and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### Description of the Greylock Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

#### Setting

*Landform:* Ground moraines  
*Landform position (three-dimensional):* Rise  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low  
*Parent material:* Loamy lodgement till  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 20  
*Available water capacity:* High (about 10.7 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Canadian white violet, trillium, spinulose shield fern, twisted stalk, rattlesnake fern, and sweet cicely

#### Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material  
A—1 to 6 inches; fine sandy loam  
E—6 to 7 inches; sandy loam  
Bhs—7 to 9 inches; sandy loam  
Bs—9 to 19 inches; sandy loam  
E/B—19 to 26 inches; sandy loam  
B/E—26 to 34 inches; sandy loam  
C—34 to 80 inches; sandy loam

### Minor Components

#### Blue Lake soils

*Percent of map unit:* 4 percent

*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Geomorphic position (three-dimensional):* Base slope, side slope, and crest

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Meets hydric soil criteria:* No

#### Charlevoix soils

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

#### Cookson soils

*Percent of map unit:* 2 percent

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

#### Escanaba soils

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Geomorphic position (three-dimensional):* Rise

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* No

## 1455396—Greylock fine sandy loam, 6 to 15 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### Map Unit Composition

Greylock and similar soils: 85 percent

Dissimilar minor components: 15 percent

### Description of the Greylock Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

#### Setting

*Landform:* Ground moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Base slope, crest, interfluvium, head slope, nose slope, and side slope

*Slope range:* 6 to 15 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Medium

*Parent material:* Loamy lodgement till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 20

*Available water capacity:* High (about 10.7 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Canadian white violet, trillium, spinulose shield fern, twisted stalk, rattlesnake fern, and sweet cicely

#### Typical Profile

O<sub>e</sub>—0 to 1 inch; moderately decomposed plant material

A—1 to 6 inches; fine sandy loam

E—6 to 7 inches; sandy loam

B<sub>hs</sub>—7 to 9 inches; sandy loam

B<sub>s</sub>—9 to 19 inches; sandy loam

E/B—19 to 26 inches; sandy loam

B/E—26 to 34 inches; sandy loam

C—34 to 80 inches; sandy loam

#### Minor Components

##### Blue Lake soils

*Percent of map unit:* 6 percent

*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Geomorphic position (three-dimensional):* Base slope, side slope, and crest

*Representative aspect:* North

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Slope range:* 6 to 15 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Meets hydric soil criteria:* No

### **Escanaba soils**

*Percent of map unit:* 4 percent  
*Landform:* Ground moraines  
*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope  
*Geomorphic position (three-dimensional):* Nose slope, head slope, interfluvium, crest, side slope, and base slope  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Meets hydric soil criteria:* No

### **Dillingham soils**

*Percent of map unit:* 3 percent  
*Landform:* Disintegration moraines  
*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope  
*Geomorphic position (three-dimensional):* Nose slope, head slope, crest, interfluvium, base slope, and side slope  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Meets hydric soil criteria:* No

### **Charlevoix soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Geomorphic position (two-dimensional):* Footslope and toeslope  
*Geomorphic position (three-dimensional):* Base slope and side slope  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Meets hydric soil criteria:* No

## **1455397—Finch-Kinross complex, 0 to 3 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Finch and similar soils: 50 percent

Kinross and similar soils: 40 percent  
Dissimilar minor components: 10 percent

#### **Description of the Finch Soil**

##### **Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Duraquods

##### **Setting**

*Landform:* Outwash plains  
*Slope range:* 0 to 3 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

##### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* Ortstein at a depth of 7 to 13 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 1.4 inches)

##### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* C

##### **Vegetation**

*Existing plants:* Wild sarsaparilla, sedge, yellow beadlily, bunchberry dogwood, goldthread, eastern teaberry, shining clubmoss, Canada mayflower, blueberry, woodsorrel, brackenfern, and American starflower

##### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
E—1 to 11 inches; sand  
Bsm—11 to 42 inches; sand  
C—42 to 80 inches; fine sand

#### **Description of the Kinross Soil**

##### **Taxonomic Classification**

Sandy, mixed, frigid Typic Endoaquods

##### **Setting**

*Slope range:* 0 to 1 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

##### **Properties and Qualities**

*Runoff:* Negligible  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 5.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* A/D

### **Vegetation**

*Existing plants:* Goldthread, black spruce, blueberry, speckled alder, sedge, leatherleaf, and bunchberry dogwood

### **Typical Profile**

Oa—0 to 3 inches; muck  
Eg—3 to 14 inches; sand  
Bhs—14 to 22 inches; sand  
Bs—22 to 35 inches; sand  
C—35 to 80 inches; sand

## **Minor Components**

### **Paquin soils**

*Percent of map unit:* 5 percent  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

### **Dawson soils**

*Percent of map unit:* 3 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

### **Garlic soils**

*Percent of map unit:* 2 percent  
*Landform:* Pitted outwash plains and disintegration moraines  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Meets hydric soil criteria:* No

## **1455402—Kalkaska-Blue Lake complex, 1 to 12 percent slopes, dissected**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Kalkaska, dissected and similar soils: 55 percent

Blue Lake, dissected and similar soils: 35 percent

Dissimilar minor components: 10 percent

### Description of the Kalkaska, Dissected Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Outwash plains

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

#### Typical Profile

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

### Description of the Blue Lake, Dissected Soil

#### Taxonomic Classification

Sandy, mixed, frigid Lamellic Haplorthods

#### Setting

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, side slope, and crest

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Slope range:* 1 to 12 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 7 inches; sand  
Bhs—7 to 9 inches; loamy sand  
Bs—9 to 27 inches; loamy sand  
E and Bt—27 to 80 inches; loamy sand

### **Minor Components**

#### **Dillingham soils**

*Percent of map unit:* 3 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* No

#### **Steuben soils**

*Percent of map unit:* 3 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 1 to 15 percent  
*Meets hydric soil criteria:* No

#### **Deford soils**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

**Halfaday soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

**1455403—Kalkaska-Blue Lake complex, 8 to 35 percent slopes, dissected**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Kalkaska, dissected and similar soils: 55 percent

Blue Lake, dissected and similar soils: 35 percent

Dissimilar minor components: 10 percent

**Description of the Kalkaska, Dissected Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Outwash plains

*Slope range:* 8 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

## **Description of the Blue Lake, Dissected Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

### **Setting**

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, side slope, and crest

*Slope range:* 8 to 35 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; sand

Bhs—7 to 9 inches; loamy sand

Bs—9 to 27 inches; loamy sand

E and Bt—27 to 80 inches; loamy sand

### Minor Components

#### Dillingham soils

*Percent of map unit:* 5 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 8 to 35 percent  
*Meets hydric soil criteria:* No

#### Steuben soils

*Percent of map unit:* 3 percent  
*Landform:* Disintegration moraines  
*Representative aspect:* North  
*Slope range:* 8 to 35 percent  
*Meets hydric soil criteria:* No

#### Deford soils

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

## 1455404—Kalkaska-Blue Lake complex, 15 to 70 percent slopes, dissected

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### Map Unit Composition

Kalkaska, dissected and similar soils: 55 percent  
Blue Lake, dissected and similar soils: 35 percent  
Dissimilar minor components: 10 percent

### Description of the Kalkaska, Dissected Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Outwash plains  
*Slope range:* 15 to 70 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low  
*Parent material:* Sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Description of the Blue Lake, Dissected Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

### **Setting**

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope  
*Landform position (three-dimensional):* Base slope, side slope, and crest  
*Slope range:* 15 to 70 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 7.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Canada mayflower, starflower, sedge, spinulose shield fern, brackenfern, shining clubmoss, sugar maple, ground pine, and twisted stalk

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; sand

Bhs—7 to 9 inches; loamy sand

Bs—9 to 27 inches; loamy sand

E and Bt—27 to 80 inches; loamy sand

**Minor Components**

**Dillingham soils**

*Percent of map unit:* 5 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 15 to 70 percent

*Meets hydric soil criteria:* No

**Steuben soils**

*Percent of map unit:* 3 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 15 to 60 percent

*Meets hydric soil criteria:* No

**Deford soils**

*Percent of map unit:* 2 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

**1455408—Spot-Finch complex, 0 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Spot and similar soils: 50 percent

Finch and similar soils: 40 percent

Dissimilar minor components: 10 percent

**Description of the Spot Soil**

**Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Duraquods

**Setting**

*Landform:* Depressions

*Slope range:* 0 to 2 percent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Restrictive feature(s):* Ortstein at a depth of 8 to 12 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Depth to water table:* At the soil surface  
*Drainage class:* Poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 1.2 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 5w  
*Meets hydric soil criteria:* Yes  
*Hydrologic soil group:* A/D

### **Vegetation**

*Existing plants:* Sphagnum moss, wintergreen, Bog Labrador tea, goldthread, and bunchberry dogwood

### **Typical Profile**

Oi—0 to 2 inches; peat  
E—2 to 8 inches; sand  
Bhsm—8 to 10 inches; sand  
Bs—10 to 18 inches; sand  
C—18 to 80 inches; sand

## **Description of the Finch Soil**

### **Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Duraquods

### **Setting**

*Landform:* Outwash plains  
*Slope range:* 0 to 3 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Outwash  
*Restrictive feature(s):* Ortstein at a depth of 7 to 13 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 1.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w

*Meets hydric soil criteria:* No

*Hydrologic soil group:* C

**Vegetation**

*Existing plants:* Wild sarsaparilla, sedge, yellow beadlily, bunchberry dogwood, goldthread, eastern teaberry, shining clubmoss, Canada mayflower, blueberry, woodsorrel, brackenfern, and American starflower

**Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 11 inches; sand

Bsm—11 to 42 inches; sand

C—42 to 80 inches; fine sand

**Minor Components**

**Dawson soils**

*Percent of map unit:* 5 percent

*Landform:* Depressions

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

**Paquin soils**

*Percent of map unit:* 5 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 6 percent

*Meets hydric soil criteria:* No

**1455409—Finch sand, 0 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Finch and similar soils: 85 percent

Dissimilar minor components: 15 percent

**Description of the Finch Soil**

**Taxonomic Classification**

Sandy, mixed, frigid, shallow, ortstein Typic Duraquods

**Setting**

*Landform:* Outwash plains

*Landform position (three-dimensional):* Rise

*Slope range:* 0 to 3 percent

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* Ortstein at a depth of 7 to 13 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* About 6 inches (see table 19)  
*Drainage class:* Somewhat poorly drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 1.4 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4w  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* C

### **Vegetation**

*Existing plants:* Wild sarsaparilla, sedge, yellow beadleily, bunchberry dogwood, goldthread, eastern teaberry, shining clubmoss, Canada mayflower, blueberry, woodsorrel, brackenfern, and American starflower

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
E—1 to 11 inches; sand  
Bsm—11 to 42 inches; sand  
C—42 to 80 inches; fine sand

## **Minor Components**

### **Spot soils**

*Percent of map unit:* 10 percent  
*Landform:* Depressions  
*Geomorphic position (three-dimensional):* Talf  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* Yes

### **Paquin soils**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

**1455410—Munising, calcareous substratum-Frohling,  
calcareous substratum-Cookson fine sandy loams, 1  
to 12 percent slopes, dissected**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

**Map Unit Composition**

Munising, calcareous substratum, dissected and similar soils: 40 percent

Frohling, calcareous substratum, dissected and similar soils: 30 percent

Cookson, dissected and similar soils: 20 percent

Dissimilar minor components: 10 percent

**Description of the Munising, Calcareous Substratum, Dissected Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

**Setting**

*Landform:* Ground moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Medium

*Parent material:* Eolian deposits over lodgement till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 12

*Available water capacity:* Low (about 3.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Oakfern, interrupted fern, sugar maple, sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, and Canada yew

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

E—1 to 3 inches; fine sandy loam  
Bhs—3 to 6 inches; fine sandy loam  
Bs—6 to 23 inches; fine sandy loam  
2E/Bx—23 to 38 inches; fine sandy loam and loamy sand  
2B/Ex—38 to 50 inches; loamy sand and fine sandy loam  
2BC—50 to 63 inches; gravelly fine sandy loam  
2C—63 to 80 inches; gravelly fine sandy loam

### Description of the Frohling, Calcareous Substratum, Dissected Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Fragiorthods

#### Setting

*Slope range:* 4 to 12 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Medium  
*Parent material:* Lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Low (about 4.3 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 3e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Canada yew, bedstraw, twisted stalk, Canadian white violet, Canada mayflower, spinulose shield fern, rattlesnake fern, and sweet cicely

#### Typical Profile

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 5 inches; fine sandy loam  
Bs—5 to 24 inches; fine sandy loam  
B/Ex—24 to 73 inches; loamy fine sand  
3C—73 to 80 inches; gravelly fine sandy loam

### Description of the Cookson, Dissected Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

#### Setting

*Landform:* Ground moraines  
*Slope range:* 1 to 12 percent  
*Representative aspect:* North

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Medium  
*Parent material:* Coarse-loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 2.2 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 8  
*Available water capacity:* Moderate (about 7.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Canadian white violet, wild leek, wild lily of the valley, spinulose woodfern, sweet cicely, sedge, downy yellow violet, twistedstalk, and trillium

### **Typical Profile**

Oi—0 to 3 inches; slightly decomposed plant material  
E—3 to 7 inches; fine sandy loam  
Bhs—7 to 11 inches; fine sandy loam  
Bs—11 to 16 inches; sandy loam  
2E'—16 to 21 inches; fine sandy loam  
2Bt—21 to 31 inches; fine sandy loam  
2BC—31 to 36 inches; fine sandy loam  
3R—36 to 80 inches; bedrock

## **Minor Components**

### **Kalkaska soils**

*Percent of map unit:* 4 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Meets hydric soil criteria:* No

### **Reade soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 4 percent  
*Meets hydric soil criteria:* No

### **Shingleton soils**

*Percent of map unit:* 2 percent  
*Landform:* Kame terraces on bedrock benches  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

**Au Train soils**

*Percent of map unit:* 1 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 1 to 8 percent

*Meets hydric soil criteria:* No

**1455411—Frohling, calcareous substratum-Garlic-Cookson complex, 8 to 35 percent slopes, dissected**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Frohling, calcareous substratum, dissected and similar soils: 50 percent

Garlic, dissected and similar soils: 20 percent

Cookson, dissected and similar soils: 20 percent

Dissimilar minor components: 10 percent

**Description of the Frohling, Calcareous Substratum, Dissected Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Fragiorthods

**Setting**

*Landform:* Bedrock-controlled ground moraines

*Slope range:* 8 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* High

*Parent material:* Lodgement till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 12

*Available water capacity:* Low (about 4.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

### Vegetation

*Existing plants:* Canada yew, bedstraw, twisted stalk, Canadian white violet, Canada mayflower, spinulose shield fern, rattlesnake fern, and sweet cicely

### Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 5 inches; fine sandy loam

Bs—5 to 24 inches; fine sandy loam

B/Ex—24 to 73 inches; loamy fine sand

3C—73 to 80 inches; gravelly fine sandy loam

### Description of the Garlic, Dissected Soil

#### Taxonomic Classification

Sandy, mixed, frigid, ortstein Typic Haplorthods

#### Setting

*Landform:* Disintegration moraines

*Slope range:* 8 to 35 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### Vegetation

*Existing plants:* American starflower, sugar maple, wild sarsaparilla, spinulose woodfern, wintergreen, shining clubmoss, Canada mayflower, partridgeberry, and twisted stalk

### Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 9 inches; sand

Bhs—9 to 11 inches; sand

Bs—11 to 20 inches; sand

BC—20 to 29 inches; sand

C—29 to 80 inches; sand

### Description of the Cookson, Dissected Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

**Setting**

*Landform:* Ground moraines  
*Slope range:* 8 to 35 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* High  
*Parent material:* Coarse-loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 2.2 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 8  
*Available water capacity:* Moderate (about 7.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Canadian white violet, wild leek, wild lily of the valley, spinulose woodfern, sweet cicely, sedge, downy yellow violet, twistedstalk, and trillium

**Typical Profile**

Oi—0 to 3 inches; slightly decomposed plant material  
E—3 to 7 inches; fine sandy loam  
Bhs—7 to 11 inches; fine sandy loam  
Bs—11 to 16 inches; sandy loam  
2E'—16 to 21 inches; fine sandy loam  
2Bt—21 to 31 inches; fine sandy loam  
2BC—31 to 36 inches; fine sandy loam  
3R—36 to 80 inches; bedrock

**Minor Components**

**Chatham soils**

*Percent of map unit:* 4 percent  
*Representative aspect:* North  
*Slope range:* 15 to 35 percent  
*Meets hydric soil criteria:* No

**Alcona soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 8 to 35 percent  
*Meets hydric soil criteria:* No

**Ensley soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

## **1455412—Munising-Yalmer-Frohling complex, calcareous substratum, 1 to 12 percent slopes, dissected**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Munising, calcareous substratum, dissected and similar soils: 40 percent

Yalmer, calcareous substratum, dissected and similar soils: 30 percent

Frohling, calcareous substratum, dissected and similar soils: 20 percent

Dissimilar minor components: 10 percent

### **Description of the Munising, Calcareous Substratum, Dissected Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

#### **Setting**

*Landform:* Ground moraines

*Slope range:* 1 to 12 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Eolian deposits over lodgement till

*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Water table (depth, kind):* About 12 inches, perched (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 12

*Available water capacity:* Low (about 3.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### **Vegetation**

*Existing plants:* Oakfern, interrupted fern, sugar maple, sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, and Canada yew

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material  
E—1 to 3 inches; fine sandy loam  
Bhs—3 to 6 inches; fine sandy loam  
Bs—6 to 23 inches; fine sandy loam  
2E/Bx—23 to 38 inches; fine sandy loam and loamy sand  
2B/Ex—38 to 50 inches; loamy sand and fine sandy loam  
2BC—50 to 63 inches; gravelly fine sandy loam  
2C—63 to 80 inches; gravelly fine sandy loam

**Description of the Yalmer, Calcareous Substratum, Dissected Soil**

**Taxonomic Classification**

Sandy, mixed, frigid Alfic Oxyaquic Fragiorthods

**Setting**

*Landform:* Ground moraines  
*Slope range:* 1 to 12 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low  
*Parent material:* Outwash over lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Very low (about 2.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Sweet cicely, Canada yew, rattlesnake fern, spinulose shield fern, bedstraw, Canada mayflower, twisted stalk, and Canadian white violet

**Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material  
A—1 to 2 inches; loamy sand  
E—2 to 5 inches; sand  
Bhs—5 to 16 inches; loamy sand  
Bs—16 to 28 inches; gravelly loamy sand  
2E/Bx—28 to 36 inches; loamy sand  
2B/Ex—36 to 62 inches; fine sandy loam  
3C—62 to 80 inches; gravelly fine sandy loam

**Description of the Frohling, Calcareous Substratum, Dissected Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Fragiorthods

**Setting**

*Slope range:* 6 to 12 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* High  
*Parent material:* Lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Low (about 4.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 3e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

**Vegetation**

*Existing plants:* Canada yew, bedstraw, twisted stalk, Canadian white violet, Canada mayflower, spinulose shield fern, rattlesnake fern, and sweet cicely

**Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material  
E—2 to 5 inches; fine sandy loam  
Bs—5 to 24 inches; fine sandy loam  
B/Ex—24 to 73 inches; loamy fine sand  
3C—73 to 80 inches; gravelly fine sandy loam

**Minor Components**

**Escanaba soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 12 percent  
*Meets hydric soil criteria:* No

**Kalkaska soils**

*Percent of map unit:* 3 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 6 to 15 percent  
*Meets hydric soil criteria:* No

**Ensley soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 1 percent  
*Meets hydric soil criteria:* Yes

**Halfaday soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

**1455413—Munising, calcareous substratum-Cookson  
fine sandy loams, 1 to 6 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Munising, calcareous substratum and similar soils: 50 percent  
Cookson and similar soils: 40 percent  
Dissimilar minor components: 10 percent

**Description of the Munising, Calcareous Substratum Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods

**Setting**

*Landform:* Ground moraines  
*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low  
*Parent material:* Eolian deposits over lodgement till  
*Restrictive feature(s):* Fragipan at a depth of 15 to 25 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 12  
*Available water capacity:* Low (about 3.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Oakfern, interrupted fern, sugar maple, sedge, spinulose woodfern, Canada mayflower, shining clubmoss, red elderberry, twisted stalk, starflower, violet, and Canada yew

### **Typical Profile**

Oa—0 to 1 inch; highly decomposed plant material  
E—1 to 3 inches; fine sandy loam  
Bhs—3 to 6 inches; fine sandy loam  
Bs—6 to 23 inches; fine sandy loam  
2E/Bx—23 to 38 inches; fine sandy loam and loamy sand  
2B/Ex—38 to 50 inches; loamy sand and fine sandy loam  
2BC—50 to 63 inches; gravelly fine sandy loam  
2C—63 to 80 inches; gravelly fine sandy loam

### **Description of the Cookson Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

#### **Setting**

*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low  
*Parent material:* Coarse-loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 2.2 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 8  
*Available water capacity:* Moderate (about 7.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Canadian white violet, wild leek, wild lily of the valley, spinulose woodfern, sweet cicely, sedge, downy yellow violet, twistedstalk, and trillium

### **Typical Profile**

Oi—0 to 3 inches; slightly decomposed plant material  
E—3 to 7 inches; fine sandy loam  
Bhs—7 to 11 inches; fine sandy loam  
Bs—11 to 16 inches; sandy loam  
2E'—16 to 21 inches; fine sandy loam  
2Bt—21 to 31 inches; fine sandy loam  
2BC—31 to 36 inches; fine sandy loam  
3R—36 to 80 inches; bedrock

### Minor Components

#### **Frohling soils**

*Percent of map unit:* 5 percent  
*Representative aspect:* North  
*Slope range:* 4 to 6 percent  
*Meets hydric soil criteria:* No

#### **Reade soils**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 0 to 4 percent  
*Meets hydric soil criteria:* No

#### **Blue Lake soils**

*Percent of map unit:* 2 percent  
*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope  
*Geomorphic position (three-dimensional):* Base slope, side slope, and crest  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Convex and concave  
*Across-slope shape:* Linear and convex  
*Meets hydric soil criteria:* No

## **1455416—Furlong-Shingleton complex, 1 to 6 percent slopes**

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Furlong and similar soils: 50 percent  
Shingleton and similar soils: 40 percent  
Dissimilar minor components: 10 percent

### Description of the Furlong Soil

#### **Taxonomic Classification**

Sandy, mixed, frigid Typic Haplorthods

#### **Setting**

*Landform:* Bedrock benches on kame terraces  
*Landform position (three-dimensional):* Rise  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Sandy outwash

*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sedge, wild leek, spinulose woodfern, blue cohosh, red elderberry, sweet cicely, and Canadian white violet

**Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; sand

E—2 to 5 inches; sand

Bhs—5 to 7 inches; sand

Bs—7 to 19 inches; sand

C—19 to 22 inches; sand

2R—22 to 80 inches; unweathered bedrock

**Description of the Shingleton Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Lithic Haplorthods

**Setting**

*Landform:* Kame terraces on bedrock benches

*Landform position (three-dimensional):* Rise

*Slope range:* 1 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Sandy outwash

*Restrictive feature(s):* Lithic bedrock at a depth of 10 to 20 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum:* Not saline

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*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 0.9 inch)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Red elderberry, spinulose shield fern, twisted stalk, sweet cicely, wild leek, and Canadian white violet

### **Typical Profile**

A—0 to 1 inch; loamy sand  
E—1 to 7 inches; loamy sand  
Bhs—7 to 8 inches; loamy sand  
Bs—8 to 11 inches; loamy sand  
2R—11 to 80 inches; unweathered bedrock

### **Minor Components**

#### **Longrie soils**

*Percent of map unit:* 5 percent  
*Landform:* Kame terraces in glacial drainage channels  
*Geomorphic position (three-dimensional):* Rise  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Meets hydric soil criteria:* No

#### **Namur soils**

*Percent of map unit:* 5 percent  
*Landform:* Glacial drainage channels  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* No

## **1455417—Furlong-Shingleton complex, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Furlong and similar soils: 50 percent  
Shingleton and similar soils: 40 percent  
Dissimilar minor components: 10 percent

### Description of the Furlong Soil

#### Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

#### Setting

*Landform:* Bedrock benches on kame terraces

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy outwash

*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.3 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sedge, wild leek, spinulose woodfern, blue cohosh, red elderberry, sweet cicely, and Canadian white violet

#### Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; sand

E—2 to 5 inches; sand

Bhs—5 to 7 inches; sand

Bs—7 to 19 inches; sand

C—19 to 22 inches; sand

2R—22 to 80 inches; unweathered bedrock

### Description of the Shingleton Soil

#### Taxonomic Classification

Sandy, isotic, frigid Lithic Haplorthods

#### Setting

*Landform:* Kame terraces on bedrock benches

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy outwash

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*Restrictive feature(s)*: Lithic bedrock at a depth of 10 to 20 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Depth to water table*: More than 72 inches  
*Drainage class*: Somewhat excessively drained  
*Shrink-swell potential*: Low (about 0.2 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 0  
*Available water capacity*: Very low (about 0.9 inch)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 6s  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: A

### **Vegetation**

*Existing plants*: Red elderberry, spinulose shield fern, twisted stalk, sweet cicely, wild leek, and Canadian white violet

### **Typical Profile**

A—0 to 1 inch; loamy sand  
E—1 to 7 inches; loamy sand  
Bhs—7 to 8 inches; loamy sand  
Bs—8 to 11 inches; loamy sand  
2R—11 to 80 inches; unweathered bedrock

## **Minor Components**

### **Longrie soils**

*Percent of map unit*: 4 percent  
*Landform*: Kame terraces in glacial drainage channels  
*Representative aspect*: North  
*Slope range*: 6 to 15 percent  
*Meets hydric soil criteria*: No

### **Eben soils**

*Percent of map unit*: 2 percent  
*Landform*: Glacial drainage channels  
*Representative aspect*: North  
*Slope range*: 6 to 15 percent  
*Meets hydric soil criteria*: No

### **Nykanen soils**

*Percent of map unit*: 2 percent  
*Landform*: Bedrock terraces in glacial drainage channels  
*Representative aspect*: North  
*Slope range*: 1 to 6 percent  
*Meets hydric soil criteria*: No

### **Ruse soils**

*Percent of map unit*: 2 percent  
*Landform*: Ground moraines  
*Representative aspect*: North  
*Slope range*: 0 to 2 percent  
*Meets hydric soil criteria*: Yes

## 1455421—Steuben-Blue Lake-Kalkaska complex, 1 to 6 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Steuben and similar soils: 40 percent

Blue Lake and similar soils: 30 percent

Kalkaska and similar soils: 20 percent

Dissimilar minor components: 10 percent

### Description of the Steuben Soil

#### Taxonomic Classification

Coarse-loamy, mixed, active, frigid Alfic Fragiorthods

#### Setting

*Landform:* Disintegration moraines

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Loamy till over sandy outwash

*Restrictive feature(s):* Fragipan at a depth of 17 to 26 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 3.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 3s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sugar maple, sedge, spinulose shield fern, shining clubmoss, violet, Canada mayflower, woodsorrel, twisted stalk, starflower, and yellow beadlily

#### Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 8 inches; fine sandy loam

Bhs—8 to 16 inches; fine sandy loam

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Bs—16 to 21 inches; fine sandy loam  
B/Ex—21 to 40 inches; fine sandy loam  
2E and Bt—40 to 45 inches; loamy sand and sand  
2C—45 to 80 inches; sand

### Description of the Blue Lake Soil

#### Taxonomic Classification

Sandy, mixed, frigid Lamellic Haplorthods

#### Setting

*Landform*: Disintegration moraines

*Landform position (two-dimensional)*: Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional)*: Base slope, side slope, and crest

*Slope range*: 1 to 6 percent

*Down-slope shape*: Convex and concave

*Across-slope shape*: Linear and convex

*Representative aspect*: North

*Soil temperature class*: Frigid

*Soil temperature regime*: Frigid

#### Properties and Qualities

*Runoff*: Negligible

*Restrictive feature(s)*: None within a depth of 60 inches

*Frequency of flooding*: None

*Frequency of ponding*: None

*Depth to water table*: More than 72 inches

*Drainage class*: Well drained

*Shrink-swell potential*: Low (about 0.1 LEP)

*Salinity maximum*: Not saline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent (maximum weight percentage)*: 0

*Available water capacity*: Moderate (about 7.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 3s

*Meets hydric soil criteria*: No

*Hydrologic soil group*: A

#### Vegetation

*Existing plants*: Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

#### Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; sand

Bhs—7 to 9 inches; loamy sand

Bs—9 to 27 inches; loamy sand

E and Bt—27 to 80 inches; loamy sand

### Description of the Kalkaska Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform*: Disintegration moraines

*Slope range*: 1 to 6 percent

*Representative aspect*: North

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sedge, trillium, spinulose woodfern, clubmoss, American starflower, Canada beadruby, and lily of the valley

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Minor Components**

### **Munising soils**

*Percent of map unit:* 4 percent  
*Landform:* Bedrock-controlled moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

### **Alcona soils**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

### **Halfaday soils**

*Percent of map unit:* 2 percent  
*Landform:* Outwash plains  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

### **Tawas soils**

*Percent of map unit:* 2 percent

*Landform:* Drainageways on moraines, depressions on moraines, depressions on outwash plains, and drainageways on outwash plains

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Meets hydric soil criteria:* Yes

## **1455422—Steuben-Blue Lake-Kalkaska complex, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Steuben and similar soils: 40 percent

Blue Lake and similar soils: 25 percent

Kalkaska and similar soils: 25 percent

Dissimilar minor components: 10 percent

### **Description of the Steuben Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Fragiorthods

#### **Setting**

*Landform:* Disintegration moraines

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Loamy till over sandy outwash

*Restrictive feature(s):* Fragipan at a depth of 17 to 26 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 3.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, sedge, spinulose shield fern, shining clubmoss, violet, Canada mayflower, woodsorrel, twisted stalk, starflower, and yellow beadlily

### **Typical Profile**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 8 inches; fine sandy loam

Bhs—8 to 16 inches; fine sandy loam

Bs—16 to 21 inches; fine sandy loam

B/Ex—21 to 40 inches; fine sandy loam

2E and Bt—40 to 45 inches; loamy sand and sand

2C—45 to 80 inches; sand

### **Description of the Blue Lake Soil**

#### **Taxonomic Classification**

Sandy, mixed, frigid Lamellic Haplorthods

#### **Setting**

*Landform:* Disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Landform position (three-dimensional):* Base slope, side slope, and crest

*Slope range:* 6 to 15 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Very low

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 7.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Brackenfern, shining clubmoss, sugar maple, ground pine, twisted stalk, Canada mayflower, starflower, sedge, and spinulose shield fern

### **Typical Profile**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; sand

Bhs—7 to 9 inches; loamy sand

Bs—9 to 27 inches; loamy sand

E and Bt—27 to 80 inches; loamy sand

## Description of the Kalkaska Soil

### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

### Setting

*Landform:* Disintegration moraines

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.9 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### Vegetation

*Existing plants:* Sedge, trillium, spinulose woodfern, clubmoss, American starflower, Canada beadruby, and lily of the valley

### Typical Profile

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

## Minor Components

### Frohling soils

*Percent of map unit:* 4 percent

*Landform:* Bedrock-controlled moraines

*Representative aspect:* North

*Slope range:* 8 to 18 percent

*Meets hydric soil criteria:* No

### Waiska soils

*Percent of map unit:* 4 percent

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Meets hydric soil criteria:* No

**Halfaday soils**

*Percent of map unit:* 2 percent

*Landform:* Outwash plains

*Representative aspect:* North

*Slope range:* 0 to 3 percent

*Meets hydric soil criteria:* No

**1455425—Greylock-Cookson fine sandy loams, 1 to 6 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Greylock and similar soils: 50 percent

Cookson and similar soils: 40 percent

Dissimilar minor components: 10 percent

**Description of the Greylock Soil**

**Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

**Setting**

*Landform:* Ground moraines

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Low

*Parent material:* Loamy lodgement till

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 20

*Available water capacity:* High (about 10.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Canadian white violet, trillium, spinulose shield fern, twisted stalk, rattlesnake fern, and sweet cicely

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
A—1 to 6 inches; fine sandy loam  
E—6 to 7 inches; sandy loam  
Bhs—7 to 9 inches; sandy loam  
Bs—9 to 19 inches; sandy loam  
E/B—19 to 26 inches; sandy loam  
B/E—26 to 34 inches; sandy loam  
C—34 to 80 inches; sandy loam

## **Description of the Cookson Soil**

### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

### **Setting**

*Slope range:* 1 to 6 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low  
*Parent material:* Coarse-loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 2.2 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 8  
*Available water capacity:* Moderate (about 7.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 2e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Canadian white violet, wild leek, wild lily of the valley, spinulose woodfern, sweet cicely, sedge, downy yellow violet, twistedstalk, and trillium

### **Typical Profile**

Oi—0 to 3 inches; slightly decomposed plant material  
E—3 to 7 inches; fine sandy loam  
Bhs—7 to 11 inches; fine sandy loam  
Bs—11 to 16 inches; sandy loam  
2E'—16 to 21 inches; fine sandy loam  
2Bt—21 to 31 inches; fine sandy loam  
2BC—31 to 36 inches; fine sandy loam  
3R—36 to 80 inches; bedrock

### Minor Components

#### Blue Lake soils

*Percent of map unit:* 3 percent

*Geomorphic position (two-dimensional):* Summit, shoulder, backslope, and footslope

*Geomorphic position (three-dimensional):* Base slope, side slope, and crest

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Down-slope shape:* Convex and concave

*Across-slope shape:* Linear and convex

*Meets hydric soil criteria:* No

#### Summerville soils

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

#### Escanaba soils

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 1 to 6 percent

*Meets hydric soil criteria:* No

#### Reade soils

*Percent of map unit:* 2 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* No

## 1455431—Rubicon sand, 0 to 6 percent slopes, severely burned

### Map Unit Setting

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 36 inches

*Mean annual air temperature:* 39 to 45 degrees F

*Frost-free period:* 90 to 155 days

### Map Unit Composition

Rubicon, severely burned and similar soils: 95 percent

Dissimilar minor components: 5 percent

### Description of the Rubicon, Severely Burned Soil

#### Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

#### Setting

*Landform:* Pitted outwash plains

*Slope range:* 0 to 6 percent

*Representative aspect:* North

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy outwash  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Excessively drained  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.0 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Trailing arbutus, hairgrass, eastern teaberry, sedge, lowbush blueberry, greengreen reindeer lichen, and brackenfern

### **Typical Profile**

E—0 to 3 inches; sand  
Bs—3 to 28 inches; sand  
BC—28 to 36 inches; sand  
C—36 to 80 inches; sand

## **Minor Components**

### **Kinross soils**

*Percent of map unit:* 3 percent  
*Representative aspect:* North  
*Slope range:* 0 to 2 percent  
*Meets hydric soil criteria:* Yes

### **Croswell soils**

*Percent of map unit:* 2 percent  
*Representative aspect:* North  
*Slope range:* 0 to 4 percent  
*Meets hydric soil criteria:* No

## **1455432—Rubicon sand, 6 to 15 percent slopes, severely burned**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 36 inches  
*Mean annual air temperature:* 39 to 45 degrees F  
*Frost-free period:* 90 to 155 days

### Map Unit Composition

Rubicon, severely burned and similar soils: 95 percent

Dissimilar minor components: 5 percent

### Description of the Rubicon, Severely Burned Soil

#### Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

#### Setting

*Landform:* Pitted outwash plains

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Sandy outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.0 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sedge, greygreen reindeer lichen, hairgrass, trailing arbutus, eastern teaberry, brackenfern, and lowbush blueberry

#### Typical Profile

E—0 to 3 inches; sand

Bs—3 to 28 inches; sand

BC—28 to 36 inches; sand

C—36 to 80 inches; sand

### Minor Components

#### Kinross soils

*Percent of map unit:* 3 percent

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

#### Croswell soils

*Percent of map unit:* 2 percent

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* No

## 1455433—Wurtsmith-Deford complex, 0 to 6 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 590 to 1,965 feet

*Mean annual precipitation:* 30 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 140 days

### Map Unit Composition

Wurtsmith and similar soils: 55 percent

Deford and similar soils: 35 percent

Dissimilar minor components: 10 percent

### Description of the Wurtsmith Soil

#### Taxonomic Classification

Mixed, frigid Oxyaquic Udipsamments

#### Setting

*Landform:* Beach ridges

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Beach sand

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* About 24 inches (see table 19)

*Drainage class:* Moderately well drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.0 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* B

#### Vegetation

*Existing plants:* Blueberry, brackenfern, Canada mayflower, trailing arbutus, sweet fern, serviceberry, cowwheat, yellow beadlily, sedge, grasses, and eastern teaberry

#### Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 4 inches; sand

Bw—4 to 24 inches; sand

C—24 to 80 inches; sand

### Description of the Deford Soil

#### Taxonomic Classification

Mixed, frigid Typic Psammaquents

#### Setting

*Landform:* Swales

*Slope range:* 0 to 1 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Negligible

*Parent material:* Beach sand

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Depth to water table:* At the soil surface

*Drainage class:* Poorly drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Moderate (about 6.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 5w

*Meets hydric soil criteria:* Yes

*Hydrologic soil group:* A/D

#### Vegetation

*Existing plants:* Common ladyfern, sedge, small enchanter's nightshade, bunchberry dogwood, spinulose woodfern, horsetail, bedstraw, oakfern, jewelweed, American fly honeysuckle, Canada mayflower, naked miterwort, sensitive fern, American red raspberry, starflower, and starflower

#### Typical Profile

Oa—0 to 4 inches; muck

C—4 to 80 inches; fine sand

### Minor Components

#### Meehan soils

*Percent of map unit:* 6 percent

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* No

#### Shelldrake soils

*Percent of map unit:* 4 percent

*Landform:* Beach ridges

*Representative aspect:* North

*Slope range:* 0 to 8 percent

*Meets hydric soil criteria:* No

## 1455434—Shell Drake fine sand, 2 to 75 percent slopes

### Map Unit Setting

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### Map Unit Composition

Shell Drake and similar soils: 99 percent

Dissimilar minor components: 1 percent

### Description of the Shell Drake Soil

#### Taxonomic Classification

Frigid, uncoated Typic Quartzipsamments

#### Setting

*Landform:* Dunes

*Slope range:* 2 to 75 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Sandy eolian deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 6.0 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sweet cicely, spinulose shield fern, bedstraw, Solomon's seal, wild lily of the valley, twisted stalk, American fly honeysuckle, horsetail, brackenfern, and sedge

#### Typical Profile

Oe—0 to 1 inch; slightly decomposed plant material

Oa—1 to 3 inches; highly decomposed plant material

A—3 to 4 inches; sand

C—4 to 80 inches; sand

### Minor Components

#### Wurtsmith soils

*Percent of map unit:* 1 percent

*Landform:* Beach ridges

*Representative aspect:* North

*Slope range:* 1 to 4 percent

*Meets hydric soil criteria:* No

### 1455435—Shell Drake-Dune land complex, 2 to 75 percent slopes

#### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

#### Map Unit Composition

Shell Drake and similar soils: 61 percent

Dune land: 38 percent

Dissimilar minor components: 1 percent

#### Description of the Shell Drake Soil

##### Taxonomic Classification

Frigid, uncoated Typic Quartzipsamments

##### Setting

*Landform:* Dunes

*Slope range:* 2 to 75 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

##### Properties and Qualities

*Runoff:* Low

*Parent material:* Sandy eolian deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 6.0 inches)

##### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Lowbush blueberry, hairgrass, twinflower, starflower, wild lily of the valley, shining clubmoss, wintergreen, blueberry, brackenfern, and sedge

### **Typical Profile**

Oe—0 to 1 inch; slightly decomposed plant material  
Oa—1 to 3 inches; highly decomposed plant material  
A—3 to 4 inches; sand  
C—4 to 80 inches; sand

### **Description of Dune Land**

This component consists of excessively drained areas on active sand dune fields. These areas are rapidly permeable, essentially barren of vegetation, and sandy throughout.

### **Minor Components**

#### **Wurtsmith soils**

*Percent of map unit:* 1 percent  
*Landform:* Beach ridges  
*Representative aspect:* North  
*Slope range:* 1 to 4 percent  
*Meets hydric soil criteria:* No

## **1455436—Cookson-Nykanen complex, 15 to 50 percent slopes, dissected**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,390 feet  
*Mean annual precipitation:* 28 to 33 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Cookson, dissected and similar soils: 55 percent  
Nykanen, dissected and similar soils: 35 percent  
Dissimilar minor components: 10 percent

### **Description of the Cookson, Dissected Soil**

#### **Taxonomic Classification**

Coarse-loamy, mixed, active, frigid Alfic Haplorthods

#### **Setting**

*Landform:* Bedrock-controlled moraines  
*Slope range:* 15 to 50 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* High  
*Parent material:* Loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 20 to 40 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Well drained  
*Shrink-swell potential:* Low (about 2.2 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 8  
*Available water capacity:* Moderate (about 7.5 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 6e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* B

### **Vegetation**

*Existing plants:* Canadian white violet, wild leek, wild lily of the valley, spinulose woodfern, sweet cicely, sedge, downy yellow violet, twistedstalk, and trillium

### **Typical Profile**

Oi—0 to 3 inches; slightly decomposed plant material  
E—3 to 7 inches; fine sandy loam  
Bhs—7 to 11 inches; fine sandy loam  
Bs—11 to 16 inches; sandy loam  
2E'—16 to 21 inches; fine sandy loam  
2Bt—21 to 31 inches; fine sandy loam  
2BC—31 to 36 inches; fine sandy loam  
3R—36 to 80 inches; bedrock

## **Description of the Nykanen, Dissected Soil**

### **Taxonomic Classification**

Coarse-loamy, isotic, frigid Oxyaquic Eutrudepts

### **Setting**

*Landform:* Bedrock-controlled moraines  
*Slope range:* 15 to 45 percent  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* High  
*Parent material:* Loamy till  
*Restrictive feature(s):* Lithic bedrock at a depth of 10 to 32 inches; paralithic bedrock at a depth of 10 to 20 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Water table (depth, kind):* About 12 inches, perched (see table 19)  
*Drainage class:* Moderately well drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Very low (about 2.4 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Meets hydric soil criteria:* No

*Hydrologic soil group:* D

### **Vegetation**

*Existing plants:* Wild leek, common ladyfern, horsetail, smooth yellow violet, sweet cicely, and jewelweed

### **Typical Profile**

A—0 to 4 inches; very fine sandy loam

BA—4 to 14 inches; very fine sandy loam

2Cr—14 to 25 inches; weathered bedrock

2R—25 to 80 inches; unweathered bedrock

### **Minor Components**

#### **Ruse soils**

*Percent of map unit:* 5 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 0 to 2 percent

*Meets hydric soil criteria:* Yes

#### **Frohling, calcareous substratum, dissected soils**

*Percent of map unit:* 3 percent

*Representative aspect:* North

*Slope range:* 15 to 50 percent

*Meets hydric soil criteria:* No

#### **Trout Bay soils**

*Percent of map unit:* 2 percent

*Landform:* Drainageways in depressions in glacial drainage channels

*Representative aspect:* North

*Slope range:* 0 to 4 percent

*Meets hydric soil criteria:* Yes

## **1455437—Dillingham-Kalkaska complex, 1 to 6 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,965 feet

*Mean annual precipitation:* 28 to 34 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Dillingham and similar soils: 45 percent

Kalkaska and similar soils: 40 percent

Dissimilar minor components: 15 percent

### **Description of the Dillingham Soil**

#### **Taxonomic Classification**

Sandy, isotic, frigid Typic Fragiorthods

**Setting**

*Landform:* Disintegration moraines

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Very low

*Parent material:* Sandy till

*Restrictive feature(s):* Fragipan at a depth of 16 to 28 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.8 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss,  
Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

**Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; loamy sand

Bhs—8 to 11 inches; loamy sand

Bs—11 to 21 inches; loamy fine sand

E/Bx—21 to 31 inches; fine sand and loamy fine sand

C—31 to 80 inches; sand

**Description of the Kalkaska Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Outwash plains

*Slope range:* 1 to 6 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Runoff:* Negligible

*Parent material:* Outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, Canada mayflower, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Minor Components**

### **Yalmer soils**

*Percent of map unit:* 10 percent  
*Landform:* Ground moraines  
*Representative aspect:* North  
*Slope range:* 1 to 6 percent  
*Meets hydric soil criteria:* No

### **Paquin soils**

*Percent of map unit:* 5 percent  
*Representative aspect:* North  
*Slope range:* 0 to 3 percent  
*Meets hydric soil criteria:* No

## **1455438—Dillingham-Kalkaska complex, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation:* 570 to 1,965 feet  
*Mean annual precipitation:* 28 to 34 inches  
*Mean annual air temperature:* 39 to 43 degrees F  
*Frost-free period:* 80 to 155 days

### **Map Unit Composition**

Dillingham and similar soils: 52 percent  
Kalkaska and similar soils: 45 percent  
Dissimilar minor components: 3 percent

### Description of the Dillingham Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Fragiorthods

#### Setting

*Landform:* Disintegration moraines

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Medium

*Parent material:* Glaciofluvial deposits

*Restrictive feature(s):* Fragipan at a depth of 16 to 28 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Very low (about 2.8 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 6s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

#### Vegetation

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, wild lily of the valley, hairy Solomon's seal, elderberry, and American starflower

#### Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; loamy sand

Bhs—8 to 11 inches; loamy sand

Bs—11 to 21 inches; loamy fine sand

E/Bx—21 to 31 inches; fine sand and loamy fine sand

C—31 to 80 inches; sand

### Description of the Kalkaska Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Disintegration moraines

*Slope range:* 6 to 15 percent

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Very low

*Parent material:* Outwash

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Restrictive feature(s)*: None within a depth of 60 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Depth to water table*: More than 72 inches  
*Drainage class*: Somewhat excessively drained  
*Shrink-swell potential*: Low (about 0.0 LEP)  
*Salinity maximum*: Not saline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent (maximum weight percentage)*: 0  
*Available water capacity*: Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 6s  
*Meets hydric soil criteria*: No  
*Hydrologic soil group*: A

### **Vegetation**

*Existing plants*: Sugar maple, spinulose woodfern, American beech, shining clubmoss, wild lily of the valley, hairy Solomon's seal, elderberry, and American starflower

### **Typical Profile**

A—0 to 2 inches; sand  
E—2 to 6 inches; sand  
Bhs—6 to 8 inches; sand  
Bs—8 to 16 inches; sand  
BC—16 to 26 inches; sand  
C—26 to 80 inches; sand

## **Minor Components**

### **Dawson soils**

*Percent of map unit*: 2 percent  
*Landform*: Depressions  
*Representative aspect*: North  
*Slope range*: 0 to 1 percent  
*Meets hydric soil criteria*: Yes

### **Voelker soils**

*Percent of map unit*: 1 percent  
*Landform*: Disintegration moraines  
*Representative aspect*: North  
*Slope range*: 6 to 15 percent  
*Meets hydric soil criteria*: No

## **1455439—Dillingham-Kalkaska complex, 15 to 35 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA)*: 94B—Michigan Eastern Upper Peninsula Sandy Drift  
*Elevation*: 570 to 1,965 feet  
*Mean annual precipitation*: 28 to 34 inches  
*Mean annual air temperature*: 39 to 43 degrees F  
*Frost-free period*: 80 to 155 days

### Map Unit Composition

Dillingham and similar soils: 50 percent  
Kalkaska and similar soils: 40 percent  
Dissimilar minor components: 10 percent

### Description of the Dillingham Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Fragiorthods

#### Setting

*Landform*: Disintegration moraines

*Landform position (two-dimensional)*: Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional)*: Nose slope, head slope, crest, interfluvium, base slope, and side slope

*Slope range*: 15 to 35 percent

*Down-slope shape*: Linear and convex

*Across-slope shape*: Convex and concave

*Representative aspect*: North

*Soil temperature class*: Frigid

*Soil temperature regime*: Frigid

#### Properties and Qualities

*Runoff*: High

*Parent material*: Sandy glaciofluvial deposits

*Restrictive feature(s)*: Fragipan at a depth of 16 to 28 inches

*Frequency of flooding*: None

*Frequency of ponding*: None

*Depth to water table*: More than 72 inches

*Drainage class*: Well drained

*Shrink-swell potential*: Low (about 0.5 LEP)

*Salinity maximum*: Not saline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent (maximum weight percentage)*: 0

*Available water capacity*: Very low (about 2.8 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Meets hydric soil criteria*: No

*Hydrologic soil group*: A

#### Vegetation

*Existing plants*: Sugar maple, spinulose woodfern, American beech, shining clubmoss, wild lily of the valley, hairy Solomon's seal, elderberry, and American starflower

#### Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; loamy sand

Bhs—8 to 11 inches; loamy sand

Bs—11 to 21 inches; loamy fine sand

E/Bx—21 to 31 inches; fine sand and loamy fine sand

C—31 to 80 inches; sand

### Description of the Kalkaska Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

### Setting

*Landform:* Disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Head slope, interfluvium, crest, base slope, side slope, and nose slope

*Slope range:* 15 to 35 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

### Properties and Qualities

*Runoff:* Low

*Parent material:* Outwash

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 4.9 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

### Vegetation

*Existing plants:* Sugar maple, spinulose woodfern, American beech, shining clubmoss, wild lily of the valley, hairy Solomon's seal, elderberry, and American starflower

### Typical Profile

A—0 to 2 inches; sand

E—2 to 6 inches; sand

Bhs—6 to 8 inches; sand

Bs—8 to 16 inches; sand

BC—16 to 26 inches; sand

C—26 to 80 inches; sand

## Minor Components

### Dawson soils

*Percent of map unit:* 5 percent

*Landform:* Depressions

*Geomorphic position (two-dimensional):* Toeslope

*Geomorphic position (three-dimensional):* Base slope and dip

*Representative aspect:* North

*Slope range:* 0 to 1 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Meets hydric soil criteria:* Yes

**Alcona soils**

*Percent of map unit:* 3 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 15 to 35 percent

*Meets hydric soil criteria:* No

**Voelker soils**

*Percent of map unit:* 2 percent

*Landform:* Disintegration moraines

*Representative aspect:* North

*Slope range:* 15 to 35 percent

*Meets hydric soil criteria:* No

**1671074—Udipsamments and Udorthents, nearly level to very steep**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Udipsamments: 50 percent

Udorthents: 50 percent

**Description of the Udipsamments**

**Taxonomic Classification**

Udipsamments

**Setting**

*Slope range:* 0 to 60 percent

*Representative aspect:* North

*Soil temperature regime:* Frigid

**Properties and Qualities**

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Excessively drained

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

*Available water capacity:* Low (about 5.6 inches)

**Typical Profile**

C—0 to 80 inches; sand

### Description of the Udorthents

#### Taxonomic Classification

Udorthents

#### Setting

*Slope range:* 0 to 60 percent

*Representative aspect:* North

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Well drained

*Salinity maximum:* Not saline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent (maximum weight percentage):* 0

### 1671282—Stutts-Kalkaska complex, 0 to 6 percent slopes

#### Map Unit Setting

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

#### Map Unit Composition

Stutts and similar soils: 65 percent

Kalkaska and similar soils: 35 percent

#### Description of the Stutts Soil

#### Taxonomic Classification

Sandy, isotic, frigid Typic Haplorthods

#### Setting

*Landform:* Disintegration moraines

*Landform position (three-dimensional):* Rise

*Slope range:* 0 to 6 percent

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### Properties and Qualities

*Runoff:* Low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 1.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 6.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Wild sarsaparilla, rattlesnake fern, sedge, spinulose shield fern, stiff clubmoss, hairy Solomon's seal, elderberry, and starflower

### **Typical Profile**

Oa—0 to 0 inches; highly decomposed plant material  
A—0 to 2 inches; fine sandy loam  
E—2 to 7 inches; fine sandy loam  
Bhs—7 to 9 inches; fine sandy loam  
Bs1—9 to 13 inches; sandy loam  
Bs2—13 to 19 inches; sandy loam  
2BC,2C—19 to 80 inches; sand

## **Description of the Kalkaska Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

### **Setting**

*Landform:* Outwash plains  
*Landform position (three-dimensional):* Rise  
*Slope range:* 0 to 6 percent  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sedge, shining clubmoss, false Solomon's seal, Canada beadruby, spinulose woodfern, trillium, and red elderberry

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 6 inches; loamy sand

Bhs—6 to 8 inches; loamy sand

Bs1—8 to 12 inches; loamy sand

Bs2—12 to 23 inches; sand

BC—23 to 38 inches; sand

C—38 to 80 inches; sand

## **1671283—Stutts-Kalkaska complex, 6 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

### **Map Unit Composition**

Stutts and similar soils: 65 percent

Kalkaska and similar soils: 25 percent

Dissimilar minor components: 10 percent

### **Description of the Stutts Soil**

#### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

#### **Setting**

*Landform:* Disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Crest, interfluve, side slope, base slope, head slope, and nose slope

*Slope range:* 6 to 15 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

*Soil temperature class:* Frigid

*Soil temperature regime:* Frigid

#### **Properties and Qualities**

*Runoff:* Low

*Parent material:* Sandy glaciofluvial deposits

*Restrictive feature(s):* None within a depth of 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Depth to water table:* More than 72 inches

*Drainage class:* Somewhat excessively drained

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Shrink-swell potential:* Low (about 1.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 6.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Wild sarsaparilla, rattlesnake fern, sedge, spinulose shield fern, stiff clubmoss, hairy Solomon's seal, elderberry, and starflower

### **Typical Profile**

Oa—0 to 0 inches; highly decomposed plant material  
A—0 to 2 inches; fine sandy loam  
E—2 to 7 inches; fine sandy loam  
Bhs—7 to 9 inches; fine sandy loam  
Bs1—9 to 13 inches; sandy loam  
Bs2—13 to 19 inches; sandy loam  
2BC,2C—19 to 80 inches; sand

## **Description of the Kalkaska Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

### **Setting**

*Landform:* Outwash plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope  
*Landform position (three-dimensional):* Head slope, interfluvium, crest, base slope, side slope, and nose slope  
*Slope range:* 6 to 15 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Negligible  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3s

*Meets hydric soil criteria:* No

*Hydrologic soil group:* A

**Vegetation**

*Existing plants:* Sedge, shining clubmoss, false Solomon's seal, Canada beadruby, spinulose woodfern, trillium, and red elderberry

**Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 6 inches; loamy sand

Bhs—6 to 8 inches; loamy sand

Bs1—8 to 12 inches; loamy sand

Bs2—12 to 23 inches; sand

BC—23 to 38 inches; sand

C—38 to 80 inches; sand

**Minor Components**

**Alcona soils**

*Percent of map unit:* 10 percent

*Landform:* Ground moraines

*Representative aspect:* North

*Slope range:* 6 to 15 percent

*Meets hydric soil criteria:* No

**1671284—Stutts-Kalkaska complex, 15 to 35 percent slopes**

**Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

*Elevation:* 570 to 1,390 feet

*Mean annual precipitation:* 28 to 33 inches

*Mean annual air temperature:* 39 to 43 degrees F

*Frost-free period:* 90 to 155 days

**Map Unit Composition**

Stutts and similar soils: 55 percent

Kalkaska and similar soils: 45 percent

**Description of the Stutts Soil**

**Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

**Setting**

*Landform:* Disintegration moraines

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope

*Landform position (three-dimensional):* Crest, side slope, base slope, head slope, interfluvium, and nose slope

*Slope range:* 15 to 35 percent

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex and concave

*Representative aspect:* North

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Medium  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 1.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Moderate (about 6.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 4e  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Wild sarsaparilla, rattlesnake fern, sedge, spinulose shield fern, stiff clubmoss, hairy Solomon's seal, elderberry, and starflower

### **Typical Profile**

Oa—0 to 0 inches; highly decomposed plant material  
A—0 to 2 inches; fine sandy loam  
E—2 to 7 inches; fine sandy loam  
Bhs—7 to 9 inches; fine sandy loam  
Bs1—9 to 13 inches; sandy loam  
Bs2—13 to 19 inches; sandy loam  
2BC,2C—19 to 80 inches; sand

## **Description of the Kalkaska Soil**

### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

### **Setting**

*Landform:* Outwash plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope, and toeslope  
*Landform position (three-dimensional):* Head slope, interfluvium, crest, base slope, side slope, and nose slope  
*Slope range:* 15 to 35 percent  
*Down-slope shape:* Linear and convex  
*Across-slope shape:* Convex and concave  
*Representative aspect:* North  
*Soil temperature class:* Frigid  
*Soil temperature regime:* Frigid

### **Properties and Qualities**

*Runoff:* Low  
*Parent material:* Sandy glaciofluvial deposits  
*Restrictive feature(s):* None within a depth of 60 inches  
*Frequency of flooding:* None

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*Frequency of ponding:* None  
*Depth to water table:* More than 72 inches  
*Drainage class:* Somewhat excessively drained  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum:* Not saline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent (maximum weight percentage):* 0  
*Available water capacity:* Low (about 4.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 3s  
*Meets hydric soil criteria:* No  
*Hydrologic soil group:* A

### **Vegetation**

*Existing plants:* Sedge, shining clubmoss, false Solomon's seal, Canada beadruby, spinulose woodfern, trillium, and red elderberry

### **Typical Profile**

Oe—0 to 1 inch; moderately decomposed plant material  
E—1 to 6 inches; loamy sand  
Bhs—6 to 8 inches; loamy sand  
Bs1—8 to 12 inches; loamy sand  
Bs2—12 to 23 inches; sand  
BC—23 to 38 inches; sand  
C—38 to 80 inches; sand

## **1693163—Water**

### **Map Unit Setting**

*Major land resource area(s) (MLRA):* 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part and 94B—Michigan Eastern Upper Peninsula Sandy Drift

### **Map Unit Composition**

Water: 100 percent

### **Description**

This map unit consists of small lakes (such as Chapel and Litte Beaver Lakes), small rivers (such as the Hurricane, Moquito, and Miners Rivers), and areas surrounding surrounding Lake Superior.



# Use and Management of the Soils

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This soil survey is an inventory and evaluation of the soils within Pictured Rocks National Lakeshore. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils as farmland and as sites for buildings, sanitary facilities, highways and other transportation systems, and recreational facilities. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the park. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, and trees and shrubs.

## Interpretive Ratings

The interpretive tables in this survey rate the soils in the park for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

## Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited*, *slightly limited*, *somewhat limited*, and *very limited*. The suitability ratings are expressed as *well suited*, *moderately well suited*, *poorly suited*, and *unsuited* or as *good*, *fair*, and *poor*.

## Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact

on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

## Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA-SCS, 1961). Only class and subclass are used in this survey.

*Capability classes*, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The capability classification of map units in this park is given in the section “Detailed Soil Map Units” and in table 2.

## Prime and Other Important Farmland

Table 3 lists the map units in the park that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

*Prime farmland* is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some soils identified as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

*Unique farmland* is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield

as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

## Hydric Soils

Table 4 lists the map unit components that are rated as hydric soils in the park. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; USDA-NRCS, 2010).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin et al., 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2010) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (USDA-NRCS, 2010).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

1. All Histels except for Folistels and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
  - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
  - B. are poorly drained or very poorly drained and have either:
    - 1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
    - 2) a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity ( $K_{sat}$ ) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
    - 3) a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity ( $K_{sat}$ ) is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for periods of long or very long duration during the growing season.
4. Soils that are frequently flooded for periods of long or very long duration during the growing season.

## Climate, Landform, and Parent Material

Table 5 displays information about the climate, landform, and parent material of each soil in the map units.

*Percent of the map unit* is the extent of the named soil in the map unit.

*Slope* is the inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. The table shows the low and high range of slope for the named component or soil.

*Elevation* is the height of an object or area on the earth's surface in reference to a fixed point, such as mean sea level. The typical low and high range of elevation is displayed for each soil.

*MAP* is the mean annual precipitation for areas of the soil in the map unit.

*Landform* is a specific shape of the earth in the area where a soil typically occurs. Examples are a mountain summit and a valley bottom.

*Parent material* is the material in which soils formed. Examples are the underlying geological material (including bedrock), a surficial deposit (such as volcanic ash), and organic material. Soils inherit their chemical and physical properties from the parent material.

## Land Management

In table 6, parts I through IV, interpretive ratings are given for various aspects of land management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified land management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified

practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified land management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for *fire damage* and *seedling mortality* are expressed as low, moderate, and high. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

Rating class terms for *hazard of erosion* are expressed as slight, moderate, severe, and very severe. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for erosion is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for land management practices.

### **Planting**

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of planting equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

### **Hazard of Erosion and Suitability for Roads**

Ratings in the column *hazard of erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in areas where 50 to 75 percent of the surface has been exposed by different kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings

indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

### Site Preparation

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

### Site Restoration

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

## Recreation

The soils of the park are rated in table 7, parts I and II, according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, and water management.

*Camp areas* require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Picnic areas* are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Foot traffic and equestrian trails* for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

*Mountain bike and off-road vehicle trails* require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, depth to a water table, ponding, slope, flooding, and texture of the surface layer.

## Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, landscaping, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

*Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.*

*The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.*

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for septic tank absorption fields and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, ponds, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

## Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 8 shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Dwellings* are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties

that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

*Small commercial buildings* are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

## **Roads and Streets, Shallow Excavations, and Landscaping**

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 9 shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Local roads and streets* have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on

the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

*Landscaping* requires soils on which turf, trees, and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

## Sewage Disposal

Table 10 shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Septic tank absorption fields* are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity ( $K_{sat}$ ), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

*Sewage lagoons* are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity ( $K_{sat}$ ), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity ( $K_{sat}$ ) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a  $K_{sat}$  rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

### Source of Gravel and Sand

Table 11 gives information about the soils as potential sources of gravel and sand. Normal compaction, minor processing, and other standard construction practices are assumed.

*Gravel* and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. Only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet.

The soils are rated *good*, *fair*, or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

### Source of Reclamation Material, Roadfill, and Topsoil

Table 12 gives information about the soils as potential sources of reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good*, *fair*, or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. Numerical ratings between 0.00 and 0.99 are given after the specified features. These numbers indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

*Reclamation material* is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not

apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

*Roadfill* is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments. The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

*Topsoil* is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

## Ponds and Embankments

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential

is determined by the saturated hydraulic conductivity ( $K_{sat}$ ) of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

*Aquifer-fed excavated ponds* are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table,  $K_{sat}$  of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

# Soil Properties

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Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering properties, physical and chemical properties, and pertinent soil and water features.

## Engineering Properties

Table 14 gives the engineering classifications and the range of engineering properties for the layers of each soil in the park.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

*Classification* of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement,

the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

## Physical Soil Properties

Table 15 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the park. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

*Sand* as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Silt* as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity ( $K_{sat}$ ), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

*Moist bulk density* is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at  $1/3$ - or  $1/10$ -bar (33-kPa or 10-kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water

and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

*Permeability* ( $K_{sat}$ ) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity ( $K_{sat}$ ). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Shrink-swell potential* is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, greater than 9 percent.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

## Erosion Properties

Table 16 shows estimates of some erosion factors that affect a soil's potential for different uses. These estimates are given for each layer of every soil for K factors and are given as one rating for the entire soil for the T factor, the wind erodibility group, and the wind erodibility index. Values are reported for each soil in the park. Estimates are based on field observations and on test data for these and similar soils.

Erosion factors are shown in the table as the K factor ( $K_w$  and  $K_f$ ) and the T factor. Soil erosion factors  $K_w$  and  $K_f$  quantify soil detachment by runoff and raindrop impact. These erosion factors are indexes used to predict the long-term average soil loss from sheet and rill erosion under crop systems and conservation techniques. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and  $K_{sat}$ . Values

of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

The procedure for determining the Kf factor is outlined in Agriculture Handbook 703, "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)," USDA, Agricultural Research Service, 1997.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Erosion factor Kw* indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments. In horizons where total rock fragments are 15 percent or more, by volume, the Kw factor is always less than the Kf factor.

*Erosion factor Kf* indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size. Soil horizons that do not have rock fragments are assigned equal Kw and Kf factors.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind erodibility groups* are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

*Wind erodibility index* is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

## Total Soil Carbon

Table 17 gives estimates of total soil carbon. Soil carbon occurs as organic and inorganic carbon.

Soil organic carbon (SOC) is carbon (C) in soil that originated from a biological source, such as plants, animals, or micro-organisms. SOC is found in both organic and mineral soil layers. The term "soil organic carbon" refers only to the carbon occurring in soil organic matter (SOM). Soil organic carbon makes up about one-half the weight of soil organic matter. The rest of SOM is mostly oxygen, nitrogen, and hydrogen.

Soil inorganic carbon (SIC) is carbon found in soil carbonates, typically as calcium carbonate layers in the soil or as clay-sized fractions throughout the soil. Carbonates in soils are most common in areas where evaporation rates exceed precipitation, as is the case in most desert environments. Typically, the carbonates accumulated from carbonatic dust or from solution during periods of wetter climates. Soil inorganic carbon also occurs in soils that formed in marl in all regions of the country.

The SOC and SIC contents are reported in kilograms per square meter to a depth of 2 meters or to a representative depth of either hard bedrock or a cemented horizon. The SOC and SIC values are on a whole soil basis, corrected for rock fragments.

SOC can be an indicator of overall soil fertility and soil quality that affects ecosystem function. SOM is the main reservoir for most plant nutrients, such as phosphorus and nitrogen. Managing for SOC by managing for SOM increases the content of these elements and improves soil resiliency.

Soil organic matter binds soil particles together and thus increases soil porosity and water infiltration and allows better root penetration and waterflow into the soil. Greater inflow of water reduces the hazard of erosion and the rate of surface water runoff.

Greater SOC levels improve not only soil quality but also the quality of air and water. Soil acts as a filter and improves water quality. Fertile soils that support plant life remove CO<sub>2</sub> from the atmosphere and increase oxygen levels through photosynthesis. Maintaining the level of soil organic carbon reduces C release into the atmosphere and thus can lessen the effects of global warming.

SIC influences the types of plants that will grow. High SIC levels are commonly associated with a higher soil pH, which limits the types of plants that will thrive.

Like SOM, soil carbonates, the source of SIC, also bind soil particles together. They fill voids in the soil and thus can reduce soil porosity. Compacted soil carbonates may restrict root penetration and waterflow into the soil.

## Chemical Soil Properties

Table 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the park. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Cation-exchange capacity* is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

*Effective cation-exchange capacity* refers to the sum of extractable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

*Soil reaction* is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

*Calcium carbonate* equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil.

## Water Features

Table 19 gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

*Water table* refers to a saturated zone in the soil. Table 19 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

*Ponding* is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

*Flooding* is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

*Duration* and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

## Soil Features

Table 20 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the thickness and hardness of the restrictive layer, both of

which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

*Potential for frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity ( $K_{sat}$ ), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

*Risk of corrosion* pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.



# Formation and Classification of the Soils

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This section relates the soils in Pictured Rocks National Lakeshore to the major factors of soil formation and describes the processes of soil horizon differentiation and the system of soil classification.

## Factors of Soil Formation

By Susan Burlew Southard, Natural Resources Conservation Service.

Soil covers the surface of the earth as a three-dimensional body of varying thickness and is made up of different proportions of organic and mineral material, pore space with gases, and water. Soils differ in their appearance, productivity, and management requirements due to their chemical and physical properties. The characteristics and properties of soils are determined by physical and chemical processes that result from the interaction of five soil-forming factors. These factors of soil formation are interdependent, and few generalizations can be made regarding any one factor unless the effects of the other factors are known. The term “pedogenesis” is often used to connote the processes of soil formation.

The interacting soil-forming factors are parent material, climate, organisms, time, and relief or topography (Jenny, 1941). *Parent material* is the source material in which soils formed. Soils are influenced by the texture and structure of the parent material and its mineralogical and chemical composition. *Climate* is predominantly the temperature and kind and amount of precipitation. It is also seasonal distribution of temperatures and precipitation. *Organisms* are the plants and other organisms living in and on the soil, including humans. *Time* refers to how long the soil-forming factors have been operating on a particular landscape. *Relief or topography* is the shape and elevation of the landscape. It affects internal and external soil properties, such as soil drainage, aeration, susceptibility to erosion, and the soil’s exposure to the sun and wind.

The processes of soil formation are a sequence of events, involving biogeochemical reactions that are energized by climate and spatially related to relief or topography (Buol et al., 2011). The physical and chemical properties of a soil are altered by these reactions over time. The influence of any one of these factors varies among all parks and within localities of a particular park. Soils may differ significantly from place to place in a park and within very short distances as a result of complex interactions among the five factors. In some cases, however, parks may have vast stretches of the same type of soil because of uniform soil-forming factors.

## Setting of Pictured Rocks National Lakeshore

Understanding the setting of Pictured Rocks National Lakeshore (Pictured Rocks NL) helps in understanding the parent materials contributing to the types of soils within it. Understanding the soils of the park helps in understanding the unique relationship between soils and the environment. Soil-forming processes are influenced by rock type, topographic expression, and the hydrologic properties of the area. Soil formation influences soil properties and behaviors, which are used when determining best management practices.

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Pictured Rocks NL is located along Lake Superior on the upper peninsula of Michigan. In 1966, it was the first officially designated national lakeshore in the park system. The lakeshore extends for 42 miles and covers a little over 73,000 acres. The park features include various rock formations in the shapes of turrets and human profiles, natural archways, waterfalls, and sand dunes. The colorful sandstone cliffs northeast of the town of Munising give the park its name.

The cliffs are composed of the 500-million-year-old Munising Formation sandstone. The Munising Formation sits atop pre-Cambrian sandstone of the Jacobsville Formation (USDI-NPS, 2013). The mottled red Jacobsville Formation is the oldest rock in the park. On top of the Munising Formation is the Au Train Formation sandstone that acts as an erosion-resistant “cap” over other layers. The colors in the cliffs are created by mineral types in the rock. Streaks on the face of the cliffs are stains from the weathering of minerals bearing iron oxides (mainly red), manganese oxides (mostly black and white), limonite (some yellow-brown colors), and copper (pink and green).

The physical geography of the broader landscape of Michigan and the Great Lakes, as well as the park, is the result of the erosion and deposition of materials caused by the advancement and retreat of glaciers over the last 2 million years. Glaciers scoured the surface of the earth, leveled hills, and altered the previous landscape. Valleys created by the river systems of the previous era were deepened and enlarged to form the basins of the Great Lakes. As the climate warmed, the glaciers retreated. Glacial retreat was followed by an interglacial period during which vegetation and wildlife thrived. This cycle was repeated several times. The most important glacial advance for northwestern Michigan in terms of shaping the Pictured Rocks NL landscape is the Wisconsin stage, having retreated from Michigan about 9,500 to 15,000 years ago.

As the glaciers retreated, meltwater formed along the front of the ice. Because the land was greatly depressed from the weight of glaciers, large post-glacial lakes formed. These lakes were much larger than the present-day Great Lakes. Evidence of these lakes can still be seen in the form of beach ridges, eroded bluffs, and flat outwash plains located hundreds of feet above present lake levels (Blewett, 2012). Different soils have been identified on the different landforms. Regional uplift (crustal rebound) caused dramatic changes in the depth, size, and drainage patterns of the post-glacial lakes. The changing drainage patterns and water velocities also changed the type and sizes of materials deposited. These different materials influenced the soils that would form from them.

The steep headlands or bluffs of Pictured Rocks are characteristic of the Great Lakes regional shoreline. The ice lobes gouged debris from the valley floors and deposited it along the sides of the valleys when the ice finally melted. This debris was eventually deposited by the ice, creating prominent moraines. The park is bordered to the south by the hilly uplands of the Munising moraine (Blewett, 2012).

The park lakeshore today is covered by recent alluvium, dune sand, and Pleistocene glacial deposits. Sand is the recent alluvium that forms present-day flood plains. Two levels of sand dunes occur in the park—dunes near the current level of Lake Superior and the Grand Sable Dunes on plateaus that are old moraines set 275 feet above the lake (USDI-NPS, 2013). The Grand Sable Dunes are considered a perched dune formation. Sand washed ashore by wave action was blown upslope by northerly prevailing winds until it came to rest atop the Munising moraine. The Grand Sable Dunes of today (fig. 1) form a sand slope that rises from Lake Superior at a 35 degree angle (USDI-NPS, 2013). The processes that formed the Grand Sable Dunes are similar to those that formed the Sleeping Bear Dunes in Sleeping Bear Dunes National Lakeshore.

### Parent Material

The unconsolidated mass in which soils form is called parent material. Mineral soil parent material is a product of the weathering of underlying bedrock in place or the



**Figure 1.—The Grand Sable Dunes are comprised of active, unstabilized dunes and stabilized dunes. Soil-forming factors have contributed to a mosaic landscape of vegetated and unvegetated areas. Most of the dune area is mapped as Shelldrake-Duneland complex, 2 to 75 percent slopes.**

weathering of material that has been transported. Organic soils form in place from the accumulation and decomposition of plant material, such as wood, leaves, and aquatic plants. Weathering refers to the chemical and physical disintegration and decomposition of parent material.

Few soils weather directly from the underlying rocks, or what is referred to as residuum. More commonly, soils form in materials that have been moved from elsewhere. Soils generally have a dominant kind of parent material but were also influenced by other types of parent material. Material may have been moved only a few feet by gravity (colluvial parent material) or transported long distances by wind (eolian or loess parent material) or water (alluvial parent material).

#### **Glaciofluvial or Outwash Deposits**

Glaciofluvial deposits are parent materials deposited by glaciers that may have also been sorted and redeposited by water. In the northeastern and north-central parts of the United States, soil scientists make a distinction between the glacial fluvial processes of the past and the recent fluvial processes forming alluvium, which are less than 10,000 years old (Holocene age). For example, late Pleistocene glaciofluvial deposits are also termed *outwash* or *glaciolacustrine* (glacial lake) deposits while Holocene flood-plain deposits are termed *alluvium*. In Pictured Rocks NL, Croswell soils have *glaciofluvial* parent material, Fence soils formed in glaciolacustrine parent material, and Evert and Sturgeon soils on flood plains are forming in sandy alluvium. The most common soil parent materials in Pictured Rocks NL are: (1) glaciofluvial deposits, (2) till, (3) eolian deposits, and (4) rock and plant residuum. Many of the soils in the park formed in a combination of all of these materials.

Drift is a broad, general term often used in describing soil parent material. It is used to describe all mineral material (clay, silt, sand, gravel, and boulders) transported

by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Outwash deposits are stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. Outwash can have a variety of particle sizes. The particle-size distribution of outwash depends upon the velocity of the meltwaters carrying the sediment away from the glaciers. In general, the higher the velocity of water the larger the particle that the water can transport. Rock fragments in outwash are commonly subrounded to rounded due to the fact that they were tumbled and polished during transport. Soils that formed from outwash may have a high content of rock fragments. Most of the soils that formed in outwash are predominantly sandy. Certain landforms are associated with outwash, and certain soils occur on these landforms.

An *outwash plain* is an extensive lowland landscape of coarse textured material. It may be pitted with depressions due to melt-out of incorporated glaciers. The depressions are commonly kettles that formed by melt-out of incorporated ice blocks of glaciers. Soils on outwash plains in the park include Rubicon, Kalkaska, Crosswell, Au Gres, and Finch. A large outwash plain is mapped predominantly as Kalkaska soil (fig. 2) in a large swath to the west of the southern end of Grand Sable Lake and north of Rhody Creek. Kalkaska is the Official State Soil of Michigan.

A *kame terrace* is a terrace-like ridge consisting of stratified sand and gravel deposited by a meltwater stream flowing between a melting glacier and a higher valley wall or lateral moraine. Soils associated with kame terraces in the park include Waiska, Cusino, Kalkaska, and Grand Sable. Based on soil maps, a large kame terrace lies to the east of Trappers Lake. It is mostly comprised of Cusino and Kalkaska soils, occurring in a map unit complex. In a map unit complex, two or more major soil or non-soil components are identified in the map unit design and the major components cannot be mapped separately at a scale of about 1:24,000.

Grand Sable soils are also associated with kame terraces adjacent to dunes. These very deep, well drained soils formed in very fine sand eolian deposits and overlie buried soils that formed in sand outwash. The kame terrace landscape mapped as Grand Sable soil is viewable at the Sable Falls parking lot. The parking lot is located on a 720-foot kame terrace (Blewett, 2012). The hill behind the parking lot is a riser up to the 75-foot terrace (Blewett, 2012). A series of terraces is viewable driving south on William Hill Road. The soil maps delineate the risers, terraces, and glacial drainage channels associated with kame terraces in this area, each with a different suite of soils.

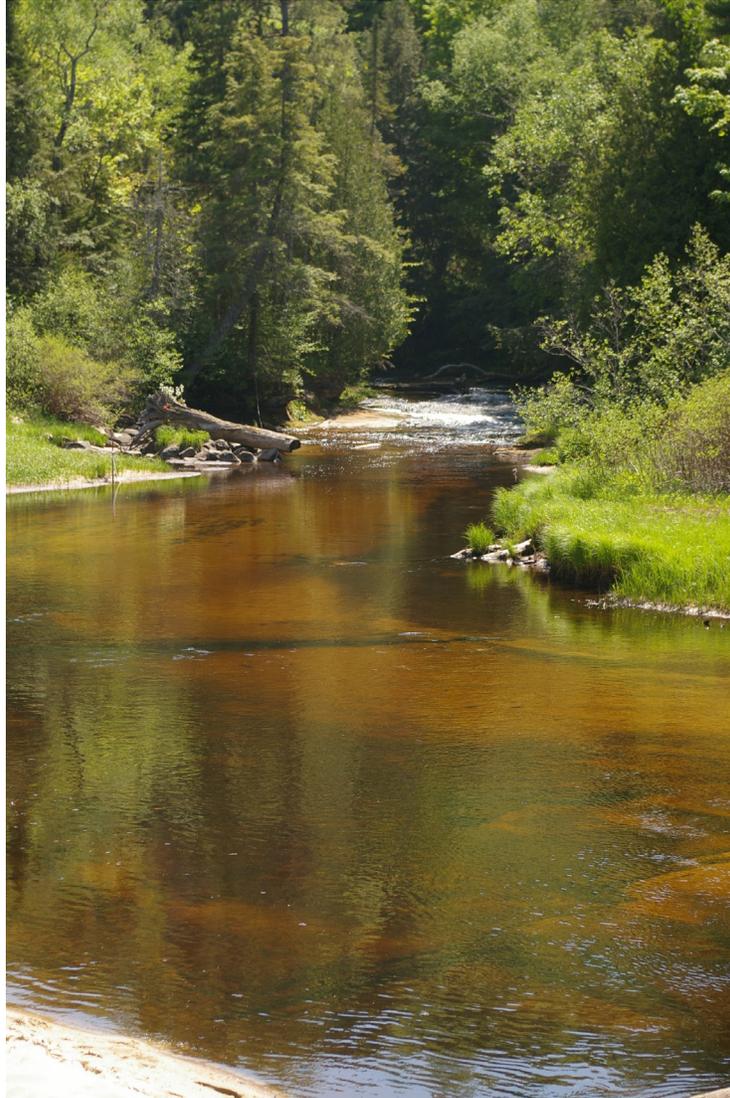
The official type location for the Grand Sable series is in the park. Maps units with Grand Sable soil typically have slopes of 1 to 35 percent. Most areas of this soil are covered with northern hardwoods. Common tree species growing on Grand Sable soil include sugar maple, American beech, paper birch, and black cherry. Ground plants include sweet cicely, yellow violet, Canadian violet, downy violet, white baneberry, sharp-lobed hepatica, spinulose shield fern, wild sarsaparilla, and shining club moss. Some small areas of Grand Sable soil near Grand Marais were previously cleared and cultivated for cropland and orchards. Soils that are geographically associated with Grand Sable soils are Shelldrake, Kalkaska, Stutts, Gongeau, Rhody, and Towes soils. The Grand Sable soil was sampled by the Kellogg Soil Survey Laboratory (Lincoln, Nebraska), and the pedon reference numbers are included in table 23. Lab data for this pedon, and the other pedons in table 23, can be retrieved online.

*Glacial drainage channels* were outlets of glacial lakes that occupied parts of the Upper Peninsula and the surrounding region. Glacial drainage channels were formed



**Figure 2.—Profile of a Kalkaska soil. The Kalkaska series consists of very deep, somewhat excessively drained soils that formed in sandy deposits on outwash plains. Kalkaska soils are mapped extensively in Pictured Rocks NL. The colorful profile displays some major soil-forming processes. Scale is in centimeters. (Image is from the soil survey of Luce County, Michigan.)**

from extensive amounts of meltwater that was present during deglaciation. The channels typically consist of a series of outwash or bedrock terraces with a current stream channel at the bottom. The large volumes of water that moved through these channels scoured some areas down to the underlying bedrock and deposited gravelly and cobbly outwash in other areas. In some areas the glacial drainage channels contain sediments that were deposited during periods of slower-moving water. Some



**Figure 3.—The bedrock valley of the Miners River controlled the flow of ice as it advanced through the area. Meanders such as this are mapped as Carbondale, Lupton, and Tawas soils. The water is darkened by organic acids leached from surrounding organic soils. (Photo by NMMIMAJ, accessed Feb 26, 2013 at [http://upload.wikimedia.org/wikipedia/commons/c/c3/Miners\\_River\\_2.jpg](http://upload.wikimedia.org/wikipedia/commons/c/c3/Miners_River_2.jpg). Licensed under Creative Commons Attribution-Share Alike 3.0 generic. Some rights reserved.)**

glacial drainage channels were blocked periodically. In some cases, melting ceased long enough to enable lacustrine soils to form in standing waters. Soils that have a high content of organic matter also formed in glacial drainage channels.

Soils mapped in glacial drainage channels include mineral soils, such as Nahma, Rhody, Towes, and Gongeau. Organic soils, such as Chippeny, Trout Bay, and Lupton, are all in channel depressions. Lupton soils are mapped around Miners Lake and the bedrock valley of the Miners River (fig. 3).

Rhody soils are mapped east of Grand Sable Lake. The official type location for the Rhody series is in the park, along Lowder Road. The Rhody series consists of moderately deep, poorly drained soils that formed in silty eolian deposits overlying

sandy outwash. Rhody soils are on eroded sandstone bedrock terraces within glacial drainage channels. Common trees growing on Rhody soils are red maple, yellow birch, striped maple, black ash, white cedar, and balsam fir. Common ground plants are shield fern, horsetail, jewelweed, yellow beadlily, twinflower, sedges, lady fern, mosses, wild lily of the valley, bunchberry, dewberry, naked miterwort, and twisted stalk.

### **Glaciolacustrine Deposits**

Glaciolacustrine deposits developed in post-glacial lakes. Post-glacial lakes were formed either by the damming action of a moraine during the retreat of a melting glacier or by meltwater trapped against an ice sheet due to isostatic depression of the earth's crust. Lakebeds in the park formed after glacial retreat and during the post-glacial variations in Lake Superior's water level. The relict lake areas are now lake plains. Lake plains are nearly level surfaces marking the floor of extinct lakes filled by well sorted, generally fine textured, stratified deposits, commonly containing varves. Varves are sedimentary layers, lamina, or sequence of laminae deposited in a body of still water within 1 year. Specifically, they are a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier. At the end of the last ice age, approximately 10,000 years ago, large lakes were a widespread feature in the northern hemisphere. Glaciolacustrine soils in Pictured Rocks NL commonly have a higher silt content than other soils because the original deposits were silty.

Fence soils, mapped on a lake plain, formed in glaciolacustrine deposits. These soils are mapped in the southwestern edge of the park in an area near Munising Falls, which is also at the edge of the Wisconsinian ice margin. Ingalls soils are also glaciolacustrine and are mapped west of the Mosquito River. Table 15 shows the relatively high silt content in Fence soils, ranging to 75 percent, by weight, and in Ingalls soils, ranging from 70 to 100 percent. Fence and Ingalls soils are of minor extent in the park.

### **Till**

Till is soil parent material transported, ground up, and then deposited by frozen ice. It is dominantly unsorted and unstratified material deposited directly by a glacier without subsequent reworking by meltwater. It consists of a heterogeneous mixture of clay, silt, sand, gravel, cobbles, stones, and boulders. Till may have rock fragments of various lithologies that are imbedded within a finer matrix that can range from clay to sand (USDA-NRCS, 2008). The rock fragments generally are angular but can also be subrounded or rounded. The composition of the till depends on the geologic formations over which the ice passed before the till was deposited. The material in the lower part of soils derived from till may be relatively unchanged from when it was deposited by moving water, ice, or wind. The composition of the till in turn affects the properties of the soils. Some of the soil properties affected by till are kinds and amounts of rock fragments, color, texture, mineralogy, and pH.

Different tills are on different landforms, and different soils are associated with the different landforms. The common tills in the park were deposited on *ground moraines*, *bedrock-controlled moraines*, or *disintegration moraines*.

A *ground moraine* is an extensive, low-relief area of till having an uneven or undulating surface and commonly bounded on the distal end by a recessional or an end moraine. The till of a ground moraine is a deposit of rock and mineral debris dragged along, in, on or beneath a glacier and emplaced by different processes. In some areas the ground moraine consists of large, relatively flat till plains, and in other areas the landscape is quite hilly (USDA-NRCS, 2006). Ground moraines occur throughout the entire Upper Peninsula. Major soils on ground moraines in the park are Greylock, Cookson, Trenary, Ensley, Charlevoix, and Munising. Based on soil maps, a

large area of ground moraine mapped as Munising and Cookson soils is located along Miners Castle Road at the park boundary and extends north to where the road begins to turn to the east.

A *bedrock-controlled moraine* consists of thin till deposits overlying bedrock. In some areas a predominance of sandy drift overlies the bedrock (USDA-NRCS, 2006). Rock outcrops are common on bedrock-controlled moraines. Deeper soils occur where the underlying bedrock is steep, fractured, and irregular in depth. In some places there may be an abundance of small outwash-filled channels. In the park, the underlying bedrock is predominantly Cambrian-age, Ordovician-age, and Silurian-age sandstone and dolomite (USDI-NPS, 2013). Major soils in the park mapped on bedrock-controlled moraines are Chippen, Trout Bay, Furlong, Ensign, Shingleton, Deerton, Jeske, and Gongeau. Chippen soils are in depressions on limestone bedrock. Soils such as Trout Bay are in the small outwash or glacial drainage channels associated with the bedrock-controlled moraines. Most of the bedrock-controlled moraines in the park lie near the shoreline from Sand Point to Spray Falls. A section of bedrock-controlled moraine and associated soils extends inland along the Miners Creek drainage. Furlong soils (fig. 4) are moderately deep and somewhat excessively drained and formed in sandy deposits underlain by limestone on bedrock-controlled moraines and outwash plains. These soils have rapid permeability. Slopes typically range from 0 to 6 percent. Quaking aspen, red maple, and sugar maple are the dominant tree species associated with Furlong soils.

Shingleton soils are shallow, somewhat excessively drained soils associated with bedrock-controlled moraines. They occur on bedrock benches and in glacial drainage channels that formed in sandy glaciofluvial deposits underlain by dolomitic sandstone and limestone. A soil pedon similar to a Shingleton pedon (referred to as Shingleton-like) was sampled during this survey, and the pedon reference numbers are included in table 23.

A *disintegration moraine* has a drift topography characterized by chaotic mounds and pits that are generally randomly oriented. The random orientation was caused by collapse and flow as underlying stagnant ice melted. Slopes on disintegration moraines may be steep and unstable, and in these areas used and unused stream courses and lake depressions are interspersed with the morainic ridges. Characteristically, there are numerous abrupt, lateral and vertical changes between unconsolidated materials of differing physical characteristics in a disintegration moraine (USDA-NRCS, 2008).

Disintegration moraines in the park are characterized by Garlic, Blue Lake, and Voelker soils (map unit 1455299, which has a complex, dissected terrain). Small areas of disintegration moraines mapped with these soils occur: (1) just south of Beaver Lake, (2) 1 mile east of Chapel Lake, (3) along the upper reaches of Miners River in the southwestern part of the park, and (4) north and south of East Munising Avenue. The imagery of the soil maps in these areas shows a rumpled, irregular terrain. Garlic soils (fig. 5) are very deep (more than 60 inches), well drained, and typically fine sand and occur on disintegration moraines. These soils have rapid permeability. Soils closely related to Garlic soils in the park are Kalkaska and Wallace.

It is difficult to consistently associate specific tills to specific soils since numerous advancements and retreats of the ice left a series of moraines that were often partially or completely destroyed. The ice varied according to the distance travelled south with each advancement and retreat. Some soils may be mapped on more than one landform due to the difficulties in identifying the landforms and parent materials consistently. Table 5 shows different till terms used in Pictured Rocks NL. The terms *basal till*, *lodgement till*, and *supraglacial till* are defined in the Glossary.

### **Eolian Deposits**

Eolian material, such as windblown sand, is a type of parent material. Windblown loess, another type of eolian parent material, consists mainly of silt-sized particles.



**Figure 4.—Profile of a Furlong soil. Limestone bedrock is visible below a depth of 32 inches. This soil has a pronounced white zone of sands that have been stripped of organic materials and iron oxides. This zone is called an albic horizon and extends mostly from 4 to 12 inches. Scale is in inches.**

During interglacial periods, strong directional winds deposited silt great distances from their lacustrine or outwash origin. Soils influenced by loess have a high silt content in the upper horizons, whereas soils influenced by eolian parent material have a high sand content. Windblown deposits buried till, outwash, and lacustrine deposits in many areas of Pictured Rocks NL. Table 15 shows the distribution of sand, silt, and clay in the soils.

Some soils on wooded and active dunes on beach ridges, such as Deer Park and Shell Drake, are comprised of pure eolian sands. Beach ridges consist of a low, essentially continuous ridge of beach and dune material heaped up by the action of waves and currents on the backshore of the beach, beyond the present limit of storm waves, and occurring singly or as one of a series of approximately parallel deposits. The dunes are either active (moving and unvegetated) or stabilized. The ridges are



**Figure 5.—Profile of a Garlic soil. Garlic soils are mapped on steep slopes on the west side of the Miners River drainage, on steep slopes west of East City Limits Road, and extensively on steep slopes of a dissected moraine between Chapel Lake and Spray Creek. Scale is in inches.**

roughly parallel to the shoreline and represent successive positions of the advancing shoreline. Many of the higher ridges are dunes that formed due to the prevailing winds along the lakes.

Beach ridges in the park are associated with the ancestral Lake Nipissing, which existed approximately 5,000 years ago (Blewett, 2012). Beach ridges can be observed along the trail from the Little Bear Lake campground to Lake Superior, near Au Sable Lake, at Chapel Beach, and along the Sand Point Marsh trail. They are typically mapped as Shelldrake and Wurtsmith soils, at Little Beaver Lake Trail and Sand Point Marsh, or as Deer Park soil, at Chapel Beach and Au Sable Point. Beaver Lake is a small lake in Pictured Rocks NL that is now separated from Lake Superior by a dune-capped barrier bar that is mapped predominantly as Deer Park soil.

The official type location for the Shelldrake series is within the park boundary. The Grand Sable Dunes area is mapped predominantly as Shelldrake soil in a complex

with active, unstablized dunes. Shell Drake soils are very deep and excessively drained. They have very rapid permeability. Slopes range mainly from 0 to 12 percent. The soils have a black, well decomposed organic surface horizon over sand. Vegetation is dominantly jack pine and red pine with some paper birch and eastern white pine. Common ground flora include bracken fern, lowsweet blueberry, wintergreen, trailing arbutus, Canada blueberry, and Canada mayflower. Vegetation is influenced by the low water-holding capacity of the soil.

Soils such as Munising, calcareous substratum, are on ground moraines with a capping of eolian sands. Munising soils have dual parent material—eolian deposits over till. These soils are mapped extensively in the southern portion of the park, on both sides of the southern Miners Creek drainage extending to the park boundary and along Chapel Road to the park boundary. They are included as a major component in eight different map units in the park.

### **Residuum**

Soils with residual parent material formed directly from underlying rocks or from an *in situ* plant (organic) source.

*Rock residuum.* Soils that formed in rock residuum may have the same general chemistry as the original rocks, depending on the degree of weathering that has occurred. Jeske, Au Train, Gongeau, Deerton, and Ruse soils are all on bedrock terraces and formed, in part, in residuum. These soils are overlain by sandy glaciofluvial deposits over weathered bedrock. All are shallow (less than 20 inches to hard or weathered bedrock) except Deerton soils, which are moderately deep.

Au Train soils have a weathered rock zone (called paralithic materials) above hard Munising sandstone at a depth of about 20 to 40 inches. Paralithic materials are cemented and root-restrictive. Au Train soils formed in sandy glaciofluvial deposits on bedrock-controlled moraines. Most areas of these soils are in second-growth northern hardwoods. Sugar maple, red maple, American beech, and eastern hemlock are the dominant trees. Au Train soils occur mainly around Grand Portal Point and north, near the coast to the Beaver Lake vicinity.

Ruse soils are typically only 15 inches deep over hard, fractured limestone. These soils are poorly drained and formed in glaciofluvial deposits over fractured bedrock. They are in nearly level areas and in depressions of bedrock terraces and ground moraines. Slopes range from 0 to 2 percent. Areas of these soils are forested primarily with alder, ash, aspen, balsam fir, black spruce, elm, white birch, and northern white cedar. Ruse soils occur mainly south of Beaver Lake and slightly inland, extending to Sand Point lying to the north.

Gongeau and Jeske soils are both shallow to a weathered rock contact, which occurs at a depth of 10 to approximately 20 inches. They are typically mapped together in a complex in the vicinity of Grand Portal Point, Chapel Basin, areas along the coastal end of the Mosquito River, and Little Beaver Lake. The differences between Gongeau and Jeske soils are landscape position and wetness. While both soils are often saturated with water, Gongeau soils are wetter, occur in drainage channels, and are saturated long enough and close enough to the surface to be hydric. Table 4 lists the soils in the park that are considered hydric. A soil similar to Gongeau (referred to here as Gongeau-like) was sampled during the course of the soil survey, and pedon information is included in table 23. This Gongeau-like soil is moderately deep with bedrock between depths of 20 and 40 inches and formed partly in rock and plant residuum and glaciofluvial deposits. It was sampled in the park on the poorly drained toeslope of a glacial drainage channel in an area of Munising sandstone southwest of Grand Portal Point and north of the Mosquito River.

*Organic residuum.* Many of the soils in the park formed largely from plant residuum. These soils are commonly in depressions (such as kettles), on outwash, on lake plains, or on moraines. The lower, wetter landscape position favors hydrophilic



**Figure 6.—Profile of a Greenwood soil. Greenwood soils are organic soils that are saturated with water close to the soil surface. The organic materials are thick and formed from moss and herbaceous plants. The surface layer is typically peat derived from sphagnum moss; the subsurface and bottom tiers are mucky peat formed from herbaceous plants. Woody fibers comprise less than 50 percent of the organic volume after rubbing. There is no mineral soil material recognized in the profile.**

vegetation. Plants grow and die, but their decomposition is retarded by wetness and cold, resulting in overall organic matter accumulation in place.

Aquents, Histosols, and Chippeny, Nahma, Loxley, Greenwood, and Dawson soils are examples of organic soils occurring in depressional areas, kettles, drainageways, or bogs. Bogs are waterlogged, spongy ground, consist primarily of mosses, and contain acidic, decaying vegetation (such as sphagnum, sedges, and heaths) that may develop into peat. Some of the bog soils are mapped northeast of Beaver Lake. Greenwood soils (fig. 6) formed in bogs near Beaver Lake. These soils are in depressions that range in size from small enclosed bogs on moraines to areas nearly 1,000 acres in size. The larger areas commonly are on outwash plains, till-floored lake plains, or other lake plains. The mineral soils in the surrounding upland area are generally derived from acid parent materials. Slopes range from 0 to 2 percent. Greenwood soils have a moderate or moderately rapid permeability.

Some soils, such as Greenwood, are entirely composed of decaying plant material while some, such as Nahma and Cathro, consist of decaying plant material over till (typically in depressions on ground moraines). Organic soils have chemical and physical properties related to the original plants from which they formed. For example, Loxley soils formed in herbaceous organic material while Chippeny soils formed in woody plant material.

The contents of soil organic carbon (SOC) and soil inorganic carbon (SIC) in each major soil for every map unit in the park are shown in table 17. Soil organic carbon is

carbon (C) in soil that originated from a biological source, such as plants, animals, or micro-organisms. SOC makes up about one-half the weight of soil organic matter.

Soil inorganic carbon is carbon occurring in soil carbonates, usually as calcium carbonate layers in the soil or as clay-sized fractions throughout the soil. Carbonates in soils are most commonly found in areas where evaporation rates exceed precipitation, as is the case in most desert environments. Usually in these dry areas the carbonates accumulated from carbonatic dust or from carbonate-containing parent material. In Pictured Rocks NL, however, some soils, such as Ensley, Cathro, Charlevoix, Greylock, and Escanaba, have high levels of inorganic carbon due to underlying limestone. Greylock soils have the highest SIC content at 48 kg/m<sup>2</sup>, which equates to 213 tons/acre. Soils in the park with the highest SIC contents are over limestone on ground moraines comprised of loamy lodgement till.

Lupton and Loxley soils have very high SOC levels because they lie in depressions or kettles on outwash plains. Kettles are depressions that formed by melt-out of incorporated ice blocks on the outwash plains. Lupton soils are mapped along Arsenault and Spray Creeks and the southern reaches of Little Beaver Creek. Based on soil survey data, Lupton soils have 246 kg/m<sup>2</sup> (to a depth of 2 meters) of soil organic carbon. That amounts to 1,094 tons/acre of stored carbon per acre of land that is mapped 100 percent pure Lupton soil. In contrast, Kalkaska soils have only 9 kg/m<sup>2</sup> of soil organic carbon. This difference is due to the nature of the parent material; the parent material of Kalkaska soils is from sandy outwash plains in high and dry landscape positions (not depressions). Soils in the park that have the highest levels of sequestered SOC are mapped in kettles on till plains, outwash plains, and moraines.

As carbon levels in soil increase, carbon is “withdrawn” from the atmosphere and “secluded” in the soil. This is carbon sequestration. CO<sub>2</sub> and CH<sub>4</sub> are greenhouse gases. The process of soil carbon sequestration transfers CO<sub>2</sub> from the atmosphere into the soil.

One way SOC becomes sequestered is through a process called humification. In this process, soil organic matter (SOM), such as leaves, wood, roots, and animals, is decomposed and converted to humic substances. Humic substances are broadly defined products of organic matter decomposition that are relatively resistant to further microbial decomposition. Humic substances with a high carbon content can persist in the soil for hundreds to thousands of years. Examples of humic substances are humic and fulvic acids and humins. Humification is a common process in the park soils occurring in depressions.

Water can transport both SOC and SIC in soil through the processes of eluviation and illuviation. Eluviation is the lateral or downward movement of dissolved or suspended material in soil when rainfall exceeds evaporation. An illuviated zone is where the substances accumulate. Eluviation is a common soil-forming process in the sandy, humid, forested soils of Pictured Rocks NL.

Soil carbon can also be buried. Burial of SOC occurs in different ways. Burial of carbon-containing soil layers limits the exposure to the atmosphere and microbial degradation, thus preserving organic carbon in the soil. Floods along Miners Creek can periodically bury and preserve old soil surface horizons with new sediment.

Erosion is a natural process in soils. Removal of soil from one place often results in burial of soil in another place. Burial of soil horizons that contain soil organic matter sequesters that carbon in the soil. Burial of carbon by dunes or landslides along the bluffs is a common process in the park.

### **Recent Alluvium**

Alluvium is parent material deposited by running water. It can have different textures, depending on whether the water moves quickly or slowly. The type of rocks occurring in the source region of the streams and rivers also determine characteristics



Figure 7.—The mouth of Miners River where it reaches Lake Superior has active alluvium where soils have not developed. (Image accessed February 26, 2012 at [http://en.wikipedia.org/wiki/File:Miners\\_River\\_1.jpg](http://en.wikipedia.org/wiki/File:Miners_River_1.jpg). Licensed under Creative Commons Attribution-Share Alike 3.0. Some rights reserved.)

of the alluvium. Fast-moving water deposits gravel, cobbles, and sand. Slow-moving water leaves finer textured deposits (clay and silt) when sediments in the water settle out. In Pictured Rocks NL, Ewart and Sturgeon soils formed in recent alluvium on flood plains. These soils are mapped together in the same map unit. This map unit is of minor extent in the park and is only located along the Mosquito River, in small acreages north of Miners Lake, and in an area southwest of Miners Falls. The active alluvium deposited at the mouth of the Miners River is sandy and not identified as a soil (fig. 7).

Table 5 lists the major soils in each map unit of the park and their most common landforms and parent material.

## Climate

Differences in climate can result in differences in soils. Temperature and moisture influence soil formation and are the two most commonly measured features of climate. Weathering is most active when soils are moist and warm because these conditions are conducive to rapid chemical reactions and increased biological activity in the soil. Cooler temperatures result in slower chemical reactions. While average temperatures and precipitation are important in determining soil properties, the extremes of climate in any given locale also play a major role in soil formation.

The climate of the park is cool and humid. Present-day climate variations are the result of topography and relief and distance from the lakes. The general climate is uniform throughout the area, but microclimates are modified locally by the proximity to Lake Superior. Table 5 gives the mean annual precipitation in the area, and table 19 lists the occurrence of soil saturation or wetness (i.e., depth to water table) for each of the soils. Probable occurrences of flooding and ponding are also listed in table 19.

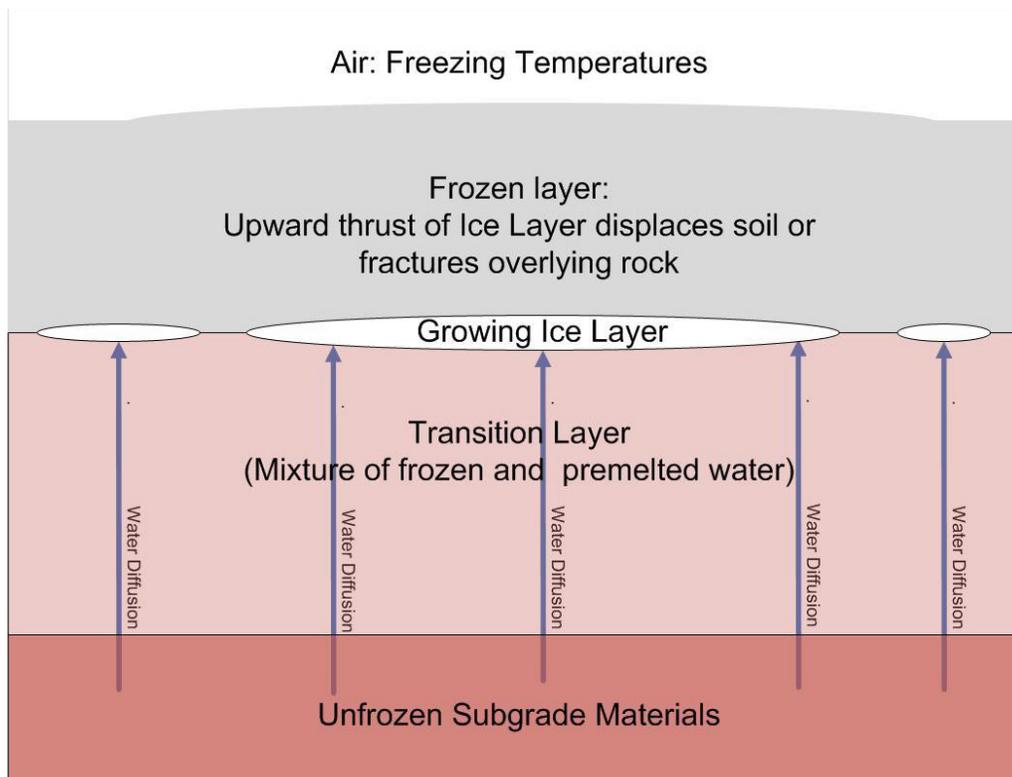


Figure 8.—Diagram illustrating ice lens formation in soils, which results in frost heave or frost action. (Image is from Williamborg [2009].)

During periods of rainfall or snowmelt, water carrying dissolved or suspended solids moves through the soil in a process called leaching. Leaching becomes active with the onset of rainfall or snowmelt. Different temperatures and moisture amounts cause different patterns of weathering and leaching in the soil. Colder temperatures result in less weathering because of decreased microbial growth, decreased vegetation, and possibly frozen soil. Seasonal and daily changes in temperature affect moisture effectiveness, biological activity, rates of chemical reactions, and the kinds of vegetation.

Fluctuations in temperature and moisture also affect the rate of organic matter production, decomposition, and accumulation and the weathering of minerals. They can result in frost action. Frost action (or frost heave) results from ice forming beneath the surface of soil during atmospheric freezing conditions. The ice grows in the direction of heat loss, which is vertically toward the surface, starting at the freezing boundary in the soil. A water supply is needed to keep the ice crystals growing. The growing ice is restrained by overlying soil, which applies a load that limits its vertical growth and promotes the formation of a lens-shaped area of ice within the soil (see figure 8). The processes of frost heave were more intense during past glacial climates than today.

A few of the soils in the park have a high potential for frost action, and many have a moderate potential. Frost heave is a natural pedogenic process that mixes and breaks up the soil surface. Table 20 lists the potential for frost heave, or frost action, as low, moderate, or high. Soils in the park that have a high rating include Ensley, Rhody, Tows, Chippeny, Loxley, Nahma, Gongeau, Dawson, and Troutbay.

The official type location for the Towes series is in the park. Towes soils are moderately deep and somewhat poorly drained and formed in silty eolian deposits overlying sandy outwash. These soils are on eroded bedrock terraces within glacial drainage channels. Because of silty material and internal wetness, they have a high potential for frost heave.

Frost heave can cause road potholes, cracked pavements, and foundations. Table 9 shows the map units and soils that are limited as sites for roads and streets due to frost action. This limitation results in higher maintenance costs for park roads and parking lots.

## Organisms

Plants, animals, micro-organisms, and humans affect the formation and shape of soils. Plants capture solar energy via photosynthesis and transfer that energy to the soil, energy that is a fundamental driver of many soil processes. Abandoned animal burrows commonly are filled with loose material from the overlying horizons and transmit water more readily than the surrounding undisturbed soil material. Fungi and bacteria are the primary organisms that decompose organic matter and add nutrients to the soil. Organisms decompose leaves and mix them with the upper part of the soil, resulting in cycling of nutrients and energy back to vegetation. Micro-organisms affect chemical exchanges between roots and soil. Animals and micro-organisms mix soils and form burrows and pores.

Humans also can mix the soil extensively by such land management practices as creating, maintaining, and using roads and trails. Soils in Pictured Rocks NL were plowed and mixed for agriculture in the past.

The sand dunes of the park provide a distinctive environment for vegetation. Long roots and dense rhizomes of dune grasses seek out water and help hold the dunes together. Grass roots are fibrous and decompose easily, adding organic matter and nitrogen to the soil. Thistles, bearberries, and other drought-resistant plants also contribute to dune stability.

Plant roots also help to develop soil structure and aggregate stability. Beach grass and sand cherry are among the first plants to grow on young dunes. Dune grass, Lake Huron tansy, jack pine, and balsam poplar are also common. These plants play an important role in dune development. They help build dunes by acting as obstacles that slow sand-laden wind and force it to drop the sand. Their roots hold sand in place and stabilize dunes. If a strong wind succeeds in stripping plants from a dune, a bowl-shaped blowout may form in the exposed area. Some dunes migrate, pushed by the wind, and sometimes shifting sands bury trees. As the dunes move on, "ghost forests" of dead trees are exposed.

Dune slack is the low-lying depression area between dunes where the water table may be closer to the surface, which produces particular plant associations. There are several seeps and springs at the base of the Grand Sable Dunes where ground water is concentrated by an impervious sedimentary layer under the dunes.

Lake level changes, coupled with wind and wave regimes, are drivers of geomorphic change that has influenced coastal vegetation and soil patterns in the park. Many rare or relict plant communities, unique buried soils, and special animal species occur within the coastal zone dune area.

Studies of plant assemblages on the dunes have suggested that the existence of rare species is tied to specific disturbance regimes (USDI-NPS, 2007). Disturbance regimes may undergo step-like shifts that cause rapid changes in vegetation, as climate and soils vary gradually over time. The suggestion that habitats and disturbance regimes on the Grand Sable Dunes plateau have changed drastically in the past are evidenced by the presence of the ghost forests of various ages within the dune field and by charcoal fragments associated with several buried paleosols. A paleosol is a buried soil that developed in a climate regime different from that of today.



**Figure 9.—Trees help break up till and outwash with their growing taproots, resulting in root channels that increase water penetration.**

Paleosols occur in the dunes. It has been hypothesized that sand supply to the Grand Sable Dunes decreases during periods of stability or when lake levels are lower and that dune building episodes are the result of rising lake levels (USDI-NPS, 2007). The Grand Sable system represents one of the few areas in the northern Great Lakes where buried paleosols are preserved and material is available for radiocarbon dating (USDI-NPS, 2007). Well developed paleosols indicate greater landscape stability and climate differences in the past.

Farther inland, where the soil is more stable and has a higher water-holding capacity, the beech/maple hardwood forest, with some hemlock, basswood, and black cherry, has taken hold. Jack pines have taken hold in the sand in some areas. Bordering the dunes to the south, east, and west is a second-growth northern hardwood forest (fig. 9).

These large plants of the forested ecosystem of Pictured Rocks NL affect soil formation. Besides the mechanical breaking of rocks by their large roots, the trees capture energy and substance through photosynthesis. The decomposition of plant residue forms organic-mineral complexes that are recycled many times within the ecosystem (Buol et al., 2011).

Differences in natural soil drainage and in parent material affect the composition of forests. The park lies within the northern hardwood/hemlock/white pine region of the eastern deciduous forest. This forest type is transitional between the more homogeneously deciduous forests to the south and the coniferous boreal forests to the north. About 80 percent of the lakeshore is dominated by upland northern hardwoods. Dominant species are beech (*Fagus americanus*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*).

On sandy outwash and coastal sands, red pine (*Pinus resinosa*), white pine (*Pinus strobus*), and Jack pine (*Pinus banksiana*) are dominant. Successional stands within these areas contain considerable amounts of paper birch (*Betula papyrifera*) and aspen (*Populus tremuloides*). Ground and crown fires influenced this pine-dominated vegetation prior to European settlement (USDI-NPS, 2013).

In general, well drained upland soils have forests of beech, hemlock, and maple. Leaf litter, whether leaves or needles, helps prevent nutrient loss, conserves soil moisture, reduces raindrop impact, and limits frost penetration. Vegetation increases soil stability by protecting the surface against wind and water erosion.

Wetland soils that have developed since the most recent glacial recession support communities of spruce, tamarack, alder, and white cedar. Streams and lakes are surrounded by alder (*Alnus incana*) and striped maple (*Acer pensylvanicum*). Scattered small patches of wetland habitat occur on upland benches and in topographic lows in areas of poorly drained soils. These habitat areas contain boreal forest species such as black spruce (*Picea mariana*), white spruce (*Picea glauca*), white cedar (*Thuja occidentalis*), and larch (*Larix laricina*). Larger white cedar glades within the national lakeshore are southwest of Grand Sable Lake, south of Au Sable Point, along the southern and western edges of Beaver Basin, and east and south of Miners Basin.

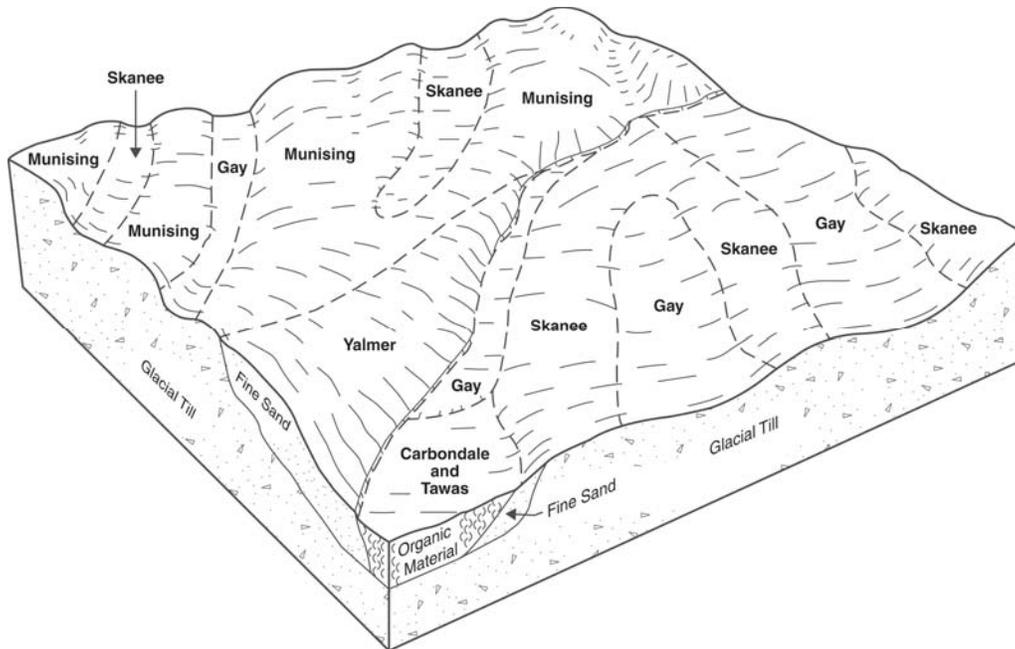
## Time

Time for parent material, climate, organisms, and relief to interact is also a soil-forming factor. Over time, soils exhibit features that reflect the interaction of other soil-forming factors. Soils recently formed from deposited material, such as material deposited by a flood, exhibit no features from soil development activities and their properties are mostly inherited from the new material. The previous soil surface and underlying horizons become buried. The time clock resets for these soils. The different horizons in a soil profile and the degree of development can be directly related to time. Terraces above the active flood plain, while similar in origin to the flood plain, are older land surfaces of old abandoned flood plains and thus have soils exhibiting more horizon development.

Many soils in the park have little soil development because they have only been forming since the last glaciation. Soils such as Shelldrake have a thin O horizon and a thin A horizon over pale brown sand. Where accumulation and translocation of organics, iron, aluminum, and clay have occurred, a colorful profile may form but the development may not be a consequence of soil age. Soils with colorful translocation include Kalkaska, Paquin, Wallace, and Voelker. Figure 2 is a profile of the Kalkaska soil. This soil has intensive translocation. Its profile contrasts with that of the Stutts soil (see figure 11). Kalkaska soils were influenced by weathering intensities different from those of Stutts soils.

## Topography and Relief

Topography refers to the shape of the landscape, and relief refers to differences in elevation. The overall landscape in a park, whether it consists of pitted outwash



**Figure 10.—Landscape position and parent material play a dominant role in determining the type of soils in any one location of the park. The organic Carbondale and Tawas soils are in low drainage channels; the better drained, mineral Gay soils are above the Carbondale and Tawas soils on the landscape; and Munising, Skanee, and Yalmer soils are above Gay soils. Yalmer and Skanee soils are derived from loamy tills, while Munising soils (in the park) commonly have an eolian influence, due to their high landscape position, and overlie variable till types.**

plains, hummocky dune hills, or step-like kame terraces, is the result of erosion and depositional processes. These processes may have occurred in response to changes in climate, fluctuating sea levels, glaciations, tectonic activities, and/or isostatic rebound. Isostatic rebound is the resulting elevation of the land surface after the glaciers receded. Cyclic periods of landscape stability and instability influence the types of soils that form on the landscape. Development of the current landscape in the park took place during the last glaciation, approximately 10,000 years ago. The age of soils can be estimated from the age of the geomorphic surfaces, such as the age of tills and outwash. The youngest geomorphic surfaces generally are flood plains, where sandy alluvium has been deposited. Hydric soils are commonly on flood plains, where flooding may occur or ground water may be closer to the surface (see table 4). Hydric soil locations are influenced by topography and relief. Hydric soils in the park are also in low-relief depressions, kettles, and marshes.

Slope and aspect of the overall landscape can affect the moisture and temperature of the soil. Steep slopes on moraines, drumlins, or dunes facing the sun are warmer than those facing away from the sun. Steep soils may be eroded and lose their surface horizons as they form. Thus, soils may be shallower than more nearly level ones that receive deposits from areas upslope, such as along some of the landslide areas of the park. Thicker, darker soils may be expected on the bottom land or in depressions on lake plains or moraines. Relief and topography also influence the location of prime farmland. Table 3 lists the map units of prime farmland and farmland of local importance in the park. Generally, prime farmland map units are level or gently rolling and have thick soils. Figure 10 is a stylized diagram illustrating the relationship of soils to landscape and relief common in the southwestern part of the park.

## Processes of Soil Horizon Differentiation

A soil profile records the activities of the five soil-forming factors. A succession of layers or horizons is formed, extending from the surface down to the parent material. The horizons differ in one or more properties, for example, thickness, color, texture, structure, consistence, porosity, and reaction (pH).

Several major processes are involved in the formation of soil horizons in Pictured Rocks National Lakeshore. The main soil-forming processes are illuviation, eluviation, podzolization, enrichment, decomposition, humification, and cumulation.

*Illuviation* is the movement of material *into* a horizon from another horizon while *eluviation* is the movement of material *from* a portion of the soil or horizon.

*Podzolization* is another process of illuvation and eluviation in which aluminum and iron and/or organic matter are moved through or *translocated* through the profile. Podzolization includes the translocation of Al and Fe (due to the presence of acidic organic compounds such as humic and fulvic acids) that results in the chelating of the metallic ions into organo-metallic complexes. The humus-metal complexes are concentrated into an *illuviated* horizon. Concentration of silica may occur in the layer *eluviated* (Buol et al., 2011). The acidic pine litter is key to podzol formation in northern soils. A large percentage of the soils identified in the park have podzolization as a major soil-forming process. This soil-forming process is identified by the soil classification and the chemical and physical properties (see tables 15, 18, 21, and 22).

*Enrichment* is another process of additions to the soil and is often used in describing organic matter enrichment to the soil surface.

*Decomposition* is the breakdown of mineral and organic materials to weathering by-products.

*Humification* is the transformation of organic matter into humic substances. Humic substances are broadly defined products of organic matter decomposition that are relatively resistant to further microbial decomposition. Humification is a type of decomposition.

*Cumulation* is the process of additions of mineral particles to the soil. An example is the cumulation of eolian material to the soils in the Grand Sable Dunes.

An excellent example for the discussion of soil-forming processes is the Kalkaska series. Kalkaska is mapped extensively in the park and has also been named the Official State Soil of Michigan. Kalkaska soils are classified as Spodosols. Spodosols are extensive in the cool, humid climates of the United States and in areas of quartz-rich sands that may have fluctuating water tables. They also may have snow cover, which during a spring thaw flushes the soil with water. Most areas are covered by coniferous vegetation or a mix of hardwoods and conifers. Kalkaska soils formed in sandy outwash deposits and occur mostly on outwash plains. The soil-forming processes discussed above are shown in italics in the following paragraphs.

In the Kalkaska soil (shown in figure 2) the 5 centimeters of surface soil has been *enriched* by organic material. Below the organic surface soil is a horizon that has been *eluviated*. This is evidenced by the light gray zone that extends to a depth of about 20 centimeters. This light-colored zone is called an albic horizon. Some of the gray material is in tongue-shaped pockets that extend to greater depths. Organics that have been *decomposed* and *humified* in this *eluviated* zone have been moved to an *illuviation* zone. In figure 2, the *illuviation* zone has the darkest colors and a tongue shape at depth. The tongue of spodic material that is visible on the left side of the image extends below a depth of 1 meter. The illuviated material is called spodic material and forms a spodic horizon below a depth of 20 centimeters. The tongues of albic and spodic material may have been created along old tree roots, rodent burrows, or preferential flow paths along soil material of contrasting pore size. In Kalkaska soils, some of the spodic materials have become cemented into orstein. Orstein occurs in

Kalkaska soils in small amounts and is weakly cemented. However, other soils of the park have orstein that is continuous enough to be root-restrictive.

Soil profiles consist commonly of five major horizons—O, A, E, B, and C horizons. The O horizon consists of decomposing organic materials. The A horizon is a mineral horizon that has an organic matter content that is higher than that of underlying horizons but lower than that of overlying O horizons. The A horizon may be the surface layer if there is no O horizon.

The E horizon is a zone of maximum eluviation of materials. E horizons usually occur in wetter climates or under wetter soil conditions and on certain landscapes and may overlie a B horizon. The E horizon is often pale or white, having been stripped of all soil constituents that provide color.

The B horizon is a zone of accumulation of clay, iron, aluminum, or organic matter. B horizons are common in the park. Color plays an important part in distinguishing these horizons. The B horizon is the horizon of maximum accumulation of dissolved or suspended materials, for example, iron, clay, or organic materials.

The C horizon is in the bottom part of a soil profile, is little affected by the soil-forming processes, and is the most related to the parent material.

The processes and sequences of horizonation are commonly seen in some of the park soils. Figure 11 displays the profiles of some of these soils.

Below is a soil description of the Kalkaska series. Although the location of the described pedon is outside the park boundary, Kalkaska soils within the park are very similar.

## **Kalkaska Series**

The Kalkaska series consists of very deep, somewhat excessively drained soils that formed in sandy deposits on outwash plains, valley trains, moraines, and stream terraces. Slope ranges from 0 to 70 percent. Mean annual precipitation is 762 millimeters (about 30 inches), and mean annual temperature is 6.1 degrees C (about 43 degrees F).

### **Taxonomic Classification**

Sandy, isotic, frigid Typic Haplorthods

#### **Typical Pedon**

Kalkaska sand; in Kalkaska County, Michigan; on a west-facing, 1 percent slope in a forested area about 4 miles northwest of Darragh, 1,900 feet north and 100 feet east of the southwest corner of sec. 13, T. 28 N., R.7 W.; Rapid River Township; USGS Westwood topographic quadrangle; lat. 44 degrees 49 minutes 13 seconds N. and long. 85 degrees 6 minutes 35 seconds W. (Colors are for moist soil unless otherwise stated.)

- O<sub>i</sub>—0 to 2 centimeters (0 to 1 inch); partially decomposed forest litter; strongly acid.
- A—2 to 5 centimeters (1 to 2 inches); black (7.5YR 2.5/1) sand, black (10YR 2/1) dry; weak fine granular structure; very friable; many fine and few medium and coarse roots; about 5 percent fine gravel; strongly acid; abrupt smooth boundary. (0 to 10 centimeters, or 0 to 4 inches, thick)
- E—5 to 13 centimeters (2 to 5 inches); brown (7.5YR 5/2) sand, gray (10YR 6/1) dry; weak fine granular structure; very friable; common fine and few medium and coarse roots; about 5 percent fine gravel; strongly acid; clear irregular boundary. (5 to 33 centimeters, or 2 to 13 inches, thick)
- B<sub>hs</sub>—13 to 18 centimeters (5 to 7 inches); dark reddish brown (5YR 3/3) sand; weak fine granular structure; very friable; common fine and few medium and coarse roots; about 5 percent fine gravel; moderately acid; clear irregular boundary. (2 to 58 centimeters, or 1 to 23 inches, thick)

Soil Survey of Pictured Rocks National Lakeshore, Michigan

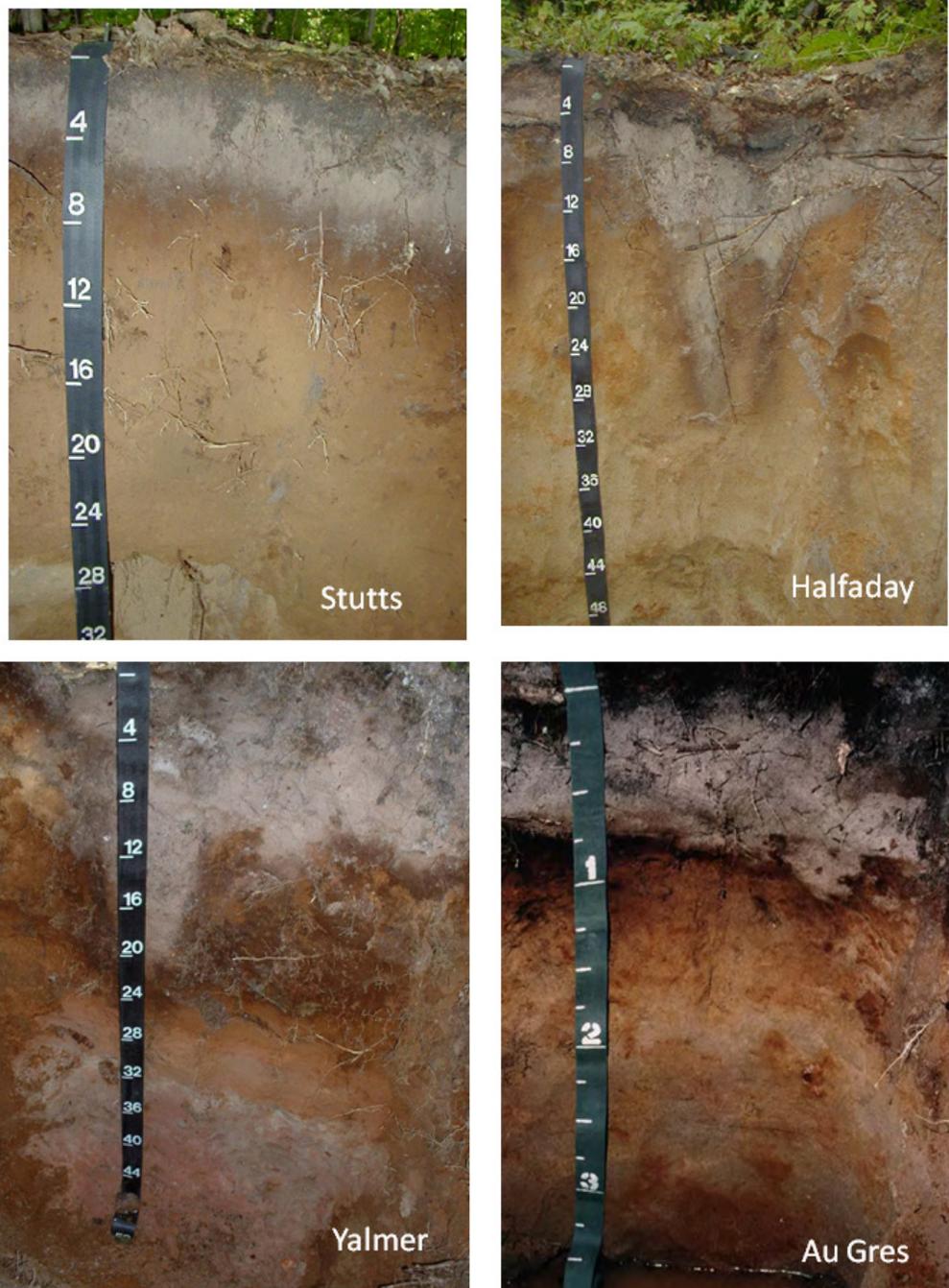


Figure 11.—Comparison of podzolization intensities in four soils mapped in Pictured Rocks National Lakeshore. All four soils are classified as Spodosols but they vary in the degree of: 1) illuviation, resulting in an albic horizon (light-colored horizon), or 2) eluviation, resulting in a spodic horizon (reddish and dark horizons). The Stutts soil has the least degree of podzolization while the Au Gres soil has the greatest. Scale is in inches for the Stutts, Halfaday, and Yalmer profiles and in feet for the Au Gres profile.

- Bs1—18 to 56 centimeters (7 to 22 inches); dark brown (7.5YR 3/4) sand; weak fine granular structure; very friable; few fine and medium roots; about 5 percent fine gravel; moderately acid; clear wavy boundary.
- Bs2—56 to 91 centimeters (22 to 36 inches); strong brown (7.5YR 4/6) sand; weak fine granular structure; very friable; few fine roots between ortstein columns; columns of weakly cemented, dark reddish brown (5YR 2.5/2) ortstein 8 to 13 centimeters (3 to 5 inches) wide extend through this horizon into the BC horizon; ortstein columns are 48 to 61 centimeters (19 to 24 inches) apart; ortstein occupies 7 percent of the horizon; about 5 percent fine gravel; slightly acid; gradual wavy boundary. (Combined thickness of the Bs horizon is 0 to 76 centimeters, or 0 to 30 inches.)
- BC—91 to 130 centimeters (36 to 51 inches); yellowish brown (10YR 5/6) sand; weak fine granular structure; very friable; few fine roots between ortstein columns; columns of weakly cemented, dark reddish brown (5YR 2.5/2) ortstein 8 to 13 centimeters (3 to 5 inches) wide extend into this horizon from the Bs2 horizon; ortstein columns are 48 to more than 100 centimeters (19 to more than 40 inches) apart; ortstein occupies 11 percent of the horizon; about 5 percent fine gravel; slightly acid; gradual wavy boundary. (0 to 53 centimeters, or 0 to 21 inches, thick)
- C—130 to 203 centimeters (51 to 80 inches); light yellowish brown (10YR 6/4) sand; single grain; loose; about 5 percent fine gravel; slightly acid.

## Classification of the Soils

Soils are named and classified on the basis of physical and chemical properties in their horizons (layers). Color, texture, structure, and other properties of the soil to a depth of 2 meters are used to key the soil into a classification system. This system helps people to use soil information and also provides a common language for scientists.

Soils and their horizons differ from one another, depending on how and when they formed. Soil scientists use the five soil-forming factors to help predict where different soils may occur. The degree and expression of the soil horizons reflect the extent of interaction of the soil-forming factors with one or more of the soil-forming processes (Simonson, 1959).

When mapping soils, a soil scientist looks for areas with similar soil-forming factors to find similar soils. The properties of the soils are described. Soils with the same kind of properties are given taxonomic names. Soils are classified, mapped, and interpreted on the basis of various kinds of soil horizons and their arrangement. The distribution of soil orders corresponds with the general patterns of the soil-forming factors within the park.

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2010). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

**ORDER.** Soil taxonomy at the highest hierarchical level identifies 12 soil orders. The names for the orders and taxonomic soil properties relate to Greek, Latin, or other root words that reveal something about the soil. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Spodosol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. Sixty-four suborders

are recognized at the next level of classification. The last syllable in the name of a suborder indicates the order. An example is Orthod (*Orth*, meaning common, plus *od*, from Spodosol).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. There are about 300 great groups. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplorthod (*Hapl*, meaning minimal horizonation, plus *Orthod*, the suborder of the Spodosols that is common).

**SUBGROUP.** There are more than 2,400 subgroups. Each great group has a typic subgroup. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Other subgroups are intergrades or extragrades. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplorthods.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties for family placement are those of horizons below a traditional agronomic plow depth. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is sandy, mixed, frigid Typic Haplorthods.

**SERIES.** The soil series is the lowest category in the soil classification system. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Most parks are mapped to the series level. The names of soil series are selected by the soil scientists during the course of mapping. The series names are commonly geographic place names or are coined. An example is the Kalkaska series, which is classified as sandy, mixed, frigid Typic Haplorthods. Because of access limitations and soil variability, soils in some remote areas are classified at the great group or subgroup level.

Table 21 indicates the order, suborder, great group, subgroup, and family of the soil series in the park. Table 22 displays the classification as a key sorted by order.

# References

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American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487–00.

Blewett, William L. 2012. Geology and landscape of Michigan's Pictured Rocks National Lakeshore and vicinity.

Buol, S.W., R.J. Southard, R.C. Graham, and P.A. McDaniel. 2011. Soil genesis and classification. 6th edition.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Jenny, Hans. 1941. Factors of soil formation.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Simonson, Roy W. 1959. Outline of a generalized theory of soil genesis. Soil Science Society of America Proceedings 23:152-156.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Soil Survey Staff. Accessed February 26, 2013. Official soil series descriptions. U.S. Department of Agriculture, Natural Resources Conservation Service. <http://soils.usda.gov/technical/classification/osd/index.html>

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. PLANTS database. National Plant Data Center. <http://plants.usda.gov>

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

United States Department of Agriculture, Natural Resources Conservation Service. 2006 (draft). Landforms of the Upper Peninsula, Michigan. By Dwight S. Jerome. [ftp://ftp-fc.sc.egov.usda.gov/MI/technical/soils/UP\\_LandformReport11-06.pdf](ftp://ftp-fc.sc.egov.usda.gov/MI/technical/soils/UP_LandformReport11-06.pdf)

United States Department of Agriculture, Natural Resources Conservation Service. 2007. Soil survey of Marquette County, Michigan.

United States Department of Agriculture, Natural Resources Conservation Service. 2008. National soil survey handbook, title 430-VI. <http://soils.usda.gov/technical/>

United States Department of Agriculture, Natural Resources Conservation Service. 2010. Field indicators of hydric soils in the United States, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble, editors. USDA-NRCS in cooperation with the National Technical Committee for Hydric Soils.

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

United States Department of the Interior, National Park Service. 2007. Grand Sable Dunes Research Natural Area fact sheet. <http://www.nature.nps.gov/geology/parks/piro/index.cfm>

United States Department of the Interior, National Park Service. Accessed January 30, 2013. Park website. <http://www.nature.nps.gov/geology/parks/piro/index.cfm>

Williamborg. December 2009. [http://en.wikipedia.org/wiki/File:Freezing\\_air\\_ice\\_lens\\_formation.jpg](http://en.wikipedia.org/wiki/File:Freezing_air_ice_lens_formation.jpg)

# Glossary

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**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial fan.** The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Alpha,alpha-dipyridyl.** A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Aspect.** The direction in which a slope faces.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low .....	0 to 3
Low .....	3 to 6
Moderate.....	6 to 9
High .....	9 to 12
Very high.....	more than 12

**Basal till.** (a) An obsolete and not preferred term that refers to subglacial till; unconsolidated material of mixed composition deposited at the base (bottom) of a glacier. The term emphasizes only the relative position of deposition, e.g., subglacial till. Types of basal till include lodgment, melt-out, and flow till. (b) An obsolete term, usually substituted with lodgment till, that refers to a firm, dense, clay-rich till containing many abraded stones (coarse fragments) that were dragged along beneath a moving glacier and deposited upon bedrock or other glacial deposits.

**Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

**Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

**Canopy.** The leafy crown of trees or shrubs. (See Crown.)

- Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
- Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Coarse textured soil.** Sand or loamy sand.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.
- Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.
- Crown.** The upper part of a tree or shrub, including the living branches and their foliage.
- Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.
- Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.
- Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained*, *somewhat excessively drained*, *well drained*, *moderately well drained*, *somewhat poorly drained*, *poorly drained*, and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”
- Drainage, surface.** Runoff, or surface flow of water, from an area.
- Ecological site.** An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

- Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.
- Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.
- Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
- Erosion* (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
- Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.
- Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.
- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.
- Fine textured soil.** Sandy clay, silty clay, or clay.
- Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Fluvial.** Of or pertaining to rivers; produced by river action, as a fluvial plain.
- Forb.** Any herbaceous plant not a grass or a sedge.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Forest type.** A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.
- Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:
- O horizon.*—An organic layer of fresh and decaying plant residue.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon.*—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon.*—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon.*—Soft, consolidated bedrock beneath the soil.

*R layer.*—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential.

The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2 .....	very low
0.2 to 0.4 .....	low
0.4 to 0.75 .....	moderately low
0.75 to 1.25 .....	moderate
1.25 to 1.75 .....	moderately high
1.75 to 2.5 .....	high
More than 2.5 .....	very high

**$K_{sat}$ .** Saturated hydraulic conductivity. (See Permeability.)

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**LEP.** See Linear extensibility percent.

**Linear extensibility (LE).** Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is

used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at  $\frac{1}{3}$ - or  $\frac{1}{10}$ -bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

**Linear extensibility percent.** Refers to the percent change in linear extensibility.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Lodgement till.** A basal till commonly characterized by compact, fissile (platy) structure and containing coarse fragments oriented with their long axes generally parallel to the direction of ice movement.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Low strength.** The soil is not strong enough to support loads.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Neutral soil.** A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low .....	less than 0.5 percent
Low .....	0.5 to 1.0 percent
Moderately low.....	1.0 to 2.0 percent
Moderate.....	2.0 to 4.0 percent
High .....	4.0 to 8.0 percent
Very high.....	more than 8.0 percent

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The movement of water through the soil.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as

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“permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow.....	0.0 to 0.01 inch
Very slow .....	0.01 to 0.06 inch
Slow .....	0.06 to 0.2 inch
Moderately slow.....	0.2 to 0.6 inch
Moderate.....	0.6 inch to 2.0 inches
Moderately rapid.....	2.0 to 6.0 inches
Rapid .....	6.0 to 20 inches
Very rapid.....	more than 20 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values.

A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid.....	less than 3.5
Extremely acid .....	3.5 to 4.4
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Moderately acid .....	5.6 to 6.0
Slightly acid.....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Slightly alkaline .....	7.4 to 7.8
Moderately alkaline.....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline.....	9.1 and higher

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed.

These zones are indications of the chemical reduction of iron resulting from saturation.

- Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.
- Relief.** The elevations or inequalities of a land surface, considered collectively.
- Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.
- Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.
- Root zone.** The part of the soil that can be penetrated by plant roots.
- Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.
- Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.
- Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.
- Sandstone.** Sedimentary rock containing dominantly sand-sized particles.
- Saprolite.** Unconsolidated residual material underlying the soil and grading to hard bedrock below.
- Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.
- Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.
- Series, soil.** A group of soils that have profiles that are almost alike. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.
- Shale.** Sedimentary rock formed by the hardening of a clay deposit.
- Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.
- Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.
- Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.
- Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.
- Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.
- Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

Slight.....	less than 13:1
Moderate.....	13-30:1
Strong .....	more than 30:1

**Sodium adsorption ratio (SAR).** A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay.....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Any surface soil horizon (A, E, AB, or EB) below the surface layer.

**Supraglacial.** Carried upon, deposited from, or pertaining to the top surface of a glacier or ice sheet; used to describe meltwater streams, till, drift, etc.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

- Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.
- Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.
- Terrace** (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.
- Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."
- Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.
- Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.
- Upland.** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.
- Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.
- Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.



# Tables

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Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455241: Deer Park sand, 0 to 10 percent slopes-----	Deer Park	90
	Croswell	5
	Kinross	5
1455242: Deer Park sand, 10 to 25 percent slopes-----	Deer Park	95
	Kinross	3
	Croswell	2
1455243: Deer Park sand, 25 to 60 percent slopes-----	Deer Park	98
	Kinross	2
1455244: Rubicon sand, 0 to 6 percent slopes-----	Rubicon	90
	Au Gres	5
	Kinross	5
1455245: Rubicon sand, 6 to 15 percent slopes-----	Rubicon	95
	Kinross	3
	Au Gres	2
1455246: Rubicon sand, 15 to 35 percent slopes-----	Rubicon	95
	Kinross	5
1455247: Kalkaska sand, 0 to 6 percent slopes-----	Kalkaska	94
	Deford	2
	Finch	2
	Paquin	2
1455248: Kalkaska sand, 6 to 15 percent slopes-----	Kalkaska	96
	Deford	2
	Wallace	2
1455249: Kalkaska sand, 15 to 35 percent slopes-----	Kalkaska	100
1455250: Croswell sand, 0 to 3 percent slopes-----	Croswell	92
	Au Gres	6
	Kinross	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455251: Paquin sand, 0 to 3 percent slopes-----	Paquin	90
	Finch	5
	Garlic	3
	Kinross	2
1455252: Au Gres sand, 0 to 3 percent slopes-----	Au Gres	92
	Croswell	4
	Deford	4
1455253: Kinross muck-----	Kinross	92
	Dawson	5
	Au Gres	3
1455254: Deford muck-----	Deford	92
	Au Gres	5
	Croswell	3
1455255: Ingalls sand, 0 to 3 percent slopes-----	Ingalls	90
	Charlevoix	3
	Ensley	3
	Deford	2
	Munising, calcareous substratum	2
1455257: Munising-Yalmer complex, 1 to 6 percent slopes-----	Munising	55
	Yalmer	30
	Frohling	5
	Gay	4
	Skanee	3
	Deford	2
	Garlic	1

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455262: Ensley muck-----	Ensley	90
	Cathro	3
	Deford	3
	Charlevoix	2
	Shoepac	2
1455263: Munising-Yalmer-Frohling complex, calcareous substratum, 1 to 6 percent slopes-----	Munising, calcareous substratum	40
	Yalmer, calcareous substratum	30
	Frohling, calcareous substratum	20
	Ensley	3
	Greylock	3
	Cookson	2
	Escanaba	2
1455266: Grand Sable fine sand, 1 to 6 percent slopes-----	Grand Sable	90
	Cusino	2
	Deerton	2
	McMaster	2
	Shelldrake	2
	Towes	2
1455267: Grand Sable fine sand, 15 to 35 percent slopes-----	Grand Sable	98
	Deerton	1
	Halfaday	1
1455268: Rhody-Towes complex, 0 to 4 percent slopes-----	Rhody	60
	Towes	30
	Nykanen	3
	Trout Bay	3
	Au Train	2
	Deerton	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455269: Waiska cobbly loamy sand, 0 to 6 percent slopes, very stony-----	Waiska, very stony	90
	Cusino	3
	Paavola	3
	Deford	2
	Kalkaska	2
1455273: Deerton-Au Train complex, 1 to 15 percent slopes-----	Deerton	55
	Au Train	30
	Abbaye	5
	Jeske	5
	Gongeau	3
	Trout Bay	2
1455274: Deerton-Au Train complex, 6 to 35 percent slopes-----	Deerton	55
	Au Train	30
	Abbaye	4
	Gongeau	4
	Jeske	4
	Trout Bay	3
1455276: Cookson fine sandy loam, 1 to 6 percent slopes-----	Cookson	90
	Chatham	5
	Trenary	3
	Reade	2
1455277: Nahma-Ruse complex-----	Nahma	50
	Ruse	40
	Chippeny	5
	Ensign	3
	Nykanen	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.--Soil Legend--Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455278: Summerville fine sandy loam, 1 to 6 percent slopes-----	Summerville	85
	Longrie	4
	Ensign	3
	Ruse	3
	Traunik	3
	Namur	2
1455281: Carbondale, Lupton, and Tawas soils-----	Carbondale	30
	Lupton	30
	Tawas	30
	Deford	5
	Paquin	4
	Kalkaska	1
1455282: Dawson, Greenwood, and Loxley soils-----	Dawson	30
	Greenwood	30
	Loxley	30
	Spot	5
	Finch	4
	Paquin	1
1455283: Chippeny-Nahma mucks-----	Chippeny	55
	Nahma	30
	Carbondale	5
	Ruse	5
	Ensign	3
	Nykanen	2
1455284: Histosols and Aquents, ponded-----	Histosols	50
	Aquents	50
1455285: Pits, sand and gravel-----	Pits	100

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455289: Jeske-Gongeau-Deerton complex, bedrock terrace, 1 to 20 percent slopes---	Jeske, bedrock terrace	45
	Gongeau, bedrock terrace	25
	Deerton, bedrock terrace	20
	Au Train	5
	Abbaye	3
	Trout Bay	2
1455290: Jeske-Gongeau-Deerton complex, bedrock terrace, 1 to 45 percent slopes---	Jeske, bedrock terrace	45
	Gongeau, bedrock terrace	25
	Deerton, bedrock terrace	20
	Au Train	5
	Abbaye	3
	Trout Bay	2
1455291: Ruse-Ensign-Nykanen complex, bedrock terrace, 1 to 20 percent slopes-----	Ruse, bedrock terrace	40
	Ensign, bedrock terrace	30
	Nykanen, bedrock terrace	20
	Chippeny	4
	Eben, stony	3
	Summerville	3
1455292: Ruse-Ensign-Nykanen complex, bedrock terrace, 1 to 45 percent slopes-----	Ruse, bedrock terrace	40
	Ensign, bedrock terrace	30
	Nykanen, bedrock terrace	20
	Namur	3
	Summerville	3
	Chippeny	2
	Deerton	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455295: Evert-Sturgeon silt loams, 0 to 2 percent slopes, frequently flooded-----	Evert	70
	Sturgeon	20
	Pelkie	5
	Tawas	5
1455296: Deerton-Tokiahok-Trout Bay complex, 8 to 35 percent slopes, dissected----	Deerton, dissected	40
	Tokiahok, dissected	30
	Trout Bay, dissected	15
	Au Train	3
	Frohling	3
	Gongeau	3
	Abbaye	2
	Jeske	2
	Munising	2
1455298: Garlic-Blue Lake-Voelker complex, 1 to 12 percent slopes, dissected-----	Garlic, dissected	40
	Blue Lake, dissected	30
	Voelker, dissected	20
	Fence	3
	Deford	2
	Munising	2
	Paquin	2
	Steuben	1

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455299: Garlic-Blue Lake-Voelker complex, 8 to 35 percent slopes, dissected-----	Garlic, dissected	40
	Blue Lake, dissected	30
	Voelker, dissected	20
	Fence	3
	Steuben	3
	Alcona	2
	Deford	2
1455300: Garlic-Blue Lake-Voelker complex, 15 to 60 percent slopes, dissected-----	Garlic, dissected	40
	Blue Lake, dissected	30
	Voelker, dissected	20
	Steuben	4
	Sporley	3
	Deford	2
	Paquin	1
1455302: Garlic-Blue Lake-Voelker complex, 6 to 15 percent slopes-----	Garlic	40
	Blue Lake	30
	Voelker	20
	Alcona	3
	McMillan	3
	Deford	2
	Paquin	2
1455304: Cathro-Ensley mucks-----	Cathro	55
	Ensley	35
	Charlevoix	4
	Nahma	2
	Shoepac	2
	Trenary	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455305: Tawas-Deford mucks-----	Tawas	70
	Deford	20
	Au Gres	5
	Halfaday	3
	Kalkaska	2
1455308: Fence very fine sandy loam, 1 to 12 percent slopes, dissected-----	Fence, dissected	90
	Shag	4
	Sporley, dissected	4
	Spear	2
1455310: Rousseau-Dawson complex, 0 to 15 percent slopes-----	Rousseau	50
	Dawson	45
	Au Gres	5
1455318: Munising, calcareous substratum-Ensley complex, 0 to 6 percent slopes----	Munising, calcareous substratum	65
	Ensley	25
	Frohling, calcareous substratum	4
	Charlevoix	2
	Escanaba	2
	Steuben	2
1455319: Munising-Yalmer complex, 1 to 12 percent slopes, dissected, very stony---	Munising, dissected, very stony	50
	Yalmer, dissected, very stony	35
	Frohling	6
	Gay	3
	Abbaye	2
	Paavola	2
	Skanee	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455320: Munising-Skaneec complex, 0 to 6 percent slopes, stony-----	Munising, stony	60
	Skaneec, stony	30
	Frohling	5
	Gay	3
	Abbaye	2
1455324: Zeba-Jacobsville complex, 0 to 3 percent slopes, very stony-----	Zeba, very stony	55
	Jacobsville, very stony	30
	Chocolay	3
	Skandia	3
	Skaneec	3
	Gay	2
	Paavola	2
1455326: Munising-Abbaye fine sandy loams, 1 to 12 percent slopes, dissected, stony-----	Munising, dissected, stony	50
	Abbaye, dissected, stony	35
	Frohling	5
	Jacobsville	3
	Zeba	3
	Skaneec	2
	Yalmer	2
1455327: Paquin-Finch sands, 0 to 6 percent slopes-----	Paquin	55
	Finch	45
1455339: Crowell-Kinross complex, 0 to 6 percent slopes-----	Crowell	50
	Kinross	40
	Greenwood	5
	Deer Park	4
	Au Gres	1

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455340: Frohling-Tokiahok complex, 8 to 35 percent slopes, dissected, stony-----	Frohling, dissected, stony	60
	Tokiahok, dissected, stony	30
	Munising	3
	Abbaye	2
	Gay	2
	Kalkaska	2
	Garlic, dissected	1
	1455341: McMaster cobbly sandy loam, 0 to 4 percent slopes-----	McMaster
Traunik		7
Davies		2
Halfaday		1
1455344: Reade silt loam, 0 to 4 percent slopes-----	Reade	85
	Cookson	4
	Shoepac	4
	Nahma	3
	Kiva	2
	Summerville	2
1455353: Charlevoix-Ensley complex, 0 to 3 percent slopes-----	Charlevoix	55
	Ensley	30
	Cathro	5
	Shoepac	5
	Trenary	3
	Traunik	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455359: Munising-Abbaye fine sandy loams, 1 to 6 percent slopes-----	Munising	55
	Abbaye	35
	Jacobsville	3
	Skanee	3
	Frohling	2
	Zeba	2
1455360: Kalkaska-Blue Lake complex, 1 to 6 percent slopes-----	Kalkaska	60
	Blue Lake	30
	Dillingham	6
	Halfaday	2
	Steuben	2
1455361: Kalkaska-Blue Lake complex, 6 to 15 percent slopes-----	Kalkaska	55
	Blue Lake	35
	Dillingham	6
	Halfaday	2
	Steuben	2
1455362: Kalkaska-Blue Lake complex, 15 to 35 percent slopes-----	Kalkaska	55
	Blue Lake	35
	Dillingham	5
	Deford	2
	Steuben	2
	Tawas	1
1455363: Jeske-Au Train-Gongeau complex, 0 to 8 percent slopes-----	Jeske	40
	Au Train	30
	Gongeau	20
	Deerton	8
	Trout Bay	2
1455365: Cusino loamy sand, 1 to 6 percent slopes-----	Cusino	95
	Waiska	5

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455366: Cusino loamy sand, 6 to 15 percent slopes-----	Cusino	95
	Waiska	5
1455367: Kalkaska-Cusino complex, 1 to 6 percent slopes-----	Kalkaska	50
	Cusino	45
	Waiska	5
1455368: Kalkaska-Cusino complex, 6 to 15 percent slopes-----	Kalkaska	50
	Cusino	45
	Waiska	5
1455369: Kalkaska-Cusino complex, 15 to 35 percent slopes-----	Kalkaska	50
	Cusino	40
	Waiska	5
	Deford	2
	Wallace	2
	Tawas	1
1455370: Kalkaska-Cusino complex, 35 to 70 percent slopes-----	Kalkaska	50
	Cusino	35
	Waiska	7
	Wallace	5
	Deford	2
	Tawas	1
1455371: Halfaday sand, 0 to 3 percent slopes-----	Halfaday	90
	Au Gres	5
	Kalkaska	5
1455372: Shelldrake sand, 0 to 8 percent slopes-----	Shelldrake	90
	Wurtsmith	5
	Meehan	3
	Deford	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455380: Trout Bay-Gongeau-Shingleton-Rock outcrop complex, 1 to 70 percent slopes	Trout Bay	30
	Gongeau	25
	Shingleton	20
	Rock outcrop	15
	Ruse	5
	Nahma	3
	Nykanen	2
1455382: Kalkaska sand, 0 to 6 percent slopes, severely burned-----	Kalkaska, severely burned	95
	Kinross	5
1455383: Kalkaska sand, 6 to 15 percent slopes, severely burned-----	Kalkaska, severely burned	95
	Kinross	5
1455386: Trout Bay-Lupton-Gongeau complex, 0 to 6 percent slopes-----	Trout Bay	40
	Lupton	30
	Gongeau	20
	Jeske	4
	Au Train	3
	Ruse	3
1455387: Garlic sand, 0 to 6 percent slopes-----	Garlic	90
	Finch	5
	Okeefe	5
1455388: Garlic sand, 6 to 15 percent slopes-----	Garlic	90
	Finch	5
	Okeefe	5
1455389: Garlic sand, 15 to 35 percent slopes-----	Garlic	90
	Finch	5
	Kinross	5

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455390: Escanaba-Greylock complex, 1 to 6 percent slopes-----	Escanaba	50
	Greylock	40
	Kalkaska	3
	Munising, calcareous substratum	3
	Blue Lake	2
	Charlevoix	1
	Cookson	1
1455391: Escanaba-Greylock complex, 6 to 15 percent slopes-----	Escanaba	50
	Greylock	40
	Kalkaska	3
	Munising, calcareous substratum	3
	Blue Lake	2
	Charlevoix	2
1455392: Escanaba-Greylock complex, 15 to 35 percent slopes-----	Escanaba	50
	Greylock	40
	Cusino	5
	Blue Lake	3
	Kalkaska	2
1455395: Greylock fine sandy loam, 1 to 6 percent slopes-----	Greylock	90
	Blue Lake	4
	Charlevoix	2
	Cookson	2
	Escanaba	2
1455396: Greylock fine sandy loam, 6 to 15 percent slopes-----	Greylock	85
	Blue Lake	6
	Escanaba	4
	Dillingham	3
	Charlevoix	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455397: Finch-Kinross complex, 0 to 3 percent slopes-----	Finch	50
	Kinross	40
	Paquin	5
	Dawson	3
	Garlic	2
1455402: Kalkaska-Blue Lake complex, 1 to 12 percent slopes, dissected-----	Kalkaska, dissected	55
	Blue Lake, dissected	35
	Dillingham	3
	Steuben	3
	Deford	2
	Halfaday	2
1455403: Kalkaska-Blue Lake complex, 8 to 35 percent slopes, dissected-----	Kalkaska, dissected	55
	Blue Lake, dissected	35
	Dillingham	5
	Steuben	3
	Deford	2
1455404: Kalkaska-Blue Lake complex, 15 to 70 percent slopes, dissected-----	Kalkaska, dissected	55
	Blue Lake, dissected	35
	Dillingham	5
	Steuben	3
	Deford	2
1455408: Spot-Finch complex, 0 to 3 percent slopes-----	Spot	50
	Finch	40
	Dawson	5
	Paquin	5

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455409: Finch sand, 0 to 3 percent slopes-----	Finch	85
	Spot	10
	Paquin	5
1455410: Munising, calcareous substratum-Frohling, calcareous substratum-Cookson fine sandy loams, 1 to 12 percent slopes, dissected-----	Munising, calcareous substratum, dissected	40
	Frohling, calcareous substratum, dissected	30
	Cookson, dissected	20
	Kalkaska	4
	Reade	3
	Shingleton	2
	Au Train	1
1455411: Frohling, calcareous substratum-Garlic-Cookson complex, 8 to 35 percent slopes, dissected-----	Frohling, calcareous substratum, dissected	50
	Garlic, dissected	20
	Cookson, dissected	20
	Chatham	4
	Alcona	3
	Ensley	3

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455412: Munising-Yalmer-Frohling complex, calcareous substratum, 1 to 12 percent slopes, dissected-----	Munising, calcareous substratum, dissected	40
	Yalmer, calcareous substratum, dissected	30
	Frohling, calcareous substratum, dissected	20
	Escanaba	3
	Kalkaska	3
	Ensley	2
	Halfaday	2
1455413: Munising, calcareous substratum-Cookson fine sandy loams, 1 to 6 percent slopes-----	Munising, calcareous substratum	50
	Cookson	40
	Frohling	5
	Reade	3
	Blue Lake	2
1455416: Furlong-Shingleton complex, 1 to 6 percent slopes-----	Furlong	50
	Shingleton	40
	Longrie	5
	Namur	5
1455417: Furlong-Shingleton complex, 6 to 15 percent slopes-----	Furlong	50
	Shingleton	40
	Longrie	4
	Eben	2
	Nykanen	2
	Ruse	2

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455421: Steuben-Blue Lake-Kalkaska complex, 1 to 6 percent slopes-----	Steuben	40
	Blue Lake	30
	Kalkaska	20
	Munising	4
	Alcona	2
	Halfaday	2
	Tawas	2
1455422: Steuben-Blue Lake-Kalkaska complex, 6 to 15 percent slopes-----	Steuben	40
	Blue Lake	25
	Kalkaska	25
	Frohling	4
	Waiska	4
	Halfaday	2
1455425: Greylock-Cookson fine sandy loams, 1 to 6 percent slopes-----	Greylock	50
	Cookson	40
	Blue Lake	3
	Summerville	3
	Escanaba	2
	Reade	2
1455431: Rubicon sand, 0 to 6 percent slopes, severely burned-----	Rubicon, severely burned	95
	Kinross	3
	Croswell	2
1455432: Rubicon sand, 6 to 15 percent slopes, severely burned-----	Rubicon, severely burned	95
	Kinross	3
	Croswell	2
1455433: Wurtsmith-Deford complex, 0 to 6 percent slopes-----	Wurtsmith	55
	Deford	35
	Meehan	6
	Shelldrake	4

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1455434: Shelldrake fine sand, 2 to 75 percent slopes-----	Shelldrake	99
	Wurtsmith	1
1455435: Shelldrake-Dune land complex, 2 to 75 percent slopes-----	Shelldrake	61
	Dune land	38
	Wurtsmith	1
1455436: Cookson-Nykanen complex, 15 to 50 percent slopes, dissected-----	Cookson, dissected	55
	Nykanen, dissected	35
	Ruse	5
	Frohling, calcareous substratum, dissected	3
	Trout Bay	2
1455437: Dillingham-Kalkaska complex, 1 to 6 percent slopes-----	Dillingham	45
	Kalkaska	40
	Yalmer	10
	Paquin	5
1455438: Dillingham-Kalkaska complex, 6 to 15 percent slopes-----	Dillingham	52
	Kalkaska	45
	Dawson	2
	Voelker	1
1455439: Dillingham-Kalkaska complex, 15 to 35 percent slopes-----	Dillingham	50
	Kalkaska	40
	Dawson	5
	Alcona	3
	Voelker	2
1671074: Udipsamments and Udorthents, nearly level to very steep-----	Udipsamments	50
	Udorthents	50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1671282: Stutts-Kalkaska complex, 0 to 6 percent slopes-----	Stutts	65
	Kalkaska	35
1671283: Stutts-Kalkaska complex, 6 to 15 percent slopes-----	Stutts	65
	Kalkaska	25
	Alcona	10
1671284: Stutts-Kalkaska complex, 15 to 35 percent slopes-----	Stutts	55
	Kalkaska	45
1693163: Water-----	Water	100

# Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification

(Land capability classification is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. Only the soils suitable for cultivation are listed. The classification is for nonirrigated areas)

Map unit symbol and component name	Land capability
1455241: Deer Park-----	7s
1455242: Deer Park-----	7s
1455243: Deer Park-----	7s
1455244: Rubicon-----	6s
1455245: Rubicon-----	7s
1455246: Rubicon-----	7s
1455247: Kalkaska-----	4s
1455248: Kalkaska-----	6s
1455249: Kalkaska-----	7s
1455250: Crowell-----	4s
1455251: Paquin-----	6s
1455252: Au Gres-----	4w
1455253: Kinross-----	6w
1455254: Deford-----	5w
1455255: Ingalls-----	3w
1455257: Munising-----	2e
Yalmer-----	2e
1455262: Ensley-----	5w

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1455263:	
Munising, calcareous substratum-----	2e
Yalmer, calcareous substratum-----	4s
Frohling, calcareous substratum-----	2e
1455266:	
Grand Sable-----	2e
1455267:	
Grand Sable-----	6e
1455268:	
Rhody-----	5w
Towes-----	3w
1455269:	
Waiska, very stony-----	4s
1455273:	
Deerton-----	6s
Au Train-----	4s
1455274:	
Deerton-----	7s
Au Train-----	6s
1455276:	
Cookson-----	2e
1455277:	
Nahma-----	5w
Ruse-----	7w
1455278:	
Summerville-----	2e
1455281:	
Carbondale-----	6w
Lupton-----	6w
Tawas-----	6w
1455282:	
Dawson-----	7w
Greenwood-----	7w
Loxley-----	7w
1455283:	
Chippeny-----	6w
Nahma-----	5w

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1455284: Histosols-----	8w
Aquents-----	8w
1455289: Jeske, bedrock terrace-----	4w
Gongeau, bedrock terrace-----	5w
Deerton, bedrock terrace-----	6s
1455290: Jeske, bedrock terrace-----	4w
Gongeau, bedrock terrace-----	5w
Deerton, bedrock terrace-----	7s
1455291: Ruse, bedrock terrace-----	5w
Ensign, bedrock terrace-----	3w
Nykanen, bedrock terrace-----	4e
1455292: Ruse, bedrock terrace-----	5w
Ensign, bedrock terrace-----	3w
Nykanen, bedrock terrace-----	7e
1455295: Ewart-----	7w
Sturgeon-----	5w
1455296: Deerton, dissected-----	7s
Tokiahok, dissected-----	7e
Trout Bay, dissected-----	6w
1455298: Garlic, dissected-----	6s
Blue Lake, dissected-----	3e
Voelker, dissected-----	3e
1455299: Garlic, dissected-----	7s
Blue Lake, dissected-----	6e
Voelker, dissected-----	6e

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1455300:	
Garlic, dissected-----	7s
Blue Lake, dissected-----	7e
Voelker, dissected-----	7e
1455302:	
Garlic-----	6s
Blue Lake-----	3e
Voelker-----	4e
1455304:	
Cathro-----	6w
Ensley-----	5w
1455305:	
Tawas-----	6w
Deford-----	5w
1455308:	
Fence, dissected-----	3e
1455310:	
Rousseau-----	4e
Dawson-----	8w
1455318:	
Munising, calcareous substratum-----	2e
Ensley-----	5w
1455319:	
Munising, dissected, very stony-----	6s
Yalmer, dissected, very stony-----	6s
1455320:	
Munising, stony-----	4e
Skanee, stony-----	4w
1455324:	
Zeba, very stony-----	3s
Jacobsville, very stony-----	5w
1455326:	
Munising, dissected, stony-----	3e
Abbaye, dissected, stony-----	3e
1455327:	
Paquin-----	6s
Finch-----	4w

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1455339: Crowell-----	4s
Kinross-----	6w
1455340: Frohling, dissected, stony-----	7s
Tokiahok, dissected, stony-----	7s
1455341: McMaster-----	6s
1455344: Reade-----	2e
1455353: Charlevoix-----	3w
Ensley-----	5w
1455359: Munising-----	2e
Abbaye-----	2e
1455360: Kalkaska-----	4s
Blue Lake-----	3s
1455361: Kalkaska-----	6s
Blue Lake-----	3e
1455362: Kalkaska-----	7s
Blue Lake-----	6e
1455363: Jeske-----	4w
Au Train-----	4s
Gongeau-----	5w
1455365: Cusino-----	4s
1455366: Cusino-----	6s
1455367: Kalkaska-----	4s
Cusino-----	4s
1455368: Kalkaska-----	6s
Cusino-----	6s

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1455369: Kalkaska-----	7s
Cusino-----	7s
1455370: Kalkaska-----	7s
Cusino-----	7s
1455371: Halfaday-----	4s
1455372: Shelldrake-----	6s
1455380: Trout Bay-----	6w
Gongeau-----	5w
Shingleton-----	7s
1455382: Kalkaska, severely burned-----	4s
1455383: Kalkaska, severely burned-----	6s
1455386: Trout Bay-----	6w
Lupton-----	6w
Gongeau-----	5w
1455387: Garlic-----	4s
1455388: Garlic-----	6s
1455389: Garlic-----	7s
1455390: Escanaba-----	3s
Greylock-----	2e
1455391: Escanaba-----	4e
Greylock-----	3e
1455392: Escanaba-----	7e
Greylock-----	6e
1455395: Greylock-----	2e

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1455396: Greylock-----	3e
1455397: Finch-----	4w
Kinross-----	6w
1455402: Kalkaska, dissected-----	6s
Blue Lake, dissected-----	3e
1455403: Kalkaska, dissected-----	7s
Blue Lake, dissected-----	6e
1455404: Kalkaska, dissected-----	7s
Blue Lake, dissected-----	7e
1455408: Spot-----	5w
Finch-----	4w
1455409: Finch-----	4w
1455410: Munising, calcareous substratum, dissected-----	3e
Frohling, calcareous substratum, dissected-----	3e
Cookson, dissected-----	3e
1455411: Frohling, calcareous substratum, dissected-----	6e
Garlic, dissected-----	7s
Cookson, dissected-----	6e
1455412: Munising, calcareous substratum, dissected-----	3e
Yalmer, calcareous substratum, dissected-----	4s
Frohling, calcareous substratum, dissected-----	3e
1455413: Munising, calcareous substratum-----	2e
Cookson-----	2e
1455416: Furlong-----	4s
Shingleton-----	4s

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1455417: Furlong-----	4e
Shingleton-----	6s
1455421: Steuben-----	3s
Blue Lake-----	3s
Kalkaska-----	4s
1455422: Steuben-----	4e
Blue Lake-----	4e
Kalkaska-----	6s
1455425: Greylock-----	2e
Cookson-----	2e
1455431: Rubicon, severely burned-----	6s
1455432: Rubicon, severely burned-----	7s
1455433: Wurtsmith-----	4s
Deford-----	5w
1455434: Shelldrake-----	7s
1455435: Shelldrake-----	7s
1455436: Cookson, dissected-----	6e
Nykanen, dissected-----	7e
1455437: Dillingham-----	4s
Kalkaska-----	4s
1455438: Dillingham-----	6s
Kalkaska-----	6s
1455439: Dillingham-----	7s
Kalkaska-----	7s

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land  capability
1671282:	
Stutts-----	4e
Kalkaska-----	3s
1671283:	
Stutts-----	4e
Kalkaska-----	3s
1671284:	
Stutts-----	4e
Kalkaska-----	3s

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 3.—Prime and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are indicated in the column "Farmland classification")

Map unit symbol	Map unit name	Farmland classification
1455255	Ingalls sand, 0 to 3 percent slopes	Prime farmland if drained
1455262	Ensley muck	Prime farmland if drained
1455276	Cookson fine sandy loam, 1 to 6 percent slopes	All areas are prime farmland
1455353	Charlevoix-Ensley complex, 0 to 3 percent slopes	Prime farmland if drained
1455395	Greylock fine sandy loam, 1 to 6 percent slopes	All areas are prime farmland

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.-Hydric Soils

(This report lists only those map unit components that are rated as hydric. Definitions of hydric criteria codes are included at the end of the report)

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455241: Deer Park sand, 0 to 10 percent slopes	Kinross	5	depressions on lake plains, outwash plains	3	No	No	Yes
1455242: Deer Park sand, 10 to 25 percent slopes	Kinross	3	depressions on outwash plains, lake plains	3	No	No	Yes
1455243: Deer Park sand, 25 to 60 percent slopes	Kinross	2	depressions on outwash plains, lake plains	3	No	No	Yes
1455244: Rubicon sand, 0 to 6 percent slopes	Kinross	5	depressions on outwash plains, lake plains	3	No	No	Yes
1455245: Rubicon sand, 6 to 15 percent slopes	Kinross	3	depressions on outwash plains, lake plains	3	No	No	Yes
1455246: Rubicon sand, 15 to 35 percent slopes	Kinross	5	depressions on outwash plains, lake plains	3	No	No	Yes
1455247: Kalkaska sand, 0 to 6 percent slopes	Deford	2	depressions on outwash plains, lake plains	2B2, 2B1	Yes	No	No
1455248: Kalkaska sand, 6 to 15 percent slopes	Deford	2	depressions on outwash plains, lake plains	2B1, 2B2	Yes	No	No
1455250: Croswell sand, 0 to 3 percent slopes	Kinross	2	lake plains, outwash plains	3	No	No	Yes
1455251: Paquin sand, 0 to 3 percent slopes	Kinross	2	lake plains, outwash plains	3	No	No	Yes

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455252: Au Gres sand, 0 to 3 percent slopes	Deford	4	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
1455253: Kinross muck	Kinross	92	depressions on outwash plains, lake plains	3	No	No	Yes
	Dawson	5	depressions on outwash plains	1, 3	No	No	Yes
1455254: Deford muck	Deford	92	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
1455255: Ingalls sand, 0 to 3 percent slopes	Ensley	3	depressions on ground moraines, drainageways on ground moraines	3, 2B3	Yes	No	Yes
	Deford	2	depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No
1455257: Munising-Yalmer complex, 1 to 6 percent slopes	Gay	4	till-floored lake plains, bedrock-controlled moraines	3, 2B3	Yes	No	Yes
	Deford	2	depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455262: Ensley muck	Ensley	90	depressions on ground moraines, drainageways on ground moraines	2B3, 3	Yes	No	Yes
	Cathro	3	drainageways on ground moraines, depressions on ground moraines	1, 3	No	No	Yes
	Deford	3	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
1455263: Munising-Yalmer-Frohling complex, calcareous substratum, 1 to 6 percent slopes	Ensley	3	depressions on ground moraines, drainageways on ground moraines	2B3, 3	Yes	No	Yes
1455268: Rhody-Towes complex, 0 to 4 percent slopes	Rhody	60	bedrock terraces on glacial drainage channels	2B3	Yes	No	No
	Trout Bay	3	drainageways in depressions on glacial drainage channels	1	No	No	No
1455269: Waiska cobbly loamy sand, 0 to 6 percent slopes, very stony	Deford	2	depressions in outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
1455273: Deerton-Au Train complex, 1 to 15 percent slopes	Gongeau	3	drainageways in depressions on bedrock-controlled moraines	2B3	Yes	No	No
	Trout Bay	2	drainageways in depressions on glacial drainage channels	1	No	No	No

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455274: Deerton-Au Train complex, 6 to 35 percent slopes	Gongeau	4	drainageways in depressions on bedrock-controlled moraines	2B3	Yes	No	No
	Trout Bay	3	drainageways in depressions on glacial drainage channels	1	No	No	No
1455277: Nahma-Ruse complex	Nahma	50	depressions on ground moraines	2B3	Yes	No	No
	Ruse	40	depressions on ground moraines	3, 2B3	Yes	No	Yes
	Chippeny	5	till plains, limestone benches, glacial drainage channels, depressions on ground moraines	1	No	No	No
1455278: Summerville fine sandy loam, 1 to 6 percent slopes	Ruse	3	depressions on ground moraines	2B3, 3	Yes	No	Yes
1455281: Carbondale, Lupton, and Tawas soils	Carbondale	30	depressions on outwash plains	1, 3	No	No	Yes
	Lupton	30	depressions on outwash plains	3, 1	No	No	Yes
	Tawas	30	depressions on outwash plains	3, 1	No	No	Yes
	Deford	5	depressions on outwash plains, lake plains	2B2, 2B1	Yes	No	No
1455282: Dawson, Greenwood, and Loxley soils	Dawson	30	bogs	1, 3	No	No	Yes
	Greenwood	30	bogs	1	No	No	No
	Loxley	30	bogs	3, 1	No	No	Yes
	Spot	5	lake plains, depressions on outwash plains, ground moraines	2B3, 3	Yes	No	Yes

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455283: Chippeny-Nahma mucks	Chippeny	55	glacial drainage channels, depressions on ground moraines, till plains, limestone benches	1	No	No	No
	Nahma	30	glacial drainage channels, depressions on ground moraines	2B3	Yes	No	No
	Carbondale	5	outwash plains, lake plains, ground moraines	3, 1	No	No	Yes
	Ruse	5	depressions on ground moraines	3, 2B3	Yes	No	Yes
1455284: Histosols and Aquent's, ponded	Aquent's	50	marshes	3, 2B3	Yes	No	Yes
	Histosols	50	marshes	3, 1	No	No	Yes
1455289: Jeske-Gongeau-Deerton complex, bedrock terrace, 1 to 20 percent slopes	Gongeau, bedrock terrace	25	bedrock terrace glacial drainage channels	2B3	Yes	No	No
	Trout Bay	2	drainageways in depressions on glacial drainage channels	1	No	No	No
1455290: Jeske-Gongeau-Deerton complex, bedrock terrace, 1 to 45 percent slopes	Gongeau, bedrock terrace	25	drainageways in depressions on kame terraces	2B3	Yes	No	No
	Trout Bay	2	drainageways in depressions on glacial drainage channels	1	No	No	No

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455291: Ruse-Ensign-Nykanen complex, bedrock terrace, 1 to 20 percent slopes	Ruse, bedrock terrace	40	bedrock terrace glacial drainage channels	2B3, 3	Yes	No	Yes
	Chippeny	4	till plains, limestone benches, glacial drainage channels, depressions on ground moraines	1	No	No	No
1455292: Ruse-Ensign-Nykanen complex, bedrock terrace, 1 to 45 percent slopes	Ruse, bedrock terrace	40	bedrock terrace glacial drainage channels	2B3, 3	Yes	No	Yes
	Chippeny	2	till plains, limestone benches, glacial drainage channels, depressions on ground moraines	1	No	No	No
1455295: Evert-Sturgeon silt loams, 0 to 2 percent slopes, frequently flooded	Tawas	5	drainageways on moraines, depressions on moraines, depressions on outwash plains, drainageways on outwash plains	3, 1	No	No	Yes
1455296: Deerton-Tokiahok-Trout Bay complex, 8 to 35 percent slopes, dissected	Trout Bay, dissected	15	drainageways on bedrock- controlled moraines	1	No	No	No
	Gongeau	3	drainageways in depressions on kame terraces	2B3	Yes	No	No
1455298: Garlic-Blue Lake-Voelker complex, 1 to 12 percent slopes, dissected	Deford	2	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455299: Garlic-Blue Lake-Voelker complex, 8 to 35 percent slopes, dissected	Deford	2	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
1455300: Garlic-Blue Lake-Voelker complex, 15 to 60 percent slopes, dissected	Deford	2	depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No
1455302: Garlic-Blue-Lake-Voelker complex, 6 to 15 percent slopes	Deford	2	depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No
1455304: Cathro-Ensley mucks	Cathro	55	depressions on ground moraines, drainageways on ground moraines	1, 3	No	No	Yes
	Ensley	35	depressions on ground moraines, drainageways on ground moraines	2B3, 3	Yes	No	Yes
	Nahma	2	depressions on ground moraines	2B3	Yes	No	No
1455305: Tawas-Deford mucks	Tawas	70	drainageways on moraines, depressions on moraines, depressions on outwash plains, drainageways on outwash plains	3, 1	No	No	Yes
	Deford	20	drainageways on outwash plains, depressions on moraines, depressions on outwash plains, drainageways on moraines	2B1, 2B2	Yes	No	No

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455308: Fence very fine sandy loam, 1 to 12 percent slopes, dissected	Shag	4	---	2B3	Yes	No	No
1455310: Rousseau-Dawson complex, 0 to 15 percent slopes	Dawson	45	swales on beach ridges, outwash plains, ground moraines, lake plains	1, 3	No	No	Yes
1455318: Munising, calcareous substratum-Ensley complex, 0 to 6 percent slopes	Ensley	25	depressions on ground moraines, drainageways on ground moraines	2B3, 3	Yes	No	Yes
1455319: Munising-Yalmer complex, 1 to 12 percent slopes, dissected, very stony	Gay	3	till-floored lake plains, bedrock-controlled moraines	2B3, 3	Yes	No	Yes
1455320: Munising-Skaneec complex, 0 to 6 percent slopes, stony	Gay	3	till-floored lake plains, bedrock-controlled moraines	3, 2B3	Yes	No	Yes
1455324: Zeba-Jacobsville complex, 0 to 3 percent slopes, very stony	Jacobsville, very stony	30	depressions on bedrock-controlled moraines, sandstone benches	3, 2B3	Yes	No	Yes
	Skandia	3	drainageways on bedrock-controlled moraines, depressions on bedrock-controlled moraines	1	No	No	No
	Gay	2	till-floored lake plains, bedrock-controlled moraines	3, 2B3	Yes	No	Yes

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455326: Munising-Abbaye fine sandy loams, 1 to 12 percent slopes, dissected, stony	Jacobsville	3	ground moraines, sandstone benches	2B3, 3	Yes	No	Yes
1455339: Crowell-Kinross complex, 0 to 6 percent slopes	Kinross	40	swales, outwash plains, lake plains	3, 2B3	Yes	No	Yes
	Greenwood	5	outwash plains, lake plains, ground moraines	1, 3	No	No	Yes
1455340: Frohling-Tokiahok complex, 8 to 35 percent slopes, dissected, stony	Gay	2	till-floored lake plains, bedrock-controlled moraines	2B3, 3	Yes	No	Yes
1455341: McMaster cobbly sandy loam, 0 to 4 percent slopes	Davies	2	kame terraces, glacial drainage channels	2B3	Yes	No	No
1455344: Reade silt loam, 0 to 4 percent slopes	Nahma	3	depressions on ground moraines	2B3	Yes	No	No
1455353: Charlevoix-Ensley complex, 0 to 3 percent slopes	Ensley	30	depressions on ground moraines, drainageways on ground moraines	2B3, 3	Yes	No	Yes
	Cathro	5	drainageways on ground moraines, depressions on ground moraines	3, 1	No	No	Yes
1455359: Munising-Abbaye fine sandy loams, 1 to 6 percent slopes	Jacobsville	3	ground moraines, sandstone benches	2B3, 3	Yes	No	Yes

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455362: Kalkaska-Blue Lake complex, 15 to 35 percent slopes	Deford	2	depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No
	Tawas	1	drainageways on moraines, depressions on moraines, depressions on outwash plains, drainageways on outwash plains	1, 3	No	No	Yes
1455363: Jeske-Au Train-Gongeau complex, 0 to 8 percent slopes	Gongeau	20	drainageways in depressions on bedrock-controlled moraines	2B3	Yes	No	No
	Trout Bay	2	drainageways in depressions on glacial drainage channels	1	No	No	No
1455369: Kalkaska-Cusino complex, 15 to 35 percent slopes	Deford	2	depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No
	Tawas	1	drainageways on moraines, depressions on moraines, depressions on outwash plains, drainageways on outwash plains	1, 3	No	No	Yes

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455370: Kalkaska-Cusino complex, 35 to 70 percent slopes	Deford	2	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
	Tawas	1	drainageways on moraines, depressions on moraines, depressions on outwash plains, drainageways on outwash plains	1, 3	No	No	Yes
1455372: Sheldrake sand, 0 to 8 percent slopes	Deford	2	depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No
1455380: Trout Bay-Gongeau- Shingleton-Rock outcrop complex, 1 to 70 percent slopes	Trout Bay	30	sandstone benches	1	No	No	No
	Gongeau	25	drainageways in depressions on kame terraces	2B3	Yes	No	No
	Ruse	5	bedrock terrace glacial drainage channels	3, 2B3	Yes	No	Yes
	Nahma	3	depressions on ground moraines	2B3	Yes	No	No
1455382: Kalkaska sand, 0 to 6 percent slopes, severely burned	Kinross	5	lake plains, outwash plains	3, 2B3	Yes	No	Yes
1455383: Kalkaska sand, 6 to 15 percent slopes, severely burned	Kinross	5	lake plains, outwash plains	3, 2B3	Yes	No	Yes

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455386: Trout Bay-Lupton-Gongeau complex, 0 to 6 percent slopes	Trout Bay	40	drainageways in depressions on drainage channels	1	No	No	No
	Lupton	30	drainageways in depressions on glacial drainage channels	1	No	No	No
	Gongeau	20	drainageways in depressions on glacial drainage channels	2B3	Yes	No	No
	Ruse	3	depressions on ground moraines	2B3, 3	Yes	No	Yes
1455389: Garlic sand, 15 to 35 percent slopes	Kinross	5	lake plains, outwash plains	3	No	No	Yes
1455397: Finch-Kinross complex, 0 to 3 percent slopes	Kinross	40	lake plains, outwash plains	2B3, 3	Yes	No	Yes
	Dawson	3	ground moraines, outwash plains, lake plains	1, 3	No	No	Yes
1455402: Kalkaska-Blue Lake complex, 1 to 12 percent slopes, dissected	Deford	2	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
1455403: Kalkaska-Blue Lake complex, 8 to 35 percent slopes, dissected	Deford	2	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No
1455404: Kalkaska-Blue Lake complex, 15 to 70 percent slopes, dissected	Deford	2	depressions on outwash plains, depressions on lake plains	2B1, 2B2	Yes	No	No

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455408: Spot-Finch complex, 0 to 3 percent slopes	Spot	50	depressions on outwash plains	2B3, 3	Yes	No	Yes
	Dawson	5	depressions on outwash plains, ground moraines, lake plains	1, 3	No	No	Yes
1455409: Finch sand, 0 to 3 percent slopes	Spot	10	depressions on outwash plains, lake plains, ground moraines	3, 2B3	Yes	No	Yes
1455411: Frohling, calcareous substratum-Garlic-Cookson complex, 8 to 35 percent slopes, dissected	Ensley	3	depressions on ground moraines, drainageways on ground moraines	3, 2B3	Yes	No	Yes
1455412: Munising-Yalmer-Frohling complex, calcareous substratum, 1 to 12 percent slopes, dissected	Ensley	2	depressions on ground moraines, drainageways on ground moraines	3, 2B3	Yes	No	Yes
1455417: Furlong-Shingleton complex, 6 to 15 percent slopes	Ruse	2	depressions on ground moraines	3, 2B3	Yes	No	Yes
1455421: Steuben-Blue Lake-Kalkaska complex, 1 to 6 percent slopes	Tawas	2	drainageways on moraines, depressions on moraines, depressions on outwash plains, drainageways on outwash plains	3, 1	No	No	Yes
1455431: Rubicon sand, 0 to 6 percent slopes, severely burned	Kinross	3	---	2A	Yes	No	No
1455432: Rubicon sand, 6 to 15 percent slopes, severely burned	Kinross	3	---	2A	Yes	No	No

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1455433: Wurtsmith-Deford complex, 0 to 6 percent slopes	Deford	35	swales, depressions on outwash plains, depressions on lake plains	2B2, 2B1	Yes	No	No
1455436: Cookson-Nykanen complex, 15 to 50 percent slopes, dissected	Ruse	5	depressions on ground moraines	3, 2B3	Yes	No	Yes
	Trout Bay	2	drainageways in depressions on glacial drainage channels	1	No	No	No
1455438: Dillingham-Kalkaska complex, 6 to 15 percent slopes	Dawson	2	ground moraines, depressions on outwash plains, lake plains	1, 3	No	No	Yes
1455439: Dillingham-Kalkaska complex, 15 to 35 percent slopes	Dawson	5	lake plains, depressions on outwash plains, ground moraines	1, 3	No	No	Yes

Explanation of hydric criteria codes

1. All Histels (except for Folistels), and Histosols (except for Folists), which are, by definition, saturated.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
  - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
  - B. are poorly drained or very poorly drained and have either:
    - 1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
    - 2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
    - 3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for periods of long or very long duration during the growing season.
4. Soils that are frequently flooded for periods of long or very long duration during the growing season.

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material

(Only major components are displayed in this report. Component percents may not add up to 100. MAP is the mean annual precipitation. Components that have "None assigned" for parent material do not have parent material entries in the database)

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455241: Deer Park-----	90	0-10	574-1394	28-33	Beach ridge and dune	Beach sand and/or eolian sands
1455242: Deer Park-----	95	10-25	574-1394	28-33	Beach ridge and dune	Beach sand and/or eolian sands
1455243: Deer Park-----	98	25-60	574-1394	28-33	Dune	Beach sand and/or eolian sands
1455244: Rubicon-----	90	0-6	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
1455245: Rubicon-----	95	6-15	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
1455246: Rubicon-----	95	15-35	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
1455247: Kalkaska-----	94	0-6	574-1394	28-33	Outwash plain	Outwash
1455248: Kalkaska-----	96	6-15	574-1394	28-33	Outwash plain	Outwash
1455249: Kalkaska-----	100	15-35	574-1394	28-33	Disintegration moraine and outwash plain	Outwash
1455250: Crowell-----	92	0-3	574-1394	28-33	Dune, lake plain, outwash plain, and stream terrace	Sandy glaciofluvial deposits
1455251: Paquin-----	90	0-3	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
1455252: Au Gres-----	92	0-3	574-1394	28-33	Lake plain and outwash plain	Sandy glaciofluvial deposits
1455253: Kinross-----	92	0-2	574-1394	28-33	Depression on outwash plain and lake plain	Outwash

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.-Climate, Landform, and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455254: Deford-----	92	0-2	574-1394	28-33	Depression on lake plain and depression on outwash plain	Sandy glaciofluvial deposits
1455255: Ingalls-----	90	0-3	591-1968	30-34	Glacial lake (relict)	Glaciofluvial deposits over glaciolacustrine deposits
1455257: Munising-----	55	1-6	591-1968	30-34	End moraine, ground moraine, and bedrock- controlled moraine	Loamy lodgement till
Yalmer-----	30	1-6	591-1968	30-34	End moraine and ground moraine	Sandy outwash over loamy till
1455262: Ensley-----	90	0-2	574-1394	28-33	Depression on ground moraine and drainageway on ground moraine	Lodgement till
1455263: Munising, calcareous substratum-----	40	1-6	574-1394	28-33	Ground moraine	Eolian deposits over lodgement till
Yalmer, calcareous substratum-----	30	1-6	574-1394	28-33	Ground moraine	Outwash over lodgement till
Frohling, calcareous substratum-----	20	4-6	574-1394	28-33	Ground moraine	Eolian deposits over lodgement till
1455266: Grand Sable-----	90	1-6	574-1394	28-33	Kame terrace	Sandy eolian deposits over sandy outwash
1455267: Grand Sable-----	98	15-35	574-1394	28-33	Kame terrace	Sandy eolian deposits over sandy outwash

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.-Climate, Landform, and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455268: Rhody-----	60	0-2	574-1394	28-33	Bedrock terrace on glacial drainage channel	Silty eolian deposits over sandy outwash
Towes-----	30	0-4	574-1394	28-33	Bedrock terrace on glacial drainage channel	Silty eolian deposits over sandy outwash
1455269: Waiska, very stony	90	0-6	591-1968	30-34	Glacial lake bench, outwash plain, and stream terrace	Sandy and gravelly outwash
1455273: Deerton-----	55	4-15	574-1394	28-33	Bedrock bench and bedrock- controlled moraine	Sandy glaciofluvial deposits over sandy residuum
Au Train-----	30	1-12	574-1968	30-34	Bedrock- controlled moraine	Sandy glaciofluvial deposits and/or sandy residuum
1455274: Deerton-----	55	6-35	574-1394	28-33	Bedrock- controlled moraine	Sandy glaciofluvial deposits over sandy residuum
Au Train-----	30	6-18	574-1968	30-34	Bedrock- controlled moraine	Sandy glaciofluvial deposits and/or sandy residuum
1455276: Cookson-----	90	1-6	574-1394	28-33	Ground moraine	Coarse-loamy till
1455277: Nahma-----	50	0-1	574-1394	28-33	Depression on ground moraine	Loamy lodgement till
Ruse-----	40	0-2	574-1394	28-33	Depression on ground moraine	Loamy till
1455278: Summerville-----	85	1-6	574-1394	28-33	Ground moraine	Loamy till
1455281: Carbondale-----	30	0-2	574-1394	28-33	Depression on outwash plain	Herbaceous organic material
Lupton-----	30	0-1	574-1394	28-33	Depression on outwash plain	Woody organic material
Tawas-----	30	0-2	574-1394	28-33	Depression on outwash plain	Woody organic material over glacial drift

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.-Climate, Landform, and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455282: Dawson-----	30	0-1	574-1394	28-33	Bog	Herbaceous organic material over sandy glaciofluvial deposits
Greenwood-----	30	0-1	574-1394	28-33	Bog	Acidic herbaceous organic material
Loxley-----	30	0-1	574-1394	28-33	Bog	Herbaceous organic material
1455283: Chippeny-----	55	0-1	574-1394	28-33	Limestone bench, depression on ground moraine, glacial drainage channel, and till plain	Woody organic material
Nahma-----	30	0-1	574-1394	28-33	Depression on ground moraine and glacial drainage channel	Woody organic material over loamy lodgment till
1455284: Aquents-----	50	0-0	600-1394	28-33	Marsh	None assigned
Histosols-----	50	0-2	574-1394	28-33	Marsh	Organic material
1455285: Pits-----	100	None assigned	574-1394	28-33	None assigned	None assigned
1455289: Jeske, bedrock terrace-----	45	1-10	574-1394	30-34	Bedrock- controlled moraine	Sandy glaciofluvial deposits and/or sandy residuum
Gongeau, bedrock terrace-----	25	1-3	574-1394	28-33	Bedrock terrace and glacial drainage channel	Sandy glaciofluvial deposits
Deerton, bedrock terrace-----	20	6-20	574-1394	28-33	Bedrock terrace and glacial drainage channel	Sandy glaciofluvial deposits over sandy residuum

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.-Climate, Landform, and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455290: Jeske, bedrock terrace-----	45	1-10	574-1394	28-33	Bedrock- controlled moraine	Sandy glaciofluvial deposits and/or sandy residuum
Gongeau, bedrock terrace-----	25	1-8	574-1394	28-33	Drainageway in depression on kame terrace	Sandy glaciofluvial deposits
Deerton, bedrock terrace-----	20	6-45	574-1394	28-33	Bedrock bench	Sandy glaciofluvial deposits over sandy residuum
1455291: Ruse, bedrock terrace-----	40	1-4	574-1394	28-33	Bedrock terrace glacial drainage channel	Loamy outwash
Ensign, bedrock terrace-----	30	1-6	574-1394	28-33	Bedrock terrace glacial drainage channel	Loamy outwash
Nykanen, bedrock terrace-----	20	6-20	574-1394	28-33	Bedrock terrace glacial drainage channel	Loamy outwash
1455292: Ruse, bedrock terrace-----	40	1-4	574-1394	28-33	Bedrock terrace glacial drainage channel	Loamy outwash
Ensign, bedrock terrace-----	30	1-6	574-1394	28-33	Bedrock terrace glacial drainage channel	Loamy outwash
Nykanen, bedrock terrace-----	20	6-45	574-1394	28-33	Bedrock terrace glacial drainage channel	Loamy outwash

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.-Climate, Landform, and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455295: Evert-----	70	0-1	574-1394	28-33	Flood plain	Alluvium
Sturgeon-----	20	0-2	574-1394	28-33	Flood plain	Alluvium
1455296: Deerton, dissected-	40	8-35	591-1968	30-34	Bedrock- controlled moraine	Sandy glaciofluvial deposits over sandy residuum
Tokiahok, dissected	30	8-35	591-1968	30-34	Bedrock- controlled moraine	Sandy outwash over loamy till
Trout Bay, dissected-----	15	8-25	591-1968	30-34	Drainageway on bedrock- controlled moraine	Herbaceous organic material and/or woody organic material
1455298: Garlic, dissected--	40	1-12	591-1968	30-34	Dissected disintegration moraine	Glaciofluvial deposits
Blue Lake, dissected-----	30	1-12	574-1394	28-33	Dissected disintegration moraine	Sandy supraglacial till
Voelker, dissected-	20	1-12	591-1968	30-34	Dissected disintegration moraine and lake plain	Sandy glaciofluvial deposits over loamy lacustrine deposits
1455299: Garlic, dissected--	40	8-35	591-1968	30-34	Disintegration moraine	Glaciofluvial deposits
Blue Lake, dissected-----	30	8-35	574-1394	28-33	Disintegration moraine	Sandy supraglacial till
Voelker, dissected-	20	8-35	591-1968	30-34	Disintegration moraine and lake plain	Sandy glaciofluvial deposits over loamy lacustrine deposits
1455300: Garlic, dissected--	40	15-60	591-1968	30-34	Disintegration moraine	Glaciofluvial deposits
Blue Lake, dissected-----	30	15-60	574-1394	28-33	Disintegration moraine	Sandy supraglacial till
Voelker, dissected-	20	15-60	591-1968	30-34	Disintegration moraine and lake plain	Sandy glaciofluvial deposits over loamy lacustrine deposits

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455302: Garlic-----	40	6-15	591-1968	30-34	Disintegration moraine and ground moraine	Glaciofluvial deposits
Blue Lake-----	30	6-15	574-1394	28-33	Disintegration moraine and ground moraine	Sandy supraglacial till
Voelker-----	20	6-15	591-1968	30-34	Disintegration moraine and lake plain	Sandy glaciofluvial deposits over loamy lacustrine deposits
1455304: Cathro-----	55	0-1	574-1394	28-33	Depression on ground moraine and drainageway on ground moraine	Woody organic material over lodgement till
Ensley-----	35	0-1	574-1394	28-33	Depression on ground moraine and drainageway on ground moraine	Lodgement till
1455305: Tawas-----	70	0-1	574-1394	28-33	Depression on outwash plain, depression on moraine, drainageway on moraine, and drainageway on outwash plain	None assigned
Deford-----	20	0-1	574-1394	28-33	Depression on moraine, depression on outwash plain, drainageway on outwash plain, and drainageway on moraine	Sandy glaciofluvial deposits
1455308: Fence, dissected---	90	1-12	591-1968	30-34	Lake plain	Stratified loamy glaciolacustrine deposits
1455310: Rousseau-----	50	2-15	574-1394	28-33	Beach ridge and dune	Eolian deposits
Dawson-----	45	0-1	574-1394	28-33	Ground moraine, lake plain, outwash plain, and swale on beach ridge	Herbaceous organic material over sandy glaciofluvial deposits

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455318: Munising, calcareous substratum-----	65	1-6	574-1394	28-33	Ground moraine	Eolian deposits over lodgement till
Ensley-----	25	0-1	574-1394	28-33	Depression on ground moraine and drainageway on ground moraine	Lodgement till
1455319: Munising, dissected, very stony-----	50	1-12	591-1968	30-34	End moraine and bedrock- controlled moraine	Loamy lodgement till
Yalmer, dissected, very stony-----	35	1-12	591-1968	30-34	End moraine and bedrock- controlled moraine	Sandy outwash over loamy till
1455320: Munising, stony----	60	1-6	591-1968	30-34	End moraine, ground moraine, and bedrock- controlled moraine	Loamy lodgement till
Skanee, stony-----	30	0-3	591-1968	30-34	Bedrock- controlled moraine and till plain	Loamy till
1455324: Zeba, very stony---	55	0-3	591-1968	30-34	Sandstone bench and flat on bedrock- controlled moraine	Loamy lodgment till
Jacobsville, very stony-----	30	0-1	591-1968	30-34	Sandstone bench and depression on bedrock- controlled moraine	Loamy lodgment till
1455326: Munising, dissected, stony-----	50	1-12	591-1968	30-34	End moraine, ground moraine, and bedrock- controlled moraine	Loamy lodgement till

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455326: Abbaye, dissected, stony-----	35	1-12	591-1968	30-34	Bedrock- controlled moraine	Lodgement till
1455327: Paquin-----	55	0-6	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
Finch-----	45	0-3	574-1394	28-33	Lake plain and outwash plain	Outwash
1455339: Crosswell-----	50	0-6	574-1394	28-33	Beach ridge, lake plain, and outwash plain	Beach sand and/or sandy glaciofluvial deposits
Kinross-----	40	0-2	574-1394	28-33	Lake plain, outwash plain, and swale	None assigned
1455340: Frohling, dissected, stony--	60	8-35	591-1968	30-34	Bedrock- controlled moraine	Loamy till
Tokiahok, dissected, stony--	30	8-35	591-1968	30-34	Bedrock- controlled moraine	Sandy outwash over loamy till
1455341: McMaster-----	90	0-4	574-1394	28-33	Nearly level recessional moraine	Loamy drift over calcareous gravelly outwash
1455344: Reade-----	85	0-4	574-1394	28-33	Ground moraine	Loamy till
1455353: Charlevoix-----	55	0-3	574-1394	28-33	Ground moraine	Eolian deposits over lodgement till
Ensley-----	30	0-2	574-1394	28-33	Depression on ground moraine and drainageway on ground moraine	Lodgement till
1455359: Munising-----	55	1-6	591-1968	30-34	End moraine, ground moraine, and bedrock- controlled moraine	Loamy lodgement till

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455359: Abbaye-----	35	1-6	591-1968	30-34	Bedrock- controlled ground moraine	Lodgement till
1455360: Kalkaska-----	60	1-6	574-1394	28-33	Disintegration moraine and outwash plain	Sandy outwash
Blue Lake-----	30	1-6	574-1394	28-33	Moraine	None assigned
1455361: Kalkaska-----	55	6-15	574-1394	28-33	Disintegration moraine and outwash plain	Sandy outwash
Blue Lake-----	35	6-15	574-1394	28-33	Moraine	None assigned
1455362: Kalkaska-----	55	15-35	574-1394	28-33	Disintegration moraine and outwash plain	Sandy outwash
Blue Lake-----	35	15-35	574-1394	28-33	Moraine	None assigned
1455363: Jeske-----	40	0-2	591-1968	30-34	Bedrock- controlled moraine	Sandy glaciofluvial deposits and/or sandy residuum
Au Train-----	30	1-8	591-1968	30-34	Bedrock- controlled moraine	Sandy glaciofluvial deposits and/or sandy residuum
Gongeau-----	20	0-1	591-1968	30-34	Drainageway in depression on bedrock- controlled moraine	Sandy glaciofluvial deposits
1455365: Cusino-----	95	1-6	574-1394	28-33	Kame terrace, moraine, and outwash plain	Sandy and gravelly outwash
1455366: Cusino-----	95	6-15	574-1394	28-33	Kame terrace, moraine, and outwash plain	Sandy and gravelly outwash
1455367: Kalkaska-----	50	1-6	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy outwash
Cusino-----	45	1-6	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy and gravelly outwash

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455368: Kalkaska-----	50	6-15	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy outwash
Cusino-----	45	6-15	574-1394	28-33	Kame terrace, moraine, and outwash plain	Sandy and gravelly outwash
1455369: Kalkaska-----	50	15-35	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy outwash
Cusino-----	40	15-35	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy and gravelly outwash
1455370: Kalkaska-----	50	35-70	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy outwash
Cusino-----	35	35-70	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy and gravelly outwash
1455371: Halfaday-----	90	0-3	574-1394	28-33	Outwash plain	Sandy outwash
1455372: Shelldrake-----	90	0-8	591-1968	30-34	Beach ridge	Beach sand
1455380: Trout Bay-----	30	1-25	574-1394	28-33	Sandstone bench	Herbaceous organic material and/or woody organic material
Gongeau-----	25	1-12	574-1394	28-33	Drainageway in depression on kame terrace	Sandy glaciofluvial deposits
Shingleton-----	20	25-70	574-1394	28-33	Kame terrace on glacial drainage channel	Sandy outwash
Rock outcrop-----	15	None assigned	574-1394	28-33	None assigned	None assigned
1455382: Kalkaska, severely burned-----	95	0-6	574-1394	28-33	Outwash plain	Outwash

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455383: Kalkaska, severely burned-----	95	6-15	574-1394	28-33	Outwash plain	Outwash
1455386: Trout Bay-----	40	0-4	574-1394	28-33	Drainageway in depression on glacial drainage channel	Herbaceous organic material and/or woody organic material
Lupton-----	30	0-2	574-1394	28-33	Drainageway in depression on glacial drainage channel	Woody organic material
Gongeau-----	20	0-6	574-1394	28-33	Drainageway in depression on glacial drainage channel	Sandy glaciofluvial deposits
1455387: Garlic-----	90	0-6	574-1394	28-33	Disintegration moraine and pitted outwash plain	Outwash
1455388: Garlic-----	90	6-15	574-1394	28-33	Disintegration moraine and pitted outwash plain	Sandy glaciofluvial deposits
1455389: Garlic-----	90	15-35	574-1394	28-33	Disintegration moraine and pitted outwash plain	Sandy glaciofluvial deposits
1455390: Escanaba-----	50	1-6	574-1394	28-33	Ground moraine	Sandy glaciofluvial deposits over loamy lodgement till
Greylock-----	40	1-6	574-1394	28-33	Ground moraine	Loamy lodgement till
1455391: Escanaba-----	50	6-15	574-1394	28-33	Ground moraine	Sandy outwash over loamy lodgement till
Greylock-----	40	6-15	574-1394	28-33	Ground moraine	Loamy lodgement till

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455392: Escanaba-----	50	15-35	574-1394	28-33	Ground moraine	Sandy outwash over loamy lodgement till
Greylock-----	40	15-35	574-1394	28-33	Ground moraine	Loamy lodgement till
1455395: Greylock-----	90	1-6	574-1394	28-33	Ground moraine	Loamy lodgement till
1455396: Greylock-----	85	6-15	574-1394	28-33	Ground moraine	Loamy lodgement till
1455397: Finch-----	50	0-3	574-1394	28-33	Lake plain and outwash plain	Sandy glaciofluvial deposits
Kinross-----	40	0-1	574-1394	28-33	Lake plain and outwash plain	None assigned
1455402: Kalkaska, dissected	55	1-12	591-1968	30-34	Disintegration moraine and outwash plain	Sandy outwash
Blue Lake, dissected-----	35	1-12	574-1394	28-33	Moraine	None assigned
1455403: Kalkaska, dissected	55	8-35	574-1394	28-33	Disintegration moraine and outwash plain	Sandy outwash
Blue Lake, dissected-----	35	8-35	574-1394	28-33	Moraine	None assigned
1455404: Kalkaska, dissected	55	15-70	591-1968	30-34	Disintegration moraine and outwash plain	Sandy outwash
Blue Lake, dissected-----	35	15-70	574-1394	28-33	Moraine	None assigned
1455408: Spot-----	50	0-2	574-1394	28-33	Depression on outwash plain	None assigned
Finch-----	40	0-3	574-1394	28-33	Outwash plain	Outwash
1455409: Finch-----	85	0-3	574-1394	28-33	Lake plain and outwash plain	Sandy glaciofluvial deposits
1455410: Munising, calcareous substratum, dissected-----	40	1-12	574-1394	28-33	Ground moraine	Eolian deposits over lodgement till

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.-Climate, Landform, and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455410: Frohling, calcareous substratum, dissected-----	30	4-12	574-1394	28-33	Ground moraine	Lodgement till
Cookson, dissected-	20	1-12	574-1394	28-33	Ground moraine	Coarse-loamy till
1455411: Frohling, calcareous substratum, dissected-----	50	8-35	574-1394	28-33	Bedrock- controlled ground moraine	Lodgement till
Cookson, dissected-	20	8-35	574-1394	28-33	Ground moraine	Coarse-loamy till
Garlic, dissected--	20	8-35	574-1394	28-33	Disintegration moraine	Glaciofluvial deposits
1455412: Munising, calcareous substratum, dissected-----	40	1-12	574-1394	28-33	Ground moraine	Eolian deposits over lodgement till
Yalmer, calcareous substratum, dissected-----	30	1-12	574-1394	28-33	Ground moraine	Outwash over lodgement till
Frohling, calcareous substratum, dissected-----	20	6-12	574-1394	28-33	Ground moraine	Lodgement till
1455413: Munising, calcareous substratum-----	50	1-6	574-1394	28-33	Ground moraine	Eolian deposits over lodgement till
Cookson-----	40	1-6	574-1394	28-33	Ground moraine	Coarse-loamy till
1455416: Furlong-----	50	0-6	574-1394	28-33	Bedrock bench on kame terrace and bedrock- controlled ground moraine	Sandy outwash
Shingleton-----	40	1-6	574-1394	28-33	Kame terrace on bedrock bench	Sandy outwash

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455417: Furlong-----	50	6-15	574-1394	28-33	Bedrock bench on kame terrace	Sandy outwash
Shingleton-----	40	6-15	574-1394	28-33	Kame terrace on bedrock bench	Sandy outwash
1455421: Steuben-----	40	1-6	591-1968	30-34	Disintegration moraine and ground moraine	Loamy till over sandy outwash
Blue Lake-----	30	1-6	574-1394	28-33	Disintegration moraine	None assigned
Kalkaska-----	20	1-6	591-1968	30-34	Disintegration moraine and outwash plain	Sandy outwash
1455422: Steuben-----	40	6-15	591-1968	30-34	Disintegration moraine	Loamy till over sandy outwash
Blue Lake-----	25	6-15	574-1394	28-33	Disintegration moraine	None assigned
Kalkaska-----	25	6-15	591-1968	30-34	Disintegration moraine and outwash plain	Sandy outwash
1455425: Greylock-----	50	1-6	574-1394	28-33	Ground moraine	Loamy lodgement till
Cookson-----	40	1-6	574-1394	28-33	Ground moraine	Coarse-loamy till
1455431: Rubicon, severely burned-----	95	0-6	574-1394	28-33	Flat on pitted outwash plain and knoll on pitted outwash plain	Sandy outwash
1455432: Rubicon, severely burned-----	95	6-15	574-1394	28-33	Flat on pitted outwash plain and knoll on pitted outwash plain	Sandy outwash
1455433: Wurtsmith-----	55	1-6	591-1968	30-34	Beach ridge and outwash plain	Sandy beach sand
Deford-----	35	0-1	591-1968	30-34	Depression on lake plain, depression on outwash plain, and swale	Sandy beach sand

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.—Climate, Landform, and Parent Material—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1455434: Shell Drake-----	99	2-75	574-1394	28-33	Dune	Sandy eolian deposits
1455435: Shell Drake-----	61	2-75	574-1394	28-33	Dune	Sandy eolian deposits
Dune land-----	38	2-75	574-1394	28-33	Dune	None assigned
1455436: Cookson, dissected-	55	15-50	574-1394	28-33	Bedrock- controlled moraine	Loamy till
Nykanen, dissected-	35	15-45	574-1394	28-33	Bedrock- controlled moraine	Loamy till
1455437: Dillingham-----	45	1-6	574-1394	28-33	Disintegration moraine	Sandy till
Kalkaska-----	40	1-6	574-1394	28-33	Disintegration moraine and outwash plain	Outwash
1455438: Dillingham-----	52	6-15	909-1161	28-33	Disintegration moraine	Glaciofluvial deposits
Kalkaska-----	45	6-15	574-1394	28-33	Disintegration moraine	Outwash
1455439: Dillingham-----	50	15-35	909-1161	28-33	Disintegration moraine	Sandy glaciofluvial deposits
Kalkaska-----	40	15-35	574-1394	28-33	Disintegration moraine	Outwash
1671074: Udipsamments-----	50	0-60	574-1394	28-33	None assigned	None assigned
Udorthents-----	50	0-60	574-1394	28-33	None assigned	None assigned
1671282: Stutts-----	65	0-6	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy glaciofluvial deposits
Kalkaska-----	35	0-6	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
1671283: Stutts-----	65	6-15	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy glaciofluvial deposits

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 5.-Climate, Landform, and Parent Material-Continued

Map unit symbol and soil name	Percent	Slope	Elevation	MAP	Landform	Parent material
	of map unit					
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>		
1671283: Kalkaska-----	25	6-15	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
1671284: Stutts-----	55	15-35	574-1394	28-33	Disintegration moraine, kame terrace, and outwash plain	Sandy glaciofluvial deposits
Kalkaska-----	45	15-35	574-1394	28-33	Outwash plain	Sandy glaciofluvial deposits
1693163. Water						

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
1455242: Deer Park-----	95	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
1455243: Deer Park-----	98	Moderately suited Sandiness Slope	0.50 0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
1455244: Rubicon-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455245: Rubicon-----	95	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455246: Rubicon-----	95	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
1455247: Kalkaska-----	94	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455248: Kalkaska-----	96	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455249: Kalkaska-----	100	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
1455250: Croswell-----	92	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455251: Paquin-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455252: Au Gres-----	92	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455253: Kinross-----	92	Well suited		Well suited		Moderate Low strength	0.50
1455254: Deford-----	92	Well suited		Well suited		Severe Low strength	1.00
1455255: Ingalls-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Severe Low strength	1.00
1455257: Munising-----	55	Well suited		Well suited		Moderate Low strength	0.50
Yalmer-----	30	Well suited		Well suited		Moderate Low strength	0.50
1455262: Ensley-----	90	Well suited		Well suited		Severe Low strength	1.00
1455263: Munising, calcareous substratum-----	40	Well suited		Well suited		Moderate Low strength	0.50
Yalmer, calcareous substratum-----	30	Well suited		Well suited		Moderate Low strength	0.50
Frohling, calcareous substratum-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455266: Grand Sable-----	90	Well suited		Well suited		Moderate Low strength	0.50
1455267: Grand Sable-----	98	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455268: Rhody-----	60	Well suited		Well suited		Severe Low strength	1.00
Towes-----	30	Well suited		Well suited		Severe Low strength	1.00
1455269: Waiska, very stony--	90	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455273: Deerton-----	55	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
Au Train-----	30	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455274: Deerton-----	55	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Au Train-----	30	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455276: Cookson-----	90	Well suited		Well suited		Moderate Low strength	0.50
1455277: Nahma-----	50	Well suited		Well suited		Severe Low strength	1.00
Ruse-----	40	Well suited		Well suited		Severe Low strength	1.00
1455278: Summerville-----	85	Well suited		Well suited		Severe Low strength	1.00
1455281: Carbondale-----	30	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Lupton-----	30	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.50	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.50	Severe Low strength Wetness	1.00 0.50
Tawas-----	30	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
1455282: Dawson-----	30	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Greenwood-----	30	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Loxley-----	30	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.50	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.50	Severe Low strength Wetness	1.00 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455283: Chippeny-----	55	Well suited		Well suited		Severe Low strength	1.00
Nahma-----	30	Well suited		Well suited		Severe Low strength	1.00
1455284: Histosols-----	50	Poorly suited Wetness	0.75	Poorly suited Wetness	0.75	Severe Low strength	1.00
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Wetness	0.50
Aquents-----	50	Not rated		Not rated		Moderate Wetness	0.50
1455285: Pits-----	100	Not rated		Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Gongeau, bedrock terrace-----	25	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Severe Low strength	1.00
Deerton, bedrock terrace-----	20	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455290: Jeske, bedrock terrace-----	45	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Gongeau, bedrock terrace-----	25	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Severe Low strength	1.00
Deerton, bedrock terrace-----	20	Moderately suited Sandiness	0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
1455291: Ruse, bedrock terrace-----	40	Well suited		Well suited		Severe Low strength	1.00
Ensign, bedrock terrace-----	30	Well suited		Well suited		Severe Low strength	1.00
Nykanen, bedrock terrace-----	20	Well suited		Moderately suited Slope	0.50	Severe Low strength	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455292: Ruse, bedrock terrace-----	40	Moderately suited Restrictive layer	0.50	Well suited		Severe Low strength	1.00
Ensign, bedrock terrace-----	30	Well suited		Well suited		Severe Low strength	1.00
Nykanen, bedrock terrace-----	20	Well suited		Unsuited Slope	1.00	Severe Low strength	1.00
1455295: Evert-----	70	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Sturgeon-----	20	Well suited		Well suited		Severe Low strength	1.00
1455296: Deerton, dissected--	40	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Tokiahok, dissected-	30	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
Trout Bay, dissected	15	Moderately suited Wetness	0.50	Poorly suited Slope Wetness	0.75 0.50	Severe Low strength Wetness	1.00 0.50
1455298: Garlic, dissected---	40	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
Blue Lake, dissected	30	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Voelker, dissected--	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455299: Garlic, dissected---	40	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Blue Lake, dissected	30	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
Voelker, dissected--	20	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455300: Garlic, dissected---	40	Moderately suited Sandiness Slope	0.50 0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455300: Blue Lake, dissected	30	Moderately suited Slope	0.50	Unsuited Slope	1.00	Moderate Low strength	0.50
Voelker, dissected--	20	Moderately suited Slope	0.50	Unsuited Slope	1.00	Moderate Low strength	0.50
1455302: Garlic-----	40	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Blue Lake-----	30	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Voelker-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455304: Cathro-----	55	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Ensley-----	35	Well suited		Well suited		Severe Low strength	1.00
1455305: Tawas-----	70	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Deford-----	20	Well suited		Well suited		Severe Low strength	1.00
1455308: Fence, dissected----	90	Well suited		Moderately suited Slope	0.50	Severe Low strength	1.00
1455310: Rousseau-----	50	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Dawson-----	45	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
1455318: Munising, calcareous substratum-----	65	Well suited		Well suited		Moderate Low strength	0.50
Ensley-----	25	Well suited		Well suited		Severe Low strength	1.00
1455319: Munising, dissected, very stony-----	50	Well suited		Moderately suited Rock fragments Slope	0.50 0.50	Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455319: Yalmer, dissected, very stony-----	35	Well suited		Moderately suited Rock fragments Slope	0.50 0.50	Moderate Low strength	0.50
1455320: Munising, stony-----	60	Well suited		Well suited		Moderate Low strength	0.50
Skanee, stony-----	30	Well suited		Well suited		Moderate Low strength	0.50
1455324: Zeba, very stony----	55	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
Jacobsville, very stony-----	30	Well suited		Well suited		Severe Low strength	1.00
1455326: Munising, dissected, stony---	50	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Abbaye, dissected, stony-----	35	Well suited		Moderately suited Slope	0.50	Severe Low strength	1.00
1455327: Paquin-----	55	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Finch-----	45	Unsuited Restrictive layer Sandiness	1.00 0.50	Moderately suited Sandiness Restrictive layer	0.50 0.50	Moderate Low strength	0.50
1455339: Croswell-----	50	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Kinross-----	40	Well suited		Well suited		Moderate Low strength	0.50
1455340: Frohling, dissected, stony---	60	Well suited		Poorly suited Slope Rock fragments	0.75 0.50	Moderate Low strength	0.50
Tokiahok, dissected, stony---	30	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455341: McMaster-----	90	Well suited		Moderately suited Rock fragments	0.50	Severe Low strength	1.00
1455344: Reade-----	85	Well suited		Moderately suited Rock fragments	0.50	Severe Low strength	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455353: Charlevoix-----	55	Well suited		Well suited		Severe Low strength	1.00
Ensley-----	30	Well suited		Well suited		Severe Low strength	1.00
1455359: Munising-----	55	Well suited		Well suited		Moderate Low strength	0.50
Abbaye-----	35	Well suited		Well suited		Severe Low strength	1.00
1455360: Kalkaska-----	60	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Blue Lake-----	30	Well suited		Well suited		Moderate Low strength	0.50
1455361: Kalkaska-----	55	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Blue Lake-----	35	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455362: Kalkaska-----	55	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Blue Lake-----	35	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455363: Jeske-----	40	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Au Train-----	30	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Gongeau-----	20	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Severe Low strength	1.00
1455365: Cusino-----	95	Well suited		Well suited		Moderate Low strength	0.50
1455366: Cusino-----	95	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455367: Kalkaska-----	50	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Cusino-----	45	Well suited		Well suited		Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455368: Kalkaska-----	50	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Cusino-----	45	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455369: Kalkaska-----	50	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Cusino-----	40	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455370: Kalkaska-----	50	Moderately suited Slope Sandiness	0.50 0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
Cusino-----	35	Moderately suited Slope	0.50	Unsuited Slope	1.00	Moderate Low strength	0.50
1455371: Halfaday-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455372: Shelldrake-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455380: Trout Bay-----	30	Moderately suited Wetness	0.50	Poorly suited Slope Wetness	0.75 0.50	Severe Low strength Wetness	1.00 0.50
Gongeau-----	25	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Severe Low strength	1.00
Shingleton-----	20	Moderately suited Slope	0.50	Unsuited Slope	1.00	Moderate Low strength	0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455383: Kalkaska, severely burned-----	95	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455386: Trout Bay-----	40	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455386: Lupton-----	30	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.50	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.50	Severe Low strength Wetness	1.00 0.50
Gongeau-----	20	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Severe Low strength	1.00
1455387: Garlic-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455388: Garlic-----	90	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455389: Garlic-----	90	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
1455390: Escanaba-----	50	Well suited		Well suited		Moderate Low strength	0.50
Greylock-----	40	Well suited		Well suited		Moderate Low strength	0.50
1455391: Escanaba-----	50	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Greylock-----	40	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455392: Escanaba-----	50	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
Greylock-----	40	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455395: Greylock-----	90	Well suited		Well suited		Moderate Low strength	0.50
1455396: Greylock-----	85	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455397: Finch-----	50	Unsuited Restrictive layer Sandiness	1.00 0.50	Moderately suited Sandiness Restrictive layer	0.50 0.50	Moderate Low strength	0.50
Kinross-----	40	Well suited		Well suited		Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455402: Kalkaska, dissected-	55	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
Blue Lake, dissected	35	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455403: Kalkaska, dissected-	55	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Blue Lake, dissected	35	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455404: Kalkaska, dissected-	55	Moderately suited Sandiness Slope	0.50 0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
Blue Lake, dissected	35	Moderately suited Slope	0.50	Unsuited Slope	1.00	Moderate Low strength	0.50
1455408: Spot-----	50	Unsuited Restrictive layer	1.00	Moderately suited Restrictive layer	0.50	Moderate Low strength	0.50
Finch-----	40	Unsuited Restrictive layer Sandiness	1.00 0.50	Moderately suited Sandiness Restrictive layer	0.50 0.50	Moderate Low strength	0.50
1455409: Finch-----	85	Unsuited Restrictive layer Sandiness	1.00 0.50	Moderately suited Sandiness Restrictive layer	0.50 0.50	Moderate Low strength	0.50
1455410: Munising, calcareous substratum, dissected-----	40	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Frohling, calcareous substratum, dissected-----	30	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Cookson, dissected--	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455411: Frohling, calcareous substratum, dissected-----	50	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455411: Garlic, dissected---	20	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Cookson, dissected--	20	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1455412: Munising, calcareous substratum, dissected-----	40	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Yalmer, calcareous substratum, dissected-----	30	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Frohling, calcareous substratum, dissected-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455413: Munising, calcareous substratum-----	50	Well suited		Well suited		Moderate Low strength	0.50
Cookson-----	40	Well suited		Well suited		Moderate Low strength	0.50
1455416: Furlong-----	50	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Shingleton-----	40	Well suited		Well suited		Moderate Low strength	0.50
1455417: Furlong-----	50	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Shingleton-----	40	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1455421: Steuben-----	40	Well suited		Well suited		Moderate Low strength	0.50
Blue Lake-----	30	Well suited		Well suited		Moderate Low strength	0.50
Kalkaska-----	20	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455422: Steuben-----	40	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Blue Lake-----	25	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Kalkaska-----	25	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455425: Greylock-----	50	Well suited		Well suited		Moderate Low strength	0.50
Cookson-----	40	Well suited		Well suited		Moderate Low strength	0.50
1455431: Rubicon, severely burned-----	95	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455432: Rubicon, severely burned-----	95	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455433: Wurtsmith-----	55	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Deford-----	35	Well suited		Well suited		Severe Low strength	1.00
1455434: Shelldrake-----	99	Moderately suited Sandiness Slope	0.50 0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
1455435: Shelldrake-----	61	Moderately suited Sandiness Slope	0.50 0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
Dune land-----	38	Moderately suited Sandiness Slope	0.50 0.50	Unsuited Slope Sandiness	1.00 0.50	Slight	
1455436: Cookson, dissected--	55	Moderately suited Slope	0.50	Unsuited Slope	1.00	Moderate Low strength	0.50
Nykanen, dissected--	35	Well suited		Poorly suited Slope	0.75	Severe Low strength	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455437: Dillingham-----	45	Well suited		Well suited		Moderate Low strength	0.50
Kalkaska-----	40	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1455438: Dillingham-----	52	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Kalkaska-----	45	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1455439: Dillingham-----	50	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
Kalkaska-----	40	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
1671074: Udipsamments-----	50	Moderately suited Sandiness	0.50	Unsuited Slope Sandiness	1.00 0.50	Slight	
Udorthents-----	50	Not rated		Not rated		Not rated	
1671282: Stutts-----	65	Well suited		Well suited		Moderate Low strength	0.50
Kalkaska-----	35	Well suited		Well suited		Moderate Low strength	0.50
1671283: Stutts-----	65	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Kalkaska-----	25	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1671284: Stutts-----	55	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
Kalkaska-----	45	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1693163: Water-----	100	Not rated		Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness	0.50
1455242: Deer Park-----	95	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1455243: Deer Park-----	98	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1455244: Rubicon-----	90	Slight		Slight		Moderately suited Sandiness	0.50
1455245: Rubicon-----	95	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1455246: Rubicon-----	95	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1455247: Kalkaska-----	94	Slight		Slight		Moderately suited Sandiness	0.50
1455248: Kalkaska-----	96	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1455249: Kalkaska-----	100	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1455250: Crowell-----	92	Slight		Slight		Moderately suited Sandiness	0.50
1455251: Paquin-----	90	Slight		Slight		Moderately suited Sandiness	0.50
1455252: Au Gres-----	92	Slight		Slight		Moderately suited Sandiness Wetness	0.50 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455253: Kinross-----	92	Slight		Slight		Poorly suited Ponding Wetness	1.00 1.00
1455254: Deford-----	92	Slight		Slight		Poorly suited Ponding Wetness	1.00 1.00
1455255: Ingalls-----	90	Slight		Slight		Moderately suited Sandiness Wetness	0.50 0.50
1455257: Munising-----	55	Slight		Slight		Moderately suited Wetness	0.50
Yalmer-----	30	Slight		Slight		Moderately suited Wetness	0.50
1455262: Ensley-----	90	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
1455263: Munising, calcareous substratum-----	40	Slight		Slight		Moderately suited Wetness	0.50
Yalmer, calcareous substratum-----	30	Slight		Slight		Moderately suited Wetness	0.50
Frohling, calcareous substratum-----	20	Slight		Moderate Slope/erodibility	0.50	Well suited	
1455266: Grand Sable-----	90	Slight		Slight		Well suited	
1455267: Grand Sable-----	98	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1455268: Rhody-----	60	Slight		Slight		Poorly suited Ponding Wetness Low strength Dusty	1.00 1.00 0.50 0.01
Towes-----	30	Slight		Slight		Moderately suited Low strength Wetness Dusty	0.50 0.50 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455269: Waiska, very stony--	90	Slight		Slight		Well suited	
1455273: Deerton-----	55	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Au Train-----	30	Slight		Slight		Moderately suited Sandiness Wetness	0.50 0.50
1455274: Deerton-----	55	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Au Train-----	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness Wetness	0.50 0.50 0.50
1455276: Cookson-----	90	Slight		Slight		Well suited	
1455277: Nahma-----	50	Slight		Slight		Poorly suited Low strength Ponding Dusty	1.00 1.00 0.01
Ruse-----	40	Slight		Slight		Poorly suited Ponding Wetness Low strength Dusty	1.00 1.00 0.50 0.01
1455278: Summerville-----	85	Slight		Slight		Moderately suited Low strength Dusty	0.50 0.01
1455281: Carbondale-----	30	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
Lupton-----	30	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
Tawas-----	30	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455282: Dawson-----	30	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
						Dusty	0.01
Greenwood-----	30	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
						Dusty	0.01
Loxley-----	30	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
						Dusty	0.01
1455283: Chippeny-----	55	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
						Dusty	0.01
Nahma-----	30	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Dusty	0.01
1455284: Histosols-----	50	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
						Dusty	0.01
Aquents-----	50	Slight		Slight		Not rated	
1455285: Pits-----	100	Not rated		Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Slight		Slight		Poorly suited	
						Wetness	1.00
						Sandiness	0.50
Gongeau, bedrock terrace-----	25	Slight		Slight		Poorly suited	
						Low strength	1.00
						Sandiness	0.50
Deerton, bedrock terrace-----	20	Slight		Moderate Slope/erodibility	0.50	Poorly suited	
						Slope	1.00
						Sandiness	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455290: Jeske, bedrock terrace-----	45	Slight		Slight		Poorly suited Wetness Sandiness	1.00 0.50
Gongeau, bedrock terrace-----	25	Slight		Slight		Poorly suited Low strength Sandiness	1.00 0.50
Deerton, bedrock terrace-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1455291: Ruse, bedrock terrace-----	40	Slight		Slight		Poorly suited Wetness Low strength Dusty	1.00 0.50 0.01
Ensign, bedrock terrace-----	30	Slight		Moderate Slope/erodibility	0.50	Poorly suited Wetness Low strength	1.00 0.50
Nykanen, bedrock terrace-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Moderately suited Slope Low strength Dusty	0.50 0.50 0.01
1455292: Ruse, bedrock terrace-----	40	Slight		Slight		Poorly suited Wetness Low strength Dusty	1.00 0.50 0.01
Ensign, bedrock terrace-----	30	Slight		Moderate Slope/erodibility	0.50	Poorly suited Wetness Low strength	1.00 0.50
Nykanen, bedrock terrace-----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Low strength Dusty	1.00 0.50 0.01
1455295: Evart-----	70	Slight		Slight		Poorly suited Ponding Wetness Low strength Flooding Dusty	1.00 1.00 0.50 0.50 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455295: Sturgeon-----	20	Slight		Slight		Moderately suited	
						Low strength	0.50
						Flooding	0.50
						Wetness	0.50
						Dusty	0.01
1455296: Deerton, dissected--	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Tokiahok, dissected-	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Trout Bay, dissected	15	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Low strength Wetness Slope Dusty	1.00 1.00 1.00 0.01
1455298: Garlic, dissected---	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
Blue Lake, dissected	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Landslides	0.50 0.02
Voelker, dissected--	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455299: Garlic, dissected---	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Blue Lake, dissected	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Landslides	1.00 0.17
Voelker, dissected--	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1455300: Garlic, dissected---	40	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Blue Lake, dissected	30	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Landslides	1.00 0.60
Voelker, dissected--	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455302: Garlic-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Blue Lake-----	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Landslides	0.50 0.05
Voelker-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455304: Cathro-----	55	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
Ensley-----	35	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
1455305: Tawas-----	70	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
Deford-----	20	Slight		Slight		Poorly suited Ponding Wetness	1.00 1.00
1455308: Fence, dissected----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Low strength Slope Landslides Dusty	0.50 0.50 0.02 0.01
1455310: Rousseau-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Dawson-----	45	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
1455318: Munising, calcareous substratum-----	65	Slight		Slight		Moderately suited Wetness	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455318: Ensley-----	25	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
						Dusty	0.01
1455319: Munising, dissected, very stony-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Wetness	0.50
						Slope	0.50
Yalmer, dissected, very stony-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Wetness	0.50
						Slope	0.50
1455320: Munising, stony-----	60	Slight		Slight		Moderately suited	
						Wetness	0.50
Skanee, stony-----	30	Slight		Slight		Well suited	
1455324: Zeba, very stony-----	55	Slight		Slight		Moderately suited	
						Wetness	0.50
Jacobsville, very stony-----	30	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
1455326: Munising, dissected, stony---	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Wetness	0.50
						Slope	0.50
Abbaye, dissected, stony-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Wetness	0.50
						Slope	0.50
1455327: Paquin-----	55	Slight		Slight		Moderately suited	
						Sandiness	0.50
Finch-----	45	Slight		Slight		Moderately suited	
						Sandiness	0.50
						Wetness	0.50
1455339: Croswell-----	50	Slight		Slight		Moderately suited	
						Sandiness	0.50
Kinross-----	40	Slight		Slight		Poorly suited	
						Ponding	1.00
						Wetness	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455340: Frohling, dissected, stony---	60	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Tokiahok, dissected, stony---	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1455341: McMaster-----	90	Slight		Slight		Well suited	
1455344: Reade-----	85	Slight		Slight		Poorly suited Low strength Wetness Dusty	1.00 0.50 0.01
1455353: Charlevoix-----	55	Slight		Slight		Moderately suited Low strength Wetness Dusty	0.50 0.50 0.01
Ensley-----	30	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
1455359: Munising-----	55	Slight		Slight		Moderately suited Wetness	0.50
Abbaye-----	35	Slight		Slight		Moderately suited Wetness	0.50
1455360: Kalkaska-----	60	Slight		Slight		Moderately suited Sandiness	0.50
Blue Lake-----	30	Slight		Slight		Well suited	
1455361: Kalkaska-----	55	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Blue Lake-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Landslides	0.50 0.06
1455362: Kalkaska-----	55	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Blue Lake-----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Landslides	1.00 0.20

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455363: Jeske-----	40	Slight		Slight		Poorly suited Wetness Sandiness	1.00 0.50
Au Train-----	30	Slight		Slight		Moderately suited Sandiness Wetness	0.50 0.50
Gongeau-----	20	Slight		Slight		Poorly suited Low strength Ponding Sandiness	1.00 1.00 0.50
1455365: Cusino-----	95	Slight		Slight		Well suited	
1455366: Cusino-----	95	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455367: Kalkaska-----	50	Slight		Slight		Moderately suited Sandiness	0.50
Cusino-----	45	Slight		Slight		Well suited	
1455368: Kalkaska-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Cusino-----	45	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455369: Kalkaska-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Cusino-----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1455370: Kalkaska-----	50	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Cusino-----	35	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1455371: Halfaday-----	90	Slight		Slight		Moderately suited Sandiness	0.50
1455372: Shelldrake-----	90	Slight		Slight		Moderately suited Sandiness	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455380: Trout Bay-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Low strength Wetness Slope Dusty	1.00 1.00 1.00 0.01
Gongeau-----	25	Slight		Moderate Slope/erodibility	0.50	Poorly suited Low strength Sandiness	1.00 0.50
Shingleton-----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Slight		Slight		Moderately suited Sandiness	0.50
1455383: Kalkaska, severely burned-----	95	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1455386: Trout Bay-----	40	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
Lupton-----	30	Slight		Slight		Poorly suited Low strength Ponding Wetness Dusty	1.00 1.00 1.00 0.01
Gongeau-----	20	Slight		Slight		Poorly suited Low strength Ponding Sandiness	1.00 1.00 0.50
1455387: Garlic-----	90	Slight		Slight		Moderately suited Sandiness	0.50
1455388: Garlic-----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1455389: Garlic-----	90	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455390: Escanaba-----	50	Slight		Slight		Well suited	
Greylock-----	40	Slight		Slight		Well suited	
1455391: Escanaba-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Landslides	0.50 0.06
Greylock-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455392: Escanaba-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Landslides	1.00 0.20
Greylock-----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1455395: Greylock-----	90	Slight		Slight		Well suited	
1455396: Greylock-----	85	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455397: Finch-----	50	Slight		Slight		Moderately suited Sandiness Wetness	0.50 0.50
Kinross-----	40	Slight		Slight		Poorly suited Ponding Wetness	1.00 1.00
1455402: Kalkaska, dissected-	55	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
Blue Lake, dissected	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Landslides	0.50 0.02
1455403: Kalkaska, dissected-	55	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Blue Lake, dissected	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Landslides	1.00 0.17
1455404: Kalkaska, dissected-	55	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Blue Lake, dissected	35	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Landslides	1.00 0.60

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455408: Spot-----	50	Slight		Slight		Poorly suited	
						Ponding	1.00
						Wetness	1.00
Finch-----	40	Slight		Slight		Moderately suited	
						Sandiness	0.50
						Wetness	0.50
1455409: Finch-----	85	Slight		Slight		Moderately suited	
						Sandiness	0.50
						Wetness	0.50
1455410: Munising, calcareous substratum, dissected-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Wetness	0.50
						Slope	0.50
Frohling, calcareous substratum, dissected-----	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Slope	0.50
Cookson, dissected--	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Slope	0.50
1455411: Frohling, calcareous substratum, dissected-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited	
						Slope	1.00
Garlic, dissected---	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited	
						Slope	1.00
						Sandiness	0.50
Cookson, dissected--	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited	
						Slope	1.00
1455412: Munising, calcareous substratum, dissected-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Wetness	0.50
						Slope	0.50
Yalmer, calcareous substratum, dissected-----	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited	
						Wetness	0.50
						Slope	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455412: Frohling, calcareous substratum, dissected-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455413: Munising, calcareous substratum-----	50	Slight		Slight		Moderately suited Wetness	0.50
Cookson-----	40	Slight		Slight		Well suited	
1455416: Furlong-----	50	Slight		Slight		Moderately suited Sandiness	0.50
Shingleton-----	40	Slight		Slight		Well suited	
1455417: Furlong-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Shingleton-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1455421: Steuben-----	40	Slight		Moderate Slope/erodibility	0.50	Well suited	
Blue Lake-----	30	Slight		Slight		Well suited	
Kalkaska-----	20	Slight		Slight		Moderately suited Sandiness	0.50
1455422: Steuben-----	40	Slight		Severe Slope/erodibility	0.95	Moderately suited Slope	0.50
Blue Lake-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Landslides	0.50 0.06
Kalkaska-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1455425: Greylock-----	50	Slight		Slight		Well suited	
Cookson-----	40	Slight		Slight		Well suited	
1455431: Rubicon, severely burned-----	95	Slight		Slight		Moderately suited Sandiness	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455432: Rubicon, severely burned-----	95	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1455433: Wurtsmith-----	55	Slight		Slight		Moderately suited Sandiness	0.50
Deford-----	35	Slight		Slight		Poorly suited Ponding Wetness	1.00 1.00
1455434: Shelldrake-----	99	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1455435: Shelldrake-----	61	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Dune land-----	38	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1455436: Cookson, dissected--	55	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Nykanen, dissected--	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Low strength Dusty	1.00 0.50 0.01
1455437: Dillingham-----	45	Slight		Slight		Well suited	
Kalkaska-----	40	Slight		Slight		Moderately suited Sandiness	0.50
1455438: Dillingham-----	52	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Kalkaska-----	45	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1455439: Dillingham-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Kalkaska-----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1671074: Udipsamments-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Udorthents-----	50	Not rated		Not rated		Not rated	
1671282: Stutts-----	65	Slight		Moderate Slope/erodibility	0.50	Well suited	
Kalkaska-----	35	Slight		Slight		Well suited	
1671283: Stutts-----	65	Slight		Severe Slope/erodibility	0.95	Moderately suited Slope	0.50
Kalkaska-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1671284: Stutts-----	55	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Kalkaska-----	45	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1693163: Water-----	100	Not rated		Not rated		Not rated	

# Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.—Land Management, Part III (Site Preparation)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Well suited		Well suited	
1455242: Deer Park-----	95	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455243: Deer Park-----	98	Unsuited Slope	1.00	Unsuited Slope	1.00
1455244: Rubicon-----	90	Well suited		Well suited	
1455245: Rubicon-----	95	Well suited		Well suited	
1455246: Rubicon-----	95	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455247: Kalkaska-----	94	Well suited		Well suited	
1455248: Kalkaska-----	96	Well suited		Well suited	
1455249: Kalkaska-----	100	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455250: Crowell-----	92	Unsuited Wetness	1.00	Well suited	
1455251: Paquin-----	90	Unsuited Wetness	1.00	Well suited	
1455252: Au Gres-----	92	Unsuited Wetness	1.00	Well suited	
1455253: Kinross-----	92	Unsuited Wetness	1.00	Well suited	
1455254: Deford-----	92	Unsuited Wetness	1.00	Well suited	
1455255: Ingalls-----	90	Unsuited Wetness	1.00	Well suited	

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Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455257: Munising-----	55	Well suited		Well suited	
Yalmer-----	30	Well suited		Well suited	
1455262: Ensley-----	90	Unsuited Wetness	1.00	Well suited	
1455263: Munising, calcareous substratum-----	40	Well suited		Well suited	
Yalmer, calcareous substratum-----	30	Well suited		Well suited	
Frohling, calcareous substratum-----	20	Well suited		Well suited	
1455266: Grand Sable-----	90	Well suited		Well suited	
1455267: Grand Sable-----	98	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455268: Rhody-----	60	Unsuited Wetness	1.00	Well suited	
Towes-----	30	Well suited		Well suited	
1455269: Waiska, very stony--	90	Well suited		Poorly suited Rock fragments	0.50
1455273: Deerton-----	55	Well suited		Well suited	
Au Train-----	30	Poorly suited Restrictive layer	0.50	Well suited	
1455274: Deerton-----	55	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Au Train-----	30	Poorly suited Restrictive layer	0.50	Well suited	
1455276: Cookson-----	90	Poorly suited Restrictive layer	0.50	Well suited	
1455277: Nahma-----	50	Unsuited Wetness Restrictive layer	1.00 1.00	Well suited	
Ruse-----	40	Unsuited Restrictive layer	1.00	Well suited	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455278: Summerville-----	85	Unsuited Restrictive layer	1.00	Well suited	
1455281: Carbondale-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Lupton-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Tawas-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
1455282: Dawson-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Greenwood-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Loxley-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
1455283: Chippeny-----	55	Unsuited Wetness Restrictive layer	1.00 0.50	Well suited	
Nahma-----	30	Unsuited Wetness Restrictive layer	1.00 1.00	Well suited	
1455284: Histosols-----	50	Unsuited Wetness	1.00	Poorly suited Wetness	0.75
Aquents-----	50	Unsuited Wetness	1.00	Poorly suited Wetness	0.75
1455285: Pits-----	100	Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Poorly suited Restrictive layer	0.50	Well suited	
Gongeau, bedrock terrace-----	25	Poorly suited Restrictive layer	0.50	Well suited	
Deerton, bedrock terrace-----	20	Well suited		Well suited	
1455290: Jeske, bedrock terrace-----	45	Poorly suited Restrictive layer	0.50	Well suited	

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Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455290: Gongeau, bedrock terrace-----	25	Poorly suited Restrictive layer	0.50	Well suited	
Deerton, bedrock terrace-----	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455291: Ruse, bedrock terrace-----	40	Unsuited Restrictive layer	1.00	Well suited	
Ensign, bedrock terrace-----	30	Unsuited Restrictive layer	1.00	Well suited	
Nykanen, bedrock terrace-----	20	Poorly suited Restrictive layer	0.50	Well suited	
1455292: Ruse, bedrock terrace-----	40	Unsuited Restrictive layer	1.00	Well suited	
Ensign, bedrock terrace-----	30	Unsuited Restrictive layer	1.00	Well suited	
Nykanen, bedrock terrace-----	20	Poorly suited Restrictive layer Slope	0.50 0.50	Poorly suited Slope	0.50
1455295: Ewart-----	70	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Sturgeon-----	20	Unsuited Wetness	1.00	Well suited	
1455296: Deerton, dissected--	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Tokiahok, dissected-	30	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Trout Bay, dissected	15	Unsuited Wetness Restrictive layer Slope	1.00 0.50 0.50	Poorly suited Wetness Slope	0.50 0.50
1455298: Garlic, dissected---	40	Well suited		Well suited	
Blue Lake, dissected	30	Well suited		Well suited	
Voelker, dissected--	20	Well suited		Well suited	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455299: Garlic, dissected---	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Blue Lake, dissected	30	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Voelker, dissected--	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455300: Garlic, dissected---	40	Unsuited Slope	1.00	Unsuited Slope	1.00
Blue Lake, dissected	30	Unsuited Slope	1.00	Unsuited Slope	1.00
Voelker, dissected--	20	Unsuited Slope	1.00	Unsuited Slope	1.00
1455302: Garlic-----	40	Well suited		Well suited	
Blue Lake-----	30	Well suited		Well suited	
Voelker-----	20	Well suited		Well suited	
1455304: Cathro-----	55	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Ensley-----	35	Unsuited Wetness	1.00	Well suited	
1455305: Tawas-----	70	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Deford-----	20	Unsuited Wetness	1.00	Well suited	
1455308: Fence, dissected---	90	Well suited		Well suited	
1455310: Rousseau-----	50	Well suited		Well suited	
Dawson-----	45	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
1455318: Munising, calcareous substratum-----	65	Well suited		Well suited	
Ensley-----	25	Unsuited Wetness	1.00	Well suited	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455319: Munising, dissected, very stony-----	50	Well suited		Well suited	
Yalmer, dissected, very stony-----	35	Well suited		Well suited	
1455320: Munising, stony----	60	Well suited		Well suited	
Skanee, stony-----	30	Well suited		Well suited	
1455324: Zeba, very stony----	55	Poorly suited Restrictive layer	0.50	Well suited	
Jacobsville, very stony-----	30	Unsuited Wetness Restrictive layer	1.00 0.50	Well suited	
1455326: Munising, dissected, stony---	50	Well suited		Well suited	
Abbaye, dissected, stony-----	35	Poorly suited Restrictive layer	0.50	Well suited	
1455327: Paquin-----	55	Unsuited Wetness	1.00	Well suited	
Finch-----	45	Unsuited Wetness	1.00	Poorly suited Restrictive layer	0.50
1455339: Croswell-----	50	Unsuited Wetness	1.00	Well suited	
Kinross-----	40	Unsuited Wetness	1.00	Well suited	
1455340: Frohling, dissected, stony---	60	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Tokiahok, dissected, stony---	30	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455341: McMaster-----	90	Unsuited Wetness	1.00	Well suited	
1455344: Reade-----	85	Poorly suited Restrictive layer	0.50	Well suited	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455353: Charlevoix-----	55	Unsuited Wetness	1.00	Well suited	
Ensley-----	30	Unsuited Wetness	1.00	Well suited	
1455359: Munising-----	55	Well suited		Well suited	
Abbaye-----	35	Poorly suited Restrictive layer	0.50	Well suited	
1455360: Kalkaska-----	60	Well suited		Well suited	
Blue Lake-----	30	Well suited		Well suited	
1455361: Kalkaska-----	55	Well suited		Well suited	
Blue Lake-----	35	Well suited		Well suited	
1455362: Kalkaska-----	55	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Blue Lake-----	35	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455363: Jeske-----	40	Poorly suited Restrictive layer	0.50	Well suited	
Au Train-----	30	Poorly suited Restrictive layer	0.50	Well suited	
Gongeau-----	20	Poorly suited Restrictive layer	0.50	Well suited	
1455365: Cusino-----	95	Well suited		Well suited	
1455366: Cusino-----	95	Well suited		Well suited	
1455367: Kalkaska-----	50	Well suited		Well suited	
Cusino-----	45	Well suited		Well suited	
1455368: Kalkaska-----	50	Well suited		Well suited	
Cusino-----	45	Well suited		Well suited	
1455369: Kalkaska-----	50	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Cusino-----	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455370: Kalkaska-----	50	Unsuited Slope	1.00	Unsuited Slope	1.00
Cusino-----	35	Unsuited Slope	1.00	Unsuited Slope	1.00
1455371: Halfaday-----	90	Unsuited Wetness	1.00	Well suited	
1455372: Shelldrake-----	90	Well suited		Well suited	
1455380: Trout Bay-----	30	Unsuited Wetness Restrictive layer Slope	1.00 0.50 0.50	Poorly suited Wetness Slope	0.50 0.50
Gongeau-----	25	Poorly suited Restrictive layer	0.50	Well suited	
Shingleton-----	20	Unsuited Slope Restrictive layer	1.00 1.00	Unsuited Slope	1.00
Rock outcrop-----	15	Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Well suited		Well suited	
1455383: Kalkaska, severely burned-----	95	Well suited		Well suited	
1455386: Trout Bay-----	40	Unsuited Wetness Restrictive layer	1.00 0.50	Poorly suited Wetness	0.50
Lupton-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Gongeau-----	20	Poorly suited Restrictive layer	0.50	Well suited	
1455387: Garlic-----	90	Well suited		Well suited	
1455388: Garlic-----	90	Well suited		Well suited	
1455389: Garlic-----	90	Poorly suited Slope	0.50	Poorly suited Slope	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455390: Escanaba-----	50	Well suited		Well suited	
Greylock-----	40	Well suited		Well suited	
1455391: Escanaba-----	50	Well suited		Well suited	
Greylock-----	40	Well suited		Well suited	
1455392: Escanaba-----	50	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Greylock-----	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455395: Greylock-----	90	Well suited		Well suited	
1455396: Greylock-----	85	Well suited		Well suited	
1455397: Finch-----	50	Unsuited Wetness	1.00	Poorly suited Restrictive layer	0.50
Kinross-----	40	Unsuited Wetness	1.00	Well suited	
1455402: Kalkaska, dissected-	55	Well suited		Well suited	
Blue Lake, dissected	35	Well suited		Well suited	
1455403: Kalkaska, dissected-	55	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Blue Lake, dissected	35	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455404: Kalkaska, dissected-	55	Unsuited Slope	1.00	Unsuited Slope	1.00
Blue Lake, dissected	35	Unsuited Slope	1.00	Unsuited Slope	1.00
1455408: Spot-----	50	Unsuited Wetness	1.00	Poorly suited Restrictive layer	0.50
Finch-----	40	Unsuited Wetness	1.00	Poorly suited Restrictive layer	0.50
1455409: Finch-----	85	Unsuited Wetness	1.00	Poorly suited Restrictive layer	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455410: Munising, calcareous substratum, dissected-----	40	Well suited		Well suited	
Frohling, calcareous substratum, dissected-----	30	Well suited		Well suited	
Cookson, dissected--	20	Poorly suited Restrictive layer	0.50	Well suited	
1455411: Frohling, calcareous substratum, dissected-----	50	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Garlic, dissected---	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Cookson, dissected--	20	Poorly suited Restrictive layer Slope	0.50 0.50	Poorly suited Slope	0.50
1455412: Munising, calcareous substratum, dissected-----	40	Well suited		Well suited	
Yalmer, calcareous substratum, dissected-----	30	Well suited		Well suited	
Frohling, calcareous substratum, dissected-----	20	Well suited		Well suited	
1455413: Munising, calcareous substratum-----	50	Well suited		Well suited	
Cookson-----	40	Poorly suited Restrictive layer	0.50	Well suited	
1455416: Furlong-----	50	Poorly suited Restrictive layer	0.50	Well suited	
Shingleton-----	40	Unsuited Restrictive layer	1.00	Well suited	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455417: Furlong-----	50	Poorly suited Restrictive layer	0.50	Well suited	
Shingleton-----	40	Unsuited Restrictive layer	1.00	Well suited	
1455421: Steuben-----	40	Well suited		Well suited	
Blue Lake-----	30	Well suited		Well suited	
Kalkaska-----	20	Well suited		Well suited	
1455422: Steuben-----	40	Well suited		Well suited	
Blue Lake-----	25	Well suited		Well suited	
Kalkaska-----	25	Well suited		Well suited	
1455425: Greylock-----	50	Well suited		Well suited	
Cookson-----	40	Poorly suited Restrictive layer	0.50	Well suited	
1455431: Rubicon, severely burned-----	95	Well suited		Well suited	
1455432: Rubicon, severely burned-----	95	Well suited		Well suited	
1455433: Wurtsmith-----	55	Unsuited Wetness	1.00	Well suited	
Deford-----	35	Unsuited Wetness	1.00	Well suited	
1455434: Shelldrake-----	99	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455435: Shelldrake-----	61	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Dune land-----	38	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1455436: Cookson, dissected--	55	Poorly suited Slope Restrictive layer	0.50 0.50	Poorly suited Slope	0.50
Nykanen, dissected--	35	Poorly suited Slope Restrictive layer	0.50 0.50	Poorly suited Slope	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part III (Site Preparation)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455437: Dillingham-----	45	Well suited		Well suited	
Kalkaska-----	40	Well suited		Well suited	
1455438: Dillingham-----	52	Well suited		Well suited	
Kalkaska-----	45	Well suited		Well suited	
1455439: Dillingham-----	50	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Kalkaska-----	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1671074: Udipsamments-----	50	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Udorthents-----	50	Not rated		Not rated	
1671282: Stutts-----	65	Well suited		Well suited	
Kalkaska-----	35	Well suited		Well suited	
1671283: Stutts-----	65	Well suited		Well suited	
Kalkaska-----	25	Well suited		Well suited	
1671284: Stutts-----	55	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Kalkaska-----	45	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1693163: Water-----	100	Not rated		Not rated	

# Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455242: Deer Park-----	95	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455243: Deer Park-----	98	Low		Low	
1455244: Rubicon-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455245: Rubicon-----	95	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455246: Rubicon-----	95	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455247: Kalkaska-----	94	Low		Low	
1455248: Kalkaska-----	96	Low		Low	
1455249: Kalkaska-----	100	Low		Low	
1455250: Crowell-----	92	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455251: Paquin-----	90	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Low	
1455252: Au Gres-----	92	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness Soil reaction	1.00 0.50
1455253: Kinross-----	92	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness Soil reaction	1.00 0.50
1455254: Deford-----	92	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00
1455255: Ingalls-----	90	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness Soil reaction	1.00 1.00
1455257: Munising-----	55	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00
Yalmer-----	30	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness Soil reaction	1.00 0.50
1455262: Ensley-----	90	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455263: Munising, calcareous substratum-----	40	Moderate		High	
		Texture/rock fragments	0.50	Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
Yalmer, calcareous substratum-----	30	Moderate		High	
		Texture/rock fragments	0.50	Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
Frohling, calcareous substratum-----	20	Moderate		Low	
		Texture/rock fragments	0.50		
		Texture/rock fragments	0.10		
1455266: Grand Sable-----	90	Moderate		Low	
		Texture/rock fragments	0.50		
		Texture/rock fragments	0.10		
1455267: Grand Sable-----	98	Moderate		Low	
		Texture/rock fragments	0.50		
		Texture/rock fragments	0.10		
1455268: Rhody-----	60	Low		High	
				Wetness	1.00
Towes-----	30	Low		High	
				Wetness	1.00
1455269: Waiska, very stony--	90	Moderate		Low	
		Texture/rock fragments	0.50		
		Texture/rock fragments	0.10		
1455273: Deerton-----	55	Moderate		Moderate	
		Texture/rock fragments	0.50	Soil reaction	0.50
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455273: Au Train-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
1455274: Deerton-----	55	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
Au Train-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
1455276: Cookson-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455277: Nahma-----	50	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Carbonate content	0.50
Ruse-----	40	Low		High Wetness	1.00
1455278: Summerville-----	85	Low		Low	
1455281: Carbondale-----	30	Low		High Wetness	1.00
Lupton-----	30	Low		High Wetness	1.00
Tawas-----	30	Low		High Wetness	1.00
1455282: Dawson-----	30	Low		High Wetness	1.00
				Soil reaction	0.50
Greenwood-----	30	Low		High Wetness	1.00
				Soil reaction	0.50
Loxley-----	30	Low		High Wetness	1.00
				Soil reaction	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455283: Chippeny-----	55	Low		High Wetness	1.00
Nahma-----	30	Moderate Texture/rock fragments	0.50	High Wetness Carbonate content	1.00 0.50
		Texture/rock fragments	0.10		
1455284: Histosols-----	50	Low		Not rated	
Aquents-----	50	Not rated		Not rated	
1455285: Pits-----	100	Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Gongeau, bedrock terrace-----	25	Moderate Texture/rock fragments	0.50	High Wetness Soil reaction	1.00 0.50
		Texture/rock fragments	0.10		
Deerton, bedrock terrace-----	20	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
1455290: Jeske, bedrock terrace-----	45	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Gongeau, bedrock terrace-----	25	Moderate Texture/rock fragments	0.50	High Wetness Soil reaction	1.00 0.50
		Texture/rock fragments	0.10		
Deerton, bedrock terrace-----	20	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		

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Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455291: Ruse, bedrock terrace-----	40	Low		High Wetness	1.00
Ensign, bedrock terrace-----	30	Low		High Wetness	1.00
Nykanen, bedrock terrace-----	20	Low		High Wetness	1.00
1455292: Ruse, bedrock terrace-----	40	Low		High Wetness	1.00
Ensign, bedrock terrace-----	30	Low		High Wetness	1.00
Nykanen, bedrock terrace-----	20	Low		High Wetness	1.00
1455295: Ewart-----	70	Low		High Wetness	1.00
Sturgeon-----	20	Low		High Wetness	1.00
1455296: Deerton, dissected--	40	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
Tokiahok, dissected-	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Trout Bay, dissected	15	Low		High Wetness	1.00
1455298: Garlic, dissected---	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Blue Lake, dissected	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455298: Voelker, dissected--	20	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455299: Garlic, dissected---	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Blue Lake, dissected	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Voelker, dissected--	20	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455300: Garlic, dissected---	40	Low		Low	
Blue Lake, dissected	30	Low		Low	
Voelker, dissected--	20	Low		Low	
1455302: Garlic-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Blue Lake-----	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Voelker-----	20	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455304: Cathro-----	55	Low		High Wetness	1.00
Ensley-----	35	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		

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Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455305: Tawas-----	70	Low		High Wetness	1.00
Deford-----	20	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00
1455308: Fence, dissected----	90	Low		Low	
1455310: Rousseau-----	50	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Low	
Dawson-----	45	Low		High Wetness Soil reaction	1.00 0.50
1455318: Munising, calcareous substratum-----	65	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness Soil reaction	1.00 0.50
Ensley-----	25	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00
1455319: Munising, dissected, very stony-----	50	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00
Yalmer, dissected, very stony-----	35	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness Soil reaction	1.00 0.50
1455320: Munising, stony-----	60	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455320: Skanee, stony-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455324: Zeba, very stony----	55	Low		High Wetness	1.00
Jacobsville, very stony-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455326: Munising, dissected, stony---	50	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Abbaye, dissected, stony-----	35	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455327: Paquin-----	55	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Finch-----	45	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455339: Croswell-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Kinross-----	40	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455340: Frohling, dissected, stony---	60	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Tokiahok, dissected, stony---	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455341: McMaster-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455344: Reade-----	85	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
1455353: Charlevoix-----	55	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Ensley-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455359: Munising-----	55	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Abbaye-----	35	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455360: Kalkaska-----	60	Low		Low	
Blue Lake-----	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455361: Kalkaska-----	55	Low		Low	
Blue Lake-----	35	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455362: Kalkaska-----	55	Low		Low	
Blue Lake-----	35	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455363: Jeske-----	40	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Au Train-----	30	Moderate Texture/rock fragments	0.50	High Wetness Soil reaction	1.00 0.50
		Texture/rock fragments	0.10		
Gongeau-----	20	Moderate Texture/rock fragments	0.50	High Wetness Soil reaction	1.00 0.50
		Texture/rock fragments	0.10		
1455365: Cusino-----	95	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
1455366: Cusino-----	95	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
1455367: Kalkaska-----	50	Low		Low	
Cusino-----	45	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455368: Kalkaska-----	50	Low		Low	
Cusino-----	45	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
1455369: Kalkaska-----	50	Low		Low	
Cusino-----	40	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
1455370: Kalkaska-----	50	High Texture/slope/ surface layer thickness	1.00	Low	
Cusino-----	35	Low		Moderate Soil reaction	0.50
1455371: Halfaday-----	90	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
1455372: Shelldrake-----	90	Moderate Texture/rock fragments	0.50	Moderate Soil reaction	0.50
		Texture/rock fragments	0.10		
1455380: Trout Bay-----	30	Low		High Wetness	1.00
Gongeau-----	25	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
Shingleton-----	20	High Texture/slope/ surface layer thickness	1.00	Low	
Rock outcrop-----	15	Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Low		Low	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455383: Kalkaska, severely burned-----	95	Low		Low	
1455386: Trout Bay-----	40	Low		High Wetness	1.00
Lupton-----	30	Low		High Wetness	1.00
Gongeau-----	20	Moderate Texture/rock fragments	0.50	High Wetness Soil reaction	1.00 0.50
		Texture/rock fragments	0.10		
1455387: Garlic-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455388: Garlic-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455389: Garlic-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455390: Escanaba-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Greylock-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455391: Escanaba-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Greylock-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455392: Escanaba-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Greylock-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455395: Greylock-----	90	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455396: Greylock-----	85	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455397: Finch-----	50	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Kinross-----	40	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
1455402: Kalkaska, dissected-	55	Low		Low	
Blue Lake, dissected	35	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455403: Kalkaska, dissected-	55	Low		Low	
Blue Lake, dissected	35	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455404: Kalkaska, dissected-	55	High Texture/slope/ surface layer thickness	1.00	Low	
Blue Lake, dissected	35	Low		Low	
1455408: Spot-----	50	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
Finch-----	40	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455409: Finch-----	85	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10		
1455410: Munising, calcareous substratum, dissected-----	40	Moderate Texture/rock fragments	0.50	High Wetness Soil reaction	1.00 0.50
		Texture/rock fragments	0.10		
Frohling, calcareous substratum, dissected-----	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Cookson, dissected--	20	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455411: Frohling, calcareous substratum, dissected-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455411: Garlic, dissected---	20	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Cookson, dissected--	20	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455412: Munising, calcareous substratum, dissected-----	40	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
Yalmer, calcareous substratum, dissected-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
Frohling, calcareous substratum, dissected-----	20	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455413: Munising, calcareous substratum-----	50	Moderate Texture/rock fragments	0.50	High Wetness	1.00
		Texture/rock fragments	0.10	Soil reaction	0.50
Cookson-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455416: Furlong-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Shingleton-----	40	Low		Low	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455417: Furlong-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Shingleton-----	40	Low		Low	
1455421: Steuben-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Blue Lake-----	30	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Kalkaska-----	20	Low		Low	
1455422: Steuben-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Blue Lake-----	25	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Kalkaska-----	25	Low		Low	
1455425: Greylock-----	50	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
Cookson-----	40	Moderate Texture/rock fragments	0.50	Low	
		Texture/rock fragments	0.10		
1455431: Rubicon, severely burned-----	95	High Texture/surface layer thickness/rock fragments	1.00	Low	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455432: Rubicon, severely burned-----	95	High Texture/surface layer thickness/rock fragments	1.00	Low	
1455433: Wurtsmith-----	55	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Moderate Soil reaction	0.50
Deford-----	35	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	High Wetness	1.00
1455434: Shelldrake-----	99	Low		Moderate Soil reaction	0.50
1455435: Shelldrake-----	61	Low		Moderate Soil reaction	0.50
Dune land-----	38	Not rated		Not rated	
1455436: Cookson, dissected--	55	Low		Low	
Nykanen, dissected--	35	Low		High Wetness	1.00
1455437: Dillingham-----	45	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Moderate Soil reaction	0.50
Kalkaska-----	40	Low		Low	
1455438: Dillingham-----	52	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Moderate Soil reaction	0.50
Kalkaska-----	45	Low		Low	
1455439: Dillingham-----	50	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Moderate Soil reaction	0.50
Kalkaska-----	40	Low		Low	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1671074: Udipsamments-----	50	High Texture/rock fragments	1.00	Not rated	
Udorthents-----	50	Not rated		Not rated	
1671282: Stutts-----	65	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Low	
Kalkaska-----	35	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Moderate Soil reaction	0.50
1671283: Stutts-----	65	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Low	
Kalkaska-----	25	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Moderate Soil reaction	0.50
1671284: Stutts-----	55	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Low	
Kalkaska-----	45	Moderate Texture/rock fragments Texture/rock fragments	0.50 0.10	Moderate Soil reaction	0.50
1693163: Water-----	100	Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.-Recreation, Part I (Camp and Picnic Areas)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table. Most components that are not rated had missing data at the time the report was generated)

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455242: Deer Park-----	95	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1455243: Deer Park-----	98	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1455244: Rubicon-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455245: Rubicon-----	95	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
1455246: Rubicon-----	95	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1455247: Kalkaska-----	94	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455248: Kalkaska-----	96	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
1455249: Kalkaska-----	100	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1455250: Crowell-----	92	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
1455251: Paquin-----	90	Very limited Depth to cemented pan Too sandy Depth to saturated zone	1.00 1.00 0.39	Very limited Too sandy Depth to cemented pan Depth to saturated zone	1.00 1.00 0.19

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455252: Au Gres-----	92	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy Depth to saturated zone	1.00 1.00
1455253: Kinross-----	92	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 1.00	Very limited Too sandy Ponding Depth to saturated zone	1.00 1.00 1.00
1455254: Deford-----	92	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 1.00	Very limited Too sandy Ponding Depth to saturated zone	1.00 1.00 1.00
1455255: Ingalls-----	90	Very limited Depth to saturated zone Too sandy Slow water movement	1.00 1.00 0.35	Very limited Too sandy Depth to saturated zone Slow water movement	1.00 1.00 0.35
1455257: Munising-----	55	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.99	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.99
Yalmer-----	30	Very limited Depth to saturated zone Too sandy Depth to cemented pan	1.00 1.00 0.90	Very limited Too sandy Depth to saturated zone Depth to cemented pan	1.00 1.00 0.90
1455262: Ensley-----	90	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
1455263: Munising, calcareous substratum-----	40	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.95	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.95

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455263: Yalmer, calcareous substratum-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to cemented pan	0.65	Depth to cemented pan	0.65
		Too sandy	0.50	Too sandy	0.50
Frohling, calcareous substratum-----	20	Somewhat limited Depth to cemented pan	0.90	Somewhat limited Depth to cemented pan	0.90
1455266: Grand Sable-----	90	Somewhat limited Too sandy	0.60	Somewhat limited Too sandy	0.60
1455267: Grand Sable-----	98	Very limited Slope Too sandy	1.00 0.60	Very limited Slope Too sandy	1.00 0.60
1455268: Rhody-----	60	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
Towes-----	30	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
1455269: Waiska, very stony--	90	Somewhat limited Too sandy Large stones content	0.66 0.47	Somewhat limited Too sandy Large stones content	0.66 0.47
1455273: Deerton-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Au Train-----	30	Very limited Depth to saturated zone Too sandy Depth to bedrock	1.00 1.00 1.00	Very limited Too sandy Depth to saturated zone Depth to bedrock	1.00 1.00 1.00
1455274: Deerton-----	55	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Au Train-----	30	Very limited Depth to saturated zone Too sandy Depth to bedrock Slope	1.00 1.00 1.00 0.63	Very limited Too sandy Depth to saturated zone Depth to bedrock Slope	1.00 1.00 1.00 0.63

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455276: Cookson-----	90	Not limited		Not limited	
1455277: Nahma-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Dusty	0.01	Dusty	0.01
Ruse-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.01	Dusty	0.01
1455278: Summerville-----	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.01	Dusty	0.01
1455281: Carbondale-----	30	Not rated		Not rated	
Lupton-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Dusty	0.01	Dusty	0.01
Tawas-----	30	Not rated		Not rated	
1455282: Dawson-----	30	Not rated		Not rated	
Greenwood-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01
Loxley-----	30	Not rated		Not rated	
1455283: Chippeny-----	55	Not rated		Not rated	
Nahma-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Dusty	0.01	Dusty	0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455284: Histosols-----	50	Not rated		Not rated	
Aquents-----	50	Not rated		Not rated	
1455285: Pits-----	100	Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy Depth to saturated zone	1.00 1.00
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone Depth to bedrock Too sandy	1.00 1.00 0.42	Very limited Depth to saturated zone Depth to bedrock Too sandy	1.00 1.00 0.42
Deerton, bedrock terrace-----	20	Very limited Too sandy Slope	1.00 0.84	Very limited Too sandy Slope	1.00 0.84
1455290: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy Depth to saturated zone	1.00 1.00
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone Depth to bedrock Too sandy	1.00 1.00 0.42	Very limited Depth to saturated zone Depth to bedrock Too sandy	1.00 1.00 0.42
Deerton, bedrock terrace-----	20	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1455291: Ruse, bedrock terrace-----	40	Very limited Depth to saturated zone Depth to bedrock Slow water movement Dusty	1.00 1.00 0.61 0.01	Very limited Depth to saturated zone Depth to bedrock Slow water movement Dusty	1.00 1.00 0.61 0.01
Ensign, bedrock terrace-----	30	Very limited Depth to saturated zone Depth to bedrock	1.00 1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455291: Nykanen, bedrock terrace-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63
		Dusty	0.01	Dusty	0.01
1455292: Ruse, bedrock terrace-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.01	Dusty	0.01
Ensign, bedrock terrace-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
Nykanen, bedrock terrace-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.01	Dusty	0.01
1455295: Evert-----	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Flooding	0.40
		Dusty	0.01	Dusty	0.01
Sturgeon-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.40
		Dusty	0.01	Dusty	0.01
1455296: Deerton, dissected--	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	1.00
Tokiahok, dissected-	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to cemented pan	0.90	Depth to cemented pan	0.90
		Too sandy	0.37	Too sandy	0.37
Trout Bay, dissected	15	Not rated		Not rated	

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Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455298:					
Garlic, dissected---	40	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Blue Lake, dissected	30	Not rated		Not rated	
Voelker, dissected--	20	Very limited Depth to cemented pan Too sandy	1.00 1.00	Very limited Too sandy Depth to cemented pan	1.00 1.00
1455299:					
Garlic, dissected---	40	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Blue Lake, dissected	30	Not rated		Not rated	
Voelker, dissected--	20	Very limited Depth to cemented pan Too sandy Slope	1.00 1.00 1.00	Very limited Too sandy Depth to cemented pan Slope	1.00 1.00 1.00
1455300:					
Garlic, dissected---	40	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Blue Lake, dissected	30	Not rated		Not rated	
Voelker, dissected--	20	Very limited Slope Depth to cemented pan Too sandy	1.00 1.00 1.00	Very limited Too sandy Slope Depth to cemented pan	1.00 1.00 1.00
1455302:					
Garlic-----	40	Very limited Too sandy Slope	1.00 0.16	Very limited Too sandy Slope	1.00 0.16
Blue Lake-----	30	Not rated		Not rated	
Voelker-----	20	Very limited Depth to cemented pan Too sandy Slope	1.00 1.00 0.16	Very limited Too sandy Depth to cemented pan Slope	1.00 1.00 0.16
1455304:					
Cathro-----	55	Not rated		Not rated	
Ensley-----	35	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455305: Tawas-----	70	Not rated		Not rated	
Deford-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00
		Ponding	1.00	Ponding	1.00
		Too sandy	1.00	Depth to saturated zone	1.00
1455308: Fence, dissected----	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75
		Slow water movement	0.61	Slow water movement	0.61
		Dusty	0.01	Dusty	0.01
1455310: Rousseau-----	50	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.37	Slope	0.37
Dawson-----	45	Not rated		Not rated	
1455318: Munising, calcareous substratum-----	65	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99
Ensley-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Dusty	0.01	Dusty	0.01
1455319: Munising, dissected, very stony-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99
		Large stones content	0.47	Large stones content	0.47
Yalmer, dissected, very stony-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.90	Depth to cemented pan	0.90
		Too sandy	0.50	Too sandy	0.50
		Large stones content	0.47	Large stones content	0.47

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455320: Munising, stony-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99
Skaneec, stony-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
1455324: Zeba, very stony----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Large stones content	0.47	Large stones content	0.47
Jacobsville, very stony-----	30	Very limited Depth to saturated zone	1.00	Very limited Ponding Depth to saturated zone	1.00
		Ponding	1.00		
1455326: Munising, dissected, stony---	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99
Abbaye, dissected, stony-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455327: Paquin-----	55	Very limited Depth to cemented pan	1.00	Very limited Too sandy Depth to cemented pan	1.00
		Too sandy Depth to saturated zone	1.00	Depth to saturated zone	1.00
			0.39		0.19
Finch-----	45	Very limited Depth to saturated zone	1.00	Very limited Too sandy Depth to saturated zone	1.00
		Depth to cemented pan	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Depth to cemented pan	1.00
1455339: Crosswell-----	50	Very limited Too sandy Depth to saturated zone	1.00	Very limited Too sandy Depth to saturated zone	1.00
			0.39		0.19

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455339: Kinross-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00
		Ponding	1.00	Ponding	1.00
		Too sandy	1.00	Depth to saturated zone	1.00
1455340: Frohling, dissected, stony---	60	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00
Tokiahok, dissected, stony---	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to cemented pan	0.90	Depth to cemented pan	0.90
		Too sandy	0.37	Too sandy	0.37
1455341: McMaster-----	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	0.19
		Too sandy	0.01	Too sandy	0.01
1455344: Reade-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Dusty	0.01	Dusty	0.01
1455353: Charlevoix-----	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.15	Slow water movement	0.15
		Dusty	0.01	Dusty	0.01
Ensley-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Dusty	0.01	Dusty	0.01
1455359: Munising-----	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99
Abbaye-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
1455360: Kalkaska-----	60	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Blue Lake-----	30	Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455361: Kalkaska-----	55	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
Blue Lake-----	35	Not rated		Not rated	
1455362: Kalkaska-----	55	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Blue Lake-----	35	Not rated		Not rated	
1455363: Jeske-----	40	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy Depth to saturated zone	1.00 1.00
Au Train-----	30	Very limited Depth to saturated zone Too sandy Depth to bedrock	1.00 1.00 1.00 1.00	Very limited Too sandy Depth to saturated zone Depth to bedrock	1.00 1.00 1.00 1.00
Gongeau-----	20	Very limited Depth to saturated zone Ponding Depth to bedrock Too sandy	1.00 1.00 1.00 1.00 0.42	Very limited Ponding Depth to saturated zone Depth to bedrock Too sandy	1.00 1.00 1.00 1.00 0.42
1455365: Cusino-----	95	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42
1455366: Cusino-----	95	Somewhat limited Too sandy Slope	0.42 0.37	Somewhat limited Too sandy Slope	0.42 0.37
1455367: Kalkaska-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Cusino-----	45	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42
1455368: Kalkaska-----	50	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
Cusino-----	45	Somewhat limited Too sandy Slope	0.42 0.37	Somewhat limited Too sandy Slope	0.42 0.37

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Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455369: Kalkaska-----	50	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Cusino-----	40	Very limited Slope Too sandy	1.00 0.42	Very limited Slope Too sandy	1.00 0.42
1455370: Kalkaska-----	50	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Cusino-----	35	Very limited Slope Too sandy	1.00 0.42	Very limited Slope Too sandy	1.00 0.42
1455371: Halfaday-----	90	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
1455372: Shelldrake-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455380: Trout Bay-----	30	Not rated		Not rated	
Gongeau-----	25	Very limited Depth to saturated zone Depth to bedrock Too sandy	1.00 1.00 0.42	Very limited Depth to saturated zone Depth to bedrock Too sandy	1.00 1.00 0.42
Shingleton-----	20	Very limited Slope Slow water movement Depth to bedrock Too sandy	1.00 1.00 1.00 0.36	Very limited Slope Slow water movement Depth to bedrock Too sandy	1.00 1.00 1.00 0.36
Rock outcrop-----	15	Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455383: Kalkaska, severely burned-----	95	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
1455386: Trout Bay-----	40	Not rated		Not rated	
Lupto-----	30	Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455386: Gongeau-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.42	Too sandy	0.42
1455387: Garlic-----	90	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
1455388: Garlic-----	90	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.37	Slope	0.37
1455389: Garlic-----	90	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
1455390: Escanaba-----	50	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Greylock-----	40	Not limited		Not limited	
1455391: Escanaba-----	50	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.37	Slope	0.37
Greylock-----	40	Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37
1455392: Escanaba-----	50	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
Greylock-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
1455395: Greylock-----	90	Not limited		Not limited	
1455396: Greylock-----	85	Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37
1455397: Finch-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00
		Depth to cemented pan	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Depth to cemented pan	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455397: Kinross-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00
		Ponding	1.00	Ponding	1.00
		Too sandy	1.00	Depth to saturated zone	1.00
1455402: Kalkaska, dissected-	55	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Blue Lake, dissected	35	Not rated		Not rated	
1455403: Kalkaska, dissected-	55	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	1.00
Blue Lake, dissected	35	Not rated		Not rated	
1455404: Kalkaska, dissected-	55	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
Blue Lake, dissected	35	Not rated		Not rated	
1455408: Spot-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00
		Ponding	1.00	Ponding	1.00
		Depth to cemented pan	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Depth to cemented pan	1.00
Finch-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00
		Depth to cemented pan	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Depth to cemented pan	1.00
1455409: Finch-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00
		Depth to cemented pan	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Depth to cemented pan	1.00
1455410: Munising, calcareous substratum, dissected-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99

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Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455410: Frohling, calcareous substratum, dissected-----	30	Somewhat limited Depth to cemented pan	0.90	Somewhat limited Depth to cemented pan	0.90
Cookson, dissected--	20	Not limited		Not limited	
1455411: Frohling, calcareous substratum, dissected-----	50	Very limited Slope Depth to cemented pan	1.00 0.90	Very limited Slope Depth to cemented pan	1.00 0.90
Garlic, dissected---	20	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Cookson, dissected--	20	Very limited Slope	1.00	Very limited Slope	1.00
1455412: Munising, calcareous substratum, dissected-----	40	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.99	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.99
Yalmer, calcareous substratum, dissected-----	30	Very limited Depth to saturated zone Depth to cemented pan Too sandy	1.00 0.65 0.50	Very limited Depth to saturated zone Depth to cemented pan Too sandy	1.00 0.65 0.50
Frohling, calcareous substratum, dissected-----	20	Somewhat limited Depth to cemented pan	0.90	Somewhat limited Depth to cemented pan	0.90
1455413: Munising, calcareous substratum-----	50	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.95	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.95
Cookson-----	40	Not limited		Not limited	

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Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455416: Furlong-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Shingleton-----	40	Very limited Slow water movement Depth to bedrock Too sandy	1.00 1.00 0.36	Very limited Slow water movement Depth to bedrock Too sandy	1.00 1.00 0.36
1455417: Furlong-----	50	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
Shingleton-----	40	Very limited Slow water movement Depth to bedrock Slope Too sandy	1.00 1.00 0.37 0.36	Very limited Slow water movement Depth to bedrock Slope Too sandy	1.00 1.00 0.37 0.36
1455421: Steuben-----	40	Somewhat limited Depth to cemented pan	0.99	Somewhat limited Depth to cemented pan	0.99
Blue Lake-----	30	Not rated		Not rated	
Kalkaska-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455422: Steuben-----	40	Somewhat limited Depth to cemented pan Slope	0.99 0.37	Somewhat limited Depth to cemented pan Slope	0.99 0.37
Blue Lake-----	25	Not rated		Not rated	
Kalkaska-----	25	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
1455425: Greylock-----	50	Not limited		Not limited	
Cookson-----	40	Not limited		Not limited	
1455431: Rubicon, severely burned-----	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455432: Rubicon, severely burned-----	95	Very limited Too sandy Slope	1.00 0.26	Very limited Too sandy Slope	1.00 0.26

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Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455433: Wurtsmith-----	55	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
Deford-----	35	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 1.00	Very limited Too sandy Ponding Depth to saturated zone	1.00 1.00 1.00
1455434: Shelldrake-----	99	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1455435: Shelldrake-----	61	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Dune land-----	38	Not rated		Not rated	
1455436: Cookson, dissected--	55	Very limited Slope	1.00	Very limited Slope	1.00
Nykanen, dissected--	35	Very limited Depth to saturated zone Slope Depth to bedrock Dusty	1.00 1.00 1.00 0.01	Very limited Slope Depth to saturated zone Depth to bedrock Dusty	1.00 1.00 1.00 0.01
1455437: Dillingham-----	45	Somewhat limited Depth to cemented pan Too sandy	0.99 0.76	Somewhat limited Depth to cemented pan Too sandy	0.99 0.76
Kalkaska-----	40	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455438: Dillingham-----	52	Somewhat limited Depth to cemented pan Too sandy Slope	0.99 0.76 0.37	Somewhat limited Depth to cemented pan Too sandy Slope	0.99 0.76 0.37
Kalkaska-----	45	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
1455439: Dillingham-----	50	Very limited Slope Depth to cemented pan Too sandy	1.00 0.99 0.76	Very limited Slope Depth to cemented pan Too sandy	1.00 0.99 0.76

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Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455439: Kalkaska-----	40	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1671074: Udipsamments-----	50	Not rated		Not rated	
Udorthents-----	50	Not rated		Not rated	
1671282: Stutts-----	65	Not limited		Not limited	
Kalkaska-----	35	Somewhat limited Too sandy	0.89	Somewhat limited Too sandy	0.89
1671283: Stutts-----	65	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37
Kalkaska-----	25	Somewhat limited Too sandy Slope	0.89 0.37	Somewhat limited Too sandy Slope	0.89 0.37
1671284: Stutts-----	55	Very limited Slope	1.00	Very limited Slope	1.00
Kalkaska-----	45	Very limited Slope Too sandy	1.00 0.89	Very limited Slope Too sandy	1.00 0.89
1693163: Water-----	100	Not rated		Not rated	

# Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.-Recreation, Part II (Trail Management)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table. Most components that are not rated had missing data at the time the report was generated)

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455242: Deer Park-----	95	Very limited Too sandy Slope	1.00 0.08	Very limited Too sandy	1.00
1455243: Deer Park-----	98	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
1455244: Rubicon-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455245: Rubicon-----	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455246: Rubicon-----	95	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy	1.00
1455247: Kalkaska-----	94	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455248: Kalkaska-----	96	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455249: Kalkaska-----	100	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy	1.00
1455250: Crowell-----	92	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455251: Paquin-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455252: Au Gres-----	92	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455253: Kinross-----	92	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
1455254: Deford-----	92	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
1455255: Ingalls-----	90	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
1455257: Munising-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Yalmer-----	30	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
1455262: Ensley-----	90	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1455263: Munising, calcareous substratum-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Yalmer, calcareous substratum-----	30	Very limited Depth to saturated zone Too sandy	1.00 0.50	Very limited Depth to saturated zone Too sandy	1.00 0.50
Frohling, calcareous substratum-----	20	Not limited		Not limited	
1455266: Grand Sable-----	90	Somewhat limited Too sandy	0.60	Somewhat limited Too sandy	0.60
1455267: Grand Sable-----	98	Very limited Slope Too sandy	1.00 0.60	Somewhat limited Too sandy	0.60

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455268: Rhody-----	60	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
Towes-----	30	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
1455269: Waiska, very stony--	90	Somewhat limited Too sandy Large stones content	0.66 0.47	Somewhat limited Too sandy Large stones content	0.66 0.47
1455273: Deerton-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Au Train-----	30	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
1455274: Deerton-----	55	Very limited Too sandy Slope	1.00 0.50	Very limited Too sandy	1.00
Au Train-----	30	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
1455276: Cookson-----	90	Not limited		Not limited	
1455277: Nahma-----	50	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
Ruse-----	40	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1455278: Summerville-----	85	Somewhat limited Dusty	0.01	Somewhat limited Dusty	0.01

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455281: Carbondale-----	30	Not rated		Not rated	
Lupton-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00
		Dusty	0.01	Dusty	0.01
Tawas-----	30	Not rated		Not rated	
1455282: Dawson-----	30	Not rated		Not rated	
Greenwood-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Ponding	1.00	Ponding	1.00
		Dusty	0.01	Dusty	0.01
Loxley-----	30	Not rated		Not rated	
1455283: Chippeny-----	55	Not rated		Not rated	
Nahma-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Ponding	1.00	Ponding	1.00
		Dusty	0.01	Dusty	0.01
1455284: Histosols-----	50	Not rated		Not rated	
Aquents-----	50	Not rated		Not rated	
1455285: Pits-----	100	Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Too sandy	1.00	Too sandy	1.00
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Too sandy	0.42	Too sandy	0.42
Deerton, bedrock terrace-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455290: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone Too sandy	1.00 0.42	Very limited Depth to saturated zone Too sandy	1.00 0.42
Deerton, bedrock terrace-----	20	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.01
1455291: Ruse, bedrock terrace-----	40	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
Ensign, bedrock terrace-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Nykanen, bedrock terrace-----	20	Very limited Depth to saturated zone Water erosion Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Water erosion Dusty	1.00 1.00 0.01
1455292: Ruse, bedrock terrace-----	40	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
Ensign, bedrock terrace-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Nykanen, bedrock terrace-----	20	Very limited Depth to saturated zone Slope Water erosion Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Slope Water erosion Dusty	1.00 1.00 0.08 0.01

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455295: Evert-----	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00
		Flooding	0.40	Flooding	0.40
		Dusty	0.01	Dusty	0.01
Sturgeon-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40
		Dusty	0.01	Dusty	0.01
1455296: Deerton, dissected--	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.82		
Tokiahok, dissected-	30	Somewhat limited		Somewhat limited	
		Slope	0.82	Too sandy	0.37
		Too sandy	0.37		
Trout Bay, dissected	15	Not rated		Not rated	
1455298: Garlic, dissected---	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Blue Lake, dissected	30	Not rated		Not rated	
Voelker, dissected--	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
1455299: Garlic, dissected---	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.82		
Blue Lake, dissected	30	Not rated		Not rated	
Voelker, dissected--	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.82		
1455300: Garlic, dissected---	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	0.96
Blue Lake, dissected	30	Not rated		Not rated	
Voelker, dissected--	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	0.96
1455302: Garlic-----	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455302: Blue Lake-----	30	Not rated		Not rated	
Voelker-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455304: Cathro-----	55	Not rated		Not rated	
Ensley-----	35	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1455305: Tawas-----	70	Not rated		Not rated	
Deford-----	20	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
1455308: Fence, dissected---	90	Somewhat limited Depth to saturated zone Dusty	0.44 0.01	Somewhat limited Depth to saturated zone Dusty	0.44 0.01
1455310: Rousseau-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Dawson-----	45	Not rated		Not rated	
1455318: Munising, calcareous substratum-----	65	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Ensley-----	25	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1455319: Munising, dissected, very stony-----	50	Very limited Depth to saturated zone Large stones content	1.00 0.47	Very limited Depth to saturated zone Large stones content	1.00 0.47

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455319: Yalmer, dissected, very stony-----	35	Very limited Depth to saturated zone Too sandy Large stones content	1.00 0.50 0.47	Very limited Depth to saturated zone Too sandy Large stones content	1.00 0.50 0.47
1455320: Munising, stony-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Skaneec, stony-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455324: Zeba, very stony----	55	Very limited Depth to saturated zone Large stones content	1.00 0.47	Very limited Depth to saturated zone Large stones content	1.00 0.47
Jacobsville, very stony-----	30	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
1455326: Munising, dissected, stony---	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Abbaye, dissected, stony-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455327: Paquin-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Finch-----	45	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
1455339: Crowell-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Kinross-----	40	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455340: Frohling, dissected, stony---	60	Somewhat limited Slope	0.82	Not limited	
Tokiahok, dissected, stony---	30	Somewhat limited Slope Too sandy	0.82 0.37	Somewhat limited Too sandy	0.37
1455341: McMaster-----	90	Somewhat limited Too sandy	0.01	Somewhat limited Too sandy	0.01
1455344: Reade-----	85	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
1455353: Charlevoix-----	55	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
Ensley-----	30	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1455359: Munising-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Abbaye-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455360: Kalkaska-----	60	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Blue Lake-----	30	Not rated		Not rated	
1455361: Kalkaska-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Blue Lake-----	35	Not rated		Not rated	
1455362: Kalkaska-----	55	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy	1.00
Blue Lake-----	35	Not rated		Not rated	

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455363: Jeske-----	40	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
Au Train-----	30	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
Gongeau-----	20	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.42	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.42
1455365: Cusino-----	95	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42
1455366: Cusino-----	95	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42
1455367: Kalkaska-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Cusino-----	45	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42
1455368: Kalkaska-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Cusino-----	45	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42
1455369: Kalkaska-----	50	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy	1.00
Cusino-----	40	Very limited Slope Too sandy	1.00 0.42	Somewhat limited Too sandy	0.42
1455370: Kalkaska-----	50	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Cusino-----	35	Very limited Slope Too sandy	1.00 0.42	Very limited Slope Too sandy	1.00 0.42
1455371: Halfaday-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455372: Shelldrake-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455380: Trout Bay-----	30	Not rated		Not rated	
Gongeau-----	25	Very limited Depth to saturated zone Too sandy	1.00 0.42	Very limited Depth to saturated zone Too sandy	1.00 0.42
Shingleton-----	20	Very limited Slope Too sandy	1.00 0.36	Very limited Slope Too sandy	1.00 0.36
Rock outcrop-----	15	Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455383: Kalkaska, severely burned-----	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455386: Trout Bay-----	40	Not rated		Not rated	
Lupton-----	30	Not rated		Not rated	
Gongeau-----	20	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.42	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.42
1455387: Garlic-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455388: Garlic-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455389: Garlic-----	90	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy	1.00
1455390: Escanaba-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Greylock-----	40	Not limited		Not limited	

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455391: Escanaba-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Greylock-----	40	Not limited		Not limited	
1455392: Escanaba-----	50	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy	1.00
Greylock-----	40	Very limited Slope	1.00	Not limited	
1455395: Greylock-----	90	Not limited		Not limited	
1455396: Greylock-----	85	Not limited		Not limited	
1455397: Finch-----	50	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
Kinross-----	40	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
1455402: Kalkaska, dissected-	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Blue Lake, dissected	35	Not rated		Not rated	
1455403: Kalkaska, dissected-	55	Very limited Too sandy Slope	1.00 0.82	Very limited Too sandy	1.00
Blue Lake, dissected	35	Not rated		Not rated	
1455404: Kalkaska, dissected-	55	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.96
Blue Lake, dissected	35	Not rated		Not rated	
1455408: Spot-----	50	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
Finch-----	40	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455409: Finch-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Too sandy	1.00
1455410: Munising, calcareous substratum, dissected-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
Frohling, calcareous substratum, dissected-----	30	Not limited		Not limited	
Cookson, dissected--	20	Not limited		Not limited	
1455411: Frohling, calcareous substratum, dissected-----	50	Somewhat limited		Not limited	
		Slope	0.82		
Garlic, dissected---	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.82		
Cookson, dissected--	20	Somewhat limited		Not limited	
		Slope	0.82		
1455412: Munising, calcareous substratum, dissected-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
Yalmer, calcareous substratum, dissected-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.50	Too sandy	0.50
Frohling, calcareous substratum, dissected-----	20	Not limited		Not limited	

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455413: Munising, calcareous substratum-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Cookson-----	40	Not limited		Not limited	
1455416: Furlong-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Shingleton-----	40	Somewhat limited Too sandy	0.36	Somewhat limited Too sandy	0.36
1455417: Furlong-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Shingleton-----	40	Somewhat limited Too sandy	0.36	Somewhat limited Too sandy	0.36
1455421: Steuben-----	40	Not limited		Not limited	
Blue Lake-----	30	Not rated		Not rated	
Kalkaska-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455422: Steuben-----	40	Not limited		Not limited	
Blue Lake-----	25	Not rated		Not rated	
Kalkaska-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455425: Greylock-----	50	Not limited		Not limited	
Cookson-----	40	Not limited		Not limited	
1455431: Rubicon, severely burned-----	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455432: Rubicon, severely burned-----	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455433: Wurtsmith-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455433: Deford-----	35	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
1455434: Shelldrake-----	99	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.78
1455435: Shelldrake-----	61	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.78
Dune land-----	38	Not rated		Not rated	
1455436: Cookson, dissected--	55	Very limited Slope	1.00	Somewhat limited Slope	0.78
Nykanen, dissected--	35	Very limited Depth to saturated zone Water erosion Slope Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Water erosion Dusty	1.00 1.00 0.01
1455437: Dillingham-----	45	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76
Kalkaska-----	40	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455438: Dillingham-----	52	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76
Kalkaska-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1455439: Dillingham-----	50	Very limited Slope Too sandy	1.00 0.76	Somewhat limited Too sandy	0.76
Kalkaska-----	40	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy	1.00
1671074: Udipsamments-----	50	Not rated		Not rated	
Udorthents-----	50	Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1671282: Stutts-----	65	Not limited		Not limited	
Kalkaska-----	35	Somewhat limited Too sandy	0.89	Somewhat limited Too sandy	0.89
1671283: Stutts-----	65	Not limited		Not limited	
Kalkaska-----	25	Somewhat limited Too sandy	0.89	Somewhat limited Too sandy	0.89
1671284: Stutts-----	55	Very limited Slope	1.00	Not limited	
Kalkaska-----	45	Very limited Slope Too sandy	1.00 0.89	Somewhat limited Too sandy	0.89
1693163: Water-----	100	Not rated		Not rated	

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Table 8.—Dwellings and Small Commercial Buildings

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Not limited		Not limited		Somewhat limited Slope	0.13
1455242: Deer Park-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455243: Deer Park-----	98	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455244: Rubicon-----	90	Not limited		Not limited		Not limited	
1455245: Rubicon-----	95	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455246: Rubicon-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455247: Kalkaska-----	94	Not limited		Not limited		Not limited	
1455248: Kalkaska-----	96	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455249: Kalkaska-----	100	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455250: Crowell-----	92	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
1455251: Paquin-----	90	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
1455252: Au Gres-----	92	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455253: Kinross-----	92	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455254: Deford-----	92	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455255: Ingalls-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455257: Munising-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Yalmer-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455262: Ensley-----	90	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455263: Munising, calcareous substratum-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Yalmer, calcareous substratum-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Frohling, calcareous substratum-----	20	Not limited		Not limited		Somewhat limited Slope	0.13
1455266: Grand Sable-----	90	Not limited		Not limited		Not limited	
1455267: Grand Sable-----	98	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455268: Rhody-----	60	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.99 0.06	Very limited Ponding Depth to saturated zone	1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455268: Towes-----	30	Very limited Depth to saturated zone Depth to hard bedrock	1.00  0.03	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00  1.00 0.79	Very limited Depth to saturated zone Depth to hard bedrock	1.00  0.03
1455269: Waiska, very stony--	90	Not limited		Not limited		Not limited	
1455273: Deerton-----	55	Somewhat limited Depth to hard bedrock	0.01	Very limited Depth to hard bedrock Depth to soft bedrock	1.00  0.90	Very limited Slope Depth to hard bedrock	1.00  0.01
Au Train-----	30	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00  0.50 0.46	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00  1.00 1.00	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00  1.00 0.46
1455274: Deerton-----	55	Very limited Slope Depth to hard bedrock	1.00  0.01	Very limited Depth to hard bedrock Slope Depth to soft bedrock	1.00  1.00 0.90	Very limited Slope Depth to hard bedrock	1.00  0.01
Au Train-----	30	Very limited Depth to saturated zone Slope Depth to soft bedrock Depth to hard bedrock	1.00  0.63 0.50 0.46	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock Slope	1.00  1.00 1.00 1.00 0.63	Very limited Depth to saturated zone Depth to soft bedrock Slope Depth to hard bedrock	1.00  1.00 1.00 0.46
1455276: Cookson-----	90	Somewhat limited Depth to hard bedrock	0.23	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.23
1455277: Nahma-----	50	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00  1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00  1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00  1.00 1.00
Ruse-----	40	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00  1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00  1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00  1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455278: Summerville-----	85	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
1455281: Carbondale-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Lupton-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Tawas-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
1455282: Dawson-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Greenwood-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Loxley-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455283: Chippeny-----	55	Very limited Ponding Subsidence Depth to saturated zone Organic matter content Depth to hard bedrock	1.00 1.00 1.00 1.00 0.64	Very limited Ponding Subsidence Depth to saturated zone Depth to hard bedrock	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content Depth to hard bedrock	1.00 1.00 1.00 1.00 0.64
Nahma-----	30	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00 1.00 1.00
1455284: Histosols-----	50	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Aguents-----	50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455285: Pits-----	100	Not rated		Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 0.64 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 1.00 0.64
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 0.90 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 1.00 0.90
Deerton, bedrock terrace-----	20	Somewhat limited Slope Depth to hard bedrock	0.84 0.01	Very limited Depth to hard bedrock Depth to soft bedrock Slope	1.00 0.90 0.84	Very limited Slope Depth to hard bedrock	1.00 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455290: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 0.64 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 1.00 0.64
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 0.90 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 1.00 0.90
Deerton, bedrock terrace-----	20	Very limited Slope Depth to hard bedrock	1.00 0.01	Very limited Depth to hard bedrock Slope Depth to soft bedrock	1.00 1.00 1.00 0.90	Very limited Slope Depth to hard bedrock	1.00 0.01
1455291: Ruse, bedrock terrace-----	40	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00
Ensign, bedrock terrace-----	30	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00
Nykanen, bedrock terrace-----	20	Very limited Depth to saturated zone Depth to hard bedrock Slope Depth to soft bedrock	1.00 0.84 0.63 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock Slope	1.00 1.00 1.00 1.00 0.63	Very limited Depth to saturated zone Depth to soft bedrock Slope Depth to hard bedrock	1.00 1.00 1.00 0.84

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455292: Ruse, bedrock terrace-----	40	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00
Ensign, bedrock terrace-----	30	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00
Nykanen, bedrock terrace-----	20	Very limited Depth to saturated zone Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.84 0.50	Very limited Depth to saturated zone Depth to hard bedrock Depth to soft bedrock Slope	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to soft bedrock Slope Depth to hard bedrock	1.00 1.00 1.00 0.84
1455295: Evert-----	70	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
Sturgeon-----	20	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
1455296: Deerton, dissected--	40	Very limited Slope Depth to hard bedrock	1.00 0.01	Very limited Depth to hard bedrock Slope Depth to soft bedrock	1.00 1.00 0.90	Very limited Slope Depth to hard bedrock	1.00 0.01
Tokiahok, dissected-	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Trout Bay, dissected	15	Very limited Subsidence Depth to saturated zone Organic matter content Slope Depth to soft bedrock	1.00 1.00 1.00 1.00 0.50	Very limited Subsidence Depth to saturated zone Organic matter content Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00 1.00	Very limited Slope Subsidence Depth to saturated zone Organic matter content Depth to soft bedrock	1.00 1.00 1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455298: Garlic, dissected---	40	Not limited		Not limited		Somewhat limited Slope	0.88
Blue Lake, dissected	30	Not limited		Not limited		Somewhat limited Slope	0.88
Voelker, dissected--	20	Not limited		Not limited		Somewhat limited Slope	0.88
1455299: Garlic, dissected---	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Blue Lake, dissected	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Voelker, dissected--	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455300: Garlic, dissected---	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Blue Lake, dissected	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Voelker, dissected--	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455302: Garlic-----	40	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Blue Lake-----	30	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Voelker-----	20	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
1455304: Cathro-----	55	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Ensley-----	35	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455305: Tawas-----	70	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455305: Deford-----	20	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455308: Fence, dissected----	90	Somewhat limited Depth to saturated zone	0.98	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone Slope	10.98 10.88
1455310: Rousseau-----	50	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Dawson-----	45	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
1455318: Munising, calcareous substratum-----	65	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Ensley-----	25	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455319: Munising, dissected, very stony-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 10.88
Yalmer, dissected, very stony-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 10.88
1455320: Munising, stony----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Skanee, stony-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455324: Zeba, very stony----	55	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20
Jacobsville, very stony-----	30	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00 1.00 0.38	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock	1.00 1.00 0.38
1455326: Munising, dissected, stony---	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 0.50
Abbaye, dissected, stony-----	35	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.46	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Very limited Depth to saturated zone Slope Depth to hard bedrock	1.00 0.50 0.46
1455327: Paquin-----	55	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Finch-----	45	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455339: Croswell-----	50	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Kinross-----	40	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455340: Frohling, dissected, stony---	60	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Tokiahok, dissected, stony---	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455341: McMaster-----	90	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455344: Reade-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to hard bedrock	0.90
1455353: Charlevoix-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Ensley-----	30	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1455359: Munising-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Abbaye-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
1455360: Kalkaska-----	60	Not limited		Not limited		Not limited	
Blue Lake-----	30	Not limited		Not limited		Not limited	
1455361: Kalkaska-----	55	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Blue Lake-----	35	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455362: Kalkaska-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Blue Lake-----	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455363: Jeske-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	0.64
Au Train-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to soft bedrock	0.50	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Depth to hard bedrock	0.46	Depth to soft bedrock	1.00	Depth to hard bedrock	0.46

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455363: Gongeau-----	20	Very limited Ponding Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.90 0.50	Very limited Ponding Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 1.00 0.90
1455365: Cusino-----	95	Not limited		Not limited		Not limited	
1455366: Cusino-----	95	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455367: Kalkaska-----	50	Not limited		Not limited		Not limited	
Cusino-----	45	Not limited		Not limited		Not limited	
1455368: Kalkaska-----	50	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Cusino-----	45	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455369: Kalkaska-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Cusino-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455370: Kalkaska-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Cusino-----	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455371: Halfaday-----	90	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
1455372: Shelldrake-----	90	Not limited		Not limited		Not limited	
1455380: Trout Bay-----	30	Very limited Subsidence Depth to saturated zone Organic matter content Slope Depth to soft bedrock	1.00 1.00 1.00 1.00 1.00 0.50	Very limited Subsidence Depth to saturated zone Organic matter content Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Organic matter content Depth to soft bedrock Slope	1.00 1.00 1.00 1.00 1.00 1.00

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455380: Gongeau-----	25	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	10.90
						Slope	10.13
Shingleton-----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Not limited		Not limited		Not limited	
1455383: Kalkaska, severely burned-----	95	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455386: Trout Bay-----	40	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00	Organic matter content	1.00
		Depth to soft bedrock	0.50	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
Lupton-----	30	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00	Organic matter content	1.00
Gongeau-----	20	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	0.90
1455387: Garlic-----	90	Not limited		Not limited		Not limited	
1455388: Garlic-----	90	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455389: Garlic-----	90	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455390: Escanaba-----	50	Not limited		Not limited		Not limited	
Greylock-----	40	Not limited		Not limited		Not limited	
1455391: Escanaba-----	50	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Greylock-----	40	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455392: Escanaba-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Greylock-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455395: Greylock-----	90	Not limited		Not limited		Not limited	
1455396: Greylock-----	85	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455397: Finch-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Kinross-----	40	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455402: Kalkaska, dissected-	55	Not limited		Not limited		Somewhat limited Slope	0.88
Blue Lake, dissected	35	Not limited		Not limited		Somewhat limited Slope	0.88
1455403: Kalkaska, dissected-	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Blue Lake, dissected	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455404: Kalkaska, dissected-	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Blue Lake, dissected	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455408: Spot-----	50	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00
Finch-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455409: Finch-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1455410: Munising, calcareous substratum, dissected-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 0.50
Frohling, calcareous substratum, dissected-----	30	Not limited		Not limited		Somewhat limited Slope	0.50
Cookson, dissected--	20	Somewhat limited Depth to hard bedrock	0.23	Very limited Depth to hard bedrock	1.00	Somewhat limited Slope Depth to hard bedrock	0.50 0.23
1455411: Frohling, calcareous substratum, dissected-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Garlic, dissected---	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Cookson, dissected--	20	Very limited Slope Depth to hard bedrock	1.00 0.23	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 0.23
1455412: Munising, calcareous substratum, dissected-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455412: Yalmer, calcareous substratum, dissected-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 0.88
Frohling, calcareous substratum, dissected-----	20	Not limited		Not limited		Somewhat limited Slope	0.88
1455413: Munising, calcareous substratum-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Cookson-----	40	Somewhat limited Depth to hard bedrock	0.23	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.23
1455416: Furlong-----	50	Somewhat limited Depth to hard bedrock	0.99	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.99
Shingleton-----	40	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
1455417: Furlong-----	50	Somewhat limited Depth to hard bedrock Slope	0.99 0.37	Very limited Depth to hard bedrock Slope	1.00 0.37	Very limited Slope Depth to hard bedrock	1.00 0.99
Shingleton-----	40	Very limited Depth to hard bedrock Slope	1.00 0.37	Very limited Depth to hard bedrock Slope	1.00 0.37	Very limited Depth to hard bedrock Slope	1.00 1.00
1455421: Steuben-----	40	Not limited		Not limited		Not limited	
Blue Lake-----	30	Not limited		Not limited		Not limited	
Kalkaska-----	20	Not limited		Not limited		Not limited	
1455422: Steuben-----	40	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Blue Lake-----	25	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Kalkaska-----	25	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455425: Greylock-----	50	Not limited		Not limited		Not limited	
Cookson-----	40	Somewhat limited Depth to hard bedrock	0.23	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.23
1455431: Rubicon, severely burned-----	95	Not limited		Not limited		Not limited	
1455432: Rubicon, severely burned-----	95	Somewhat limited Slope	0.26	Somewhat limited Slope	0.26	Very limited Slope	1.00
1455433: Wurtsmith-----	55	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Deford-----	35	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455434: Shelldrake-----	99	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455435: Shelldrake-----	61	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Dune land-----	38	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1455436: Cookson, dissected--	55	Very limited Slope Depth to hard bedrock	1.00 0.23	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 0.23
Nykanen, dissected--	35	Very limited Slope Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.84 0.50	Very limited Slope Depth to saturated zone Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00 1.00	Very limited Slope Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 1.00 0.84
1455437: Dillingham-----	45	Not limited		Not limited		Not limited	
Kalkaska-----	40	Not limited		Not limited		Not limited	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455438: Dillingham-----	52	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Kalkaska-----	45	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1455439: Dillingham-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Kalkaska-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1671074: Udipsamments-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Udorthents-----	50	Not rated		Not rated		Not rated	
1671282: Stutts-----	65	Not limited		Not limited		Not limited	
Kalkaska-----	35	Not limited		Not limited		Not limited	
1671283: Stutts-----	65	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Kalkaska-----	25	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1671284: Stutts-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Kalkaska-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1693163: Water-----	100	Not rated		Not rated		Not rated	

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.23
1455242: Deer Park-----	95	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.23
1455243: Deer Park-----	98	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.23
1455244: Rubicon-----	90	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.18
1455245: Rubicon-----	95	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Slope Droughty	0.37 0.18
1455246: Rubicon-----	95	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.18
1455247: Kalkaska-----	94	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
1455248: Kalkaska-----	96	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
1455249: Kalkaska-----	100	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455250: Crowell-----	92	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Depth to saturated zone Droughty	0.19 0.19
1455251: Paquin-----	90	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Droughty Depth to saturated zone	1.00 1.00 0.19
1455252: Au Gres-----	92	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Very limited Depth to saturated zone Droughty	1.00 0.08
1455253: Kinross-----	92	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Droughty	1.00 1.00 0.04
1455254: Deford-----	92	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455255: Ingalls-----	90	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Unstable excavation walls	1.00 0.01	Very limited Depth to saturated zone	1.00
1455257: Munising-----	55	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.99 0.58
Yalmer-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Droughty Depth to cemented pan	1.00 0.91 0.90

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455262: Ensley-----	90	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
1455263: Munising, calcareous substratum-----	40	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.95 0.01
Yalmer, calcareous substratum-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Droughty Depth to cemented pan	1.00 0.76 0.64
Frohling, calcareous substratum-----	20	Somewhat limited Frost action	0.50	Somewhat limited Dense layer Unstable excavation walls	0.50 0.01	Somewhat limited Depth to cemented pan	0.90
1455266: Grand Sable-----	90	Not limited		Very limited Unstable excavation walls	1.00	Not limited	
1455267: Grand Sable-----	98	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope	1.00
1455268: Rhody-----	60	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Depth to hard bedrock Unstable excavation walls Depth to soft bedrock	1.00 1.00 0.99 0.32 0.06	Very limited Ponding Depth to saturated zone Depth to bedrock Dusty	1.00 1.00 0.07 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455268: Towes-----	30	Very limited Depth to saturated zone Frost action Depth to hard bedrock	1.00 1.00 0.03	Very limited Depth to hard bedrock Depth to saturated zone bedrock Unstable excavation walls Dusty	1.00 1.00 0.79 0.01 0.01	Very limited Depth to saturated zone Depth to bedrock Dusty	1.00 1.00 0.80 0.01
1455269: Waska, very stony--	90	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
1455273: Deerton-----	55	Somewhat limited Depth to hard bedrock	0.01	Very limited Depth to hard bedrock Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.90	Somewhat limited Depth to bedrock Droughty	0.84 0.83
Au Train-----	30	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 0.46	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Droughty Depth to bedrock	1.00 1.00 1.00
1455274: Deerton-----	55	Very limited Slope Depth to hard bedrock	1.00 0.01	Very limited Depth to hard bedrock Unstable excavation walls Slope Depth to soft bedrock	1.00 1.00 1.00 1.00 0.90	Very limited Slope Depth to bedrock Droughty	1.00 0.84 0.83
Au Train-----	30	Very limited Depth to saturated zone Depth to soft bedrock Slope Depth to hard bedrock	1.00 1.00 0.63 0.46	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls Slope	1.00 1.00 1.00 1.00 1.00 0.63	Very limited Depth to saturated zone Droughty Depth to bedrock Slope	1.00 1.00 1.00 0.63

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455276: Cookson-----	90	Somewhat limited Frost action Depth to hard bedrock	0.50 0.23	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.01	Somewhat limited Depth to bedrock	0.07
1455277: Nahma-----	50	Very limited Depth to hard bedrock Ponding Depth to saturated zone Frost action Low strength	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Depth to bedrock Dusty	1.00 1.00 1.00 1.00 0.46 0.01
Ruse-----	40	Very limited Depth to hard bedrock Ponding Depth to saturated zone Frost action	1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Depth to bedrock Droughty Dusty	1.00 1.00 1.00 0.93 0.01
1455278: Summerville-----	85	Very limited Depth to hard bedrock Frost action	1.00 0.50	Very limited Depth to hard bedrock Unstable excavation walls Dusty	1.00 0.01 0.01	Very limited Depth to bedrock Droughty Dusty	1.00 0.93 0.01
1455281: Carbondale-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
Lupton-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455281: Tawas-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 1.00 0.01
1455282: Dawson-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
Greenwood-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 1.00 0.01
Loxley-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
1455283: Chippeny-----	55	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Depth to bedrock Dusty	1.00 1.00 1.00 1.00 0.65 0.01
Nahma-----	30	Very limited Depth to hard bedrock Ponding Depth to saturated zone Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Depth to bedrock Dusty	1.00 1.00 1.00 1.00 0.46 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455284: Histosols-----	50	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	 1.00 1.00  1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	 1.00 1.00  1.00  0.01 0.01	Not rated	
Aquents-----	50	Very limited Ponding Depth to saturated zone Frost action Low strength	 1.00 1.00  1.00 1.00	Not rated		Not rated	
1455285: Pits-----	100	Not rated		Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock Frost action	 1.00 1.00  0.64 0.50	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	 1.00 1.00  1.00 1.00	Very limited Depth to saturated zone Depth to bedrock Droughty	 1.00 0.99 0.94
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone Depth to soft bedrock Frost action Depth to hard bedrock	 1.00 1.00  1.00 0.90	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	 1.00 1.00  1.00 1.00	Very limited Depth to saturated zone Depth to bedrock Droughty	 1.00 1.00 0.54
Deerton, bedrock terrace-----	20	Somewhat limited Slope Depth to hard bedrock	 0.84 0.01	Very limited Depth to hard bedrock Unstable excavation walls Depth to soft bedrock Slope	 1.00  1.00 0.90 0.84	Somewhat limited Depth to bedrock Slope Droughty	 0.84 0.84 0.83

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455290: Jeske, bedrock terrace-----	45	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock Frost action	1.00 1.00 0.64 0.50	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock Droughty	1.00 0.99 0.94
Gongeau, bedrock terrace-----	25	Very limited Depth to saturated zone Depth to soft bedrock Frost action Depth to hard bedrock	1.00 1.00 1.00 0.90	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock Droughty	1.00 1.00 0.54
Deerton, bedrock terrace-----	20	Very limited Slope Depth to hard bedrock	1.00 0.01	Very limited Depth to hard bedrock Unstable excavation walls Slope Depth to soft bedrock	1.00 1.00 1.00 1.00 0.90	Very limited Slope Depth to bedrock Droughty	1.00 0.84 0.83
1455291: Ruse, bedrock terrace-----	40	Very limited Depth to hard bedrock Depth to saturated zone Depth to soft bedrock Frost action	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 1.00 1.00 0.01 0.01	Very limited Depth to saturated zone Depth to bedrock Droughty Dusty	1.00 1.00 0.48 0.01
Ensign, bedrock terrace-----	30	Very limited Depth to hard bedrock Depth to saturated zone Depth to soft bedrock Frost action	1.00 1.00 1.00 0.50	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Depth to bedrock Droughty	1.00 1.00 0.70

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455291: Nykanen, bedrock terrace-----	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to hard bedrock	0.84	Depth to saturated zone	1.00	Droughty	0.90
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Unstable excavation walls	0.01	Dusty	0.01
1455292: Ruse, bedrock terrace-----	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Depth to saturated zone	1.00	Droughty	0.72
		Frost action	1.00	Unstable excavation walls	0.01	Dusty	0.01
				Dusty	0.01		
Ensign, bedrock terrace-----	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Depth to saturated zone	1.00	Droughty	0.70
		Frost action	0.50	Unstable excavation walls	0.01		
Nykanen, bedrock terrace-----	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Depth to saturated zone	1.00	Slope	1.00
		Depth to hard bedrock	0.84	Slope	1.00	Droughty	0.90
		Frost action	0.50	Unstable excavation walls	0.01	Dusty	0.01
1455295: Evart-----	70	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	0.01	Dusty	0.01
				Dusty	0.01		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455295: Sturgeon-----	20	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Unstable excavation walls Dusty	1.00 1.00 0.80 0.01 0.01	Very limited Flooding Depth to saturated zone Dusty	1.00 1.00 0.01
1455296: Deerton, dissected--	40	Very limited Slope Depth to hard bedrock	1.00 0.01	Very limited Depth to hard bedrock Unstable excavation walls Slope Depth to soft bedrock	1.00 1.00 1.00 1.00 1.00 0.90	Very limited Slope Depth to bedrock Droughty	1.00 0.84 0.83
Tokiahok, dissected-	30	Very limited Slope	1.00	Very limited Slope Dense layer Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Slope Depth to cemented pan Droughty	1.00 0.90 0.40
Trout Bay, dissected	15	Very limited Depth to saturated zone Subsidence Depth to soft bedrock Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Slope Unstable excavation walls	1.00 1.00 1.00 1.00 1.00 1.00 0.01	Very limited Organic matter content Depth to saturated zone Depth to bedrock Slope Dusty	1.00 1.00 1.00 1.00 1.00 0.01
1455298: Garlic, dissected---	40	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.05
Blue Lake, dissected	30	Not limited		Somewhat limited Unstable excavation walls	0.68	Not limited	
Voelker, dissected--	20	Not limited		Very limited Unstable excavation walls	1.00	Very limited Depth to cemented pan Droughty	1.00 1.00
1455299: Garlic, dissected---	40	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.05
Blue Lake, dissected	30	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.68	Very limited Slope	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455299: Voelker, dissected--	20	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00	Very limited Depth to cemented pan Droughty Slope	1.00 1.00 1.00
1455300: Garlic, dissected---	40	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.05
Blue Lake, dissected	30	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.68	Very limited Slope	1.00
Voelker, dissected--	20	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Slope Droughty	1.00 1.00 1.00
1455302: Garlic-----	40	Somewhat limited Slope	0.16	Very limited Unstable excavation walls Slope	1.00 0.16	Somewhat limited Slope Droughty	0.16 0.05
Blue Lake-----	30	Somewhat limited Slope	0.16	Somewhat limited Unstable excavation walls Slope	0.68 0.16	Somewhat limited Slope	0.16
Voelker-----	20	Somewhat limited Slope	0.16	Very limited Unstable excavation walls Slope	1.00 0.16	Very limited Depth to cemented pan Droughty Slope	1.00 1.00 1.00 0.16
1455304: Cathro-----	55	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 1.00 0.01
Ensley-----	35	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 1.00 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455305: Tawas-----	70	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 1.00
Deford-----	20	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455308: Fence, dissected----	90	Very limited Frost action Low strength Depth to saturated zone	1.00 1.00 0.75	Very limited Depth to saturated zone Unstable excavation walls Dusty	1.00 0.01 0.01	Somewhat limited Depth to saturated zone Dusty	0.75 0.01
1455310: Rousseau-----	50	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Slope	0.46 0.37
Dawson-----	45	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
1455318: Munising, calcareous substratum-----	65	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.99 0.06
Ensley-----	25	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455319: Munising, dissected, very stony-----	50	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.99 0.58
Yalmer, dissected, very stony-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Droughty Depth to cemented pan	1.00 0.91 0.90
1455320: Munising, stony-----	60	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.99 0.58
Skaneec, stony-----	30	Very limited Depth to saturated zone Frost action	1.00 1.00	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 0.75
1455324: Zeba, very stony----	55	Very limited Depth to saturated zone Frost action Depth to hard bedrock	1.00 1.00 0.20	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 0.01	Very limited Depth to saturated zone Depth to bedrock	1.00 0.21
Jacobsville, very stony-----	30	Very limited Ponding Depth to saturated zone Frost action Depth to hard bedrock	1.00 1.00 1.00 0.38	Very limited Depth to hard bedrock Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Depth to bedrock	1.00 1.00 0.07
1455326: Munising, dissected, stony---	50	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.99 0.58

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455326: Abbaye, dissected, stony-----	35	Very limited Depth to saturated zone Frost action Depth to hard bedrock	1.00 0.50 0.46	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 0.01	Very limited Depth to saturated zone Depth to bedrock	1.00 0.29
1455327: Paquin-----	55	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Droughty Depth to saturated zone	1.00 1.00 0.19
Finch-----	45	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00
1455339: Croswell-----	50	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Depth to saturated zone Droughty	0.19 0.19
Kinross-----	40	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Droughty	1.00 1.00 0.04
1455340: Frohling, dissected, stony---	60	Very limited Slope Frost action	1.00 0.50	Very limited Slope Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to cemented pan Slope Droughty Large stones content	1.00 1.00 0.54 0.03
Tokiahok, dissected, stony---	30	Very limited Slope	1.00	Very limited Slope Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Slope Depth to cemented pan Droughty	1.00 0.90 0.40

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455341: McMaster-----	90	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Large stones content Droughty Depth to saturated zone	0.95 0.69 0.19
1455344: Reade-----	85	Very limited Depth to saturated zone Depth to hard bedrock Frost action	1.00 0.90 0.50	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Depth to saturated zone Depth to bedrock Large stones content Dusty	1.00 1.00 0.65 0.03 0.01
1455353: Charlevoix-----	55	Very limited Depth to saturated zone Frost action	1.00 1.00	Very limited Depth to saturated zone Dense layer Unstable excavation walls Dusty	1.00 1.00 0.50 0.01 0.01	Very limited Depth to saturated zone Dusty	1.00 1.00 0.01
Ensley-----	30	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
1455359: Munising-----	55	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.99 0.58
Abbaye-----	35	Very limited Depth to saturated zone Frost action Depth to hard bedrock	1.00 0.50 0.46	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Depth to bedrock	1.00 0.29
1455360: Kalkaska-----	60	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
Blue Lake-----	30	Not limited		Somewhat limited Unstable excavation walls	0.68	Not limited	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455361: Kalkaska-----	55	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
Blue Lake-----	35	Somewhat limited Slope	0.37	Somewhat limited Unstable excavation walls Slope	0.68 0.37	Somewhat limited Slope	0.37
1455362: Kalkaska-----	55	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Blue Lake-----	35	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.68	Very limited Slope	1.00
1455363: Jeske-----	40	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock Frost action	1.00 1.00 0.64 0.50	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock Droughty	1.00 0.99 0.94
Au Train-----	30	Very limited Depth to saturated zone Depth to soft bedrock Depth to hard bedrock	1.00 1.00 0.46	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Droughty Depth to bedrock	1.00 1.00 1.00
Gongeau-----	20	Very limited Ponding Depth to saturated zone Depth to soft bedrock Frost action Depth to hard bedrock	1.00 1.00 1.00 1.00 0.90	Very limited Depth to hard bedrock Depth to soft bedrock Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Depth to bedrock Droughty	1.00 1.00 1.00 0.54
1455365: Cusino-----	95	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.34

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455366: Cusino-----	95	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Slope Droughty	0.37 0.34
1455367: Kalkaska-----	50	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
Cusino-----	45	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.34
1455368: Kalkaska-----	50	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
Cusino-----	45	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Slope Droughty	0.37 0.34
1455369: Kalkaska-----	50	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Cusino-----	40	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.34
1455370: Kalkaska-----	50	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Cusino-----	35	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.34
1455371: Halfaday-----	90	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Depth to saturated zone Droughty	0.19 0.17
1455372: Shelldrake-----	90	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.10

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455380: Trout Bay-----	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to soft bedrock	1.00	Depth to saturated zone	1.00
		Depth to soft bedrock	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Frost action	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.01	Dusty	0.01
Gongeau-----	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Frost action	1.00	Depth to saturated zone	1.00	Droughty	0.54
		Depth to hard bedrock	0.90	Unstable excavation walls	1.00		
Shingleton-----	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Low strength	1.00	Unstable excavation walls	0.01	Depth to bedrock	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Not limited		Very limited		Somewhat limited	
				Unstable excavation walls	1.00	Droughty	0.87
						Too sandy	0.50
1455383: Kalkaska, severely burned-----	95	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Unstable excavation walls	1.00	Droughty	0.87
				Slope	0.37	Too sandy	0.50
						Slope	0.37
1455386: Trout Bay-----	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Depth to hard bedrock	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00	Organic matter content	1.00
		Subsidence	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Depth to soft bedrock	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Frost action	1.00	Unstable excavation walls	0.01	Dusty	0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455386: Lupton-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
Gongeau-----	20	Very limited Ponding Depth to saturated zone Depth to soft bedrock Frost action Depth to hard bedrock	1.00 1.00 1.00 1.00 1.00 0.90	Very limited Depth to hard bedrock Depth to soft bedrock Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Depth to bedrock Droughty	1.00 1.00 1.00 0.54
1455387: Garlic-----	90	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.05
1455388: Garlic-----	90	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Slope Droughty	0.37 0.05
1455389: Garlic-----	90	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.05
1455390: Escanaba-----	50	Not limited		Somewhat limited Unstable excavation walls	0.01	Not limited	
Greylock-----	40	Somewhat limited Frost action	0.50	Somewhat limited Unstable excavation walls	0.01	Not limited	
1455391: Escanaba-----	50	Somewhat limited Slope	0.37	Somewhat limited Slope Unstable excavation walls	0.37 0.01	Somewhat limited Slope	0.37
Greylock-----	40	Somewhat limited Frost action Slope	0.50 0.37	Somewhat limited Slope Unstable excavation walls	0.37 0.01	Somewhat limited Slope	0.37

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455392: Escanaba-----	50	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.01	Very limited Slope	1.00
Greylock-----	40	Very limited Slope Frost action	1.00 0.50	Very limited Slope Unstable excavation walls	1.00 0.01	Very limited Slope	1.00
1455395: Greylock-----	90	Somewhat limited Frost action	0.50	Somewhat limited Unstable excavation walls	0.01	Not limited	
1455396: Greylock-----	85	Somewhat limited Frost action Slope	0.50 0.37	Somewhat limited Slope Unstable excavation walls	0.37 0.01	Somewhat limited Slope	0.37
1455397: Finch-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00
Kinross-----	40	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Droughty	1.00 1.00 1.00 0.04
1455402: Kalkaska, dissected-	55	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
Blue Lake, dissected	35	Not limited		Somewhat limited Unstable excavation walls	0.68	Not limited	
1455403: Kalkaska, dissected-	55	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Blue Lake, dissected	35	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.68	Very limited Slope	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455404: Kalkaska, dissected-	55	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Blue Lake, dissected	35	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.68	Very limited Slope	1.00
1455408: Spot-----	50	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to cemented pan Ponding Depth to saturated zone Droughty	1.00 1.00 1.00 1.00
Finch-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00
1455409: Finch-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00
1455410: Munising, calcareous substratum, dissected-----	40	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 1.09 0.06
Frohling, calcareous substratum, dissected-----	30	Somewhat limited Frost action	0.50	Somewhat limited Dense layer Unstable excavation walls	0.50 0.01	Somewhat limited Depth to cemented pan	0.90
Cookson, dissected--	20	Somewhat limited Frost action Depth to hard bedrock	0.50 0.23	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.01	Somewhat limited Depth to bedrock	0.07

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455411: Frohling, calcareous substratum, dissected-----	50	Very limited Slope Frost action	1.00 0.50	Very limited Slope Dense layer Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Slope Depth to cemented pan	1.00 0.90
Garlic, dissected---	20	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.05
Cookson, dissected--	20	Very limited Slope Frost action Depth to hard bedrock	1.00 0.50 0.23	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.01	Very limited Slope Depth to bedrock	1.00 0.07
1455412: Munising, calcareous substratum, dissected-----	40	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.99 0.06
Yalmer, calcareous substratum, dissected-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Depth to saturated zone Droughty Depth to cemented pan	1.00 0.76 0.64
Frohling, calcareous substratum, dissected-----	20	Somewhat limited Frost action	0.50	Somewhat limited Dense layer Unstable excavation walls	0.50 0.01	Somewhat limited Depth to cemented pan	0.90
1455413: Munising, calcareous substratum-----	50	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Droughty	1.00 0.95 0.01

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455413: Cookson-----	40	Somewhat limited Frost action Depth to hard bedrock	0.50 0.23	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.01	Somewhat limited Depth to bedrock	0.07
1455416: Furlong-----	50	Somewhat limited Depth to hard bedrock	0.99	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00	Somewhat limited Depth to bedrock Droughty	0.97 0.94
Shingleton-----	40	Very limited Depth to hard bedrock Low strength	1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.01	Very limited Droughty Depth to bedrock	1.00 1.00
1455417: Furlong-----	50	Somewhat limited Depth to hard bedrock Slope	0.99 0.37	Very limited Depth to hard bedrock Unstable excavation walls Slope	1.00 1.00 0.37	Somewhat limited Depth to bedrock Droughty Slope	0.97 0.94 0.37
Shingleton-----	40	Very limited Depth to hard bedrock Low strength Slope	1.00 1.00 0.37	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 0.37 0.01	Very limited Droughty Depth to bedrock Slope	1.00 1.00 0.37
1455421: Steuben-----	40	Somewhat limited Frost action	0.50	Somewhat limited Unstable excavation walls Dense layer	0.96 0.50	Somewhat limited Depth to cemented pan Droughty	0.99 0.01
Blue Lake-----	30	Not limited		Somewhat limited Unstable excavation walls	0.68	Not limited	
Kalkaska-----	20	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
1455422: Steuben-----	40	Somewhat limited Frost action Slope	0.50 0.37	Somewhat limited Unstable excavation walls Dense layer Slope	0.96 0.50 0.37	Somewhat limited Depth to cemented pan Slope Droughty	0.99 0.37 0.01
Blue Lake-----	25	Somewhat limited Slope	0.37	Somewhat limited Unstable excavation walls Slope	0.68 0.37	Somewhat limited Slope	0.37

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455422: Kalkaska-----	25	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
1455425: Greylock-----	50	Somewhat limited Frost action	0.50	Somewhat limited Unstable excavation walls	0.01	Not limited	
Cookson-----	40	Somewhat limited Frost action Depth to hard bedrock	0.50 0.23	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.01	Somewhat limited Depth to bedrock	0.07
1455431: Rubicon, severely burned-----	95	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.90 0.50
1455432: Rubicon, severely burned-----	95	Somewhat limited Slope	0.26	Very limited Unstable excavation walls Slope	1.00 0.26	Somewhat limited Droughty Too sandy Slope	0.90 0.50 0.26
1455433: Wurtsmith-----	55	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Droughty Depth to saturated zone	0.46 0.19
Deford-----	35	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1455434: Shelldrake-----	99	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.10
1455435: Shelldrake-----	61	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.10
Dune land-----	38	Not rated		Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455436: Cookson, dissected--	55	Very limited Slope Frost action Depth to hard bedrock	1.00 0.50 0.23	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.01	Very limited Slope Depth to bedrock	1.00 0.07
Nykanen, dissected--	35	Very limited Slope Depth to saturated zone Depth to soft bedrock Depth to hard bedrock Frost action	1.00 1.00 1.00 0.84 0.50	Very limited Depth to hard bedrock Depth to soft bedrock Slope Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00 1.00 1.00 1.00 0.01	Very limited Slope Depth to saturated zone Depth to bedrock Droughty Dusty	1.00 1.00 1.00 0.90 0.01
1455437: Dillingham-----	45	Not limited		Very limited Unstable excavation walls Dense layer	1.00 0.50	Somewhat limited Depth to cemented pan Droughty	0.99 0.69
Kalkaska-----	40	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
1455438: Dillingham-----	52	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Dense layer Slope	1.00 0.50 0.37	Somewhat limited Depth to cemented pan Droughty Slope	0.99 0.69 0.37
Kalkaska-----	45	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
1455439: Dillingham-----	50	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Dense layer	1.00 1.00 1.00 0.50	Very limited Slope Depth to cemented pan Droughty	1.00 0.99 0.69
Kalkaska-----	40	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
1671074: Udipsamments-----	50	Very limited Slope	1.00	Very limited Unstable excavation walls Slope	1.00 1.00	Not rated	
Udorthents-----	50	Not rated		Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1671282: Stutts-----	65	Not limited		Somewhat limited Unstable excavation walls	0.01	Not limited	
Kalkaska-----	35	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.22
1671283: Stutts-----	65	Somewhat limited Slope	0.37	Somewhat limited Slope Unstable excavation walls	0.37 0.01	Somewhat limited Slope	0.37
Kalkaska-----	25	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Slope Droughty	0.37 0.22
1671284: Stutts-----	55	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.01	Very limited Slope	1.00
Kalkaska-----	45	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.22
1693163: Water-----	100	Not rated		Not rated		Not rated	

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Table 10.—Sewage Disposal

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.68
1455242: Deer Park-----	95	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455243: Deer Park-----	98	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455244: Rubicon-----	90	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
1455245: Rubicon-----	95	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
1455246: Rubicon-----	95	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455247: Kalkaska-----	94	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455248: Kalkaska-----	96	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.37		
1455249: Kalkaska-----	100	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Seepage, bottom layer	1.00		
1455250: Crowell-----	92	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		
1455251: Paquin-----	90	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
1455252: Au Gres-----	92	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		
1455253: Kinross-----	92	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
1455254: Deford-----	92	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455255: Ingalls-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
1455257: Munising-----	55	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Slope	0.32
				Seepage	0.08
Yalmer-----	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
				Slope	0.32
1455262: Ensley-----	90	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	0.50	Depth to saturated zone	1.00
				Seepage	0.50
1455263: Munising, calcareous substratum-----	40	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Seepage	0.68
				Slope	0.08
Yalmer, calcareous substratum-----	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
				Slope	0.08
Frohling, calcareous substratum-----	20	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455266: Grand Sable-----	90	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
1455267: Grand Sable-----	98	Very limited Slope Seepage, bottom layer	1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455268: Rhody-----	60	Very limited Ponding Depth to saturated zone Filtering capacity Seepage, bottom layer Depth to bedrock	1.00 1.00 1.00 1.00 1.00	Very limited Depth to soft bedrock Ponding Seepage Depth to saturated zone Depth to hard bedrock	1.00 1.00 1.00 1.00 0.99
Towes-----	30	Very limited Depth to bedrock Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Seepage Depth to saturated zone	1.00 1.00 1.00 1.00
1455269: Waiska, very stony--	90	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
1455273: Deerton-----	55	Very limited Filtering capacity Seepage, bottom layer Depth to bedrock	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Seepage Slope	1.00 1.00 1.00 1.00
Au Train-----	30	Very limited Depth to bedrock Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Seepage Depth to saturated zone Slope	1.00 1.00 1.00 1.00 0.32

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455274: Deerton-----	55	Very limited		Very limited	
		Filtering capacity	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
Au Train-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.63	Depth to saturated zone	1.00
				Slope	1.00
1455276: Cookson-----	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	0.50	Seepage	0.50
1455277: Nahma-----	50	Very limited		Very limited	
		Ponding	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Depth to bedrock	1.00	Organic matter content	1.00
		Slow water movement	0.50	Depth to saturated zone	1.00
				Seepage	0.50
Ruse-----	40	Very limited		Very limited	
		Ponding	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
1455278: Summerville-----	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Seepage	0.50
1455281: Carbondale-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455281: Lupton-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Tawas-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
1455282: Dawson-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
Greenwood-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Loxley-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
1455283: Chippeny-----	55	Very limited		Very limited	
		Ponding	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Depth to bedrock	1.00	Organic matter content	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
				Seepage	1.00
Nahma-----	30	Very limited		Very limited	
		Ponding	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Depth to bedrock	1.00	Organic matter content	1.00
		Slow water movement	0.50	Depth to saturated zone	1.00
				Seepage	0.50

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455284: Histosols-----	50	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Aquents-----	50	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Seepage	0.50
1455285: Pits-----	100	Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Depth to saturated zone	1.00
				Slope	0.08
Gongeau, bedrock terrace-----	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Organic matter content	1.00
				Seepage	1.00
				Depth to saturated zone	1.00
Deerton, bedrock terrace-----	20	Very limited		Very limited	
		Filtering capacity	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Slope	0.84	Slope	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455290: Jeske, bedrock terrace-----	45	Very limited Depth to bedrock Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Seepage Depth to saturated zone Slope	1.00 1.00 1.00 1.00 0.32
Gongeau, bedrock terrace-----	25	Very limited Depth to bedrock Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Organic matter content Seepage Depth to saturated zone	1.00 1.00 1.00 1.00 1.00
Deerton, bedrock terrace-----	20	Very limited Filtering capacity Seepage, bottom layer Depth to bedrock Slope	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Seepage Slope	1.00 1.00 1.00 1.00
1455291: Ruse, bedrock terrace-----	40	Very limited Depth to bedrock Depth to saturated zone	1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Seepage	1.00 1.00 1.00 0.50
Ensign, bedrock terrace-----	30	Very limited Depth to bedrock Depth to saturated zone	1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Depth to saturated zone Seepage Slope	1.00 1.00 1.00 1.00 0.50 0.32

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455291: Nykanen, bedrock terrace-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Depth to saturated zone	1.00
				Slope	1.00
				Seepage	0.50
1455292: Ruse, bedrock terrace-----	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
				Depth to saturated zone	1.00
				Seepage	0.50
Ensign, bedrock terrace-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
				Depth to saturated zone	1.00
				Seepage	0.50
				Slope	0.08
Nykanen, bedrock terrace-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Depth to saturated zone	1.00
				Slope	1.00
				Seepage	0.50
1455295: Evert-----	70	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455295: Sturgeon-----	20	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		
1455296: Deerton, dissected--	40	Very limited		Very limited	
		Filtering capacity	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
Tokiahok, dissected-	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
Trout Bay, dissected	15	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Organic matter content	1.00
		Seepage, bottom layer	1.00	Slope	1.00
				Depth to saturated zone	1.00
1455298: Garlic, dissected---	40	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00
Blue Lake, dissected	30	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	1.00
Voelker, dissected--	20	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	1.00
				Slope	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455299: Garlic, dissected---	40	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Blue Lake, dissected	30	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Voelker, dissected--	20	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
1455300: Garlic, dissected---	40	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Blue Lake, dissected	30	Very limited Slope Seepage, bottom layer Filtering capacity	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Voelker, dissected--	20	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
1455302: Garlic-----	40	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 1.00
Blue Lake-----	30	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 1.00
Voelker-----	20	Very limited Depth to cemented pan Slope	1.00 0.16	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455304: Cathro-----	55	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Subsidence	1.00	Seepage	1.00
Ensley-----	35	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	0.50	Depth to saturated zone	1.00
				Seepage	0.50
1455305: Tawas-----	70	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
Deford-----	20	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
1455308: Fence, dissected----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
				Seepage	0.50
1455310: Rousseau-----	50	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.37		
Dawson-----	45	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Subsidence	1.00	Depth to saturated zone	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455318: Munising, calcareous substratum-----	65	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage Slope	1.00 1.00 0.68 0.08
Ensley-----	25	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Ponding Organic matter content Depth to saturated zone Seepage	1.00 1.00 1.00 1.00 0.50
1455319: Munising, dissected, very stony-----	50	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Slope Seepage	1.00 1.00 1.00 0.08
Yalmer, dissected, very stony-----	35	Very limited Depth to cemented pan Depth to saturated zone Filtering capacity	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Slope	1.00 1.00 1.00 1.00
1455320: Munising, stony-----	60	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage Slope	1.00 1.00 0.08 0.08
Skanee, stony-----	30	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage	1.00 1.00 0.50

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455324: Zeba, very stony----	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.92	Seepage	0.68
Jacobsville, very stony-----	30	Very limited		Very limited	
		Ponding	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Slow water movement	0.50	Organic matter content	1.00
				Depth to saturated zone	1.00
				Seepage	0.50
1455326: Munising, dissected, stony---	50	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Slope	0.92
				Seepage	0.08
Abbaye, dissected, stony-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.92	Slope	0.92
				Seepage	0.50
1455327: Paquin-----	55	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
				Slope	0.08
Finch-----	45	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455339: Crowell-----	50	Very limited Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.08
Kinross-----	40	Very limited Ponding Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Ponding Organic matter content Seepage Depth to saturated zone	1.00 1.00 1.00 1.00
1455340: Frohling, dissected, stony---	60	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 0.68
Tokiahok, dissected, stony---	30	Very limited Depth to cemented pan Filtering capacity Slope	1.00 1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
1455341: McMaster-----	90	Very limited Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Large stones	1.00 1.00 0.01
1455344: Reade-----	85	Very limited Depth to saturated zone Depth to bedrock Slow water movement	1.00 1.00 0.50	Very limited Depth to hard bedrock Depth to saturated zone Seepage	1.00 1.00 0.50
1455353: Charlevoix-----	55	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.18

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455353: Ensley-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	0.50	Depth to saturated zone	1.00
				Seepage	0.50
1455359: Munising-----	55	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Seepage	0.08
				Slope	0.08
Abbaye-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.92	Seepage	0.50
				Slope	0.08
1455360: Kalkaska-----	60	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.08
Blue Lake-----	30	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	0.08
1455361: Kalkaska-----	55	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.37		
Blue Lake-----	35	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	1.00
		Slope	0.37		
1455362: Kalkaska-----	55	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Seepage, bottom layer	1.00		

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455362: Blue Lake-----	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00		
1455363: Jeske-----	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Depth to saturated zone	1.00
Au Train-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Depth to saturated zone	1.00
				Slope	0.32
Gongeau-----	20	Very limited		Very limited	
		Ponding	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Seepage, bottom layer	1.00	Organic matter content	1.00
				Seepage	1.00
1455365: Cusino-----	95	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.08
1455366: Cusino-----	95	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.37		
1455367: Kalkaska-----	50	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.08

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455367: Cusino-----	45	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
1455368: Kalkaska-----	50	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
Cusino-----	45	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
1455369: Kalkaska-----	50	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Cusino-----	40	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455370: Kalkaska-----	50	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00 1.00
Cusino-----	35	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455371: Halfaday-----	90	Very limited Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455372: Shelldrake-----	90	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.32
1455380: Trout Bay-----	30	Very limited Depth to saturated zone Depth to bedrock Slope Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Organic matter content Depth to saturated zone Slope	1.00 1.00 1.00 1.00 1.00
Gongeau-----	25	Very limited Depth to bedrock Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Organic matter content Seepage Depth to saturated zone	1.00 1.00 1.00 1.00 1.00
Shingleton-----	20	Very limited Depth to bedrock Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
Rock outcrop-----	15	Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
1455383: Kalkaska, severely burned-----	95	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455386: Trout Bay-----	40	Very limited Ponding Depth to saturated zone Depth to bedrock Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Ponding Organic matter content Depth to saturated zone	1.00 1.00 1.00 1.00 1.00 1.00
Lupton-----	30	Very limited Ponding Depth to saturated zone Subsidence Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Ponding Organic matter content Depth to saturated zone Seepage	1.00 1.00 1.00 1.00 1.00
Gongeau-----	20	Very limited Ponding Depth to bedrock Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Ponding Organic matter content Seepage	1.00 1.00 1.00 1.00 1.00 1.00
1455387: Garlic-----	90	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
1455388: Garlic-----	90	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
1455389: Garlic-----	90	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455390: Escanaba-----	50	Somewhat limited Slow water movement	0.92	Very limited Seepage Slope	1.00 0.08
Greylock-----	40	Somewhat limited Slow water movement	0.92	Somewhat limited Seepage Slope	0.50 0.08

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455391: Escanaba-----	50	Somewhat limited		Very limited	
		Slow water movement	0.92	Seepage	1.00
		Slope	0.37	Slope	1.00
Greylock-----	40	Somewhat limited		Very limited	
		Slow water movement	0.92	Slope	1.00
		Slope	0.37	Seepage	0.50
1455392: Escanaba-----	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.92	Seepage	1.00
Greylock-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.92	Seepage	0.50
1455395: Greylock-----	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.92	Seepage	0.50
				Slope	0.08
1455396: Greylock-----	85	Somewhat limited		Very limited	
		Slow water movement	0.92	Slope	1.00
		Slope	0.37	Seepage	0.50
1455397: Finch-----	50	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
Kinross-----	40	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
1455402: Kalkaska, dissected-	55	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455402: Blue Lake, dissected	35	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00
1455403: Kalkaska, dissected	55	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Blue Lake, dissected	35	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455404: Kalkaska, dissected	55	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Blue Lake, dissected	35	Very limited Slope Seepage, bottom layer Filtering capacity	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1455408: Spot-----	50	Very limited Ponding Depth to cemented pan Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Depth to cemented pan Ponding Organic matter content Seepage Depth to saturated zone	1.00 1.00 1.00 1.00 1.00
Finch-----	40	Very limited Depth to cemented pan Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone	1.00 1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455409: Finch-----	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
1455410: Munising, calcareous substratum, dissected-----	40	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Slope	0.92
				Seepage	0.68
Frohling, calcareous substratum, dissected-----	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	0.50	Slope	0.92
				Seepage	0.50
Cookson, dissected--	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	0.50	Slope	0.92
				Seepage	0.50
1455411: Frohling, calcareous substratum, dissected-----	50	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Garlic, dissected---	20	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	1.00		
Cookson, dissected--	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455412: Munising, calcareous substratum, dissected-----	40	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Slope Seepage	1.00 1.00 1.00 0.92 0.68
Yalmer, calcareous substratum, dissected-----	30	Very limited Depth to cemented pan Depth to saturated zone Filtering capacity	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Slope	1.00 1.00 1.00 1.00
Frohling, calcareous substratum, dissected-----	20	Very limited Depth to cemented pan Slow water movement	1.00 0.50	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 0.50
1455413: Munising, calcareous substratum-----	50	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage Slope	1.00 1.00 0.68 0.08
Cookson-----	40	Very limited Depth to bedrock Slow water movement	1.00 0.50	Very limited Depth to hard bedrock Seepage Slope	1.00 0.50 0.08
1455416: Furlong-----	50	Very limited Seepage, bottom layer Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 0.32
Shingleton-----	40	Very limited Depth to bedrock Seepage, bottom layer	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 0.08

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455417: Furlong-----	50	Very limited Seepage, bottom layer Depth to bedrock Slope	1.00 1.00 0.37	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
Shingleton-----	40	Very limited Depth to bedrock Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Depth to hard bedrock Slope	1.00 1.00
1455421: Steuben-----	40	Very limited Depth to cemented pan Seepage, bottom layer	1.00 1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.08
Blue Lake-----	30	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00	Very limited Seepage Slope	1.00 0.08
Kalkaska-----	20	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
1455422: Steuben-----	40	Very limited Depth to cemented pan Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 1.00
Blue Lake-----	25	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
Kalkaska-----	25	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
1455425: Greylock-----	50	Somewhat limited Slow water movement	0.92	Somewhat limited Seepage Slope	0.50 0.08

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455425: Cookson-----	40	Very limited Depth to bedrock Slow water movement	1.00 0.50	Very limited Depth to hard bedrock Seepage Slope	1.00 0.50 0.08
1455431: Rubicon, severely burned-----	95	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
1455432: Rubicon, severely burned-----	95	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.26	Very limited Seepage Slope	1.00 1.00
1455433: Wurtsmith-----	55	Very limited Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.08
Deford-----	35	Very limited Ponding Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Ponding Organic matter content Seepage Depth to saturated zone	1.00 1.00 1.00 1.00
1455434: Shelldrake-----	99	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00
1455435: Shelldrake-----	61	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00
Dune land-----	38	No rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455436: Cookson, dissected--	55	Very limited Slope Depth to bedrock Slow water movement	 1.00 1.00 0.50	Very limited Depth to hard bedrock Slope Seepage	 1.00  1.00 0.50
Nykanen, dissected--	35	Very limited Depth to bedrock Depth to saturated zone Slope	 1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Depth to saturated zone Seepage	 1.00  1.00 1.00 1.00 1.00 0.50
1455437: Dillingham-----	45	Very limited Depth to cemented pan Seepage, bottom layer	 1.00 1.00	Very limited Depth to cemented pan Seepage Slope	 1.00 1.00 0.08
Kalkaska-----	40	Very limited Filtering capacity Seepage, bottom layer	 1.00 1.00	Very limited Seepage Slope	 1.00 0.08
1455438: Dillingham-----	52	Very limited Depth to cemented pan Seepage, bottom layer Slope	 1.00 1.00 0.37	Very limited Depth to cemented pan Seepage Slope	 1.00 1.00 1.00
Kalkaska-----	45	Very limited Filtering capacity Seepage, bottom layer Slope	 1.00 1.00 0.37	Very limited Seepage Slope	 1.00 1.00
1455439: Dillingham-----	50	Very limited Depth to cemented pan Slope Seepage, bottom layer	 1.00 1.00 1.00	Very limited Depth to cemented pan Slope Seepage	 1.00 1.00 1.00
Kalkaska-----	40	Very limited Filtering capacity Slope Seepage, bottom layer	 1.00 1.00 1.00	Very limited Slope Seepage	 1.00 1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1671074: Udipsamments-----	50	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00
Udorthents-----	50	Not rated		Not rated	
1671282: Stutts-----	65	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
Kalkaska-----	35	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage	1.00
1671283: Stutts-----	65	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
Kalkaska-----	25	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 1.00
1671284: Stutts-----	55	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
Kalkaska-----	45	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
1693163: Water-----	100	Not rated		Not rated	

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Table 11.—Source of Gravel and Sand

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455242: Deer Park-----	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455243: Deer Park-----	98	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455244: Rubicon-----	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455245: Rubicon-----	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455246: Rubicon-----	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455247: Kalkaska-----	94	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455248: Kalkaska-----	96	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455249: Kalkaska-----	100	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455250: Crowell-----	92	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455251: Paquin-----	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455252: Au Gres-----	92	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455253: Kinross-----	92	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455254: Deford-----	92	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.25
		Thickest layer	0.00	Thickest layer	0.99
1455255: Ingalls-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
1455257: Munising-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.09
Yalmer-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.16
1455262: Ensley-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
1455263: Munising, calcareous substratum-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
Yalmer, calcareous substratum-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.13
Frohling, calcareous substratum-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.15
1455266: Grand Sable-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.91
		Thickest layer	0.00	Thickest layer	0.92

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455267: Grand Sable-----	98	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.91
		Thickest layer	0.00	Thickest layer	0.92
1455268: Rhody-----	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.91
Towes-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.02
		Thickest layer	0.00	Bottom layer	0.91
1455269: Waiska, very stony--	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.89
		Thickest layer	0.00		
1455273: Deerton-----	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.89
		Thickest layer	0.00		
Au Train-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.66
		Thickest layer	0.00	Thickest layer	0.98
1455274: Deerton-----	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.89
		Thickest layer	0.00		
Au Train-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.66
		Thickest layer	0.00	Thickest layer	0.98
1455276: Cookson-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455277: Nahma-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ruse-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.03
1455278: Summerville-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.05
1455281: Carbondale-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455281: Lupton-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Tawas-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.91
1455282: Dawson-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.25
Greenwood-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Loxley-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
1455283: Chippeny-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nahma-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1455284: Histosols-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Aquents-----	50	Not rated		Not rated	
1455285: Pits-----	100	Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.98
Gongeau, bedrock terrace-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.91

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455289: Deerton, bedrock terrace-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.89
		Thickest layer	0.00		
1455290: Jeske, bedrock terrace-----	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.98
Gongeau, bedrock terrace-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.91
Deerton, bedrock terrace-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.89
		Thickest layer	0.00		
1455291: Ruse, bedrock terrace-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ensign, bedrock terrace-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
Nykanen, bedrock terrace-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455292: Ruse, bedrock terrace-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ensign, bedrock terrace-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
Nykanen, bedrock terrace-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455295: Ewart-----	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.74
		Thickest layer	0.00	Bottom layer	0.95
Sturgeon-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.37
		Thickest layer	0.00	Bottom layer	0.43

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455296: Deerton, dissected--	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.89
		Thickest layer	0.00		
Tokiahok, dissected-	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.10
Trout Bay, dissected	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
1455298: Garlic, dissected---	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
Blue Lake, dissected	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
Voelker, dissected--	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00		
1455299: Garlic, dissected---	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
Blue Lake, dissected	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
Voelker, dissected--	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00		
1455300: Garlic, dissected---	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
Blue Lake, dissected	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
Voelker, dissected--	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00		
1455302: Garlic-----	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
Blue Lake-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455302: Voelker-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00		
1455304: Cathro-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ensley-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
1455305: Tawas-----	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.91
Deford-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.25
		Thickest layer	0.00	Thickest layer	0.99
1455308: Fence, dissected----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1455310: Rousseau-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.96
		Thickest layer	0.00		
Dawson-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.25
1455318: Munising, calcareous substratum-----	65	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
Ensley-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
1455319: Munising, dissected, very stony-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.09
Yalmer, dissected, very stony-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.16

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455320: Munising, stony-----	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.09
Skanee, stony-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.08
1455324: Zeba, very stony----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.09
Jacobsville, very stony-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.08
1455326: Munising, dissected, stony---	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.09
Abbaye, dissected, stony-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.10
1455327: Paquin-----	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Finch-----	45	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.43
		Thickest layer	0.00		
1455339: Crowell-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
Kinross-----	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455340: Frohling, dissected, stony---	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
Tokiahok, dissected, stony---	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.10

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455341: McMaster-----	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.23
		Thickest layer	0.00	Bottom layer	0.31
1455344: Reade-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
1455353: Charlevoix-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
Ensley-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
1455359: Munising-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.09
Abbaye-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.10
1455360: Kalkaska-----	60	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Blue Lake-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
1455361: Kalkaska-----	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Blue Lake-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
1455362: Kalkaska-----	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Blue Lake-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
1455363: Jeske-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.98

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455363: Au Train-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.66
		Thickest layer	0.00	Thickest layer	0.98
Gongeau-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.91
1455365: Cusino-----	95	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.89
		Thickest layer	0.00	Bottom layer	0.91
1455366: Cusino-----	95	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.89
		Thickest layer	0.00	Bottom layer	0.91
1455367: Kalkaska-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Cusino-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.89
		Thickest layer	0.00	Bottom layer	0.91
1455368: Kalkaska-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Cusino-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.89
		Thickest layer	0.00	Bottom layer	0.91
1455369: Kalkaska-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Cusino-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.89
		Thickest layer	0.00	Bottom layer	0.91
1455370: Kalkaska-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Cusino-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.89
		Thickest layer	0.00	Bottom layer	0.91
1455371: Halfaday-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.65
		Thickest layer	0.00	Thickest layer	0.99

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455372: Shelldrake-----	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455380: Trout Bay-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Gongeau-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.91
Shingleton-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.18
Rock outcrop-----	15	Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455383: Kalkaska, severely burned-----	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455386: Trout Bay-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Lupton-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Gongeau-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.52
		Thickest layer	0.00	Thickest layer	0.91
1455387: Garlic-----	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455388: Garlic-----	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455389: Garlic-----	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455390: Escanaba-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.11
Greylock-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.09
1455391: Escanaba-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.11
Greylock-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.09
1455392: Escanaba-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.11
Greylock-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.09
1455395: Greylock-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.09
1455396: Greylock-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.09
1455397: Finch-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.43
		Thickest layer	0.00		
Kinross-----	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455402: Kalkaska, dissected-	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Blue Lake, dissected	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455403: Kalkaska, dissected-	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Blue Lake, dissected	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
1455404: Kalkaska, dissected-	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Blue Lake, dissected	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
1455408: Spot-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
Finch-----	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.43
		Thickest layer	0.00		
1455409: Finch-----	85	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.43
		Thickest layer	0.00		
1455410: Munising, calcareous substratum, dissected-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
Frohling, calcareous substratum, dissected-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.15
Cookson, dissected--	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455411: Frohling, calcareous substratum, dissected-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.15

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455411: Garlic, dissected---	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
Cookson, dissected--	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455412: Munising, calcareous substratum, dissected-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
Yalmer, calcareous substratum, dissected-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.13
Frohling, calcareous substratum, dissected-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.15
1455413: Munising, calcareous substratum-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
Cookson-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455416: Furlong-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00		
Shingleton-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.18
1455417: Furlong-----	50	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00		
Shingleton-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.18

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455421: Steuben-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.30
		Thickest layer	0.00	Bottom layer	0.93
Blue Lake-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
Kalkaska-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455422: Steuben-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.30
		Thickest layer	0.00	Bottom layer	0.93
Blue Lake-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.30
Kalkaska-----	25	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455425: Greylock-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.09
Cookson-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455431: Rubicon, severely burned-----	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455432: Rubicon, severely burned-----	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1455433: Wurtsmith-----	55	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.71
		Thickest layer	0.00		
Deford-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.25
		Thickest layer	0.00	Thickest layer	0.99
1455434: Shelldrake-----	99	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1455435: Shelldrake-----	61	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
Dune land-----	38	Not rated		Not rated	
1455436: Cookson, dissected--	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
Nykanen, dissected--	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1455437: Dillingham-----	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.68
		Thickest layer	0.00	Thickest layer	0.87
Kalkaska-----	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455438: Dillingham-----	52	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.68
		Thickest layer	0.00	Thickest layer	0.87
Kalkaska-----	45	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1455439: Dillingham-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.68
		Thickest layer	0.00	Thickest layer	0.87
Kalkaska-----	40	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.95
		Thickest layer	0.00		
1671074: Udipsamments-----	50	Not rated		Not rated	
Udorthents-----	50	Not rated		Not rated	
1671282: Stutts-----	65	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.86
		Thickest layer	0.00	Bottom layer	0.89
Kalkaska-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00	Thickest layer	0.97

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1671283: Stutts-----	65	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.86
		Thickest layer	0.00	Bottom layer	0.89
Kalkaska-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00	Thickest layer	0.97
1671284: Stutts-----	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.86
		Thickest layer	0.00	Bottom layer	0.89
Kalkaska-----	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00	Thickest layer	0.97
1693163: Water-----	100	Not rated		Not rated	

## Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Good		Poor Too sandy Too acid	0.00 0.85
1455242: Deer Park-----	95	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Slope	0.92	Poor Too sandy Slope Too acid	0.00 0.00 0.85
1455243: Deer Park-----	98	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.85
1455244: Rubicon-----	90	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.08	Good		Poor Too sandy	0.00
1455245: Rubicon-----	95	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.08	Good		Poor Too sandy Slope	0.00 0.63
1455246: Rubicon-----	95	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.08	Poor Slope	0.00	Poor Slope Too sandy	0.00 0.00
1455247: Kalkaska-----	94	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Good		Poor Too sandy Too acid	0.00 0.98
1455248: Kalkaska-----	96	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Good		Poor Too sandy Slope Too acid	0.00 0.63 0.98

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455249: Kalkaska-----	100	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.18			Too acid	0.98
1455250: Crowell-----	92	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.53	Too sandy	0.00
		Wind erosion	0.00			Wetness	0.53
		Low content of organic matter	0.13				
1455251: Paquin-----	90	Poor		Poor		Poor	
		Too sandy	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00	Wetness	0.53	Wetness	0.53
1455252: Au Gres-----	92	Poor		Poor		Poor	
		Too sandy	0.00	Wetness	0.00	Wetness	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.13			Too acid	0.85
1455253: Kinross-----	92	Poor		Poor		Poor	
		Too sandy	0.00	Wetness	0.00	Wetness	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.13			Too acid	0.96
1455254: Deford-----	92	Poor		Poor		Poor	
		Too sandy	0.00	Wetness	0.00	Wetness	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.13			Too acid	0.99
1455255: Ingalls-----	90	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Too sandy	0.03			Too sandy	0.03
		Low content of organic matter	0.13			Too acid	0.71
1455257: Munising-----	55	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to cemented pan	0.00	Wetness	0.00
		Droughty	0.00			Depth to cemented pan	0.01
		Depth to cemented pan	0.01	Wetness	0.00	Too acid	0.76
Yalmer-----	30	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to cemented pan	0.00	Wetness	0.00
		Droughty	0.00			Too sandy	0.01
		Too acid	0.00	Wetness	0.00	Depth to cemented pan	0.10

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455262: Ensley-----	90	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13			Rock fragments	0.26
						Hard to reclaim (rock fragments)	0.92
1455263: Munising, calcareous substratum-----	40	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to cemented pan	0.00	Wetness	0.00
		Too acid	0.00	Wetness	0.00	Depth to cemented pan	0.05
		Depth to cemented pan	0.05			Too acid	0.96
Yalmer, calcareous substratum-----	30	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to cemented pan	0.00	Wetness	0.00
		Droughty	0.00	Wetness	0.00	Too sandy	0.16
		Too acid	0.00			Depth to cemented pan	0.36
Frohling, calcareous substratum-----	20	Fair		Poor		Fair	
		Depth to cemented pan	0.10	Depth to cemented pan	0.00	Depth to cemented pan	0.10
		Too acid	0.21			Too sandy	0.94
		Droughty	0.43			Too acid	0.97
1455266: Grand Sable-----	90	Fair		Good		Fair	
		Too sandy	0.01			Too sandy	0.01
		Too acid	0.26				
		Low content of organic matter	0.88				
1455267: Grand Sable-----	98	Fair		Poor		Poor	
		Too sandy	0.01	Slope	0.00	Slope	0.00
		Too acid	0.26			Too sandy	0.01
		Low content of organic matter	0.88				
1455268: Rhody-----	60	Fair		Poor		Poor	
		Droughty	0.65	Wetness	0.00	Wetness	0.00
		Too acid	0.84	Depth to bedrock	0.00	Rock fragments	0.91
		Depth to bedrock	0.93	Dusty	0.91	Depth to bedrock	0.93
Towes-----	30	Fair		Poor		Poor	
		Depth to bedrock	0.21	Depth to bedrock	0.00	Wetness	0.00
		Too acid	0.61	Wetness	0.00	Depth to bedrock	0.21
		Droughty	0.72	Dusty	0.98		
1455269: Waiska, very stony--	90	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.13			Hard to reclaim (rock fragments)	0.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455273: Deerton-----	55	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to bedrock	 0.00	Poor Too sandy Depth to bedrock Too acid	 0.00 0.16 0.75
Au Train-----	30	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Too sandy Depth to bedrock	 0.00 0.00 0.00
1455274: Deerton-----	55	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to bedrock Slope	 0.00 0.50	Poor Too sandy Slope Depth to bedrock	 0.00 0.00 0.16
Au Train-----	30	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Too sandy Depth to bedrock	 0.00 0.00 0.00
1455276: Cookson-----	90	Fair Too acid Low content of organic matter Depth to bedrock	 0.50 0.68 0.93	Poor Depth to bedrock	 0.00	Fair Depth to bedrock	 0.93
1455277: Nahma-----	50	Poor Wind erosion Depth to bedrock Water erosion	 0.00 0.54 0.90	Poor Wetness Depth to bedrock Dusty	 0.00 0.00 0.80	Poor Wetness Organic matter content high Depth to bedrock	 0.00 0.00 0.54
Ruse-----	40	Poor Droughty Depth to bedrock	 0.00 0.00	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Depth to bedrock Organic matter content low	 0.00 0.00 0.78
1455278: Summerville-----	85	Poor Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.88	Poor Depth to bedrock	 0.00	Poor Depth to bedrock	 0.00
1455281: Carbondale-----	30	Fair Too acid	 0.99	Poor Wetness Dusty	 0.00 0.80	Poor Wetness Organic matter content high	 0.00 0.00
Lupton-----	30	Good		Poor Wetness Dusty	 0.00 0.80	Poor Wetness Organic matter content high	 0.00 0.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455281: Tawas-----	30	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.50	Dusty	0.80	Organic matter content high	0.00
						Too acid	0.98
1455282: Dawson-----	30	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.50	Dusty	0.80	Organic matter content high	0.00
						Too acid	0.01
Greenwood-----	30	Fair		Poor		Poor	
		Too acid	0.03	Wetness	0.00	Wetness	0.00
				Dusty	0.80	Organic matter content high	0.00
						Too acid	0.32
Loxley-----	30	Fair		Poor		Poor	
		Too acid	0.50	Wetness	0.00	Wetness	0.00
				Dusty	0.80	Organic matter content high	0.00
						Too acid	0.41
1455283: Chippeny-----	55	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Depth to bedrock	0.35	Depth to bedrock	0.00	Organic matter	0.00
		Water erosion	0.90	Dusty	0.80	content high	
						Depth to bedrock	0.35
Nahma-----	30	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Depth to bedrock	0.54	Depth to bedrock	0.00	Organic matter	0.00
		Carbonate content	0.92	Dusty	0.80	content high	
						Depth to bedrock	0.54
1455284: Histosols-----	50	Not rated		Poor		Not rated	
				Wetness	0.00		
				Dusty	0.80		
Aquents-----	50	Not rated		Not rated		Not rated	
1455285: Pits-----	100	Not rated		Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Wetness	0.00
		Wind erosion	0.00	Wetness	0.00	Too sandy	0.00
		Droughty	0.00			Depth to bedrock	0.01
Gongeau, bedrock terrace-----	25	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Wetness	0.00
		Wind erosion	0.00	Wetness	0.00	Too sandy	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455289: Deerton, bedrock terrace-----	20	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to bedrock	 0.00	Poor Too sandy Depth to bedrock Slope	 0.00 0.16 0.16
1455290: Jeske, bedrock terrace-----	45	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Too sandy Depth to bedrock	 0.00 0.00 0.01
Gongeau, bedrock terrace-----	25	Poor Too sandy Wind erosion Depth to bedrock	 0.00 0.00 0.00	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Too sandy Depth to bedrock	 0.00 0.00 0.00
Deerton, bedrock terrace-----	20	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to bedrock Slope	 0.00 0.00	Poor Too sandy Slope Depth to bedrock	 0.00 0.00 0.16
1455291: Ruse, bedrock terrace-----	40	Poor Depth to bedrock Droughty Water erosion	 0.00 0.00 0.90	Poor Depth to bedrock Wetness Dusty	 0.00 0.00 0.95	Poor Wetness Depth to bedrock Organic matter content low	 0.00 0.00 0.78
Ensign, bedrock terrace-----	30	Poor Droughty Depth to bedrock Water erosion	 0.00 0.00 0.99	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Depth to bedrock	 0.00 0.00
Nykanen, bedrock terrace-----	20	Poor Droughty Depth to bedrock Too acid	 0.00 0.00 0.50	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Depth to bedrock Slope	 0.00 0.00 0.37
1455292: Ruse, bedrock terrace-----	40	Poor Droughty Depth to bedrock Water erosion	 0.00 0.00 0.90	Poor Depth to bedrock Wetness Dusty	 0.00 0.00 0.95	Poor Wetness Depth to bedrock Organic matter content low	 0.00 0.00 0.78
Ensign, bedrock terrace-----	30	Poor Droughty Depth to bedrock Water erosion	 0.00 0.00 0.99	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Depth to bedrock	 0.00 0.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455292: Nykanen, bedrock terrace-----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Wetness	0.00
		Depth to bedrock	0.00	Wetness	0.00	Depth to bedrock	0.00
		Too acid	0.50	Slope	0.00	Slope	0.00
1455295: Evert-----	70	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too sandy	0.29			Too sandy	0.29
		Too acid	0.99				
Sturgeon-----	20	Fair		Poor		Poor	
		Too acid	0.74	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.88			Too sandy	0.99
		Too sandy	0.99				
1455296: Deerton, dissected--	40	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Too sandy	0.00
		Wind erosion	0.00	Slope	0.18	Slope	0.00
		Droughty	0.00			Depth to bedrock	0.16
Tokiahok, dissected-	30	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to	0.00	Slope	0.00
		Droughty	0.01	cemented pan		Depth to	0.10
		Depth to cemented pan	0.10	Slope	0.18	cemented pan	
						Too sandy	0.89
Trout Bay, dissected	15	Poor		Poor		Poor	
		Depth to bedrock	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.74	Depth to bedrock	0.00	Organic matter	0.00
				Dusty	0.80	content high	
						Depth to bedrock	0.00
1455298: Garlic, dissected---	40	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Too acid	0.92
		Low content of organic matter	0.13				
Blue Lake, dissected	30	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.03
		Too sandy	0.03			Too acid	0.87
		Low content of organic matter	0.13				
Voelker, dissected--	20	Poor		Poor		Poor	
		Too sandy	0.00	Depth to	0.00	Depth to	0.00
		Wind erosion	0.00	cemented pan		cemented pan	
		Droughty	0.00			Too sandy	0.00
						Too acid	0.88

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455299: Garlic, dissected---	40	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Slope	0.18	Poor Too sandy Slope Too acid	0.00 0.00 0.92
Blue Lake, dissected	30	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Fair Slope	0.18	Poor Slope Too sandy Too acid	0.00 0.03 0.87
Voelker, dissected--	20	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Slope	0.00 0.18	Poor Depth to cemented pan Too sandy Slope	0.00 0.00 0.00
1455300: Garlic, dissected---	40	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.92
Blue Lake, dissected	30	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.03 0.87
Voelker, dissected--	20	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Slope	0.00 0.00	Poor Depth to cemented pan Slope Too sandy	0.00 0.00 0.00
1455302: Garlic-----	40	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Good		Poor Too sandy Slope Too acid	0.00 0.84 0.92
Blue Lake-----	30	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Good		Fair Too sandy Slope Too acid	0.03 0.84 0.87
Voelker-----	20	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan	0.00	Poor Depth to cemented pan Too sandy Slope	0.00 0.00 0.00 0.84

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455304: Cathro-----	55	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.84	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high Hard to reclaim (rock fragments)	0.00 0.00 0.99
Ensley-----	35	Poor Wind erosion Low content of organic matter	0.00 0.13	Poor Wetness	0.00	Poor Wetness Rock fragments Hard to reclaim (rock fragments)	0.00 0.26 0.92
1455305: Tawas-----	70	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.50	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high Too acid	0.00 0.00 0.98
Deford-----	20	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	0.00 0.00 0.99
1455308: Fence, dissected----	90	Fair Low content of organic matter Too acid Water erosion	0.13 0.39 0.90	Fair Wetness	0.14	Fair Wetness	0.14
1455310: Rousseau-----	50	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Good		Poor Too sandy Slope Too acid	0.00 0.63 0.99
Dawson-----	45	Fair Low content of organic matter Too acid	0.13 0.50	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high Too acid	0.00 0.00 0.01
1455318: Munising, calcareous substratum-----	65	Poor Wind erosion Too acid Depth to cemented pan	0.00 0.00 0.01	Poor Depth to cemented pan Wetness	0.00 0.00	Poor Wetness Depth to cemented pan Too acid	0.00 0.01 0.96
Ensley-----	25	Poor Wind erosion Low content of organic matter	0.00 0.13	Poor Wetness	0.00	Poor Wetness Rock fragments Hard to reclaim (rock fragments)	0.00 0.26 0.92

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455319: Munising, dissected, very stony-----	50	Poor Droughty Depth to cemented pan Too acid	 0.00 0.01  0.12	Poor Depth to cemented pan Wetness	 0.00 0.00 0.00	Poor Wetness Depth to cemented pan Too acid	 0.00 0.01  0.76
Yalmer, dissected, very stony-----	35	Poor Droughty Too acid Too sandy	 0.00 0.00 0.01	Poor Depth to cemented pan Wetness	 0.00 0.00 0.00	Poor Wetness Too sandy Depth to cemented pan	 0.00 0.01 0.10
1455320: Munising, stony-----	60	Poor Wind erosion Droughty Depth to cemented pan	 0.00 0.00 0.01	Poor Depth to cemented pan Wetness	 0.00 0.00 0.00	Poor Wetness Depth to cemented pan Too acid	 0.00 0.01  0.76
Skanee, stony-----	30	Poor Wind erosion Depth to cemented pan Droughty	 0.00 0.00 0.00	Poor Depth to cemented pan Wetness	 0.00 0.00 0.00	Poor Wetness Depth to cemented pan Too acid	 0.00 0.00 0.97
1455324: Zeba, very stony----	55	Fair Low content of organic matter Droughty Too acid	 0.13 0.47 0.50	Poor Wetness Depth to bedrock	 0.00 0.00	Poor Wetness Depth to bedrock Too acid	 0.00 0.79 0.99
Jacobsville, very stony-----	30	Fair Too acid Low content of organic matter Depth to bedrock	 0.50 0.88 0.93	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Depth to bedrock	 0.00 0.93
1455326: Munising, dissected, stony---	50	Poor Wind erosion Droughty Depth to cemented pan	 0.00 0.00 0.01	Poor Depth to cemented pan Wetness	 0.00 0.00 0.00	Poor Wetness Depth to cemented pan Too acid	 0.00 0.01  0.76
Abbaye, dissected, stony-----	35	Fair Too acid Depth to bedrock Droughty	 0.50 0.71 0.97	Poor Wetness Depth to bedrock	 0.00 0.00	Poor Wetness Depth to bedrock Too acid	 0.00 0.71 0.99

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455327: Paquin-----	55	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Wetness	0.00 0.00 0.53	Poor Depth to cemented pan Too sandy Wetness	0.00 0.00 0.00 0.53
Finch-----	45	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Wetness	0.00 0.00 0.00	Poor Wetness Depth to cemented pan Too sandy	0.00 0.00 0.00 0.00
1455339: Crosswell-----	50	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Wetness	0.53	Poor Too sandy Wetness	0.00 0.53
Kinross-----	40	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	0.00 0.00 0.96
1455340: Frohling, dissected, stony---	60	Poor Depth to cemented pan Droughty Too acid	0.00 0.00 0.50	Poor Depth to cemented pan Slope	0.00 0.18	Poor Depth to cemented pan Slope Too sandy	0.00 0.00 0.00 0.88
Tokiahok, dissected, stony---	30	Fair Droughty Depth to cemented pan Too acid	0.01 0.10 0.21	Poor Depth to cemented pan Slope	0.00 0.18	Poor Slope Depth to cemented pan Too sandy	0.00 0.10 0.89
1455341: McMaster-----	90	Fair Droughty Low content of organic matter Too sandy	0.09 0.13 0.14	Fair Wetness Cobble content	0.53 0.80	Poor Rock fragments Hard to reclaim (rock fragments) Too sandy	0.00 0.00 0.14
1455344: Reade-----	85	Fair Low content of organic matter Depth to bedrock Too acid	0.13 0.35 0.50	Poor Wetness Depth to bedrock	0.00 0.00	Poor Wetness Depth to bedrock Rock fragments	0.00 0.35 0.59
1455353: Charlevoix-----	55	Fair Low content of organic matter Too acid	0.13 0.50	Poor Wetness	0.00	Poor Wetness Rock fragments Hard to reclaim (rock fragments)	0.00 0.19 0.82

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455353: Ensley-----	30	Poor Wind erosion Low content of organic matter	0.00 0.13	Poor Wetness	0.00	Poor Wetness Rock fragments Hard to reclaim (rock fragments)	0.00 0.26 0.92
1455359: Munising-----	55	Poor Wind erosion Droughty Depth to cemented pan	0.00 0.00 0.01	Poor Depth to cemented pan Wetness	0.00 0.00	Poor Wetness Depth to cemented pan Too acid	0.00 0.01 0.76
Abbaye-----	35	Fair Too acid Depth to bedrock Droughty	0.50 0.71 0.97	Poor Wetness Depth to bedrock	0.00 0.00	Poor Wetness Depth to bedrock Too acid	0.00 0.71 0.99
1455360: Kalkaska-----	60	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Good		Poor Too sandy Too acid	0.00 0.98
Blue Lake-----	30	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Good		Fair Too sandy Too acid	0.03 0.87
1455361: Kalkaska-----	55	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Good		Poor Too sandy Slope Too acid	0.00 0.63 0.98
Blue Lake-----	35	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Good		Fair Too sandy Slope Too acid	0.03 0.63 0.87
1455362: Kalkaska-----	55	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.98
Blue Lake-----	35	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.03 0.87

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455363: Jeske-----	40	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Wetness	0.00
		Wind erosion	0.00	Wetness	0.00	Too sandy	0.00
		Droughty	0.00			Depth to bedrock	0.01
Au Train-----	30	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Wetness	0.00
		Wind erosion	0.00	Wetness	0.00	Too sandy	0.00
		Droughty	0.00			Depth to bedrock	0.00
Gongeau-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Wetness	0.00
		Wind erosion	0.00	Wetness	0.00	Too sandy	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
1455365: Cusino-----	95	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Too acid	0.92
		Low content of organic matter	0.13			Rock fragments	0.99
1455366: Cusino-----	95	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.63
		Low content of organic matter	0.13			Too acid	0.92
1455367: Kalkaska-----	50	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Too acid	0.98
		Low content of organic matter	0.18				
Cusino-----	45	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Too acid	0.92
		Low content of organic matter	0.13			Rock fragments	0.99
1455368: Kalkaska-----	50	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.63
		Low content of organic matter	0.18			Too acid	0.98
Cusino-----	45	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.63
		Low content of organic matter	0.13			Too acid	0.92
1455369: Kalkaska-----	50	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.18			Too acid	0.98

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455369: Cusino-----	40	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.92
1455370: Kalkaska-----	50	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.98
Cusino-----	35	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.92
1455371: Halfaday-----	90	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Wetness	0.53	Poor Too sandy Wetness Too acid	0.00 0.53 0.83
1455372: Shelldrake-----	90	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Good		Poor Too sandy Too acid	0.00 0.40
1455380: Trout Bay-----	30	Poor Depth to bedrock Too acid	0.00 0.74	Poor Wetness Depth to bedrock Dusty	0.00 0.00 0.80	Poor Wetness Organic matter content high Depth to bedrock	0.00 0.00 0.00 0.00
Gongeau-----	25	Poor Too sandy Wind erosion Depth to bedrock	0.00 0.00 0.00	Poor Depth to bedrock Wetness	0.00 0.00	Poor Wetness Too sandy Depth to bedrock	0.00 0.00 0.00 0.00
Shingleton-----	20	Poor Wind erosion Droughty Depth to bedrock	0.00 0.00 0.00	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Depth to bedrock Too sandy	0.00 0.00 0.00 0.38
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Good		Poor Too sandy Too acid	0.00 0.98

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455383: Kalkaska, severely burned-----	95	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.18	Good		Poor Too sandy Slope Too acid	 0.00 0.63 0.98
1455386: Trout Bay-----	40	Poor Depth to bedrock Too acid	 0.00 0.74	Poor Wetness Depth to bedrock Dusty	 0.00 0.00 0.80	Poor Wetness Organic matter content high Depth to bedrock	 0.00 0.00 0.00
Lupton-----	30	Good		Poor Wetness Dusty	 0.00 0.80	Poor Wetness Organic matter content high	 0.00 0.00
Gongeau-----	20	Poor Too sandy Wind erosion Depth to bedrock	 0.00 0.00 0.00	Poor Depth to bedrock Wetness	 0.00 0.00	Poor Wetness Too sandy Depth to bedrock	 0.00 0.00 0.00
1455387: Garlic-----	90	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Good		Poor Too sandy Too acid	 0.00 0.92
1455388: Garlic-----	90	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Good		Poor Too sandy Slope Too acid	 0.00 0.63 0.92
1455389: Garlic-----	90	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Poor Slope	 0.00	Poor Slope Too sandy Too acid	 0.00 0.00 0.92
1455390: Escanaba-----	50	Poor Wind erosion Low content of organic matter Too sandy	 0.00 0.13 0.49	Good		Fair Too sandy Hard to reclaim (rock fragments)	 0.49 0.89
Greylock-----	40	Fair Low content of organic matter Too acid Carbonate content	 0.13 0.50 0.92	Good		Fair Rock fragments	 0.99

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455391: Escanaba-----	50	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.13 0.49	Good		Fair Too sandy Slope Hard to reclaim (rock fragments)	0.49 0.63 0.89
Greylock-----	40	Fair Low content of organic matter Too acid Carbonate content	0.13 0.50 0.92	Good		Fair Slope Rock fragments	0.63 0.99
1455392: Escanaba-----	50	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.13 0.49	Poor Slope	0.00	Poor Slope Too sandy Hard to reclaim (rock fragments)	0.00 0.49 0.89
Greylock-----	40	Fair Low content of organic matter Too acid Carbonate content	0.13 0.50 0.92	Poor Slope	0.00	Poor Slope Rock fragments	0.00 0.99
1455395: Greylock-----	90	Fair Low content of organic matter Too acid Carbonate content	0.13 0.50 0.92	Good		Fair Rock fragments	0.99
1455396: Greylock-----	85	Fair Low content of organic matter Too acid Carbonate content	0.13 0.50 0.92	Good		Fair Slope Rock fragments	0.63 0.99
1455397: Finch-----	50	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Wetness	0.00 0.00 0.00	Poor Wetness Depth to cemented pan Too sandy	0.00 0.00 0.00
Kinross-----	40	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	0.00 0.00 0.96
1455402: Kalkaska, dissected-	55	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Good		Poor Too sandy Too acid	0.00 0.98

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455402: Blue Lake, dissected	35	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Good		Fair Too sandy Too acid	0.03 0.87
1455403: Kalkaska, dissected	55	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Fair Slope	0.18	Poor Too sandy Slope Too acid	0.00 0.00 0.98
Blue Lake, dissected	35	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Fair Slope	0.18	Poor Slope Too sandy Too acid	0.00 0.03 0.87
1455404: Kalkaska, dissected	55	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.98
Blue Lake, dissected	35	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.03 0.87
1455408: Spot-----	50	Poor Too sandy Droughty Depth to cemented pan	0.00 0.00 0.00	Poor Depth to cemented pan Wetness	0.00	Poor Wetness Depth to cemented pan Too sandy	0.00 0.00 0.00
Finch-----	40	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Wetness	0.00	Poor Wetness Depth to cemented pan Too sandy	0.00 0.00 0.00
1455409: Finch-----	85	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Wetness	0.00	Poor Wetness Depth to cemented pan Too sandy	0.00 0.00 0.00
1455410: Munising, calcareous substratum, dissected-----	40	Poor Wind erosion Too acid Depth to cemented pan	0.00 0.00 0.01	Poor Depth to cemented pan Wetness	0.00	Poor Wetness Depth to cemented pan Too acid	0.00 0.01 0.96

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455410: Frohling, calcareous substratum, dissected-----	30	Fair Depth to cemented pan Too acid Droughty	 0.10 0.21 0.43	Poor Depth to cemented pan	 0.00	Fair Depth to cemented pan Too sandy Too acid	 0.10 0.94 0.97
Cookson, dissected--	20	Fair Too acid Low content of organic matter Depth to bedrock	 0.50 0.68 0.93	Poor Depth to bedrock	 0.00	Fair Depth to bedrock	 0.93
1455411: Frohling, calcareous substratum, dissected-----	50	Fair Depth to cemented pan Too acid Droughty	 0.10 0.21 0.43	Poor Depth to cemented pan Slope	 0.00 0.18	Poor Slope Depth to cemented pan Too sandy	 0.00 0.00 0.94
Garlic, dissected---	20	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Fair Slope	 0.18	Poor Too sandy Slope Too acid	 0.00 0.00 0.92
Cookson, dissected--	20	Fair Too acid Low content of organic matter Depth to bedrock	 0.50 0.68 0.93	Poor Depth to bedrock Slope	 0.00 0.18	Poor Slope Depth to bedrock	 0.00 0.93
1455412: Munising, calcareous substratum, dissected-----	40	Poor Wind erosion Too acid Depth to cemented pan	 0.00 0.00 0.01	Poor Depth to cemented pan Wetness	 0.00 0.00	Poor Wetness Depth to cemented pan Too acid	 0.00 0.01 0.96
Yalmer, calcareous substratum, dissected-----	30	Poor Wind erosion Droughty Too acid	 0.00 0.00 0.00	Poor Depth to cemented pan Wetness	 0.00 0.00	Poor Wetness Too sandy Depth to cemented pan	 0.00 0.16 0.36

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455412: Frohling, calcareous substratum, dissected-----	20	Fair Depth to cemented pan Too acid Droughty	0.10 0.21 0.43	Poor Depth to cemented pan	0.00	Fair Depth to cemented pan Too sandy Too acid	0.10 0.94 0.97
1455413: Munising, calcareous substratum-----	50	Poor Wind erosion Too acid Depth to cemented pan	0.00 0.00 0.05	Poor Depth to cemented pan Wetness	0.00 0.00	Poor Wetness Depth to cemented pan Too acid	0.00 0.05 0.96
Cookson-----	40	Fair Too acid Low content of organic matter Depth to bedrock	0.50 0.68 0.93	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.93
1455416: Furlong-----	50	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Depth to bedrock Too acid	0.00 0.03 0.93
Shingleton-----	40	Poor Wind erosion Droughty Depth to bedrock	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Depth to bedrock Too sandy Too acid	0.00 0.38 0.86
1455417: Furlong-----	50	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Depth to bedrock Slope	0.00 0.03 0.63
Shingleton-----	40	Poor Wind erosion Droughty Depth to bedrock	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Depth to bedrock Too sandy Slope	0.00 0.38 0.63
1455421: Steuben-----	40	Fair Depth to cemented pan Droughty Too acid	0.01 0.20 0.32	Poor Depth to cemented pan	0.00	Fair Depth to cemented pan Too acid	0.01 0.95
Blue Lake-----	30	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.03 0.13	Good		Fair Too sandy Too acid	0.03 0.87

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455421: Kalkaska-----	20	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.18	Good		Poor Too sandy Too acid	 0.00 0.98
1455422: Steuben-----	40	Fair Depth to cemented pan Droughty Too acid	 0.01 0.20 0.32	Poor Depth to cemented pan	 0.00	Fair Depth to cemented pan Slope Too acid	 0.01 0.63 0.95
Blue Lake-----	25	Poor Wind erosion Too sandy Low content of organic matter	 0.00 0.03 0.13	Good		Fair Too sandy Slope Too acid	 0.03 0.63 0.87
Kalkaska-----	25	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.18	Good		Poor Too sandy Slope Too acid	 0.00 0.63 0.98
1455425: Greylock-----	50	Fair Low content of organic matter Too acid Carbonate content	 0.13 0.50 0.92	Good		Fair Rock fragments	 0.99
Cookson-----	40	Fair Too acid Low content of organic matter Depth to bedrock	 0.50 0.68 0.93	Poor Depth to bedrock	 0.00	Fair Depth to bedrock	 0.93
1455431: Rubicon, severely burned-----	95	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Good		Poor Too sandy	 0.00
1455432: Rubicon, severely burned-----	95	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Good		Poor Too sandy Slope	 0.00 0.75
1455433: Wurtsmith-----	55	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Fair Wetness	 0.53	Poor Too sandy Too acid Wetness	 0.00 0.24 0.53

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455433: Deford-----	35	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Poor Wetness	 0.00	Poor Wetness Too sandy Too acid	 0.00 0.00 0.99
1455434: Shelldrake-----	99	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Poor Slope	 0.00	Poor Too sandy Slope Too acid	 0.00 0.00 0.40
1455435: Shelldrake-----	61	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Poor Slope	 0.00	Poor Too sandy Slope Too acid	 0.00 0.00 0.40
Dune land-----	38	Not rated		Not rated		Not rated	
1455436: Cookson, dissected--	55	Fair Too acid Low content of organic matter Depth to bedrock	 0.50 0.68 0.93	Poor Depth to bedrock Slope	 0.00 0.00	Poor Slope Depth to bedrock	 0.00 0.93
Nykanen, dissected--	35	Poor Droughty Depth to bedrock Too acid	 0.00 0.00 0.50	Poor Depth to bedrock Wetness Slope	 0.00 0.00 0.00	Poor Wetness Slope Depth to bedrock	 0.00 0.00 0.00
1455437: Dillingham-----	45	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to cemented pan	 0.00	Poor Too sandy Depth to cemented pan Too acid	 0.00 0.01 0.85
Kalkaska-----	40	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.18	Good		Poor Too sandy Too acid	 0.00 0.98
1455438: Dillingham-----	52	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.00	Poor Depth to cemented pan	 0.00	Poor Too sandy Depth to cemented pan Slope	 0.00 0.01 0.63
Kalkaska-----	45	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.18	Good		Poor Too sandy Slope Too acid	 0.00 0.63 0.98

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455439: Dillingham-----	50	Poor Too sandy Wind erosion Droughty	0.00 0.00 0.00	Poor Depth to cemented pan Slope	0.00 0.00 0.00	Poor Slope Too sandy Depth to cemented pan	0.00 0.00 0.00 0.01
Kalkaska-----	40	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.18	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.98
1671074: Udipsamments-----	50	Not rated		Poor Slope	0.00	Not rated	
Udorthents-----	50	Not rated		Not rated		Not rated	
1671282: Stutts-----	65	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.01 0.03	Good		Fair Too sandy Too acid	0.03 0.95
Kalkaska-----	35	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.02	Good		Poor Too sandy Too acid	0.00 0.47
1671283: Stutts-----	65	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.01 0.03	Good		Fair Too sandy Slope Too acid	0.03 0.63 0.95
Kalkaska-----	25	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.02	Good		Poor Too sandy Too acid Slope	0.00 0.47 0.63
1671284: Stutts-----	55	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.01 0.03	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.03 0.95
Kalkaska-----	45	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.02	Poor Slope	0.00	Poor Slope Too sandy Too acid	0.00 0.00 0.47
1693163: Water-----	100	Not rated		Not rated		Not rated	

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455241: Deer Park-----	90	Very limited Seepage Slope	1.00 0.32	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455242: Deer Park-----	95	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455243: Deer Park-----	98	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455244: Rubicon-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455245: Rubicon-----	95	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455246: Rubicon-----	95	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455247: Kalkaska-----	94	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455248: Kalkaska-----	96	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455249: Kalkaska-----	100	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455250: Croswell-----	92	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
1455251: Paquin-----	90	Very limited Depth to cemented pan Seepage	1.00 1.00	Very limited Seepage Thin layer Depth to saturated zone	1.00 1.00 0.99	Very limited Unstable excavation walls	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455252: Au Gres-----	92	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Unstable excavation walls	1.00
1455253: Kinross-----	92	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455254: Deford-----	92	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455255: Ingalls-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls	1.00
1455257: Munising-----	55	Somewhat limited Depth to cemented pan Seepage Slope	0.99 0.30 0.08	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Yalmer-----	30	Very limited Seepage Depth to cemented pan Slope	1.00 0.98 0.08	Very limited Depth to saturated zone Thin layer	1.00 1.00 0.99	Very limited Depth to water	1.00
1455262: Ensley-----	90	Somewhat limited Seepage	0.70	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
1455263: Munising, calcareous substratum-----	40	Somewhat limited Depth to cemented pan Seepage	0.99 0.81	Very limited Depth to saturated zone Thin layer	1.00 0.99	Very limited Depth to water	1.00
Yalmer, calcareous substratum-----	30	Very limited Seepage Depth to cemented pan	1.00 0.91	Very limited Depth to saturated zone Thin layer	1.00 0.94	Very limited Depth to water	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455263: Frohling, calcareous substratum-----	20	Somewhat limited Depth to cemented pan Seepage Slope	0.98 0.70 0.32	Somewhat limited Thin layer	0.99	Very limited Depth to water	1.00
1455266: Grand Sable-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455267: Grand Sable-----	98	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455268: Rhody-----	60	Very limited Seepage Depth to bedrock	1.00 0.42	Very limited Ponding Depth to saturated zone Seepage Thin layer Dusty	1.00 1.00 1.00 0.66 0.01	Very limited Unstable excavation walls Depth to hard bedrock	1.00 0.99
Towes-----	30	Very limited Seepage Depth to bedrock	1.00 0.61	Very limited Depth to saturated zone Piping Thin layer Dusty	1.00 1.00 1.00 0.95 0.01	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00
1455269: Waska, very stony--	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455273: Deerton-----	55	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.52	Very limited Seepage Thin layer	1.00 0.98	Very limited Depth to water	1.00
Au Train-----	30	Somewhat limited Depth to bedrock Slope Seepage	0.81 0.08 0.01	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10
1455274: Deerton-----	55	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.52	Very limited Seepage Thin layer	1.00 0.98	Very limited Depth to water	1.00
Au Train-----	30	Very limited Slope Depth to bedrock Seepage	1.00 0.81 0.01	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455276: Cookson-----	90	Somewhat limited Seepage Depth to bedrock	0.70 0.66	Somewhat limited Thin layer	0.78	Very limited Depth to water	1.00
1455277: Nahma-----	50	Somewhat limited Depth to bedrock Seepage	0.86 0.70	Very limited Ponding Depth to saturated zone Thin layer Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00 1.00
Ruse-----	40	Very limited Depth to bedrock	1.00	Very limited Ponding Depth to saturated zone Thin layer Piping Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10
1455278: Summerville-----	85	Very limited Depth to bedrock Seepage	1.00 0.11	Very limited Thin layer Piping Dusty	1.00 1.00 0.01	Very limited Depth to water	1.00
1455281: Carbondale-----	30	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Lupton-----	30	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Tawas-----	30	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455282: Dawson-----	30	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
Greenwood-----	30	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Loxley-----	30	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
1455283: Chippeny-----	55	Very limited Seepage Depth to bedrock	1.00 0.91	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.50
Nahma-----	30	Somewhat limited Depth to bedrock Seepage	0.86 0.70	Very limited Ponding Depth to saturated zone Thin layer Hard to pack Dusty	1.00 1.00 1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00
1455284: Histosols-----	50	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Aquents-----	50	Somewhat limited Seepage	0.70	Not rated		Somewhat limited Slow refill Unstable excavation walls	0.30 0.10

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455285: Pits-----	100	Not rated		Not rated		Not rated	
1455289: Jeske, bedrock terrace-----	45	Very limited Seepage Depth to bedrock	1.00 0.83	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00
Gongeau, bedrock terrace-----	25	Somewhat limited Depth to bedrock Seepage	0.88 0.01	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10
Deerton, bedrock terrace-----	20	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.52	Very limited Seepage Thin layer	1.00 1.00 0.98	Very limited Depth to water	1.00
1455290: Jeske, bedrock terrace-----	45	Very limited Seepage Depth to bedrock Slope	1.00 0.83 0.08	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00
Gongeau, bedrock terrace-----	25	Somewhat limited Depth to bedrock Seepage	0.88 0.01	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10
Deerton, bedrock terrace-----	20	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.52	Very limited Seepage Thin layer	1.00 1.00 0.98	Very limited Depth to water	1.00
1455291: Ruse, bedrock terrace-----	40	Very limited Depth to bedrock	1.00	Very limited Depth to saturated zone Thin layer Piping Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Slow refill Unstable excavation walls	1.00 0.30 0.10
Ensign, bedrock terrace-----	30	Very limited Depth to bedrock Slope	1.00 0.08	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to hard bedrock Slow refill Unstable excavation walls	1.00 0.30 0.10

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455291: Nykanen, bedrock terrace-----	20	Very limited Slope Depth to bedrock Seepage	1.00 0.96 0.05	Very limited Depth to saturated zone Thin layer Piping Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Slow refill Unstable excavation walls	1.00 0.30 0.10
1455292: Ruse, bedrock terrace-----	40	Very limited Depth to bedrock	1.00	Very limited Depth to saturated zone Thin layer Dusty	1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Slow refill Unstable excavation walls	1.00 0.30 0.10
Ensign, bedrock terrace-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to hard bedrock Slow refill Unstable excavation walls	1.00 0.30 0.10
Nykanen, bedrock terrace-----	20	Very limited Slope Depth to bedrock Seepage	1.00 0.96 0.05	Very limited Depth to saturated zone Thin layer Piping Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Slow refill Unstable excavation walls	1.00 0.30 0.10
1455295: Evert-----	70	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
Sturgeon-----	20	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage Dusty	1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
1455296: Deerton, dissected--	40	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.52	Very limited Seepage Thin layer	1.00 0.98	Very limited Depth to water	1.00
Tokiahok, dissected-	30	Very limited Seepage Slope Depth to cemented pan	1.00 1.00 0.98	Somewhat limited Thin layer	0.99	Very limited Depth to water	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455296: Trout Bay, dissected	15	Very limited Slope Depth to bedrock Seepage	1.00 0.74 0.01	Very limited Organic matter content Depth to saturated zone Seepage Thin layer Hard to pack	1.00 1.00 1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00 0.10
1455298: Garlic, dissected---	40	Very limited Seepage Slope	1.00 0.92	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake, dissected	30	Very limited Seepage Slope	1.00 0.92	Very limited Seepage	1.00	Very limited Depth to water	1.00
Voelker, dissected--	20	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.92	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
1455299: Garlic, dissected---	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake, dissected	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Voelker, dissected--	20	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
1455300: Garlic, dissected---	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake, dissected	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Voelker, dissected--	20	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
1455302: Garlic-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00

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Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455302: Blue Lake-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Voelker-----	20	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
1455304: Cathro-----	55	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
Ensley-----	35	Somewhat limited Seepage	0.70	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
1455305: Tawas-----	70	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
Deford-----	20	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455308: Fence, dissected----	90	Somewhat limited Slope Seepage	0.92 0.01	Very limited Depth to saturated zone Piping Dusty	1.00 1.00 1.00 0.01	Very limited Unstable excavation walls Slow refill	1.00 0.30
1455310: Rousseau-----	50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Dawson-----	45	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455318: Munising, calcareous substratum-----	65	Somewhat limited Depth to cemented pan Seepage	0.99 0.81	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Ensley-----	25	Somewhat limited Seepage	0.70	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
1455319: Munising, dissected, very stony-----	50	Somewhat limited Depth to cemented pan Slope Seepage	0.99 0.92 0.30	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Yalmer, dissected, very stony-----	35	Very limited Seepage Depth to cemented pan Slope	1.00 0.98 0.92	Very limited Depth to saturated zone Thin layer	1.00 1.00 0.99	Very limited Depth to water	1.00
1455320: Munising, stony-----	60	Somewhat limited Depth to cemented pan Seepage	0.99 0.30	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Skanee, stony-----	30	Very limited Depth to cemented pan Seepage	1.00 0.30	Very limited Depth to saturated zone Thin layer	1.00 1.00 1.00	Somewhat limited Depth to saturated zone Slow refill Unstable excavation walls	0.96 0.70 0.10
1455324: Zeba, very stony----	55	Somewhat limited Depth to bedrock Seepage	0.77 0.30	Very limited Depth to saturated zone Thin layer	1.00 0.77	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.19
Jacobsville, very stony-----	30	Somewhat limited Seepage Depth to bedrock	0.70 0.66	Very limited Ponding Depth to saturated zone Thin layer	1.00 1.00 0.84	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.50

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455326: Munising, dissected, stony---	50	Somewhat limited Depth to cemented pan Slope Seepage	0.99 0.68 0.30	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Abbaye, dissected, stony-----	35	Somewhat limited Depth to bedrock Seepage Slope	0.81 0.70 0.68	Very limited Depth to saturated zone Thin layer	1.00 1.00 0.87	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 1.00 0.30
1455327: Paquin-----	55	Very limited Depth to cemented pan Seepage	1.00 1.00	Very limited Seepage Thin layer Depth to saturated zone	1.00 1.00 0.99	Very limited Unstable excavation walls	1.00
Finch-----	45	Very limited Depth to cemented pan Seepage	1.00 1.00	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455339: Crowell-----	50	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
Kinross-----	40	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455340: Frohling, dissected, stony---	60	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Thin layer	1.00	Very limited Depth to water	1.00
Tokiahok, dissected, stony---	30	Very limited Seepage Slope Depth to cemented pan	1.00 1.00 0.98	Somewhat limited Thin layer	0.99	Very limited Depth to water	1.00
1455341: McMaster-----	90	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455344: Reade-----	85	Somewhat limited Depth to bedrock Seepage	0.91 0.70	Very limited Depth to saturated zone Thin layer Dusty	1.00 0.98 0.01	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 1.00 0.30
1455353: Charlevoix-----	55	Somewhat limited Seepage	0.30	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Unstable excavation walls Slow refill	1.00 0.30
Ensley-----	30	Somewhat limited Seepage	0.70	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
1455359: Munising-----	55	Somewhat limited Depth to cemented pan Seepage	0.99 0.30	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Abbaye-----	35	Somewhat limited Depth to bedrock Seepage	0.81 0.70	Very limited Depth to saturated zone Thin layer	1.00 0.87	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 1.00 0.30
1455360: Kalkaska-----	60	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake-----	30	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455361: Kalkaska-----	55	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455362: Kalkaska-----	55	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455363: Jeske-----	40	Very limited Seepage Depth to bedrock	1.00 0.83	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00 1.00 1.00
Au Train-----	30	Somewhat limited Depth to bedrock Slope Seepage	0.81 0.08 0.01	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00 10.10 1.00
Gongeau-----	20	Somewhat limited Depth to bedrock Seepage	0.88 0.01	Very limited Ponding Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00 10.10 1.00
1455365: Cusino-----	95	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455366: Cusino-----	95	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455367: Kalkaska-----	50	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Cusino-----	45	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455368: Kalkaska-----	50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Cusino-----	45	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455369: Kalkaska-----	50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Cusino-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455370: Kalkaska-----	50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Cusino-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455371: Halfaday-----	90	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
1455372: Shelldrake-----	90	Very limited Seepage Slope	1.00 0.08	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455380: Trout Bay-----	30	Very limited Slope Depth to bedrock Seepage	1.00 0.74 0.01	Very limited Organic matter content Depth to saturated zone Seepage Thin layer Hard to pack	1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10
Gongeau-----	25	Somewhat limited Depth to bedrock Slope Seepage	0.88 0.32 0.01	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10
Shingleton-----	20	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Seepage	1.00 0.80	Very limited Depth to water	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1455382: Kalkaska, severely burned-----	95	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455383: Kalkaska, severely burned-----	95	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455386: Trout Bay-----	40	Somewhat limited Depth to bedrock Seepage	0.74 0.01	Very limited Organic matter content Ponding Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.10
Lupton-----	30	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455386: Gongeau-----	20	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.88	Ponding	1.00	Depth to hard	1.00
		Seepage	0.01	Depth to	1.00	bedrock	
				saturated zone		Unstable	0.10
				Seepage	1.00	excavation walls	
				Thin layer	1.00		
1455387: Garlic-----	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
1455388: Garlic-----	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00				
1455389: Garlic-----	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00				
1455390: Escanaba-----	50	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Greylock-----	40	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
1455391: Escanaba-----	50	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
Greylock-----	40	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.70				
1455392: Escanaba-----	50	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
Greylock-----	40	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.70				
1455395: Greylock-----	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
1455396: Greylock-----	85	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.70				
1455397: Finch-----	50	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	1.00	Unstable	1.00
		cemented pan		saturated zone		excavation walls	
		Seepage	1.00	Seepage	1.00		
				Thin layer	1.00		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455397: Kinross-----	40	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455402: Kalkaska, dissected-	55	Very limited Seepage Slope	1.00 0.92	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake, dissected	35	Very limited Seepage Slope	1.00 0.92	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455403: Kalkaska, dissected-	55	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake, dissected	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455404: Kalkaska, dissected-	55	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Blue Lake, dissected	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455408: Spot-----	50	Very limited Depth to cemented pan Seepage	1.00 1.00	Very limited Ponding Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
Finch-----	40	Very limited Depth to cemented pan Seepage	1.00 1.00	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455409: Finch-----	85	Very limited Depth to cemented pan Seepage	1.00 1.00	Very limited Depth to saturated zone Seepage Thin layer	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455410: Munising, calcareous substratum, dissected-----	40	Somewhat limited Depth to cemented pan Seepage Slope	0.99 0.81 0.68	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Frohling, calcareous substratum, dissected-----	30	Somewhat limited Depth to cemented pan Seepage Slope	0.98 0.70 0.68	Somewhat limited Thin layer	0.99	Very limited Depth to water	1.00
Cookson, dissected--	20	Somewhat limited Seepage Slope Depth to bedrock	0.70 0.68 0.66	Somewhat limited Thin layer	0.78	Very limited Depth to water	1.00
1455411: Frohling, calcareous substratum, dissected-----	50	Very limited Slope Depth to cemented pan Seepage	1.00 0.98 0.70	Somewhat limited Thin layer	0.99	Very limited Depth to water	1.00
Garlic, dissected---	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Cookson, dissected--	20	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.66	Somewhat limited Thin layer	0.78	Very limited Depth to water	1.00
1455412: Munising, calcareous substratum, dissected-----	40	Somewhat limited Depth to cemented pan Seepage Slope	0.99 0.81 0.68	Very limited Depth to saturated zone Thin layer	1.00 1.00	Very limited Depth to water	1.00
Yalmer, calcareous substratum, dissected-----	30	Very limited Seepage Slope Depth to cemented pan	1.00 0.92 0.91	Very limited Depth to saturated zone Thin layer	1.00 0.94	Very limited Depth to water	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455412: Frohling, calcareous substratum, dissected-----	20	Somewhat limited Depth to cemented pan Slope Seepage	0.98 0.92 0.70	Somewhat limited Thin layer	0.99	Very limited Depth to water	1.00
1455413: Munising, calcareous substratum-----	50	Somewhat limited Depth to cemented pan Seepage	0.99 0.81	Very limited Depth to saturated zone Thin layer	1.00 0.99	Very limited Depth to water	1.00
Cookson-----	40	Somewhat limited Seepage Depth to bedrock	0.70 0.66	Somewhat limited Thin layer	0.78	Very limited Depth to water	1.00
1455416: Furlong-----	50	Very limited Seepage Depth to bedrock Slope	1.00 0.99 0.08	Very limited Seepage Thin layer	1.00 0.99	Very limited Depth to water	1.00
Shingleton-----	40	Very limited Depth to bedrock	1.00	Very limited Thin layer Seepage	1.00 0.80	Very limited Depth to water	1.00
1455417: Furlong-----	50	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.99	Very limited Seepage Thin layer	1.00 0.99	Very limited Depth to water	1.00
Shingleton-----	40	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Thin layer Seepage	1.00 0.80	Very limited Depth to water	1.00
1455421: Steuben-----	40	Very limited Seepage Depth to cemented pan	1.00 0.99	Very limited Thin layer Seepage	1.00 0.83	Very limited Depth to water	1.00
Blue Lake-----	30	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Kalkaska-----	20	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455422: Steuben-----	40	Very limited Seepage Slope Depth to cemented pan	1.00 1.00 0.99	Very limited Thin layer Seepage	1.00 0.83	Very limited Depth to water	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455422: Blue Lake-----	25	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Kalkaska-----	25	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455425: Greylock-----	50	Somewhat limited Seepage	0.70	Not limited		Very limited Depth to water	1.00
Cookson-----	40	Somewhat limited Seepage Depth to bedrock	0.70 0.66	Somewhat limited Thin layer	0.78	Very limited Depth to water	1.00
1455431: Rubicon, severely burned-----	95	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455432: Rubicon, severely burned-----	95	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455433: Wurtsmith-----	55	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
Deford-----	35	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1455434: Shelldrake-----	99	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455435: Shelldrake-----	61	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Dune land-----	38	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455436: Cookson, dissected--	55	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.66	Somewhat limited Thin layer	0.78	Very limited Depth to water	1.00

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Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1455436: Nykanen, dissected--	35	Very limited Slope Depth to bedrock Seepage	1.00 0.96	Very limited Depth to saturated zone Thin layer Piping Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Depth to hard bedrock Slow refill Unstable excavation walls	1.00 0.30 0.10
1455437: Dillingham-----	45	Very limited Seepage Depth to cemented pan	1.00 0.99	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
Kalkaska-----	40	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455438: Dillingham-----	52	Very limited Seepage Slope Depth to cemented pan	1.00 1.00 0.99	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
Kalkaska-----	45	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1455439: Dillingham-----	50	Very limited Seepage Slope Depth to cemented pan	1.00 1.00 0.99	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
Kalkaska-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1671074: Udipsamments-----	50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Udorthents-----	50	Very limited Seepage Slope	1.00 1.00	Not rated		Not rated	
1671282: Stutts-----	65	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Kalkaska-----	35	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1671283: Stutts-----	65	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1671283: Kalkaska-----	25	Very limited Seepage Slope	 1.00 1.00	Very limited Seepage	 1.00	Very limited Depth to water	 1.00
1671284: Stutts-----	55	Very limited Seepage Slope	 1.00 1.00	Very limited Seepage	 1.00	Very limited Depth to water	 1.00
Kalkaska-----	45	Very limited Seepage Slope	 1.00 1.00	Very limited Seepage	 1.00	Very limited Depth to water	 1.00
1693163: Water-----	100	Not rated		Not rated		Not rated	

Table 14.—Engineering Properties

(Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455241: Deer Park-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-3	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-15	0-14	NP
	3-10	Sand, fine sand	SP, SP-SM	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
	10-21	Fine sand, sand	SP, SP-SM	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
	21-80	Fine sand, sand	SP-SM, SP	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
1455242: Deer Park-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-3	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-15	0-14	NP
	3-10	Sand, fine sand	SP, SP-SM	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
	10-21	Fine sand, sand	SP, SP-SM	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
	21-80	Fine sand, sand	SP-SM, SP	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
1455243: Deer Park-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-3	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-15	0-14	NP
	3-10	Sand, fine sand	SP, SP-SM	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
	10-21	Fine sand, sand	SP, SP-SM	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
	21-80	Fine sand, sand	SP-SM, SP	A-2-4, A-3	0	0	100	100	50-95	0-35	0-14	NP
1455244: Rubicon-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	7-32	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	32-40	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
	40-80	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
1455245: Rubicon-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	7-32	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	32-40	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
	40-80	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455246: Rubicon-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	7-32	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	32-40	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
	40-80	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
1455247: Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1455248: Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1455249: Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1455250: Croswell-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	6-15	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	15-22	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	22-80	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455251: Paquin-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-12	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	12-14	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	14-17	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	17-27	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	27-34	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	34-80	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
1455252: Au Gres-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand	SM	A-2-4, A-3	0	0	95-100	85-100	45-70	5-15	0-0	NP
	7-17	Sand	SM	A-3, A-2-4	0	0	95-100	85-100	45-70	5-15	0-0	NP
	17-28	Sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	85-100	40-70	5-15	0-0	NP
	28-80	Sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	85-100	40-70	5-15	0-0	NP
1455253: Kinross-----	0-3	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	3-14	Sand	SM, SP-SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-20	NP-2
	14-22	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-27	NP-2
	22-35	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-23	NP-2
	35-80	Sand, fine sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
1455254: Deford-----	0-4	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	4-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-95	5-35	0-17	NP-2
1455255: Ingalls-----	0-4	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	4-5	Sand	SP, SP-SM	A-3	0	0	95-100	85-100	45-70	0-10	0-31	NP-4
	5-14	Sand, loamy sand, fine sand	SP-SM, SP	A-2-4, A-3	0	0	95-100	85-100	40-95	0-35	0-26	NP-6
	14-16	Sand, fine sand, loamy sand	SP-SM, SP	A-2-4, A-3	0	0	95-100	85-100	40-95	0-35	0-33	NP-6
	16-35	Loamy sand, sand, fine sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	85-100	40-95	0-35	0-26	NP-6
	35-80	Stratified loamy very fine sand, stratified silt, stratified silt loam, stratified loamy fine sand	SM, ML	A-4	0	0	100	100	60-100	35-95	0-27	NP-10

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455257: Munising-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Fine sandy loam, loamy sand, sandy loam	SM	A-2-4, A-4	0-3	0-8	95-100	85-98	40-85	10-50	0-38	NP-6
	2-10	Loamy sand, fine sandy loam, sandy loam	SM	A-2-4	0-3	0-8	95-100	85-98	62-84	21-35	0-25	NP-6
	10-14	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	20-32	1-6
	14-22	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	16-27	1-6
	22-49	Loamy sand, sandy loam, fine sandy loam, loamy fine sand	SC-SM	A-4, A-2-4	0-3	0-8	95-100	85-98	40-90	10-50	19-25	4-9
	49-63	Sandy loam, sandy clay loam, fine sandy loam	SC-SM, SC	A-6, A-4, A-2-4	0-3	0-8	95-100	85-98	50-90	25-50	21-35	6-17
	63-80	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	17-24	3-7
Yalmer-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-2-4, A-3	0	0-6	90-100	80-100	35-95	0-35	0-30	NP-3
	3-8	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-3, A-2-4	0	0-6	90-100	80-100	35-95	0-35	0-22	NP-3
	8-11	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-3, A-2-4	0	0-6	90-100	80-100	35-95	0-35	0-28	NP-3
	11-24	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-3, A-2-4	0	0-6	90-100	80-100	35-95	0-35	0-24	NP-3
	24-40	Loamy fine sand, fine sandy loam, loamy sand, sandy loam	SM	A-4, A-2-4	0	0-6	90-100	80-100	35-90	10-50	15-25	1-7
	40-66	Sandy loam, fine sandy loam	SC-SM	A-4, A-2-4	0	0-6	90-100	80-100	45-85	20-50	19-30	4-12
	66-80	Sandy loam, fine sandy loam	SC-SM	A-4, A-2-4	0	0-6	90-100	80-100	45-85	20-50	19-26	4-9
1455262: Ensley-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loam, mucky fine sandy loam, mucky sandy loam	SM, ML	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	40-84	3-12
	7-19	Fine sandy loam, sandy loam, loam	ML, SM	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	19-33	3-13
	19-80	Gravelly fine sandy loam	SM	A-4	0-4	0-15	65-85	60-80	45-75	25-50	16-27	2-10

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455263: Munising, calcareous substratum-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-25	2-6
	3-6	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	20-32	2-6
	6-23	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-27	2-6
	23-38	Loamy sand, fine sandy loam	SM	A-2-4, A-4	0-3	0-8	90-100	70-95	35-85	10-50	0-20	NP-4
	38-50	Fine sandy loam, loamy sand	SM	A-4, A-2-4	0-3	0-8	90-100	70-95	35-85	10-50	16-24	2-7
	50-63	Gravelly fine sandy loam	SC-SM	A-2-4, A-4	0-3	0-8	90-100	70-85	45-75	25-45	19-26	4-9
	63-80	Gravelly fine sandy loam	SC-SM	A-4, A-2-4	0-3	0-8	90-100	65-85	45-75	25-45	19-26	4-9
Yalmer, calcareous substratum-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Loamy sand	SM	A-2-4	0	0-6	90-100	70-100	40-75	10-30	0-30	NP-4
	2-5	Sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0-6	90-100	70-100	40-70	10-30	0-23	NP-4
	5-16	Loamy sand, sand	SM	A-2-4	0	0-6	90-100	70-100	40-70	14-26	0-30	NP-4
	16-28	Gravelly loamy sand, gravelly sand, loamy sand, sand	SM	A-2-4	0	0-6	90-100	70-100	40-70	16-32	0-25	NP-4
	28-36	Fine sandy loam, loamy sand	SM	A-2-4	0-5	0-6	90-100	70-100	45-85	23-45	0-22	NP-6
	36-62	Fine sandy loam, loamy sand	SM	A-2-4, A-4	0-5	0-6	90-100	70-100	45-85	32-45	0-24	NP-7
	62-80	Gravelly fine sandy loam, loamy sand	SM	A-4, A-2-4	0-5	0-10	85-100	65-100	45-85	23-45	0-26	NP-9
Frohling, calcareous substratum-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	---	---	---	---
	2-5	Loamy fine sand, fine sandy loam	SM	A-2-4, A-4	0	0-8	85-100	80-100	50-95	30-50	0-25	NP-4
	5-24	Fine sandy loam	SM	A-4	0	0-8	85-100	80-100	50-95	30-50	0-27	NP-4
	24-73	Loamy fine sand, fine sandy loam	SM	A-4, A-2-4	0	0-8	85-100	80-100	50-95	30-50	15-25	1-7
	73-80	Gravelly fine sandy loam	SM	A-4, A-2-4	0-3	3-15	55-95	50-90	45-70	25-45	19-25	4-7

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Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455266: Grand Sable-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-4	Very fine sandy loam, fine sand, loamy fine sand, loamy very fine sand	ML, SM	A-4	0	0	100	100	85-95	40-65	0-27	NP-2
	4-30	Loamy fine sand, loamy very fine sand	SM	A-4	0	0	100	100	85-95	40-65	0-18	NP-2
	30-32	Loamy sand, sand	SM	A-2-4	0	0-8	95-100	85-100	70-78	24-28	0-20	NP-1
	32-43	Sand	SP-SM, SP	A-3	0	0-8	95-100	85-100	40-70	0-10	0-0	NP
	43-55	Sand, gravelly sand	SP	A-3	0	0-8	95-100	85-100	35-70	0-10	0-0	NP
	55-80	Sand, gravelly sand	SP	A-3	0	0-8	95-100	85-100	35-70	0-10	0-0	NP
1455267: Grand Sable-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-4	Very fine sandy loam, fine sand, loamy fine sand, loamy very fine sand	ML, SM	A-4	0	0	100	100	85-95	40-65	0-27	NP-2
	4-30	Loamy fine sand, loamy very fine sand	SM	A-4	0	0	100	100	85-95	40-65	0-18	NP-2
	30-32	Loamy sand, sand	SM	A-2-4	0	0-8	95-100	85-100	70-78	24-28	0-20	NP-1
	32-43	Sand	SP-SM, SP	A-3	0	0-8	95-100	85-100	40-70	0-10	0-0	NP
	43-55	Sand, gravelly sand	SP	A-3	0	0-8	95-100	85-100	35-70	0-10	0-0	NP
	55-80	Sand, gravelly sand	SP	A-3	0	0-8	95-100	85-100	35-70	0-10	0-0	NP
1455268: Rhody-----	0-19	Mucky silt loam, silt loam	ML	A-4	0	0	100	100	90-100	70-90	0-74	NP-2
	19-36	Gravelly sand, sand	SP-SM, SP	A-3	0	0	70-100	65-95	20-70	0-10	0-14	NP
	36-41	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	41-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Towes-----	0-19	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	0-36	NP-3
	19-22	Sand, gravelly sand	SP-SM, SP	A-3	0	0-15	85-100	65-100	30-70	0-15	0-0	NP
	22-26	Gravelly sand, sand	SP-SM, SP	A-3	0	0-15	85-100	65-100	30-70	0-15	0-0	NP
	26-37	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	37-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455269: Waiska, very stony-----	0-1	Moderately decomposed plant material	PT	A-8	0-15	0-15	100	100	100	90-100	---	---
	1-4	Very gravelly loamy sand, cobbly loamy sand, sand	GP, SM, SP	A-1, A-3, A-2-4	0-15	0-15	50-100	25-92	15-70	0-25	0-22	NP-3
	4-8	Very cobbly loamy sand, very gravelly coarse sand, gravelly sand	SP, SP-SM, SM, GP	A-3, A-2-4, A-1	0-15	0-15	50-100	25-92	15-70	0-25	0-28	NP-3
	8-18	Very gravelly coarse sand, gravelly sand, very gravelly sand	SP-SM, SP, GP	A-3, A-1	0-15	0-15	35-75	10-55	10-45	0-20	0-14	NP
	18-80	Extremely gravelly coarse sand, very gravelly sand, gravelly sand	GP, SP, SP-SM	A-3, A-1	0-15	0-30	35-75	10-55	10-45	0-20	0-14	NP
1455273: Deerton-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-9	Sand	SP, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	40-70	0-10	0-0	NP
	9-10	Channery sand, loamy sand, sand	SP-SM, SM, SP	A-2-4, A-3	0-8	0-30	80-100	60-100	35-75	0-30	0-27	NP-2
	10-25	Sand, loamy sand, channery sand	SP, SM, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	35-70	0-30	0-23	NP-2
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---	
Au Train-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Coarse sand	SP-SM, SP	A-1	0	0	95-100	90-100	45-70	0-15	0-20	NP-1
	9-14	Coarse sand, sand	SP, SP-SM	A-1, A-3	0	0	95-100	90-100	45-70	0-15	0-27	NP-1
	14-32	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455274: Deerton-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-9	Sand	SP, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	40-70	0-10	0-0	NP
	9-10	Channery sand, loamy sand, sand	SP-SM, SM, SP	A-2-4, A-3	0-8	0-30	80-100	60-100	35-75	0-30	0-27	NP-2
	10-25	Sand, loamy sand, channery sand	SP, SM, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	35-70	0-30	0-23	NP-2
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455274: Au Train-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Coarse sand	SP-SM, SP	A-1	0	0	95-100	90-100	45-70	0-15	0-20	NP-1
	9-14	Coarse sand, sand	SP, SP-SM	A-1, A-3	0	0	95-100	90-100	45-70	0-15	0-27	NP-1
	14-32	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455276: Cookson-----	0-3	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-7	Very fine sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-4	95-100	88-100	64-100	31-59	0-33	NP-12
	7-11	Fine sandy loam, very fine sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	95-100	88-100	65-100	31-58	0-40	NP-12
	11-16	Very fine sandy loam, fine sandy loam, sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	95-100	88-100	59-97	31-59	0-36	NP-12
	16-21	Fine sandy loam, sandy loam, loamy fine sand	SM, ML	A-2-4, A-4	0	0-3	90-100	70-100	59-96	21-51	0-31	NP-12
	21-31	Sandy clay loam, fine sandy loam, sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	90-100	70-100	58-94	24-50	16-37	2-17
	31-36	Loam, sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	90-100	70-100	55-96	22-53	0-36	NP-17
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
1455277: Nahma-----	0-11	Muck	PT	A-8	0-30	0-30	100	75-100	95-100	90-100	---	---
	11-14	Mucky loam, loam, fine sandy loam	SC-SM, ML	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-84	NP-12
	14-17	Loam, fine sandy loam	SC-SM, ML	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-41	NP-13
	17-19	Loam, fine sandy loam	SC-SM, ML	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-33	NP-13
	19-24	Gravelly fine sandy loam, loam, fine sandy loam	ML, SC-SM	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-32	NP-13
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---
Ruse-----	0-7	Mucky silt loam, silt loam, sandy loam, fine sandy loam	ML, SM	A-2-4, A-4	0	0-15	85-100	65-100	45-100	20-90	0-84	NP-12
	7-11	Sandy loam, fine sandy loam	SM, ML	A-4, A-2-4	0	0-15	85-100	65-100	45-85	20-50	0-41	NP-13
	11-15	Sandy loam, fine sandy loam	ML, SM	A-4, A-2-4	0	0-15	85-100	65-100	45-85	20-50	0-33	NP-13
	15-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	In				Pct	Pct					Pct	
1455278:												
Summerville-----	0-3	Very fine sandy loam, fine sandy loam, loam	ML, SM	A-4	0-20	0-20	95-100	92-100	55-95	35-55	0-41	NP-7
	3-13	Fine sandy loam, channery fine sandy loam, very fine sandy loam	ML, SM	A-4	0-20	0-20	95-100	92-100	55-95	35-65	0-24	NP-6
	13-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455281:												
Carbondale-----	0-38	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	38-80	Mucky peat	PT	A-8	0	0	100	100	90-100	40-100	---	---
Lupton-----	0-4	Peat	PT	A-8	0	0	100	100	100	90-100	---	---
	4-80	Muck	PT	A-8	0	0	100	100	90-100	40-100	---	---
Tawas-----	0-26	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	26-80	Sand, fine sand, coarse sand, gravelly sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
1455282:												
Dawson-----	0-10	Peat	PT	A-8	0	0	100	100	100	90-100	---	---
	10-19	Mucky peat	PT	A-8	0	0	100	100	90-100	40-100	---	---
	19-38	Muck	PT	A-8	0	0	100	100	90-100	40-100	---	---
	38-80	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	75-100	50-100	40-95	0-35	0-17	NP-2
Greenwood-----	0-65	Mucky peat	PT	A-8	0	0	100	100	100	90-100	---	---
	65-80	Muck	PT	A-8	0	0	100	100	90-100	40-100	---	---
Loxley-----	0-8	Peat	PT	A-8	0	0	100	100	100	90-100	---	---
	8-80	Muck	PT	A-8	0	0	100	100	90-100	40-100	---	---
1455283:												
Chippeny-----	0-20	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	20-28	Very gravelly sandy loam, silty clay loam	CL-ML, SM, CL	A-2-4, A-4, A-6	0	0-15	100	40-100	25-100	5-95	16-51	2-29
	28-80	Bedrock	---	---	---	---	---	---	---	---	---	---
Nahma-----	0-11	Muck	PT	A-8	0-30	0-30	100	75-100	95-100	90-100	---	---
	11-14	Mucky loam, loam, fine sandy loam	SC-SM, ML	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-84	NP-12
	14-17	Loam, fine sandy loam	SC-SM, ML	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-41	NP-13
	17-19	Loam, fine sandy loam	SC-SM, ML	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-33	NP-13
	19-24	Gravelly fine sandy loam, loam, fine sandy loam	ML, SC-SM	A-4	0-30	0-30	95-100	75-100	50-95	30-75	0-32	NP-13
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455284: Histosols-----	0-91	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
Aquents.												
1455289: Jeske, bedrock terrace-----	0-3	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-21	Sand	SP, SP-SM	A-3	0	0-8	95-100	90-100	60-80	0-10	0-14	NP
	21-31	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	31-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Gongeau, bedrock terrace	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loamy sand	SM	A-2-4	0	0	95-100	92-100	45-75	10-30	0-74	NP-4
	7-18	Sand	SP, SP-SM	A-3	0	0	95-100	92-100	45-70	0-10	0-17	NP-2
	18-29	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	29-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Deerton, bedrock terrace	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-9	Sand	SP, SP-SM	A-3	0-8	0-30	80-100	60-100	40-70	0-10	0-0	NP
	9-10	Channery sand, loamy sand, sand	SP-SM, SM, SP	A-3, A-2-4	0-8	0-30	80-100	60-100	35-75	0-30	0-27	NP-2
	10-25	Loamy sand, channery sand, sand	SP, SM, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	35-70	0-30	0-23	NP-2
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455290: Jeske, bedrock terrace-----	0-3	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-21	Sand	SP, SP-SM	A-3	0	0-8	95-100	90-100	60-80	0-10	0-14	NP
	21-31	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	31-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Gongeau, bedrock terrace	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loamy sand	SM	A-2-4	0	0	95-100	92-100	45-75	10-30	0-74	NP-4
	7-18	Sand	SP, SP-SM	A-3	0	0	95-100	92-100	45-70	0-10	0-17	NP-2
	18-29	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	29-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455290: Deerton, bedrock terrace	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-9	Sand	SP, SP-SM	A-3	0-8	0-30	80-100	60-100	40-70	0-10	0-0	NP
	9-10	Channery sand, loamy sand, sand	SP-SM, SM, SP	A-3, A-2-4	0-8	0-30	80-100	60-100	35-75	0-30	0-27	NP-2
	10-25	Loamy sand, channery sand, sand	SP, SM, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	35-70	0-30	0-23	NP-2
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455291: Ruse, bedrock terrace-----	0-10	Mucky silt loam	ML	A-4	0	0-15	85-100	65-100	55-95	45-90	0-84	NP-12
	10-13	Silt loam	ML	A-4	0	0-15	85-100	65-100	55-95	45-90	0-41	NP-13
	13-19	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	19-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Ensign, bedrock terrace-----	0-10	Very fine sandy loam, fine sandy loam	ML, SM	A-4	0	0-30	75-100	55-100	35-95	20-65	20-32	1-6
	10-14	Very fine sandy loam, fine sandy loam	SM, ML	A-4	0	0-30	75-100	55-100	35-95	20-65	16-28	1-6
	14-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	18-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Nykanen, bedrock terrace	0-4	Fine sandy loam, very fine sandy loam	ML, SM	A-4, A-2-4	0	0	85-100	80-100	50-95	30-65	0-39	NP-6
	4-14	Fine sandy loam, very fine sandy loam	SM, ML	A-4, A-2-4	0	0-4	85-100	80-95	50-95	30-65	0-32	NP-6
	14-25	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	25-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455292: Ruse, bedrock terrace-----	0-10	Mucky silt loam	ML	A-4	0	0-15	85-100	65-100	55-95	45-90	0-84	NP-12
	10-13	Silt loam	ML	A-4	0	0-15	85-100	65-100	55-95	45-90	0-41	NP-13
	13-19	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	19-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455292: Ensign, bedrock terrace-----	0-10	Very fine sandy loam, fine sandy loam	ML, SM	A-4	0	0-30	75-100	55-100	35-95	20-65	20-32	1-6
	10-14	Very fine sandy loam, fine sandy loam	SM, ML	A-4	0	0-30	75-100	55-100	35-95	20-65	16-28	1-6
	14-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	18-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Nykanen, bedrock terrace	0-4	Fine sandy loam, very fine sandy loam	ML, SM	A-4, A-2-4	0	0	85-100	80-100	50-95	30-65	0-39	NP-6
	4-14	Fine sandy loam, very fine sandy loam	SM, ML	A-4, A-2-4	0	0-4	85-100	80-95	50-95	30-65	0-32	NP-6
	14-25	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	25-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455295: Evart-----	0-10	Silt loam, loam	ML	A-4	0	0-5	95-100	90-100	75-95	55-90	0-35	NP-7
	10-18	Sand, loamy fine sand	SM, SP	A-3, A-4	0	0-5	95-100	90-100	40-95	0-45	0-27	NP-2
	18-80	Gravelly sand, fine sand, sand	SP, SM, SP-SM	A-1, A-3	0	0-5	85-100	60-100	30-95	0-35	0-0	NP
Sturgeon-----	0-6	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	50-90	20-40	1-6
	6-16	Very fine sandy loam, silt loam	ML	A-4	0	0	100	100	85-100	50-90	16-26	1-6
	16-80	Sand, fine sand, loamy fine sand	SP, SM, SP-SM	A-2-4, A-3	0	0	100	100	50-95	0-35	0-18	NP-1
1455296: Deerton, dissected-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-9	Sand	SP, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	40-70	0-10	0-0	NP
	9-10	Channery sand, loamy sand, sand	SP-SM, SM, SP	A-2-4, A-3	0-8	0-30	80-100	60-100	35-75	0-30	0-27	NP-2
	10-25	Sand, loamy sand, channery sand	SP, SM, SP-SM	A-2-4, A-3	0-8	0-30	80-100	60-100	35-70	0-30	0-23	NP-2
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455296: Tokiahok, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-11	Loamy fine sand	SM	A-2-4	0-4	0-8	95-100	80-98	75-90	30-50	0-23	NP-4
	11-15	Sand, loamy fine sand	SP-SM, SM	A-2-4, A-3	0-3	0-8	95-100	80-98	35-90	5-50	0-30	NP-4
	15-24	Sand, loamy fine sand	SP-SM, SM	A-3, A-2-4	0-3	0-8	95-100	80-98	35-90	5-50	0-25	NP-4
	24-59	Sandy loam, loamy sand	SM	A-2-4, A-4	0-3	0-8	95-100	80-98	45-75	10-40	0-26	NP-9
	59-80	Sandy loam	SC-SM	A-4, A-2-4	0-3	0-8	95-100	80-98	45-70	20-40	0-26	NP-9
Trout Bay, dissected-----	0-19	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	19-34	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	34-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455298: Garlic, dissected-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
Blue Lake, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
Voelker, dissected-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-5	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	5-11	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-22	NP-3
	11-15	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0	100	95-100	50-95	5-35	0-28	NP-3
	15-31	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	31-39	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM	A-4	0	0	100	95-100	55-100	15-80	0-27	NP-10
	39-80	Stratified fine sand to loamy very fine sand to silt loam	SM, ML	A-2-4, A-4	0	0	100	95-100	40-95	10-80	0-27	NP-10

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455299: Garlic, dissected-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
Blue Lake, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
Voelker, dissected-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-5	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	5-11	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-22	NP-3
	11-15	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0	100	95-100	50-95	5-35	0-28	NP-3
	15-31	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	31-39	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM	A-4	0	0	100	95-100	55-100	15-80	0-27	NP-10
	39-80	Stratified fine sand to loamy very fine sand to silt loam	SM, ML	A-2-4, A-4	0	0	100	95-100	40-95	10-80	0-27	NP-10
1455300: Garlic, dissected-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	In				Pct	Pct					Pct	
1455300: Blue Lake, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
Voelker, dissected-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-5	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	5-11	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-22	NP-3
	11-15	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0	100	95-100	50-95	5-35	0-28	NP-3
	15-31	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	31-39	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM	A-4	0	0	100	95-100	55-100	15-80	0-27	NP-10
	39-80	Stratified fine sand to loamy very fine sand to silt loam	SM, ML	A-2-4, A-4	0	0	100	95-100	40-95	10-80	0-27	NP-10
1455302: Garlic-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
Blue Lake-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2

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Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455302: Voelker-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-5	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	5-11	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-22	NP-3
	11-15	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0	100	95-100	50-95	5-35	0-28	NP-3
	15-31	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-95	5-35	0-28	NP-3
	31-39	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM	A-4	0	0	100	95-100	55-100	15-80	0-27	NP-10
	39-80	Stratified fine sand to loamy very fine sand to silt loam	SM, ML	A-2-4, A-4	0	0	100	95-100	40-95	10-80	0-27	NP-10
1455304: Cathro-----	0-34	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	34-80	Gravelly fine sandy loam	ML, SM	A-4, A-2-4	0	0-10	75-100	55-100	30-100	15-90	16-32	2-13
Ensley-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loam, mucky fine sandy loam, mucky sandy loam	SM, ML	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	40-84	3-12
	7-19	Fine sandy loam, sandy loam, loam	ML, SM	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	19-33	3-13
	19-80	Gravelly fine sandy loam	SM	A-4	0-4	0-15	65-85	60-80	45-75	25-50	16-27	2-10
1455305: Tawas-----	0-26	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	26-80	Sand, fine sand, coarse sand, gravelly sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
Deford-----	0-4	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	4-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-95	5-35	0-17	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit  Pct	Plas- ticity index
			Unified	AASHTO	>10 in Pct	3-10 in Pct	4	10	40	200		
	In											
1455308: Fence, dissected	0-3	Very fine sandy loam	ML	A-4	0	0	100	95-100	85-95	70-80	0-35	NP-6
	3-7	Very fine sandy loam, silt loam	ML	A-4	0	0	100	95-100	85-100	70-90	0-26	NP-6
	7-11	Very fine sandy loam, silt loam	ML	A-4	0	0	100	95-100	85-100	70-90	0-33	NP-6
	11-19	Loamy very fine sand, very fine sandy loam, silt loam	ML	A-4	0	0	100	95-100	85-100	60-90	0-26	NP-6
	19-42	Loamy very fine sand, very fine sandy loam, silt loam	CL-ML	A-4	0	0	100	95-100	90-100	60-90	16-32	2-13
	42-80	Stratified very fine sand to loamy very fine sand to very fine sandy loam to silty clay loam to silt loam	SM, ML	A-4	0	0	100	95-100	50-100	25-95	0-32	NP-13
1455310: Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-4	Fine sand	SM	A-2-4	0	0	100	95-100	75-95	20-35	0-18	NP-2
	4-20	Fine sand	SM	A-2-4	0	0	100	95-100	75-95	20-35	0-23	NP-2
	20-33	Fine sand	SM	A-2-4	0	0	100	95-100	75-95	20-35	0-0	NP
	33-66	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	0-5	100	95-100	50-95	5-35	0-0	NP
Dawson-----	0-10	Peat	PT	A-8	0	0	100	100	100	90-100	---	---
	10-19	Mucky peat	PT	A-8	0	0	100	100	90-100	40-100	---	---
	19-38	Muck	PT	A-8	0	0	100	100	90-100	40-100	---	---
	38-80	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	75-100	50-100	40-95	0-35	0-17	NP-2
1455318: Munising, calcareous substratum-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-25	2-6
	3-6	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	20-32	2-6
	6-23	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-27	2-6
	23-38	Loamy sand, fine sandy loam	SM	A-2-4, A-4	0-3	0-8	90-100	70-95	35-85	10-50	0-20	NP-4
	38-50	Fine sandy loam, loamy sand	SM	A-4, A-2-4	0-3	0-8	90-100	70-95	35-85	10-50	16-24	2-7
	50-63	Gravelly fine sandy loam	SC-SM	A-2-4, A-4	0-3	0-8	90-100	70-85	45-75	25-45	19-26	4-9
	63-80	Gravelly fine sandy loam	SC-SM	A-4, A-2-4	0-3	0-8	90-100	65-85	45-75	25-45	19-26	4-9

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455318: Ensley-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loam, mucky fine sandy loam, mucky sandy loam	SM, ML	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	40-84	3-12
	7-19	Fine sandy loam, sandy loam, loam	ML, SM	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	19-33	3-13
	19-80	Gravelly fine sandy loam	SM	A-4	0-4	0-15	65-85	60-80	45-75	25-50	16-27	2-10
1455319: Munising, dissected, very stony-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Fine sandy loam, loamy sand, sandy loam	SM	A-2-4, A-4	0-3	0-8	95-100	85-98	40-85	10-50	0-38	NP-6
	2-10	Loamy sand, fine sandy loam, sandy loam	SM	A-2-4	0-3	0-8	95-100	85-98	62-84	21-35	0-25	NP-6
	10-14	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	20-32	1-6
	14-22	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	16-27	1-6
	22-49	Loamy sand, sandy loam, fine sandy loam, loamy fine sand	SC-SM	A-4, A-2-4	0-3	0-8	95-100	85-98	40-90	10-50	19-25	4-9
	49-63	Sandy loam, sandy clay loam, fine sandy loam	SC-SM, SC	A-6, A-4, A-2-4	0-3	0-8	95-100	85-98	50-90	25-50	21-35	6-17
	63-80	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	17-24	3-7

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455319: Yalmer, dissected, very stony-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-2-4, A-3	0	0-6	90-100	80-100	35-95	0-35	0-28	NP-3
	3-8	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-3, A-2-4	0	0-6	90-100	80-100	35-95	0-35	0-22	NP-3
	8-11	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-3, A-2-4	0	0-6	90-100	80-100	35-95	0-35	0-28	NP-3
	11-24	Fine sand, loamy sand, sand	SP, SP-SM, SM	A-3, A-2-4	0	0-6	90-100	80-100	35-95	0-35	0-24	NP-3
	24-40	Loamy fine sand, fine sandy loam, loamy sand, sandy loam	SM	A-4, A-2-4	0	0-6	90-100	80-100	35-90	10-50	15-25	1-7
	40-66	Sandy loam, fine sandy loam	SC-SM	A-4, A-2-4	0	0-6	90-100	80-100	45-85	20-50	19-30	4-12
	66-80	Sandy loam, fine sandy loam	SC-SM	A-4, A-2-4	0	0-6	90-100	80-100	45-85	20-50	19-26	4-9
1455320: Munising, stony-	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Fine sandy loam, loamy sand, sandy loam	SM	A-2-4, A-4	0-3	0-8	95-100	85-98	40-85	10-50	0-38	NP-6
	2-10	Loamy sand, fine sandy loam, sandy loam	SM	A-2-4	0-3	0-8	95-100	85-98	62-84	21-35	0-25	NP-6
	10-14	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	20-32	1-6
	14-22	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	16-27	1-6
	22-49	Loamy sand, sandy loam, fine sandy loam, loamy fine sand	SC-SM	A-4, A-2-4	0-3	0-8	95-100	85-98	40-90	10-50	19-25	4-9
	49-63	Sandy loam, sandy clay loam, fine sandy loam	SC-SM, SC	A-6, A-4, A-2-4	0-3	0-8	95-100	85-98	50-90	25-50	21-35	6-17
	63-80	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	17-24	3-7

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455320: Skanee, stony---	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Loamy sand, sandy loam, cobbly fine sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-24	95-100	85-100	40-85	10-50	0-33	NP-6
	8-14	Cobbly fine sandy loam, sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-24	95-100	85-100	50-85	25-50	0-33	NP-6
	14-31	Sandy loam, loamy sand, fine sandy loam	SM	A-4, A-2-4	0-3	0-15	95-100	85-100	40-85	10-50	15-25	1-7
	31-42	Sandy loam, sandy clay loam, fine sandy loam	SC-SM, SC	A-6, A-4, A-2-4	0-3	0-15	95-100	85-100	50-90	25-50	16-40	2-21
	42-80	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-15	95-100	85-100	50-85	25-50	15-25	1-7
1455324: Zeba, very stony	0-2	Cobbly fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-30	95-100	75-100	45-85	20-50	20-38	2-9
	2-5	Cobbly fine sandy loam, sandy loam	SM	A-2-4, A-4	0	0-30	95-100	75-100	45-85	20-50	0-25	NP-6
	5-13	Sandy loam, cobbly fine sandy loam	SM	A-4, A-2-4	0	0-30	95-100	75-100	45-85	20-50	17-29	2-7
	13-33	Loamy sand, sandy loam, fine sandy loam	SM	A-4, A-2-4	0	0-15	95-100	75-100	35-75	10-50	0-26	NP-9
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Jacobsville, very stony-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-9	Loamy sand, cobbly fine sandy loam, sandy loam, fine sandy loam	SM	A-2-4, A-4	0-8	0-30	90-100	70-100	35-85	10-50	0-27	NP-7
	9-23	Sandy loam, fine sandy loam, cobbly fine sandy loam	SM	A-4, A-2-4	0-8	0-30	90-100	70-100	40-85	25-50	17-28	2-10
	23-36	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-8	0-30	90-100	70-100	40-85	25-50	16-27	2-10
	36-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455326: Munising, dissected, stony-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Fine sandy loam, loamy sand, sandy loam	SM	A-2-4, A-4	0-3	0-8	95-100	85-98	40-85	10-50	0-38	NP-6
	2-10	Loamy sand, fine sandy loam, sandy loam	SM	A-2-4	0-3	0-8	95-100	85-98	62-84	21-35	0-25	NP-6
	10-14	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	20-32	1-6
	14-22	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	16-27	1-6
	22-49	Loamy sand, sandy loam, fine sandy loam, loamy fine sand	SC-SM	A-4, A-2-4	0-3	0-8	95-100	85-98	40-90	10-50	19-25	4-9
	49-63	Sandy loam, sandy clay loam, fine sandy loam	SC-SM, SC	A-6, A-4, A-2-4	0-3	0-8	95-100	85-98	50-90	25-50	21-35	6-17
	63-80	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	17-24	3-7
Abbaye, dissected, stony-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-4	Fine sandy loam, loamy fine sand, sandy loam, loamy sand	SM	A-2-4, A-4	0-8	0-8	95-100	78-100	45-85	10-55	0-32	NP-6
	4-13	Sandy loam, loamy fine sand, fine sandy loam, loamy sand	SM	A-2-4	0-8	0-8	95-100	78-100	45-85	10-55	0-23	NP-4
	13-25	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-8	0-8	95-100	78-100	45-85	20-55	16-27	1-6
	25-32	Loamy sand, sandy loam, loamy fine sand, fine sandy loam	SC-SM	A-4, A-2-4	0-8	0-8	95-100	78-100	45-85	10-55	19-26	4-9
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

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Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455327: Paquin-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-12	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	12-14	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	14-17	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	17-27	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	27-34	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
	34-80	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-0	NP
Finch-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-11	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	11-42	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	42-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	95-100	90-100	50-95	0-35	0-17	NP-2
1455339: Croswell-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	6-15	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	15-22	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	22-80	Sand	SP-SM, SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
Kinross-----	0-3	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	3-14	Sand	SM, SP-SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-20	NP-2
	14-22	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-27	NP-2
	22-35	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-23	NP-2
	35-80	Sand, fine sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
1455340: Frohling, dissected, stonny-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Fine sandy loam	SM	A-4	0	0-8	95-100	85-100	55-85	30-50	0-34	NP-6
	2-7	Sandy loam, loamy fine sand, loamy sand, fine sandy loam	SM	A-2-4, A-4	0	0-8	95-100	85-100	35-85	10-50	0-25	NP-6
	7-9	Fine sandy loam	SM	A-4	0	0-8	95-100	85-100	55-85	30-50	0-32	NP-6
	9-16	Fine sandy loam	SM	A-4	0	0-8	95-100	85-100	50-85	30-50	0-27	NP-6
	16-34	Fine sandy loam, sandy loam, loamy sand, loamy fine sand	SM	A-2-4, A-4	0	0-8	95-100	85-100	35-90	10-50	0-20	NP-4
	34-80	Fine sandy loam, sandy loam, loamy sand, loamy fine sand	SM	A-4, A-2-4	0	0-8	95-100	85-100	35-85	10-50	0-29	NP-12

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
			In		Pct	Pct					Pct	
1455340: Tokiahok, dissected, stony-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-11	Loamy fine sand	SM	A-2-4	0-4	0-8	95-100	80-98	75-90	30-50	0-23	NP-4
	11-15	Sand, loamy fine sand	SP-SM, SM	A-2-4, A-3	0-3	0-8	95-100	80-98	35-90	5-50	0-30	NP-4
	15-24	Sand, loamy fine sand	SP-SM, SM	A-3, A-2-4	0-3	0-8	95-100	80-98	35-90	5-50	0-25	NP-4
	24-59	Sandy loam, loamy sand	SM	A-2-4, A-4	0-3	0-8	95-100	80-98	45-75	10-40	0-26	NP-9
	59-80	Sandy loam	SC-SM	A-4, A-2-4	0-3	0-8	95-100	80-98	45-70	20-40	0-26	NP-9
1455341: McMaster-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-4	Cobbly sandy loam	SM	A-2-4	0-3	8-37	85-95	65-85	35-60	15-35	0-35	NP-6
	4-8	Cobbly loamy sand	SM	A-2-4	0-3	8-37	85-95	65-85	30-65	10-25	0-22	NP-2
	8-11	Cobbly sandy loam	SM	A-2-4	0-3	8-37	85-95	65-85	35-60	15-35	0-33	NP-6
	11-24	Very gravelly loamy sand	SM, SW-SM, GW-GM	A-1	0-3	8-37	50-90	30-70	10-50	5-20	0-24	NP-2
	24-39	Very gravelly coarse sand	GW-GM, GM	A-1	0-3	8-37	50-90	30-70	10-40	0-15	0-18	NP-1
	39-80	Extremely gravelly coarse sand	GW-GM, GW	A-1	0-3	8-37	50-90	30-70	5-25	0-10	0-17	NP-1
1455344: Reade-----	0-4	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	4-7	Fine sandy loam, silt loam	SM, ML	A-4	0-3	0-15	85-100	65-100	50-100	30-90	0-31	NP-10
	7-9	Fine sandy loam, loam	SM, ML	A-4	0-3	0-15	85-100	65-100	50-95	35-75	0-37	NP-10
	9-15	Fine sandy loam, silt loam	SM, ML	A-4	0-3	0-15	85-100	65-100	50-100	30-90	0-33	NP-10
	15-20	Fine sandy loam	SM	A-4, A-2-4	0-3	0-15	85-100	65-100	50-95	30-50	0-30	NP-12
	20-28	Gravelly fine sandy loam, fine sandy loam	SM	A-2-4, A-4	0-3	0-15	80-95	65-100	50-80	30-50	0-30	NP-12
	28-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455353: Charlevoix-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-5	Silt loam	ML	A-4	0	0-7	90-100	78-100	75-100	55-90	0-26	NP-6
	5-7	Silt loam	ML	A-4	0	0-7	90-100	78-100	75-100	55-90	0-29	NP-6
	7-12	Silt loam, fine sandy loam	ML, SM	A-4	0	0-7	90-100	78-100	55-90	30-90	0-29	NP-6
	12-16	Fine sandy loam, loamy fine sand	SM	A-4, A-2-4	0	2-8	90-100	78-100	55-90	30-50	15-25	1-7
	16-27	Cobbly fine sandy loam, cobbly loamy fine sand	SM	A-2-4, A-4	0	8-15	80-100	60-100	50-80	30-50	17-28	3-10
	27-80	Gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-5	8-15	80-100	60-100	45-80	25-50	15-27	1-10
Ensley-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loam, mucky fine sandy loam, mucky sandy loam	SM, ML	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	40-84	3-12
	7-19	Fine sandy loam, sandy loam, loam	ML, SM	A-2-4, A-4	0-4	0-7	90-100	85-100	50-95	25-75	19-33	3-13
	19-80	Gravelly fine sandy loam	SM	A-4	0-4	0-15	65-85	60-80	45-75	25-50	16-27	2-10
1455359: Munising-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Fine sandy loam, loamy sand, sandy loam	SM	A-2-4, A-4	0-3	0-8	95-100	85-98	40-85	10-50	0-38	NP-6
	2-10	Loamy sand, fine sandy loam, sandy loam	SM	A-2-4	0-3	0-8	95-100	85-98	62-84	21-35	0-25	NP-6
	10-14	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	20-32	1-6
	14-22	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	16-27	1-6
	22-49	Loamy sand, sandy loam, fine sandy loam, loamy fine sand	SC-SM	A-4, A-2-4	0-3	0-8	95-100	85-98	40-90	10-50	19-25	4-9
	49-63	Sandy loam, sandy clay loam, fine sandy loam	SC-SM, SC	A-6, A-4, A-2-4	0-3	0-8	95-100	85-98	50-90	25-50	21-35	6-17
	63-80	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	95-100	85-98	50-85	25-50	17-24	3-7

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455359: Abbaye-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-4	Fine sandy loam, loamy fine sand, sandy loam, loamy sand	SM	A-2-4, A-4	0-8	0-8	95-100	78-100	45-85	10-55	0-32	NP-6
	4-13	Sandy loam, loamy fine sand, fine sandy loam, loamy sand	SM	A-2-4	0-8	0-8	95-100	78-100	45-85	10-55	0-23	NP-4
	13-25	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0-8	0-8	95-100	78-100	45-85	20-55	16-27	1-6
	25-32	Loamy sand, sandy loam, loamy fine sand, fine sandy loam	SC-SM	A-4, A-2-4	0-8	0-8	95-100	78-100	45-85	10-55	19-26	4-9
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455360: Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Blue Lake-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
1455361: Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Blue Lake-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455362:												
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Blue Lake-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
1455363:												
Jeske-----	0-3	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-21	Sand	SP, SP-SM	A-3	0	0-8	95-100	90-100	60-80	0-10	0-14	NP
	21-31	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	31-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Au Train-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Coarse sand	SP-SM, SP	A-1	0	0	95-100	90-100	45-70	0-15	0-20	NP-1
	9-14	Coarse sand, sand	SP, SP-SM	A-1, A-3	0	0	95-100	90-100	45-70	0-15	0-27	NP-1
	14-32	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Gongeau-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loamy sand	SM	A-2-4	0	0	95-100	92-100	45-75	10-30	0-74	NP-4
	7-18	Sand	SP, SP-SM	A-3	0	0	95-100	92-100	45-70	0-10	0-17	NP-2
	18-29	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	29-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455365:												
Cusino-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Loamy sand	SM	A-2-4	0	0-8	90-100	85-100	40-75	10-30	0-25	NP-4
	8-10	Gravelly sand, sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4	0	0-8	75-100	70-100	35-75	0-30	0-33	NP-6
	10-17	Loamy sand, sand, gravelly sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	75-100	70-100	35-75	0-30	0-22	NP-2
	17-80	Sand, stratified gravelly sand to sand	SP-SM, SP	A-3	0	0-15	60-100	55-100	30-70	0-10	0-19	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455366: Cusino-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Loamy sand	SM	A-2-4	0	0-8	90-100	85-100	40-75	10-30	0-25	NP-4
	8-10	Gravelly sand, sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4	0	0-8	75-100	70-100	35-75	0-30	0-33	NP-6
	10-17	Loamy sand, sand, gravelly sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	75-100	70-100	35-75	0-30	0-22	NP-2
	17-80	Sand, stratified gravelly sand to sand	SP-SM, SP	A-3	0	0-15	60-100	55-100	30-70	0-10	0-19	NP-2
1455367: Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Cusino-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Loamy sand	SM	A-2-4	0	0-8	90-100	85-100	40-75	10-30	0-25	NP-4
	8-10	Gravelly sand, sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4	0	0-8	75-100	70-100	35-75	0-30	0-33	NP-6
	10-17	Loamy sand, sand, gravelly sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	75-100	70-100	35-75	0-30	0-22	NP-2
	17-80	Sand, stratified gravelly sand to sand	SP-SM, SP	A-3	0	0-15	60-100	55-100	30-70	0-10	0-19	NP-2
1455368: Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Cusino-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Loamy sand	SM	A-2-4	0	0-8	90-100	85-100	40-75	10-30	0-25	NP-4
	8-10	Gravelly sand, sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4	0	0-8	75-100	70-100	35-75	0-30	0-33	NP-6
	10-17	Loamy sand, sand, gravelly sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	75-100	70-100	35-75	0-30	0-22	NP-2
	17-80	Sand, stratified gravelly sand to sand	SP-SM, SP	A-3	0	0-15	60-100	55-100	30-70	0-10	0-19	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455369:												
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Cusino-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Loamy sand	SM	A-2-4	0	0-8	90-100	85-100	40-75	10-30	0-25	NP-4
	8-10	Gravelly sand, sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4	0	0-8	75-100	70-100	35-75	0-30	0-33	NP-6
	10-17	Loamy sand, sand, gravelly sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	75-100	70-100	35-75	0-30	0-22	NP-2
	17-80	Sand, stratified gravelly sand to sand	SP-SM, SP	A-3	0	0-15	60-100	55-100	30-70	0-10	0-19	NP-2
1455370:												
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Cusino-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Loamy sand	SM	A-2-4	0	0-8	90-100	85-100	40-75	10-30	0-25	NP-4
	8-10	Gravelly sand, sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4	0	0-8	75-100	70-100	35-75	0-30	0-33	NP-6
	10-17	Loamy sand, sand, gravelly sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	75-100	70-100	35-75	0-30	0-22	NP-2
	17-80	Sand, stratified gravelly sand to sand	SP-SM, SP	A-3	0	0-15	60-100	55-100	30-70	0-10	0-19	NP-2
1455371:												
Halfaday-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Loamy sand, sand	SP, SM	A-3, A-2-4	0	0	95-100	85-100	40-75	0-30	0-20	NP-2
	9-10	Loamy sand, sand	SP, SM	A-3, A-2-4	0	0	95-100	85-100	40-75	0-30	0-27	NP-2
	10-35	Sand	SP	A-3	0	0	95-100	85-100	40-70	0-10	0-22	NP-1
	35-80	Sand	SP	A-3	0	0	95-100	85-100	40-70	0-10	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
					Pct	Pct					Pct	
1455372:												
Shell Drake-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Highly decomposed plant material			0	0	100	100	90-100	40-100	---	---
	3-4	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-10	0-0	NP
	4-80	Sand	SP, SP-SM	A-3	0	0	100	100	50-70	0-10	0-0	NP
1455380:												
Trout Bay-----	0-19	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	19-34	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	34-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Gongea-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loamy sand	SM	A-2-4	0	0	95-100	92-100	45-75	10-30	0-74	NP-4
	7-18	Sand	SP, SP-SM	A-3	0	0	95-100	92-100	45-70	0-10	0-17	NP-2
	18-29	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	29-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Shingleton-----	0-1	Sand, loamy sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-37	NP-4
	1-7	Sand, loamy sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-23	NP-4
	7-8	Loamy sand, sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-30	NP-4
	8-11	Loamy sand, sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-25	NP-4
	11-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455382:												
Kalkaska, severely burned	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1455383:												
Kalkaska, severely burned	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455386:												
Trout Bay-----	0-19	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	19-34	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	34-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Lupton-----	0-4	Peat	PT	A-8	0	0	100	100	100	90-100	---	---
	4-80	Muck	PT	A-8	0	0	100	100	90-100	40-100	---	---
Gongeau-----	0-5	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	5-7	Mucky loamy sand	SM	A-2-4	0	0	95-100	92-100	45-75	10-30	0-74	NP-4
	7-18	Sand	SP, SP-SM	A-3	0	0	95-100	92-100	45-70	0-10	0-17	NP-2
	18-29	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	29-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455387:												
Garlic-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
1455388:												
Garlic-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
1455389:												
Garlic-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455390: Escanaba-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Loamy sand, sand, loamy fine sand, fine sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	90-100	85-100	40-95	0-50	0-35	NP-3
	3-6	Loamy fine sand, fine sand, sand	SM, SP-SM, SP	A-3, A-2-4	0	0-8	90-100	85-100	40-95	0-50	0-22	NP-3
	6-26	Fine sand, loamy fine sand, sand, loamy sand	SM, SP-SM, SP	A-3, A-2-4	0	0-8	90-100	85-100	40-95	0-50	0-24	NP-3
	26-35	Loamy fine sand, fine sandy loam, loamy sand	SM, SC-SM	A-4, A-2-4	0	0-8	90-100	85-100	40-95	10-50	17-27	3-10
	35-42	Fine sandy loam, sandy loam	CL-ML, SC-SM	A-4, A-2-4	0	0-8	90-100	85-100	50-85	25-50	20-30	6-12
	42-80	Sandy loam, gravelly fine sandy loam	SC-SM, SM	A-4, A-2-4	0	0-25	70-100	65-95	45-65	25-45	17-26	3-9
Greylock-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	0-31	NP-4
	6-7	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	0-25	NP-4
	7-9	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	9-19	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	19-26	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	15-23	1-6
	26-34	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	17-27	3-10
	34-80	Sandy loam, gravelly fine sandy loam	SM	A-4, A-2-4	0	0-15	85-100	80-95	45-85	20-50	17-26	3-9
1455391: Escanaba-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Loamy sand, sand, loamy fine sand, fine sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	90-100	85-100	40-95	0-50	0-35	NP-3
	3-6	Loamy fine sand, fine sand, sand	SM, SP-SM, SP	A-3, A-2-4	0	0-8	90-100	85-100	40-95	0-50	0-22	NP-3
	6-26	Fine sand, loamy fine sand, sand, loamy sand	SM, SP-SM, SP	A-3, A-2-4	0	0-8	90-100	85-100	40-95	0-50	0-24	NP-3
	26-35	Loamy fine sand, fine sandy loam, loamy sand	SM, SC-SM	A-4, A-2-4	0	0-8	90-100	85-100	40-95	10-50	17-27	3-10
	35-42	Fine sandy loam, sandy loam	CL-ML, SC-SM	A-4, A-2-4	0	0-8	90-100	85-100	50-85	25-50	20-30	6-12
	42-80	Sandy loam, gravelly fine sandy loam	SC-SM, SM	A-4, A-2-4	0	0-25	70-100	65-95	45-65	25-45	17-26	3-9

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455391: Greylock-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	0-31	NP-4
	6-7	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	0-25	NP-4
	7-9	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	9-19	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	19-26	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	15-23	1-6
	26-34	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	17-27	3-10
	34-80	Sandy loam, gravelly fine sandy loam	SM	A-4, A-2-4	0	0-15	85-100	80-95	45-85	20-50	17-26	3-9
1455392: Escanaba-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Loamy sand, sand, loamy fine sand, fine sand	SP, SP-SM, SM	A-2-4, A-3	0	0-8	90-100	85-100	40-95	0-50	0-35	NP-3
	3-6	Loamy fine sand, fine sand, sand	SM, SP-SM, SP	A-3, A-2-4	0	0-8	90-100	85-100	40-95	0-50	0-22	NP-3
	6-26	Fine sand, loamy fine sand, sand, loamy sand	SM, SP-SM, SP	A-3, A-2-4	0	0-8	90-100	85-100	40-95	0-50	0-24	NP-3
	26-35	Loamy fine sand, fine sandy loam, loamy sand	SM, SC-SM	A-4, A-2-4	0	0-8	90-100	85-100	40-95	10-50	17-27	3-10
	35-42	Fine sandy loam, sandy loam	CL-ML, SC-SM	A-4, A-2-4	0	0-8	90-100	85-100	50-85	25-50	20-30	6-12
	42-80	Sandy loam, gravelly fine sandy loam	SC-SM, SM	A-4, A-2-4	0	0-25	70-100	65-95	45-65	25-45	17-26	3-9

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455392: Greylock-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	0-31	NP-4
	6-7	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	0-25	NP-4
	7-9	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	9-19	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	19-26	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	15-23	1-6
	26-34	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	17-27	3-10
	34-80	Sandy loam, gravelly fine sandy loam	SM	A-4, A-2-4	0	0-15	85-100	80-95	45-85	20-50	17-26	3-9
1455395: Greylock-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	0-31	NP-4
	6-7	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	0-25	NP-4
	7-9	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	9-19	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	19-26	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	15-23	1-6
	26-34	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	17-27	3-10
	34-80	Sandy loam, gravelly fine sandy loam	SM	A-4, A-2-4	0	0-15	85-100	80-95	45-85	20-50	17-26	3-9

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Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455396: Greylock-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	0-31	NP-4
	6-7	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	0-25	NP-4
	7-9	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	9-19	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	19-26	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	15-23	1-6
	26-34	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	17-27	3-10
	34-80	Sandy loam, gravelly fine sandy loam	SM	A-4, A-2-4	0	0-15	85-100	80-95	45-85	20-50	17-26	3-9
1455397: Finch-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-11	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	11-42	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	42-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	95-100	90-100	50-95	0-35	0-17	NP-2
Kinross-----	0-3	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	3-14	Sand	SM, SP-SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-20	NP-2
	14-22	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-27	NP-2
	22-35	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-23	NP-2
	35-80	Sand, fine sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
1455402: Kalkaska, dissected-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455402: Blue Lake, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
1455403: Kalkaska, dissected-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Blue Lake, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
1455404: Kalkaska, dissected-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Blue Lake, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2

Table 14.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455408:												
Spot-----	0-2	Peat	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
Finch-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-11	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	11-42	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	42-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	95-100	90-100	50-95	0-35	0-17	NP-2
1455409:												
Finch-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-11	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	11-42	Sand	SP-SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-70	0-10	0-14	NP
	42-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	95-100	90-100	50-95	0-35	0-17	NP-2
1455410:												
Munising, calcareous substratum, dissected-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-25	2-6
	3-6	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	20-32	2-6
	6-23	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-27	2-6
	23-38	Loamy sand, fine sandy loam	SM	A-2-4, A-4	0-3	0-8	90-100	70-95	35-85	10-50	0-20	NP-4
	38-50	Fine sandy loam, loamy sand	SM	A-4, A-2-4	0-3	0-8	90-100	70-95	35-85	10-50	16-24	2-7
	50-63	Gravelly fine sandy loam	SC-SM	A-2-4, A-4	0-3	0-8	90-100	70-85	45-75	25-45	19-26	4-9
	63-80	Gravelly fine sandy loam	SC-SM	A-4, A-2-4	0-3	0-8	90-100	65-85	45-75	25-45	19-26	4-9

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455410: Frohling, calcareous substratum, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	---	---	---	---
	2-5	Loamy fine sand, fine sandy loam	SM	A-2-4, A-4	0	0-8	85-100	80-100	50-95	30-50	0-25	NP-4
	5-24	Fine sandy loam	SM	A-4	0	0-8	85-100	80-100	50-95	30-50	0-27	NP-4
	24-73	Loamy fine sand, fine sandy loam	SM	A-4, A-2-4	0	0-8	85-100	80-100	50-95	30-50	15-25	1-7
	73-80	Gravelly fine sandy loam	SM	A-4, A-2-4	0-3	3-15	55-95	50-90	45-70	25-45	19-25	4-7
Cookson, dissected-----	0-3	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-7	Very fine sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-4	95-100	88-100	64-100	31-59	0-33	NP-12
	7-11	Fine sandy loam, very fine sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	95-100	88-100	65-100	31-58	0-40	NP-12
	11-16	Very fine sandy loam, fine sandy loam, sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	95-100	88-100	59-97	31-59	0-36	NP-12
	16-21	Fine sandy loam, sandy loam, loamy fine sand	SM, ML	A-2-4, A-4	0	0-3	90-100	70-100	59-96	21-51	0-31	NP-12
	21-31	Sandy clay loam, fine sandy loam, sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	90-100	70-100	58-94	24-50	16-37	2-17
	31-36	Loam, sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	90-100	70-100	55-96	22-53	0-36	NP-17
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
1455411: Frohling, calcareous substratum, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	---	---	---	---
	2-5	Loamy fine sand, fine sandy loam	SM	A-2-4, A-4	0	0-8	85-100	80-100	50-95	30-50	0-25	NP-4
	5-24	Fine sandy loam	SM	A-4	0	0-8	85-100	80-100	50-95	30-50	0-27	NP-4
	24-73	Loamy fine sand, fine sandy loam	SM	A-4, A-2-4	0	0-8	85-100	80-100	50-95	30-50	15-25	1-7
	73-80	Gravelly fine sandy loam	SM	A-4, A-2-4	0-3	3-15	55-95	50-90	45-70	25-45	19-25	4-7

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455411: Garlic, dissected-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-9	Sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-25	NP-6
	9-11	Fine sand, sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-27	NP-2
	11-20	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-23	NP-2
	20-29	Fine sand, sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Fine sand, sand	SP-SM, SM, SP	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
Cookson, dissected-----	0-3	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-7	Very fine sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-4	95-100	88-100	64-100	31-59	0-33	NP-12
	7-11	Fine sandy loam, very fine sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	95-100	88-100	65-100	31-58	0-40	NP-12
	11-16	Very fine sandy loam, fine sandy loam, sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	95-100	88-100	59-97	31-59	0-36	NP-12
	16-21	Fine sandy loam, sandy loam, loamy fine sand	SM, ML	A-2-4, A-4	0	0-3	90-100	70-100	59-96	21-51	0-31	NP-12
	21-31	Sandy clay loam, fine sandy loam, sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	90-100	70-100	58-94	24-50	16-37	2-17
	31-36	Loam, sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	90-100	70-100	55-96	22-53	0-36	NP-17
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
1455412: Munising, calcareous substratum, dissected-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-25	2-6
	3-6	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	20-32	2-6
	6-23	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-27	2-6
	23-38	Loamy sand, fine sandy loam	SM	A-2-4, A-4	0-3	0-8	90-100	70-95	35-85	10-50	0-20	NP-4
	38-50	Fine sandy loam, loamy sand	SM	A-4, A-2-4	0-3	0-8	90-100	70-95	35-85	10-50	16-24	2-7
	50-63	Gravelly fine sandy loam	SC-SM	A-2-4, A-4	0-3	0-8	90-100	70-85	45-75	25-45	19-26	4-9
	63-80	Gravelly fine sandy loam	SC-SM	A-4, A-2-4	0-3	0-8	90-100	65-85	45-75	25-45	19-26	4-9

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455412: Yalmer, calcareous substratum, dissected-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Loamy sand	SM	A-2-4	0	0-6	90-100	70-100	40-75	10-30	0-30	NP-4
	2-5	Sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0-6	90-100	70-100	40-70	10-30	0-23	NP-4
	5-16	Loamy sand, sand	SM	A-2-4	0	0-6	90-100	70-100	40-70	14-26	0-30	NP-4
	16-28	Gravelly loamy sand, gravelly sand, loamy sand, sand	SM	A-2-4	0	0-6	90-100	70-100	40-70	16-32	0-25	NP-4
	28-36	Fine sandy loam, loamy sand	SM	A-2-4	0-5	0-6	90-100	70-100	45-85	23-45	0-22	NP-6
	36-62	Fine sandy loam, loamy sand	SM	A-2-4, A-4	0-5	0-6	90-100	70-100	45-85	32-45	0-24	NP-7
	62-80	Gravelly fine sandy loam, loamy sand	SM	A-4, A-2-4	0-5	0-10	85-100	65-100	45-85	23-45	0-26	NP-9
Frohling, calcareous substratum, dissected-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	---	---	---	---
	2-5	Loamy fine sand, fine sandy loam	SM	A-2-4, A-4	0	0-8	85-100	80-100	50-95	30-50	0-25	NP-4
	5-24	Fine sandy loam	SM	A-4	0	0-8	85-100	80-100	50-95	30-50	0-27	NP-4
	24-73	Loamy fine sand, fine sandy loam	SM	A-4, A-2-4	0	0-8	85-100	80-100	50-95	30-50	15-25	1-7
	73-80	Gravelly fine sandy loam	SM	A-4, A-2-4	0-3	3-15	55-95	50-90	45-70	25-45	19-25	4-7
1455413: Munising, calcareous substratum-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-25	2-6
	3-6	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	20-32	2-6
	6-23	Fine sandy loam	SM	A-4	0-3	0-8	95-100	78-95	55-85	30-50	17-27	2-6
	23-38	Loamy sand, fine sandy loam	SM	A-2-4, A-4	0-3	0-8	90-100	70-95	35-85	10-50	0-20	NP-4
	38-50	Fine sandy loam, loamy sand	SM	A-4, A-2-4	0-3	0-8	90-100	70-95	35-85	10-50	16-24	2-7
	50-63	Gravelly fine sandy loam	SC-SM	A-2-4, A-4	0-3	0-8	90-100	70-85	45-75	25-45	19-26	4-9
	63-80	Gravelly fine sandy loam	SC-SM	A-4, A-2-4	0-3	0-8	90-100	65-85	45-75	25-45	19-26	4-9

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455413: Cookson-----	0-3	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-7	Very fine sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-4	95-100	88-100	64-100	31-59	0-33	NP-12
	7-11	Fine sandy loam, very fine sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	95-100	88-100	65-100	31-58	0-40	NP-12
	11-16	Very fine sandy loam, fine sandy loam, sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	95-100	88-100	59-97	31-59	0-36	NP-12
	16-21	Fine sandy loam, sandy loam, loamy fine sand	SM, ML	A-2-4, A-4	0	0-3	90-100	70-100	59-96	21-51	0-31	NP-12
	21-31	Sandy clay loam, fine sandy loam, sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	90-100	70-100	58-94	24-50	16-37	2-17
	31-36	Loam, sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	90-100	70-100	55-96	22-53	0-36	NP-17
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
1455416: Furlong-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Sand	SP, SP-SM	A-3	0	0	95-100	85-100	45-70	0-10	0-27	NP-2
	2-5	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3	0	0	95-100	85-100	45-75	0-30	0-25	NP-6
	5-7	Sand, loamy sand	SP, SM, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-75	0-30	0-32	NP-6
	7-19	Sand, loamy sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	85-100	40-75	0-30	0-27	NP-6
	19-22	Sand	SP-SM, SP	A-3	0	0	95-100	85-100	40-75	0-10	0-17	NP-2
	22-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Shingleton-----	0-1	Sand, loamy sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-37	NP-4
	1-7	Sand, loamy sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-23	NP-4
	7-8	Loamy sand, sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-30	NP-4
	8-11	Loamy sand, sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-25	NP-4
	11-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455417: Furlong-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-2	Sand	SP, SP-SM	A-3	0	0	95-100	85-100	45-70	0-10	0-27	NP-2
	2-5	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3	0	0	95-100	85-100	45-75	0-30	0-25	NP-6
	5-7	Sand, loamy sand	SP, SM, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-75	0-30	0-32	NP-6
	7-19	Sand, loamy sand	SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	85-100	40-75	0-30	0-27	NP-6
	19-22	Sand	SP-SM, SP	A-3	0	0	95-100	85-100	40-75	0-10	0-17	NP-2
	22-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
			In		Pct	Pct					Pct	
1455417: Shingleton-----	0-1	Sand, loamy sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-37	NP-4
	1-7	Sand, loamy sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-23	NP-4
	7-8	Loamy sand, sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-30	NP-4
	8-11	Loamy sand, sand	SM	A-3, A-2-4	0	0-8	95-100	85-100	47-75	7-30	0-25	NP-4
	11-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455421: Steuben-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Fine sandy loam	SM	A-4	0-3	0-8	90-100	75-100	55-85	30-50	16-24	1-4
	8-16	Fine sandy loam	SM	A-4	0-3	0-8	90-100	75-100	55-85	30-50	22-36	3-9
	16-21	Fine sandy loam	SM	A-4	0-3	0-8	90-100	75-100	55-85	30-50	18-31	3-9
	21-40	Loamy fine sand, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	90-100	75-100	50-90	30-50	16-24	2-7
	40-45	Loamy sand, sand	SM, SP-SM	A-2-4, A-3	0-3	0-8	90-100	70-100	45-75	0-30	0-17	NP-2
	45-80	Sand, gravelly sand	SP	A-3	0-3	0-8	90-100	70-100	35-70	0-10	0-0	NP
Blue Lake-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1455422: Steuben-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-8	Fine sandy loam	SM	A-4	0-3	0-8	90-100	75-100	55-85	30-50	16-24	1-4
	8-16	Fine sandy loam	SM	A-4	0-3	0-8	90-100	75-100	55-85	30-50	22-36	3-9
	16-21	Fine sandy loam	SM	A-4	0-3	0-8	90-100	75-100	55-85	30-50	18-31	3-9
	21-40	Loamy fine sand, fine sandy loam	SM	A-4, A-2-4	0-3	0-8	90-100	75-100	50-90	30-50	16-24	2-7
	40-45	Loamy sand, sand	SM, SP-SM	A-2-4, A-3	0-3	0-8	90-100	70-100	45-75	0-30	0-17	NP-2
	45-80	Sand, gravelly sand	SP	A-3	0-3	0-8	90-100	70-100	35-70	0-10	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455422: Blue Lake-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	2-7	Sand, loamy sand	SM	A-2-4	0	0-8	95-100	85-100	40-75	10-30	0-14	NP
	7-9	Loamy sand, sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	0-30	0-14	NP
	27-80	Sand, loamy sand, loamy fine sand, sandy loam	SP-SM, SM	A-2-4	0	0-8	95-100	85-100	40-75	5-50	0-17	NP-2
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1455425: Greylock-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Sandy loam, fine sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	0-31	NP-4
	6-7	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	0-25	NP-4
	7-9	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	9-19	Fine sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	90-100	85-95	50-85	25-50	16-33	1-6
	19-26	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	15-23	1-6
	26-34	Sandy loam, fine sandy loam, loamy sand	SM	A-4, A-2-4	0	0-15	90-100	85-95	40-85	10-50	17-27	3-10
	34-80	Sandy loam, gravelly fine sandy loam	SM	A-4, A-2-4	0	0-15	85-100	80-95	45-85	20-50	17-26	3-9

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455425: Cookson-----	0-3	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-7	Very fine sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-4	95-100	88-100	64-100	31-59	0-33	NP-12
	7-11	Fine sandy loam, very fine sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	95-100	88-100	65-100	31-58	0-40	NP-12
	11-16	Very fine sandy loam, fine sandy loam, sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	95-100	88-100	59-97	31-59	0-36	NP-12
	16-21	Fine sandy loam, sandy loam, loamy fine sand	SM, ML	A-2-4, A-4	0	0-3	90-100	70-100	59-96	21-51	0-31	NP-12
	21-31	Sandy clay loam, fine sandy loam, sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	90-100	70-100	58-94	24-50	16-37	2-17
	31-36	Loam, sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	90-100	70-100	55-96	22-53	0-36	NP-17
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
1455431: Rubicon, severely burned	0-3	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	3-28	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	28-36	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
	36-80	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
1455432: Rubicon, severely burned	0-3	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	3-28	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	95-100	80-100	40-70	0-15	0-0	NP
	28-36	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
	36-80	Coarse sand, sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	95-100	80-100	40-70	0-15	0-0	NP
1455433: Wurtsmith-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-4	Sand, loamy sand	SP, SM	A-3, A-2-4	0	0	95-100	80-100	35-75	0-30	0-20	NP-2
	4-24	Coarse sand, sand	SP, SP-SM	A-1, A-3	0	0	95-100	80-100	35-70	0-10	0-0	NP
	24-80	Sand, coarse sand	SP-SM, SP	A-3, A-1	0	0	95-100	80-100	35-70	0-10	0-0	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455433: Deford-----	0-4	Muck	PT	A-8	0	0	100	100	100	90-100	---	---
	4-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-95	5-35	0-17	NP-2
1455434: Shelldrake-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Highly decomposed plant material			0	0	100	100	90-100	40-100	---	---
	3-4	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-10	0-0	NP
	4-80	Sand	SP, SP-SM	A-3	0	0	100	100	50-70	0-10	0-0	NP
1455435: Shelldrake-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-3	Highly decomposed plant material			0	0	100	100	90-100	40-100	---	---
	3-4	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-10	0-0	NP
	4-80	Sand	SP, SP-SM	A-3	0	0	100	100	50-70	0-10	0-0	NP
1455436: Cookson, dissected-----	0-3	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	3-7	Very fine sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-4	95-100	88-100	64-100	31-59	0-33	NP-12
	7-11	Fine sandy loam, very fine sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	95-100	88-100	65-100	31-58	0-40	NP-12
	11-16	Very fine sandy loam, fine sandy loam, sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	95-100	88-100	59-97	31-59	0-36	NP-12
	16-21	Fine sandy loam, sandy loam, loamy fine sand	SM, ML	A-2-4, A-4	0	0-3	90-100	70-100	59-96	21-51	0-31	NP-12
	21-31	Sandy clay loam, fine sandy loam, sandy loam, silt loam	SM, ML	A-4, A-2-4	0	0-3	90-100	70-100	58-94	24-50	16-37	2-17
	31-36	Loam, sandy loam, fine sandy loam, silt loam	ML, SM	A-4, A-2-4	0	0-3	90-100	70-100	55-96	22-53	0-36	NP-17
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1455436: Nykanen, dissected-----	0-4	Fine sandy loam, very fine sandy loam	ML, SM	A-4, A-2-4	0	0	85-100	80-100	50-95	30-65	0-39	NP-6
	4-14	Fine sandy loam, very fine sandy loam	SM, ML	A-4, A-2-4	0	0-4	85-100	80-95	50-95	30-65	0-32	NP-6
	14-25	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	25-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1455437: Dillingham-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-8	Loamy sand, loamy fine sand	SM	A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-21	NP-2
	8-11	Loamy fine sand, loamy sand	SM, SP-SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-28	NP-2
	11-21	Loamy fine sand, loamy sand	SM, SP-SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-23	NP-2
	21-31	Fine sand, loamy fine sand, sand, loamy sand	SM, SP-SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-18	NP-2
	31-80	Stratified sand to loamy sand, sand	SM, SP-SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-18	NP-2
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1455438: Dillingham-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-8	Loamy sand, loamy fine sand	SM	A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-21	NP-2
	8-11	Loamy fine sand, loamy sand	SM, SP-SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-28	NP-2
	11-21	Loamy fine sand, loamy sand	SM, SP-SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-23	NP-2
	21-31	Fine sand, loamy fine sand, sand, loamy sand	SM, SP-SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-18	NP-2
	31-80	Stratified sand to loamy sand, sand	SM, SP-SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-18	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1455438:												
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-14	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-14	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-14	NP
1455439:												
Dillingham-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-8	Loamy sand, loamy fine sand	SM	A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-21	NP-2
	8-11	Loamy fine sand, loamy sand	SM, SP-SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-28	NP-2
	11-21	Loamy fine sand, loamy sand	SM, SP-SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-23	NP-2
	21-31	Fine sand, loamy fine sand, sand, loamy sand	SM, SP-SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-18	NP-2
	31-80	Stratified sand to loamy sand, sand	SM, SP-SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-18	NP-2
Kalkaska-----	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-18	NP-2
	6-8	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-27	NP-2
	8-16	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
1671282:												
Stutts-----	0-0	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	0-2	Fine sandy loam, sandy loam	SM	A-2-4, A-4	0	0	96-100	90-100	55-85	25-50	0-39	NP-6
	2-7	Fine sandy loam, sandy loam	SM	A-2-4, A-4	0	0	96-100	90-100	55-85	25-50	0-35	NP-6
	7-9	Fine sandy loam, sandy loam	SM	A-4	0	0	96-100	90-100	55-85	25-50	0-35	NP-6
	9-13	Sandy loam, fine sandy loam	SM	A-4	0	0	96-100	90-100	69-82	36-45	0-35	NP-6
	13-19	Fine sandy loam, sandy loam	SM	A-4	0	0	96-100	90-100	70-82	37-47	0-28	NP-6
	19-80	Sand	SP-SM	A-2-4	0	0	92-100	84-100	64-80	5-11	0-16	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
			In		Pct	Pct					Pct	
1671282: Kalkaska-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-23	NP-4
	6-8	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-30	NP-4
	8-12	Loamy sand, sand	SM, SP-SM	A-3, A-2-4	0	0-5	95-100	85-100	50-75	5-30	0-26	NP-4
	12-23	Sand	SM	A-3, A-2-4	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	23-38	Sand	SM	A-3, A-2-4	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	38-80	Sand	SM	A-2-4, A-3	0	0-5	95-100	75-100	50-70	5-15	0-14	NP
1671283: Stutts-----	0-0	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	0-2	Fine sandy loam, sandy loam	SM	A-2-4, A-4	0	0	96-100	90-100	55-85	25-50	0-39	NP-6
	2-7	Fine sandy loam, sandy loam	SM	A-2-4, A-4	0	0	96-100	90-100	55-85	25-50	0-35	NP-6
	7-9	Fine sandy loam, sandy loam	SM	A-4	0	0	96-100	90-100	55-85	25-50	0-35	NP-6
	9-13	Sandy loam, fine sandy loam	SM	A-4	0	0	96-100	90-100	69-82	36-45	0-35	NP-6
	13-19	Fine sandy loam, sandy loam	SM	A-4	0	0	96-100	90-100	70-82	37-47	0-28	NP-6
	19-80	Sand	SP-SM	A-2-4	0	0	92-100	84-100	64-80	5-11	0-16	NP-2
Kalkaska-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-23	NP-4
	6-8	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-30	NP-4
	8-12	Loamy sand, sand	SM, SP-SM	A-3, A-2-4	0	0-5	95-100	85-100	50-75	5-30	0-26	NP-4
	12-23	Sand	SM	A-3, A-2-4	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	23-38	Sand	SM	A-3, A-2-4	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	38-80	Sand	SM	A-2-4, A-3	0	0-5	95-100	75-100	50-70	5-15	0-14	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1671284: Stutts-----	0-0	Highly decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	0-2	Fine sandy loam, sandy loam	SM	A-2-4, A-4	0	0	96-100	90-100	55-85	25-50	0-39	NP-6
	2-7	Fine sandy loam, sandy loam	SM	A-2-4, A-4	0	0	96-100	90-100	55-85	25-50	0-35	NP-6
	7-9	Fine sandy loam, sandy loam	SM	A-4	0	0	96-100	90-100	55-85	25-50	0-35	NP-6
	9-13	Sandy loam, fine sandy loam	SM	A-4	0	0	96-100	90-100	69-82	36-45	0-35	NP-6
	13-19	Fine sandy loam, sandy loam	SM	A-4	0	0	96-100	90-100	70-82	37-47	0-28	NP-6
	19-80	Sand	SP-SM	A-2-4	0	0	92-100	84-100	64-80	5-11	0-16	NP-2
Kalkaska-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	90-100	---	---
	1-6	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-23	NP-4
	6-8	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-30	NP-4
	8-12	Loamy sand, sand	SM, SP-SM	A-3, A-2-4	0	0-5	95-100	85-100	50-75	5-30	0-26	NP-4
	12-23	Sand	SM	A-3, A-2-4	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	23-38	Sand	SM	A-3, A-2-4	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	38-80	Sand	SM	A-2-4, A-3	0	0-5	95-100	75-100	50-70	5-15	0-14	NP

Table 15.—Physical Soil Properties

(Sand, silt, and clay values are shown either as a range or as a representative value. Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455241: Deer Park-----	0-2	---	---	---	---	6.0-20.0	0.35-0.45	---	50-90
	2-3	85-100	0-10	0-2	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.0	2.0-5.0
	3-10	85-100	0-10	0-2	1.20-1.50	6.0-20.0	0.07-0.09	0.0-0.0	0.5-2.0
	10-21	85-100	0-10	0-2	1.30-1.60	6.0-20.0	0.06-0.08	0.0-0.0	0.5-3.0
	21-80	85-100	0-10	0-2	1.50-1.60	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
1455242: Deer Park-----	0-2	---	---	---	---	6.0-20.0	0.35-0.45	---	50-90
	2-3	85-100	0-10	0-2	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.0	2.0-5.0
	3-10	85-100	0-10	0-2	1.20-1.50	6.0-20.0	0.07-0.09	0.0-0.0	0.5-2.0
	10-21	85-100	0-10	0-2	1.30-1.60	6.0-20.0	0.06-0.08	0.0-0.0	0.5-3.0
	21-80	85-100	0-10	0-2	1.50-1.60	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
1455243: Deer Park-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-3	85-100	0-10	0-2	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.0	2.0-5.0
	3-10	85-100	0-10	0-2	1.20-1.50	6.0-20.0	0.07-0.09	0.0-0.0	0.5-2.0
	10-21	85-100	0-10	0-2	1.30-1.60	6.0-20.0	0.06-0.08	0.0-0.0	0.5-3.0
	21-80	85-100	0-10	0-2	1.50-1.60	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
1455244: Rubicon-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-7	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.06-0.12	0.0-0.0	0.1-1.0
	7-32	85-100	0-14	0-3	1.30-1.60	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	32-40	85-100	0-14	0-3	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
	40-80	85-100	0-14	0-2	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
1455245: Rubicon-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-7	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.06-0.12	0.0-0.0	0.1-1.0
	7-32	85-100	0-14	0-3	1.30-1.60	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	32-40	85-100	0-14	0-3	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
	40-80	85-100	0-14	0-2	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
1455246: Rubicon-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-7	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.06-0.12	0.0-0.0	0.1-1.0
	7-32	85-100	0-14	0-3	1.30-1.60	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	32-40	85-100	0-14	0-3	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
	40-80	85-100	0-14	0-2	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
1455247: Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455248: Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455249: Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455250: Crowell-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-6	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-15	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	15-22	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.0-0.5
	22-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.0-0.5
1455251: Paquin-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-12	85-100	0-10	0-3	1.35-1.45	6.0-20.0	0.06-0.10	0.0-0.0	0.5-2.0
	12-14	85-100	0-10	0-3	1.40-1.65	6.0-20.0	0.06-0.08	0.0-0.0	2.0-5.0
	14-17	85-100	0-10	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	1.0-5.0
	17-27	85-100	0-10	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	1.0-5.0
	27-34	85-100	0-10	0-1	1.45-1.60	6.0-20.0	0.06-0.08	0.0-0.0	0.3-1.0
	34-80	85-100	0-10	0-1	1.50-1.70	6.0-20.0	0.06-0.08	0.0-0.0	0.0-0.5
1455252: Au Gres-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-7	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.0	0.1-1.0
	7-17	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.07-0.09	0.0-0.0	0.5-3.0
	17-28	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.06-0.07	0.0-0.0	0.0-0.5
	28-80	85-100	0-14	0-3	1.50-1.65	6.0-20.0	0.05-0.06	0.0-0.0	0.0-0.5
1455253: Kinross-----	0-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	3-14	95-100	1-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	0.5-2.0
	14-22	95-100	1-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	2.0-5.0
	22-35	95-100	0-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	0.5-3.0
	35-80	95-100	0-5	0-1	1.40-1.70	6.0-20.0	0.04-0.06	0.0-0.0	0.0-0.5
1455254: Deford-----	0-4	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	4-80	85-100	0-14	0-5	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455255: Ingalls-----	0-4	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	60-90
	4-5	85-100	0-14	0-8	1.20-1.55	6.0-20.0	0.06-0.09	0.0-2.9	2.0-5.0
	5-14	70-100	0-10	0-10	1.20-1.55	6.0-20.0	0.06-0.12	0.0-2.9	0.5-2.0
	14-16	70-100	0-10	0-10	1.35-1.65	6.0-20.0	0.05-0.11	0.0-2.9	2.0-5.0
	16-35	70-100	0-10	0-10	1.35-1.65	6.0-20.0	0.05-0.11	0.0-2.9	0.5-2.0
	35-80	10-90	5-95	0-15	1.65-1.80	0.2-0.6	0.14-0.22	0.0-2.9	0.0-0.5
1455257: Munising-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	45-90	10-50	0-10	1.35-1.60	0.6-2.0	0.08-0.18	0.0-1.0	2.0-8.0
	2-10	45-90	10-50	0-10	1.30-1.65	0.6-2.0	0.08-0.18	0.0-1.0	0.5-2.0
	10-14	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	2.0-5.0
	14-22	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	0.5-3.0
	22-49	45-90	10-50	8-14	1.80-2.10	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	49-63	45-85	10-50	10-25	1.35-1.70	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
	63-80	45-85	20-50	6-12	1.70-1.80	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
Yalmer-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-6.0
	3-8	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-2.0
	8-11	75-100	0-30	0-6	1.40-1.70	6.0-20.0	0.05-0.11	0.0-0.5	2.0-5.0
	11-24	75-100	0-30	0-6	1.40-1.70	6.0-20.0	0.05-0.11	0.0-0.5	0.5-3.0
	24-40	45-90	10-50	4-12	1.80-2.10	0.0-0.1	0.02-0.04	0.2-2.9	0.0-0.5
	40-66	45-85	15-50	8-18	1.35-1.70	0.6-2.0	0.03-0.05	0.2-2.9	0.0-0.5
	66-80	45-85	20-50	8-14	1.60-1.80	0.6-2.0	0.03-0.05	0.2-2.9	0.0-0.5
1455262: Ensley-----	0-5	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	5-7	25-70	20-50	7-20	1.10-1.35	0.6-2.0	0.19-0.21	0.5-2.9	10-25
	7-19	25-70	20-50	7-20	1.50-1.85	0.6-2.0	0.10-0.19	0.5-2.9	0.5-1.0
	19-80	45-75	20-40	5-15	1.70-1.80	0.6-2.0	0.10-0.19	0.5-2.9	0.1-0.5
1455263: Munising, calcareous substratum----	0-1	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	1-3	45-85	10-40	5-10	1.30-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-2.0
	3-6	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	2.0-5.0
	6-23	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-3.0
	23-38	45-90	10-40	3-8	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	38-50	45-90	10-40	5-12	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	50-63	45-80	10-30	8-15	1.60-1.80	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
	63-80	45-80	10-30	8-15	1.60-1.85	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455263: Yalmer, calcareous substratum-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-2	70-90	10-25	0-8	1.35-1.65	6.0-20.0	0.08-0.12	0.0-0.5	2.0-5.0
	2-5	70-95	5-25	0-8	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-2.0
	5-16	70-95	5-25	0-8	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-5.0
	16-28	70-95	5-25	0-8	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-3.0
	28-36	45-90	10-40	2-10	1.80-1.90	0.0-0.1	0.02-0.04	0.0-1.0	0.0-0.5
	36-62	45-90	10-40	2-12	1.80-1.90	0.0-0.1	0.02-0.04	0.0-1.0	0.0-0.5
	62-80	45-80	10-30	2-15	1.60-1.85	0.6-2.0	0.11-0.14	0.0-1.0	0.0-0.5
Frohling, calcareous substratum-----	0-2	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	2-5	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	5-24	45-85	30-50	2-8	1.35-1.70	0.6-2.0	0.14-0.17	0.5-2.9	0.5-3.0
	24-73	45-90	5-50	4-12	1.80-2.10	0.0-0.1	0.02-0.04	0.5-2.9	0.0-0.5
	73-80	45-85	20-50	8-12	1.60-1.80	0.6-2.0	0.11-0.15	0.5-2.9	0.0-0.5
1455266: Grand Sable-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-4	45-90	5-50	0-5	1.35-1.60	2.0-6.0	0.11-0.21	0.0-0.5	2.0-5.0
	4-30	70-90	0-30	0-5	1.55-1.75	2.0-6.0	0.09-0.11	0.0-0.5	0.5-1.0
	30-32	71-100	0-29	0-4	1.30-1.55	6.0-20.0	0.07-0.12	0.0-0.5	0.5-2.0
	32-43	85-100	0-10	0-2	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	43-55	85-100	0-10	0-2	1.55-1.65	6.0-20.0	0.03-0.07	0.0-0.0	0.1-0.5
	55-80	85-100	0-10	0-2	1.55-1.65	6.0-20.0	0.03-0.07	0.0-0.0	0.1-0.3
1455267: Grand Sable-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-4	45-90	5-50	0-5	1.35-1.60	2.0-6.0	0.11-0.21	0.0-0.5	2.0-5.0
	4-30	70-90	0-30	0-5	1.55-1.75	2.0-6.0	0.09-0.11	0.0-0.5	0.5-1.0
	30-32	71-100	0-29	0-4	1.30-1.55	6.0-20.0	0.07-0.12	0.0-0.5	0.5-2.0
	32-43	85-100	0-10	0-2	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	43-55	85-100	0-10	0-2	1.55-1.65	6.0-20.0	0.03-0.07	0.0-0.0	0.1-0.5
	55-80	85-100	0-10	0-2	1.55-1.65	6.0-20.0	0.03-0.07	0.0-0.0	0.1-0.3
1455268: Rhody-----	0-19	20-50	50-80	0-6	1.10-1.60	0.6-2.0	0.20-0.24	0.2-2.0	2.0-25
	19-36	90-100	0-10	0-2	1.50-1.70	6.0-20.0	0.02-0.04	0.0-0.0	0.1-1.0
	36-41	---	---	---	---	0.2-0.6	---	---	---
	41-80	---	---	---	---	0.0-0.2	---	---	---
Towes-----	0-19	20-50	50-70	0-6	1.35-1.50	0.6-2.0	0.22-0.24	0.2-2.9	2.0-8.0
	19-22	90-100	0-10	0-2	1.40-1.60	6.0-20.0	0.03-0.08	0.0-0.0	0.5-1.0
	22-26	90-100	0-10	0-2	1.50-1.65	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
	26-37	---	---	---	---	0.2-0.6	---	---	---
	37-80	---	---	---	---	0.0-0.2	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455269: Waiska, very stony-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-4	80-95	5-30	0-6	1.40-1.70	6.0-60.0	0.03-0.11	0.0-0.5	0.5-2.0
	4-8	80-98	1-30	0-6	1.40-1.65	6.0-60.0	0.03-0.08	0.0-0.5	2.0-5.0
	8-18	90-98	1-10	0-2	1.40-1.65	20.0-60.0	0.02-0.07	0.0-0.0	0.5-3.0
	18-80	90-100	0-10	0-2	1.50-1.60	20.0-60.0	0.01-0.03	0.0-0.0	0.1-0.5
1455273: Deerton-----	0-1	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-9	90-100	0-10	0-2	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.5-2.0
	9-10	80-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	2.0-5.0
	10-25	80-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	0.5-3.0
	25-39	---	---	---	---	0.2-0.6	---	---	---
	39-80	---	---	---	---	0.0-0.2	---	---	---
Au Train-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-9	85-100	0-15	0-4	0.90-1.50	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-14	85-100	0-15	0-4	1.45-1.70	2.0-6.0	0.07-0.09	0.0-0.5	2.0-5.0
	14-32	---	---	---	---	0.2-0.6	---	---	---
	32-80	---	---	---	---	0.0-0.2	---	---	---
1455274: Deerton-----	0-1	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-9	90-100	0-10	0-2	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.5-2.0
	9-10	80-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	2.0-5.0
	10-25	80-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	0.5-3.0
	25-39	---	---	---	---	0.2-0.6	---	---	---
	39-80	---	---	---	---	0.0-0.2	---	---	---
Au Train-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-9	85-100	0-15	0-4	0.90-1.50	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-14	85-100	0-15	0-4	1.45-1.70	2.0-6.0	0.07-0.09	0.0-0.5	2.0-5.0
	14-32	---	---	---	---	0.2-0.6	---	---	---
	32-80	---	---	---	---	0.0-0.2	---	---	---
1455276: Cookson-----	0-3	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	3-7	30-70	20-70	0-18	1.30-1.60	0.6-6.0	0.14-0.24	0.0-2.9	0.5-2.0
	7-11	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	2.0-5.0
	11-16	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.5-3.4
	16-21	50-85	10-50	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.3-1.0
	21-31	30-70	20-70	5-25	1.35-1.71	0.6-2.0	0.11-0.22	0.0-2.9	0.3-1.0
	31-36	30-70	20-70	0-25	1.60-1.80	0.6-2.0	0.10-0.22	0.0-2.9	0.1-0.5
	36-80	---	---	---	---	0.0-0.6	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455277:									
Nahma-----	0-11	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	11-14	40-70	20-50	3-20	1.10-1.60	0.6-2.0	0.14-0.24	0.0-2.9	2.0-25
	14-17	40-70	20-50	3-20	1.10-1.60	0.6-2.0	0.14-0.24	0.0-2.9	2.0-5.0
	17-19	40-70	20-50	3-20	1.48-1.80	0.6-2.0	0.14-0.24	0.0-2.9	0.5-1.0
	19-24	40-79	20-50	3-20	1.46-1.80	0.6-2.0	0.09-0.16	0.0-2.9	0.1-0.5
	24-80	---	---	---	---	0.0-0.6	---	---	---
Ruse-----	0-7	20-70	20-70	1-20	1.10-1.60	0.6-6.0	0.14-0.24	0.0-2.9	10-25
	7-11	55-75	20-45	1-20	1.50-1.80	0.6-6.0	0.11-0.15	0.0-2.9	2.0-5.0
	11-15	55-75	20-45	1-20	1.50-1.80	0.6-6.0	0.10-0.14	0.0-2.9	0.5-1.0
	15-80	---	---	---	---	0.0-0.6	---	---	---
1455278:									
Summerville----	0-3	40-70	20-50	2-12	1.30-1.60	0.6-2.0	0.14-0.22	0.0-2.9	2.0-8.0
	3-13	50-70	20-50	2-10	1.35-1.70	0.6-2.0	0.10-0.19	0.0-2.9	0.5-1.0
	13-80	---	---	---	---	0.0-0.6	---	---	---
1455281:									
Carbondale-----	0-38	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	38-80	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	90-95
Lupton-----	0-4	0-10	15-95	0-15	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	4-80	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
Tawas-----	0-26	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	26-80	90-100	0-10	0-3	1.20-1.57	6.0-20.0	0.07-0.09	0.0-0.0	0.1-0.5
1455282:									
Dawson-----	0-10	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	85-95
	10-19	---	---	---	0.10-0.17	0.6-6.0	0.45-0.55	---	90-95
	19-38	---	---	---	0.13-0.23	0.2-6.0	0.35-0.45	---	80-95
	38-80	70-100	0-20	0-5	1.50-1.70	6.0-20.0	0.03-0.10	0.0-0.0	0.0-0.5
Greenwood-----	0-65	0-10	15-95	0-15	0.10-0.17	0.6-6.0	0.45-0.55	---	50-90
	65-80	0-10	15-95	0-15	0.13-0.23	0.2-6.0	0.35-0.45	---	50-90
Loxley-----	0-8	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	85-95
	8-80	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	80-95
1455283:									
Chippeny-----	0-20	---	---	---	0.20-0.45	0.2-6.0	0.35-0.45	---	75-90
	20-28	10-70	20-70	5-40	1.50-1.80	0.2-2.0	0.07-0.22	0.0-6.0	0.1-1.0
	28-80	---	---	---	---	0.0-0.6	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455283: Nahma-----	0-11	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	11-14	40-70	20-50	3-20	1.10-1.60	0.6-2.0	0.14-0.24	0.0-2.9	2.0-25
	14-17	40-70	20-50	3-20	1.10-1.60	0.6-2.0	0.14-0.24	0.0-2.9	2.0-5.0
	17-19	40-70	20-50	3-20	1.48-1.80	0.6-2.0	0.14-0.24	0.0-2.9	0.5-1.0
	19-24	40-79	20-50	3-20	1.46-1.80	0.6-2.0	0.09-0.16	0.0-2.9	0.1-0.5
	24-80	---	---	---	---	0.0-0.6	---	---	---
1455284: Histosols-----	0-91	---	---	---	---	0.2-6.0	---	---	75-90
Aquents-----	0-80	---	---	---	---	0.2-2.0	---	---	---
1455289: Jeske, bedrock terrace-----	0-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	3-21	90-100	0-8	0-3	1.50-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	21-31	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	31-80	---	---	---	---	0.0-0.2	---	---	---
Gongeau, bedrock terrace-----	0-5	---	---	---	0.30-0.40	0.2-6.0	0.35-0.45	---	75-90
	5-7	75-85	5-25	0-8	1.35-1.50	6.0-20.0	0.10-0.12	0.0-0.5	10-25
	7-18	90-100	0-8	0-5	1.50-1.70	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
	18-29	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	29-80	---	---	---	---	0.0-0.2	---	---	---
Deerton, bedrock terrace-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-9	85-100	0-10	0-2	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.5-2.0
	9-10	70-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	2.0-5.0
	10-25	70-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	0.5-3.0
	25-39	---	---	---	---	0.2-0.6	---	---	---
	39-80	---	---	---	---	0.0-0.2	---	---	---
1455290: Jeske, bedrock terrace-----	0-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	3-21	90-100	0-8	0-3	1.50-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	21-31	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	31-80	---	---	---	---	0.0-0.2	---	---	---
Gongeau, bedrock terrace-----	0-5	---	---	---	0.30-0.40	0.2-6.0	0.35-0.45	---	75-90
	5-7	75-85	5-25	0-8	1.35-1.50	6.0-20.0	0.10-0.12	0.0-0.5	10-25
	7-18	90-100	0-8	0-5	1.50-1.70	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
	18-29	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	29-80	---	---	---	---	0.0-0.2	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455290: Deerton, bedrock terrace-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-9	85-100	0-10	0-2	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.5-2.0
	9-10	70-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	2.0-5.0
	10-25	70-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	0.5-3.0
	25-39	---	---	---	---	0.2-0.6	---	---	---
	39-80	---	---	---	---	0.0-0.2	---	---	---
1455291: Ruse, bedrock terrace-----	0-10	10-40	50-80	1-20	1.10-1.60	0.6-2.0	0.21-0.24	0.5-3.0	10-25
	10-13	10-40	50-80	1-20	1.10-1.60	0.6-2.0	0.21-0.24	0.5-3.0	2.0-5.0
	13-19	---	---	---	---	0.2-0.6	---	---	---
	19-80	---	---	---	---	0.0-0.2	---	---	---
Ensign, bedrock terrace-----	0-10	45-85	30-50	4-10	1.20-1.50	0.6-2.0	0.15-0.22	0.0-2.0	2.0-5.0
	10-14	45-85	20-50	4-10	1.35-1.60	0.6-2.0	0.15-0.19	0.0-2.0	0.5-3.0
	14-18	---	---	---	---	0.2-0.6	---	---	---
	18-80	---	---	---	---	0.0-0.2	---	---	---
Nykanen, bedrock terrace-----	0-4	45-85	20-50	3-10	1.35-1.60	0.6-2.0	0.14-0.22	0.0-2.0	2.0-8.0
	4-14	45-85	20-50	3-10	1.35-1.70	0.6-2.0	0.14-0.19	0.0-2.0	0.5-5.0
	14-25	---	---	---	---	0.2-0.6	---	---	---
	25-80	---	---	---	---	0.0-0.2	---	---	---
1455292: Ruse, bedrock terrace-----	0-10	10-40	50-80	1-20	1.10-1.60	0.6-2.0	0.21-0.24	0.5-3.0	10-25
	10-13	10-40	50-80	1-20	1.10-1.60	0.6-2.0	0.21-0.24	0.5-3.0	2.0-5.0
	13-19	---	---	---	---	0.2-0.6	---	---	---
	19-80	---	---	---	---	0.0-0.2	---	---	---
Ensign, bedrock terrace-----	0-10	45-85	30-50	4-10	1.20-1.50	0.6-2.0	0.15-0.22	0.0-2.0	2.0-5.0
	10-14	45-85	20-50	4-10	1.35-1.60	0.6-2.0	0.15-0.19	0.0-2.0	0.5-3.0
	14-18	---	---	---	---	0.2-0.6	---	---	---
	18-80	---	---	---	---	0.0-0.2	---	---	---
Nykanen, bedrock terrace-----	0-4	45-85	20-50	3-10	1.35-1.60	0.6-2.0	0.14-0.22	0.0-2.0	2.0-8.0
	4-14	45-85	20-50	3-10	1.35-1.70	0.6-2.0	0.14-0.19	0.0-2.0	0.5-5.0
	14-25	---	---	---	---	0.2-0.6	---	---	---
	25-80	---	---	---	---	0.0-0.2	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455295:									
Evert-----	0-10	0-50	40-80	2-12	1.35-1.55	6.0-20.0	0.20-0.24	0.0-2.9	2.0-8.0
	10-18	70-100	0-30	0-5	1.30-1.65	6.0-20.0	0.08-0.11	0.0-0.5	2.0-6.0
	18-80	85-100	0-10	0-2	1.50-1.65	6.0-20.0	0.02-0.10	0.0-0.0	0.1-1.0
Sturgeon-----	0-6	10-60	30-85	4-10	1.20-1.50	0.6-2.0	0.17-0.22	0.5-2.9	2.0-8.0
	6-16	10-60	30-85	4-10	1.35-1.70	0.6-2.0	0.17-0.22	0.5-2.9	0.5-2.0
	16-80	75-100	0-20	0-4	1.50-1.65	6.0-20.0	0.05-0.10	0.0-0.5	0.5-1.0
1455296:									
Deerton, dissected-----	0-1	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-9	90-100	0-10	0-2	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.5-2.0
	9-10	80-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	2.0-5.0
	10-25	80-100	0-20	0-5	1.40-1.65	6.0-20.0	0.06-0.11	0.0-0.5	0.5-3.0
	25-39	---	---	---	---	0.2-0.6	---	---	---
	39-80	---	---	---	---	0.0-0.2	---	---	---
Tokiahok, dissected-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-11	75-88	5-30	0-8	1.35-1.65	6.0-20.0	0.10-0.12	0.0-0.5	0.5-2.0
	11-15	75-95	5-30	0-8	1.30-1.70	6.0-20.0	0.07-0.12	0.0-0.5	2.0-5.0
	15-24	75-95	5-30	0-8	1.30-1.70	6.0-20.0	0.07-0.12	0.0-0.5	0.5-3.0
	24-59	50-85	10-40	2-15	1.80-2.10	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	59-80	50-75	15-50	2-15	1.60-1.80	0.6-2.0	0.09-0.13	0.0-1.0	0.1-0.5
Trout Bay, dissected-----	0-19	---	---	---	0.20-0.45	0.2-6.0	0.35-0.45	---	75-90
	19-34	---	---	---	---	0.2-0.6	---	---	---
	34-80	---	---	---	---	0.0-0.2	---	---	---
1455298:									
Garlic, dissected-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
	20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
	29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
Blue Lake, dissected-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455298: Voelker, dissected-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-5	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	2.0-5.0
	5-11	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	11-15	85-100	0-14	0-6	1.40-1.65	6.0-20.0	0.06-0.08	0.0-0.5	2.0-5.0
	15-31	85-100	0-14	0-6	1.40-1.65	0.6-6.0	0.06-0.08	0.0-0.5	2.0-5.0
	31-39	45-90	5-50	0-15	1.35-1.70	0.2-0.6	0.12-0.19	0.0-2.9	0.0-0.5
	39-80	5-90	5-70	0-15	1.55-1.75	0.2-0.6	0.08-0.20	0.0-2.9	0.0-0.5
1455299: Garlic, dissected-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
	20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
	29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
Blue Lake, dissected-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
Voelker, dissected-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-5	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	2.0-5.0
	5-11	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	11-15	85-100	0-14	0-6	1.40-1.65	6.0-20.0	0.06-0.08	0.0-0.5	2.0-5.0
	15-31	85-100	0-14	0-6	1.40-1.65	0.6-6.0	0.06-0.08	0.0-0.5	2.0-5.0
	31-39	45-90	5-50	0-15	1.35-1.70	0.2-0.6	0.12-0.19	0.0-2.9	0.0-0.5
	39-80	5-90	5-70	0-15	1.55-1.75	0.2-0.6	0.08-0.20	0.0-2.9	0.0-0.5
1455300: Garlic, dissected-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
	20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
	29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455300: Blue Lake, dissected-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
Voelker, dissected-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-5	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	2.0-5.0
	5-11	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	11-15	85-100	0-14	0-6	1.40-1.65	6.0-20.0	0.06-0.08	0.0-0.5	2.0-5.0
	15-31	85-100	0-14	0-6	1.40-1.65	0.6-6.0	0.06-0.08	0.0-0.5	2.0-5.0
	31-39	45-90	5-50	0-15	1.35-1.70	0.2-0.6	0.12-0.19	0.0-2.9	0.0-0.5
	39-80	5-90	5-70	0-15	1.55-1.75	0.2-0.6	0.08-0.20	0.0-2.9	0.0-0.5
1455302: Garlic-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
	20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
	29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
Blue Lake-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
Voelker-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-5	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	2.0-5.0
	5-11	85-100	0-14	0-6	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	11-15	85-100	0-14	0-6	1.40-1.65	6.0-20.0	0.06-0.08	0.0-0.5	2.0-5.0
	15-31	85-100	0-14	0-6	1.40-1.65	0.6-6.0	0.06-0.08	0.0-0.5	2.0-5.0
	31-39	45-90	5-50	0-15	1.35-1.70	0.2-0.6	0.12-0.19	0.0-2.9	0.0-0.5
	39-80	5-90	5-70	0-15	1.55-1.75	0.2-0.6	0.08-0.20	0.0-2.9	0.0-0.5
1455304: Cathro-----	0-34	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	34-80	45-85	15-75	5-20	1.70-1.80	0.2-0.6	0.07-0.22	0.0-2.9	0.0-0.5
Ensley-----	0-5	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	5-7	25-70	20-50	7-20	1.10-1.35	0.6-2.0	0.19-0.21	0.5-2.9	10-25
	7-19	25-70	20-50	7-20	1.50-1.85	0.6-2.0	0.10-0.19	0.5-2.9	0.5-1.0
	19-80	45-75	20-40	5-15	1.70-1.80	0.6-2.0	0.10-0.19	0.5-2.9	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455305:									
Tawas-----	0-26	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	26-80	90-100	0-10	0-3	1.20-1.57	6.0-20.0	0.07-0.09	0.0-0.0	0.1-0.5
Deford-----	0-4	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	4-80	85-100	0-14	0-5	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.0-0.5
1455308:									
Fence, dissected	0-3	35-65	30-49	2-10	1.35-1.55	0.6-2.0	0.20-0.22	0.5-3.0	3.0-8.0
	3-7	20-65	30-75	2-10	1.35-1.55	0.6-2.0	0.22-0.24	0.5-3.0	0.5-2.0
	7-11	20-70	30-75	2-10	1.40-1.70	0.6-2.0	0.17-0.22	0.5-3.0	2.0-5.0
	11-19	20-80	15-75	2-10	1.40-1.70	0.6-2.0	0.17-0.19	0.5-3.0	0.5-2.0
	19-42	20-80	15-75	5-20	1.35-1.55	0.2-0.6	0.18-0.20	0.5-3.0	0.1-0.5
	42-80	20-70	15-70	2-20	1.45-1.75	0.2-0.6	0.17-0.19	0.5-3.0	0.1-0.5
1455310:									
Rousseau-----	0-1	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	1-4	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.1-1.0
	4-20	85-100	0-14	0-5	1.40-1.65	6.0-20.0	0.06-0.08	0.0-0.5	0.5-3.0
	20-33	85-100	0-10	0-1	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
	33-66	85-100	0-5	0-1	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
	66-80	85-100	0-5	0-1	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
Dawson-----	0-10	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	0.0-0.0	85-95
	10-19	---	---	---	0.10-0.17	0.6-6.0	0.45-0.55	0.0-0.0	90-95
	19-38	---	---	---	0.13-0.23	0.2-6.0	0.35-0.45	0.0-0.0	80-95
	38-80	70-100	0-20	0-5	1.50-1.70	6.0-20.0	0.03-0.10	0.0-0.0	0.0-0.5
1455318:									
Munising, calcareous substratum-----	0-1	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	1-3	45-85	10-40	5-10	1.30-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-2.0
	3-6	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	2.0-5.0
	6-23	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-3.0
	23-38	45-90	10-40	3-8	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	38-50	45-90	10-40	5-12	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	50-63	45-80	10-30	8-15	1.60-1.80	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
	63-80	45-80	10-30	8-15	1.60-1.85	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
Ensley-----	0-5	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	5-7	25-70	20-50	7-20	1.10-1.35	0.6-2.0	0.19-0.21	0.5-2.9	10-25
	7-19	25-70	20-50	7-20	1.50-1.85	0.6-2.0	0.10-0.19	0.5-2.9	0.5-1.0
	19-80	45-75	20-40	5-15	1.70-1.80	0.6-2.0	0.10-0.19	0.5-2.9	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455319: Munising, dissected, very stony-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	45-90	10-50	0-10	1.35-1.60	0.6-2.0	0.08-0.18	0.0-1.0	2.0-8.0
	2-10	45-90	10-50	0-10	1.30-1.65	0.6-2.0	0.08-0.18	0.0-1.0	0.5-2.0
	10-14	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	2.0-5.0
	14-22	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	0.5-3.0
	22-49	45-90	10-50	8-14	1.80-2.10	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	49-63	45-85	10-50	10-25	1.35-1.70	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
	63-80	45-85	20-50	6-12	1.70-1.80	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
Yalmer, dissected, very stony-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-5.0
	3-8	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-2.0
	8-11	75-100	0-30	0-6	1.40-1.70	6.0-20.0	0.05-0.11	0.0-0.5	2.0-5.0
	11-24	75-100	0-30	0-6	1.40-1.70	6.0-20.0	0.05-0.11	0.0-0.5	0.5-3.0
	24-40	45-90	10-50	4-12	1.80-2.10	0.0-0.1	0.02-0.04	0.2-2.9	0.0-0.5
	40-66	45-85	15-50	8-18	1.35-1.70	0.6-2.0	0.03-0.05	0.2-2.9	0.0-0.5
	66-80	45-85	20-50	8-14	1.60-1.80	0.6-2.0	0.03-0.05	0.2-2.9	0.0-0.5
1455320: Munising, stony-	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	45-90	10-50	0-10	1.35-1.60	0.6-2.0	0.08-0.18	0.0-1.0	2.0-8.0
	2-10	45-90	10-50	0-10	1.30-1.65	0.6-2.0	0.08-0.18	0.0-1.0	0.5-2.0
	10-14	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	2.0-5.0
	14-22	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	0.5-3.0
	22-49	45-90	10-50	8-14	1.80-2.10	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	49-63	45-85	10-50	10-25	1.35-1.70	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
	63-80	45-85	20-50	6-12	1.70-1.80	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
Skanee, stony---	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-8	50-85	10-50	2-10	1.20-1.50	0.6-2.0	0.09-0.18	0.0-2.9	2.0-5.0
	8-14	50-75	20-50	2-10	1.35-1.60	0.6-2.0	0.14-0.17	0.0-2.9	2.0-5.0
	14-31	50-85	10-50	4-12	1.80-2.10	0.0-0.1	0.02-0.04	0.0-2.9	0.1-0.5
	31-42	50-70	5-50	5-30	1.35-1.70	0.6-2.0	0.03-0.05	0.0-2.9	0.1-0.5
	42-80	55-70	20-50	4-12	1.55-1.70	0.6-2.0	0.03-0.05	0.0-2.9	0.1-0.5
1455324: Zeba, very stony	0-2	55-75	10-40	5-15	1.30-1.60	0.6-2.0	0.13-0.15	0.0-1.0	2.0-6.0
	2-5	55-75	20-40	2-10	1.30-1.60	0.6-2.0	0.13-0.18	0.0-1.0	0.5-2.0
	5-13	55-75	20-40	5-12	1.35-1.70	0.6-2.0	0.11-0.16	0.0-1.0	0.5-3.0
	13-33	55-85	5-40	2-15	1.35-1.70	0.6-2.0	0.09-0.14	0.0-1.0	0.1-0.5
	33-80	---	---	---	---	0.0-0.2	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455324: Jacobsville, very stony-----	0-5	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	5-9	55-85	10-40	2-12	1.10-1.35	0.6-2.0	0.08-0.18	0.0-2.0	1.0-3.0
	9-23	55-75	10-40	5-15	1.50-1.85	0.6-2.0	0.10-0.17	0.0-2.0	0.5-1.0
	23-36	55-75	10-40	5-15	1.70-1.80	0.6-2.0	0.10-0.17	0.0-2.0	0.1-0.5
	36-80	---	---	---	---	0.0-0.2	---	---	---
1455326: Munising, dissected, stony-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	45-90	10-50	0-10	1.35-1.60	0.6-2.0	0.08-0.18	0.0-1.0	2.0-8.0
	2-10	45-90	10-50	0-10	1.30-1.65	0.6-2.0	0.08-0.18	0.0-1.0	0.5-2.0
	10-14	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	2.0-5.0
	14-22	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	0.5-3.0
	22-49	45-90	10-50	8-14	1.80-2.10	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	49-63	45-85	10-50	10-25	1.35-1.70	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
	63-80	45-85	20-50	6-12	1.70-1.80	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
	---	---	---	---	---	---	---	---	---
Abbaye, dissected, stony-----	0-2	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	2-4	45-90	10-50	2-10	1.35-1.65	0.6-2.0	0.13-0.18	0.0-1.0	2.0-5.0
	4-13	45-90	10-50	2-8	1.35-1.65	0.6-2.0	0.13-0.18	0.0-1.0	0.5-2.0
	13-25	45-85	25-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	0.5-3.0
	25-32	45-90	10-50	8-15	1.30-1.70	0.6-2.0	0.09-0.17	0.0-1.0	0.1-0.5
	32-80	---	---	---	---	0.0-0.2	---	---	---
1455327: Paquin-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-12	85-100	0-10	0-3	1.35-1.45	6.0-20.0	0.06-0.10	0.0-0.0	0.5-2.0
	12-14	85-100	0-10	0-3	1.40-1.65	6.0-20.0	0.06-0.08	0.0-0.0	2.0-5.0
	14-17	85-100	0-10	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	1.0-5.0
	17-27	85-100	0-10	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	1.0-5.0
	27-34	85-100	0-10	0-1	1.45-1.60	6.0-20.0	0.06-0.08	0.0-0.0	0.3-1.0
	34-80	85-100	0-10	0-1	1.50-1.70	6.0-20.0	0.06-0.08	0.0-0.0	0.0-0.5
Finch-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-11	90-100	0-5	0-3	1.20-1.57	6.0-20.0	0.07-0.09	0.0-0.0	0.5-2.0
	11-42	90-100	0-5	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	0.5-3.0
	42-80	90-100	0-14	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
1455339: Crowell-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-6	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-15	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	15-22	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.0-0.5
	22-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455339: Kinross-----	0-3				0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	3-14	95-100	1-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	0.5-2.0
	14-22	95-100	1-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	2.0-5.0
	22-35	95-100	0-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	0.5-3.0
	35-80	95-100	0-5	0-1	1.40-1.70	6.0-20.0	0.04-0.06	0.0-0.0	0.0-0.5
1455340: Frohling, dissected, stony-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	55-75	15-40	1-10	1.30-1.60	0.6-2.0	0.14-0.18	0.0-1.0	2.0-6.0
	2-7	55-85	15-40	1-10	1.30-1.60	0.6-2.0	0.09-0.18	0.0-1.0	0.5-2.0
	7-9	55-75	15-40	1-10	1.35-1.60	0.6-2.0	0.14-0.18	0.0-1.0	2.0-5.0
	9-16	55-75	15-40	1-10	1.35-1.60	0.6-2.0	0.14-0.18	0.0-1.0	0.5-3.0
	16-34	55-85	15-40	1-8	1.80-1.90	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	34-80	55-80	15-40	3-18	1.80-1.90	0.0-0.1	0.02-0.04	0.0-2.0	0.1-0.5
Tokiahok, dissected, stony-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-11	75-88	5-30	0-8	1.35-1.65	6.0-20.0	0.10-0.12	0.0-0.5	0.5-2.0
	11-15	75-95	5-30	0-8	1.30-1.70	6.0-20.0	0.07-0.12	0.0-0.5	2.0-5.0
	15-24	75-95	5-30	0-8	1.30-1.70	6.0-20.0	0.07-0.12	0.0-0.5	0.5-3.0
	24-59	50-85	10-40	2-15	1.80-2.10	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	59-80	50-75	15-50	2-15	1.60-1.80	0.6-2.0	0.09-0.13	0.0-1.0	0.1-0.5
1455341: McMaster-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-4	55-75	15-40	3-10	1.30-1.60	2.0-6.0	0.09-0.13	0.0-3.0	2.0-6.0
	4-8	70-85	10-25	1-5	1.30-1.65	2.0-6.0	0.07-0.11	0.0-3.0	0.5-2.0
	8-11	55-75	15-40	3-10	1.35-1.70	2.0-6.0	0.08-0.12	0.0-3.0	2.0-5.0
	11-24	70-85	10-25	0-5	1.35-1.70	6.0-20.0	0.04-0.07	0.0-3.0	0.5-3.0
	24-39	87-100	0-12	0-3	1.50-1.70	20.0-60.0	0.01-0.02	0.0-3.0	0.1-0.8
	39-80	87-100	0-12	0-3	1.50-1.70	20.0-60.0	0.01-0.02	0.0-3.0	0.1-0.5
1455344: Reade-----	0-4	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	4-7	20-85	20-70	1-15	1.35-1.60	0.6-2.0	0.15-0.24	0.0-2.9	0.5-2.0
	7-9	25-85	20-50	1-15	1.40-1.70	0.6-2.0	0.14-0.19	0.0-2.9	2.0-5.0
	9-15	20-85	20-70	1-15	1.35-1.70	0.6-2.0	0.15-0.22	0.0-2.9	0.5-3.0
	15-20	45-90	20-50	2-18	1.30-1.70	0.6-2.0	0.08-0.17	0.0-2.9	0.0-0.5
	20-28	45-85	20-50	2-18	1.60-1.80	0.6-2.0	0.11-0.15	0.0-2.9	0.0-0.5
	28-80	---	---	---	---	0.0-0.2	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455353:									
Charlevoix-----	0-2	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	2-5	20-50	50-80	2-10	1.20-1.50	0.6-2.0	0.20-0.22	0.5-2.9	0.5-2.0
	5-7	20-50	50-80	2-10	1.35-1.60	0.6-2.0	0.20-0.22	0.5-2.9	0.5-3.0
	7-12	0-50	35-80	2-10	1.20-1.50	0.6-2.0	0.20-0.22	0.5-2.9	0.5-3.0
	12-16	45-80	15-40	4-12	1.60-1.80	0.6-2.0	0.15-0.17	0.5-2.9	0.0-0.5
	16-27	45-80	15-40	6-16	1.60-1.80	0.6-2.0	0.15-0.17	0.5-2.9	0.0-0.5
	27-80	50-75	20-35	4-15	1.70-1.85	0.2-0.6	0.14-0.16	0.5-2.9	0.0-0.5
Ensley-----	0-5	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	5-7	25-70	20-50	7-20	1.10-1.35	0.6-2.0	0.19-0.21	0.5-2.9	10-25
	7-19	25-70	20-50	7-20	1.50-1.85	0.6-2.0	0.10-0.19	0.5-2.9	0.5-1.0
	19-80	45-75	20-40	5-15	1.70-1.80	0.6-2.0	0.10-0.19	0.5-2.9	0.1-0.5
1455359:									
Munising-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	45-90	10-50	0-10	1.35-1.60	0.6-2.0	0.08-0.18	0.0-1.0	2.0-8.0
	2-10	45-90	10-50	0-10	1.30-1.65	0.6-2.0	0.08-0.18	0.0-1.0	0.5-2.0
	10-14	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	2.0-5.0
	14-22	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	0.5-3.0
	22-49	45-90	10-50	8-14	1.80-2.10	0.0-0.1	0.02-0.04	0.0-1.0	0.1-0.5
	49-63	45-85	10-50	10-25	1.35-1.70	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
	63-80	45-85	20-50	6-12	1.70-1.80	0.6-2.0	0.03-0.05	0.5-2.0	0.1-0.5
Abbaye-----	0-2	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	2-4	45-90	10-50	2-10	1.35-1.65	0.6-2.0	0.13-0.18	0.0-1.0	2.0-5.0
	4-13	45-90	10-50	2-8	1.35-1.65	0.6-2.0	0.13-0.18	0.0-1.0	0.5-2.0
	13-25	45-85	25-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.0-1.0	0.5-3.0
	25-32	45-90	10-50	8-15	1.30-1.70	0.6-2.0	0.09-0.17	0.0-1.0	0.1-0.5
	32-80	---	---	---	---	0.0-0.2	---	---	---
1455360:									
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Blue Lake-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455361:									
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Blue Lake-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
1455362:									
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Blue Lake-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
1455363:									
Jeske-----	0-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	3-21	90-100	0-8	0-3	1.50-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	21-31	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	31-80	---	---	---	---	0.0-0.2	---	---	---
Au Train-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-9	85-100	0-15	0-4	0.90-1.50	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-14	85-100	0-15	0-4	1.45-1.70	2.0-6.0	0.07-0.09	0.0-0.5	2.0-5.0
	14-32	---	---	---	---	0.2-0.6	---	---	---
	32-80	---	---	---	---	0.0-0.2	---	---	---
Gongeau-----	0-5	---	---	---	0.30-0.40	0.2-6.0	0.35-0.45	---	75-90
	5-7	75-85	5-25	0-8	1.35-1.50	6.0-20.0	0.10-0.12	0.0-0.5	10-25
	7-18	90-100	0-8	0-5	1.50-1.70	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
	18-29	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	29-80	---	---	---	---	0.0-0.2	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455365: Cusino-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-8	70-90	10-30	0-8	1.35-1.65	6.0-20.0	0.09-0.12	0.0-1.0	0.5-2.0
	8-10	70-100	0-25	0-10	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	2.0-5.0
	10-17	70-100	0-25	0-5	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	0.5-2.0
	17-80	85-100	0-2	0-5	1.55-1.65	20.0-60.0	0.02-0.07	0.0-0.0	0.0-0.5
1455366: Cusino-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-8	70-90	10-30	0-8	1.35-1.65	6.0-20.0	0.09-0.12	0.0-1.0	0.5-2.0
	8-10	70-100	0-25	0-10	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	2.0-5.0
	10-17	70-100	0-25	0-5	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	0.5-2.0
	17-80	85-100	0-2	0-5	1.55-1.65	20.0-60.0	0.02-0.07	0.0-0.0	0.0-0.5
1455367: Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Cusino-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-8	70-90	10-30	0-8	1.35-1.65	6.0-20.0	0.09-0.12	0.0-1.0	0.5-2.0
	8-10	70-100	0-25	0-10	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	2.0-5.0
	10-17	70-100	0-25	0-5	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	0.5-2.0
	17-80	85-100	0-2	0-5	1.55-1.65	20.0-60.0	0.02-0.07	0.0-0.0	0.0-0.5
1455368: Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Cusino-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-8	70-90	10-30	0-8	1.35-1.65	6.0-20.0	0.09-0.12	0.0-1.0	0.5-2.0
	8-10	70-100	0-25	0-10	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	2.0-5.0
	10-17	70-100	0-25	0-5	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	0.5-2.0
	17-80	85-100	0-2	0-5	1.55-1.65	20.0-60.0	0.02-0.07	0.0-0.0	0.0-0.5
1455369: Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455369:									
Cusino-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-8	70-90	10-30	0-8	1.35-1.65	6.0-20.0	0.09-0.12	0.0-1.0	0.5-2.0
	8-10	70-100	0-25	0-10	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	2.0-5.0
	10-17	70-100	0-25	0-5	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	0.5-2.0
	17-80	85-100	0-2	0-5	1.55-1.65	20.0-60.0	0.02-0.07	0.0-0.0	0.0-0.5
1455370:									
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Cusino-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-8	70-90	10-30	0-8	1.35-1.65	6.0-20.0	0.09-0.12	0.0-1.0	0.5-2.0
	8-10	70-100	0-25	0-10	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	2.0-5.0
	10-17	70-100	0-25	0-5	1.30-1.65	6.0-20.0	0.05-0.11	0.0-1.0	0.5-2.0
	17-80	85-100	0-2	0-5	1.55-1.65	20.0-60.0	0.02-0.07	0.0-0.0	0.0-0.5
1455371:									
Halfaday-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-9	70-100	0-20	0-4	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.0	0.5-2.0
	9-10	70-100	0-20	0-4	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.0	2.0-5.0
	10-35	85-100	0-10	0-4	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	35-80	85-100	0-10	0-2	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.0-0.5
1455372:									
Shelldrake-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	3-4	90-100	0-10	0-2	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.0	2.0-6.0
	4-80	90-100	0-10	0-2	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455380:									
Trout Bay-----	0-19	---	---	---	0.20-0.45	0.2-6.0	0.35-0.45	---	75-90
	19-34	---	---	---	---	0.2-0.6	---	---	---
	34-80	---	---	---	---	0.0-0.2	---	---	---
Gongeau-----	0-5	---	---	---	0.30-0.40	0.2-6.0	0.35-0.45	---	75-90
	5-7	75-85	5-25	0-8	1.35-1.50	6.0-20.0	0.10-0.12	0.0-0.5	10-25
	7-18	90-100	0-8	0-5	1.50-1.70	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
	18-29	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	29-80	---	---	---	---	0.0-0.2	---	---	---
Shingleton-----	0-1	75-100	0-25	0-8	1.35-1.65	6.0-20.0	0.05-0.12	0.0-0.5	2.0-8.0
	1-7	75-100	0-25	0-8	1.35-1.65	6.0-20.0	0.05-0.12	0.0-0.5	0.5-2.0
	7-8	75-100	0-25	0-8	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	2.0-5.0
	8-11	75-100	0-25	0-8	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	0.5-3.0
	11-80	---	---	---	---	0.0-0.1	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455382: Kalkaska, severely burned	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455383: Kalkaska, severely burned	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455386: Trout Bay-----	0-19	---	---	---	0.20-0.45	0.2-6.0	0.35-0.45	---	75-90
	19-34	---	---	---	---	0.2-0.6	---	---	---
	34-80	---	---	---	---	0.0-0.2	---	---	---
Lupton-----	0-4	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	85-95
	4-80	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	80-95
Gongeau-----	0-5	---	---	---	0.30-0.40	0.2-6.0	0.35-0.45	---	75-90
	5-7	75-85	5-25	0-8	1.35-1.50	6.0-20.0	0.10-0.12	0.0-0.5	10-25
	7-18	90-100	0-8	0-5	1.50-1.70	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
	18-29	---	---	---	---	0.2-0.6	0.01-0.02	---	---
	29-80	---	---	---	---	0.0-0.2	---	---	---
1455387: Garlic-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
	20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
1455388: Garlic-----	29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5	
29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5	

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455389:									
Garlic-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
	20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
	29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
1455390:									
Escanaba-----	0-1	0-10	15-95	0-15	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	75-100	0-30	0-6	1.30-1.70	6.0-20.0	0.06-0.15	0.0-0.5	3.0-8.0
	3-6	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.06-0.14	0.0-0.5	0.5-2.0
	6-26	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.05-0.14	0.0-0.5	0.5-3.0
	26-35	45-90	10-40	6-15	1.30-1.70	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	35-42	45-80	15-50	10-18	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.0-0.5
	42-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
Greylock-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	45-85	20-50	2-8	1.30-1.60	0.6-2.0	0.12-0.18	0.5-2.9	2.0-5.0
	6-7	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	7-9	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	9-19	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	19-26	55-90	5-50	4-10	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	26-34	45-90	5-50	6-15	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	34-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
1455391:									
Escanaba-----	0-1	0-10	15-95	0-15	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	75-100	0-30	0-6	1.30-1.70	6.0-20.0	0.06-0.15	0.0-0.5	3.0-8.0
	3-6	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.06-0.14	0.0-0.5	0.5-2.0
	6-26	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.05-0.14	0.0-0.5	0.5-3.0
	26-35	45-90	10-40	6-15	1.30-1.70	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	35-42	45-80	15-50	10-18	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.0-0.5
	42-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
Greylock-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	45-85	20-50	2-8	1.30-1.60	0.6-2.0	0.12-0.18	0.5-2.9	2.0-5.0
	6-7	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	7-9	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	9-19	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	19-26	55-90	5-50	4-10	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	26-34	45-90	5-50	6-15	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	34-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455392:									
Escanaba-----	0-1	0-10	15-95	0-15	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	75-100	0-30	0-6	1.30-1.70	6.0-20.0	0.06-0.15	0.0-0.5	3.0-8.0
	3-6	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.06-0.14	0.0-0.5	0.5-2.0
	6-26	75-100	0-30	0-6	1.30-1.65	6.0-20.0	0.05-0.14	0.0-0.5	0.5-3.0
	26-35	45-90	10-40	6-15	1.30-1.70	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	35-42	45-80	15-50	10-18	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.0-0.5
	42-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
Greylock-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	45-85	20-50	2-8	1.30-1.60	0.6-2.0	0.12-0.18	0.5-2.9	2.0-5.0
	6-7	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	7-9	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	9-19	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	19-26	55-90	5-50	4-10	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	26-34	45-90	5-50	6-15	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	34-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
1455395:									
Greylock-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	45-85	20-50	2-8	1.30-1.60	0.6-2.0	0.12-0.18	0.5-2.9	2.0-5.0
	6-7	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	7-9	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	9-19	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	19-26	55-90	5-50	4-10	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	26-34	45-90	5-50	6-15	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	34-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
1455396:									
Greylock-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	45-85	20-50	2-8	1.30-1.60	0.6-2.0	0.12-0.18	0.5-2.9	2.0-5.0
	6-7	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	7-9	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	9-19	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	19-26	55-90	5-50	4-10	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	26-34	45-90	5-50	6-15	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	34-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
1455397:									
Finch-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-11	90-100	0-5	0-3	1.20-1.57	6.0-20.0	0.07-0.09	0.0-0.0	0.5-2.0
	11-42	90-100	0-5	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	0.5-3.0
	42-80	90-100	0-14	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
Kinross-----	0-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	3-14	95-100	1-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	0.5-2.0
	14-22	95-100	1-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	2.0-5.0
	22-35	95-100	0-15	0-5	1.40-1.70	6.0-20.0	0.04-0.09	0.0-0.0	0.5-3.0
	35-80	95-100	0-5	0-1	1.40-1.70	6.0-20.0	0.04-0.06	0.0-0.0	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455402: Kalkaska, dissected-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Blue Lake, dissected-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
1455403: Kalkaska, dissected-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Blue Lake, dissected-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
1455404: Kalkaska, dissected-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
Blue Lake, dissected-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455408:									
Spot-----	0-2	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	85-95
	2-8	90-100	0-10	0-5	1.45-1.70	6.0-20.0	0.06-0.08	0.0-0.0	0.1-1.0
	8-10	90-100	0-10	0-5	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	2.0-5.0
	10-18	90-100	0-10	0-5	1.45-1.70	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	18-80	90-100	0-10	0-5	1.50-1.70	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
Finch-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-11	90-100	0-5	0-3	1.20-1.57	6.0-20.0	0.07-0.09	0.0-0.0	0.5-2.0
	11-42	90-100	0-5	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	0.5-3.0
	42-80	90-100	0-14	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
1455409:									
Finch-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-11	90-100	0-5	0-3	1.20-1.57	6.0-20.0	0.07-0.09	0.0-0.0	0.5-2.0
	11-42	90-100	0-5	0-3	1.65-1.80	0.6-6.0	0.02-0.04	0.0-0.0	0.5-3.0
	42-80	90-100	0-14	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.0-0.5
1455410:									
Munising, calcareous substratum, dissected-----	0-1	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	1-3	45-85	10-40	5-10	1.30-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-2.0
	3-6	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	2.0-5.0
	6-23	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-3.0
	23-38	45-90	10-40	3-8	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	38-50	45-90	10-40	5-12	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	50-63	45-80	10-30	8-15	1.60-1.80	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
	63-80	45-80	10-30	8-15	1.60-1.85	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
Frohling, calcareous substratum, dissected-----	0-2	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	2-5	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	5-24	45-85	30-50	2-8	1.35-1.70	0.6-2.0	0.14-0.17	0.5-2.9	0.5-3.0
	24-73	45-90	5-50	4-12	1.80-2.10	0.0-0.1	0.02-0.04	0.5-2.9	0.0-0.5
	73-80	45-85	20-50	8-12	1.60-1.80	0.6-2.0	0.11-0.15	0.5-2.9	0.0-0.5
Cookson, dissected-----	0-3	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	3-7	30-70	20-70	0-18	1.30-1.60	0.6-6.0	0.14-0.24	0.0-2.9	0.5-2.0
	7-11	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	2.0-5.0
	11-16	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.5-3.4
	16-21	50-85	10-50	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.3-1.0
	21-31	30-70	20-70	5-25	1.35-1.71	0.6-2.0	0.11-0.22	0.0-2.9	0.3-1.0
	31-36	30-70	20-70	0-25	1.60-1.80	0.6-2.0	0.10-0.22	0.0-2.9	0.1-0.5
	36-80	---	---	---	---	0.0-0.6	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455411: Frohling, calcareous substratum, dissected-----	0-2	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	2-5	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	5-24	45-85	30-50	2-8	1.35-1.70	0.6-2.0	0.14-0.17	0.5-2.9	0.5-3.0
	24-73	45-90	5-50	4-12	1.80-2.10	0.0-0.1	0.02-0.04	0.5-2.9	0.0-0.5
	73-80	45-85	20-50	8-12	1.60-1.80	0.6-2.0	0.11-0.15	0.5-2.9	0.0-0.5
Garlic, dissected-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-9	85-100	0-15	0-10	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.5	0.5-2.0
	9-11	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	2.0-5.0
	11-20	85-100	0-10	0-5	1.30-1.60	6.0-20.0	0.06-0.09	0.0-0.5	0.5-3.0
	20-29	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
	29-80	85-100	0-10	0-3	1.55-1.75	6.0-20.0	0.06-0.09	0.0-0.0	0.0-0.5
Cookson, dissected-----	0-3	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	3-7	30-70	20-70	0-18	1.30-1.60	0.6-6.0	0.14-0.24	0.0-2.9	0.5-2.0
	7-11	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	2.0-5.0
	11-16	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.5-3.4
	16-21	50-85	10-50	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.3-1.0
	21-31	30-70	20-70	5-25	1.35-1.71	0.6-2.0	0.11-0.22	0.0-2.9	0.3-1.0
	31-36	30-70	20-70	0-25	1.60-1.80	0.6-2.0	0.10-0.22	0.0-2.9	0.1-0.5
	36-80	---	---	---	---	0.0-0.6	---	---	---
1455412: Munising, calcareous substratum, dissected-----	0-1	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	1-3	45-85	10-40	5-10	1.30-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-2.0
	3-6	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	2.0-5.0
	6-23	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-3.0
	23-38	45-90	10-40	3-8	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	38-50	45-90	10-40	5-12	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	50-63	45-80	10-30	8-15	1.60-1.80	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
	63-80	45-80	10-30	8-15	1.60-1.85	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455412: Yalmer, calcareous substratum, dissected-----	0-1	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	1-2	70-90	10-25	0-8	1.35-1.65	6.0-20.0	0.08-0.12	0.0-0.5	2.0-5.0
	2-5	70-95	5-25	0-8	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-2.0
	5-16	70-95	5-25	0-8	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-5.0
	16-28	70-95	5-25	0-8	1.30-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-3.0
	28-36	45-90	10-40	2-10	1.80-1.90	0.0-0.1	0.02-0.04	0.0-1.0	0.0-0.5
	36-62	45-90	10-40	2-12	1.80-1.90	0.0-0.1	0.02-0.04	0.0-1.0	0.0-0.5
	62-80	45-80	10-30	2-15	1.60-1.85	0.6-2.0	0.11-0.14	0.0-1.0	0.0-0.5
Frohling, calcareous substratum, dissected-----	0-2	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	2-5	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	5-24	45-85	30-50	2-8	1.35-1.70	0.6-2.0	0.14-0.17	0.5-2.9	0.5-3.0
	24-73	45-90	5-50	4-12	1.80-2.10	0.0-0.1	0.02-0.04	0.5-2.9	0.0-0.5
	73-80	45-85	20-50	8-12	1.60-1.80	0.6-2.0	0.11-0.15	0.5-2.9	0.0-0.5
1455413: Munising, calcareous substratum-----	0-1	---	---	---	0.20-0.30	0.6-2.0	0.35-0.45	---	50-90
	1-3	45-85	10-40	5-10	1.30-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-2.0
	3-6	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	2.0-5.0
	6-23	45-85	10-40	5-10	1.35-1.60	0.6-2.0	0.14-0.18	0.2-1.0	0.5-3.0
	23-38	45-90	10-40	3-8	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	38-50	45-90	10-40	5-12	1.80-1.90	0.0-0.1	0.02-0.04	0.2-1.0	0.0-0.5
	50-63	45-80	10-30	8-15	1.60-1.80	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
	63-80	45-80	10-30	8-15	1.60-1.85	0.6-2.0	0.11-0.14	0.2-1.0	0.0-0.5
Cookson-----	0-3	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	3-7	30-70	20-70	0-18	1.30-1.60	0.6-6.0	0.14-0.24	0.0-2.9	0.5-2.0
	7-11	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	2.0-5.0
	11-16	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.5-3.4
	16-21	50-85	10-50	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.3-1.0
	21-31	30-70	20-70	5-25	1.35-1.71	0.6-2.0	0.11-0.22	0.0-2.9	0.3-1.0
	31-36	30-70	20-70	0-25	1.60-1.80	0.6-2.0	0.10-0.22	0.0-2.9	0.1-0.5
	36-80	---	---	---	---	0.0-0.6	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455416:									
Furlong-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	85-100	0-15	0-5	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-5.0
	2-5	70-100	0-15	0-10	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-2.0
	5-7	70-100	0-15	0-10	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-5.0
	7-19	70-100	0-15	0-10	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	0.5-3.0
	19-22	70-100	0-15	0-5	1.55-1.75	6.0-20.0	0.05-0.11	0.0-0.5	0.0-0.5
	22-80	---	---	---	---	0.1-0.6	---	---	---
Shingleton-----	0-1	75-100	0-25	0-8	1.35-1.65	6.0-20.0	0.05-0.12	0.0-0.5	2.0-8.0
	1-7	75-100	0-25	0-8	1.35-1.65	6.0-20.0	0.05-0.12	0.0-0.5	0.5-2.0
	7-8	75-100	0-25	0-8	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	2.0-5.0
	8-11	75-100	0-25	0-8	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	0.5-3.0
	11-80	---	---	---	---	0.0-0.1	---	---	---
1455417:									
Furlong-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-2	85-100	0-15	0-5	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-5.0
	2-5	70-100	0-15	0-10	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	0.5-2.0
	5-7	70-100	0-15	0-10	1.35-1.65	6.0-20.0	0.06-0.12	0.0-0.5	2.0-5.0
	7-19	70-100	0-15	0-10	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	0.5-3.0
	19-22	70-100	0-15	0-5	1.55-1.75	6.0-20.0	0.05-0.11	0.0-0.5	0.0-0.5
	22-80	---	---	---	---	0.1-0.6	---	---	---
Shingleton-----	0-1	75-100	0-25	0-8	1.35-1.65	6.0-20.0	0.05-0.12	0.0-0.5	2.0-8.0
	1-7	75-100	0-25	0-8	1.35-1.65	6.0-20.0	0.05-0.12	0.0-0.5	0.5-2.0
	7-8	75-100	0-25	0-8	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	2.0-5.0
	8-11	75-100	0-25	0-8	1.30-1.70	6.0-20.0	0.05-0.11	0.0-0.5	0.5-3.0
	11-80	---	---	---	---	0.0-0.1	---	---	---
1455421:									
Steuben-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-8	45-85	20-45	4-8	1.30-1.60	0.6-2.0	0.14-0.18	0.5-2.0	0.5-2.0
	8-16	45-85	20-45	6-14	1.35-1.70	0.6-2.0	0.14-0.16	0.5-2.0	2.0-5.0
	16-21	45-85	20-45	6-14	1.35-1.70	0.6-2.0	0.14-0.16	0.5-2.0	0.5-3.0
	21-40	45-90	5-40	5-12	1.80-1.90	0.1-0.2	0.02-0.04	0.0-1.0	0.0-0.5
	40-45	70-100	0-20	2-5	1.50-1.65	2.0-6.0	0.05-0.10	0.0-0.5	0.0-0.5
	45-80	85-100	0-8	0-2	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.0-0.5
Blue Lake-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455421:									
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455422:									
Steuben-----	0-2	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	2-8	45-85	20-45	4-8	1.30-1.60	0.6-2.0	0.14-0.18	0.5-2.0	0.5-2.0
	8-16	45-85	20-45	6-14	1.35-1.70	0.6-2.0	0.14-0.16	0.5-2.0	2.0-5.0
	16-21	45-85	20-45	6-14	1.35-1.70	0.6-2.0	0.14-0.16	0.5-2.0	0.5-3.0
	21-40	45-90	5-40	5-12	1.80-1.90	0.1-0.2	0.02-0.04	0.0-1.0	0.0-0.5
	40-45	70-100	0-20	2-5	1.50-1.65	2.0-6.0	0.05-0.10	0.0-0.5	0.0-0.5
	45-80	85-100	0-8	0-2	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.0-0.5
Blue Lake-----	0-2	0-10	15-95	0-15	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	2-7	70-95	5-25	0-3	1.35-1.65	6.0-20.0	0.06-0.11	0.0-0.3	0.5-2.0
	7-9	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	2.0-5.0
	9-27	70-95	5-25	0-3	1.30-1.70	6.0-20.0	0.06-0.11	0.0-0.3	0.5-3.0
	27-80	65-90	10-40	0-5	1.35-1.65	2.0-20.0	0.08-0.12	0.0-0.3	0.1-0.5
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455425:									
Greylock-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	45-85	20-50	2-8	1.30-1.60	0.6-2.0	0.12-0.18	0.5-2.9	2.0-5.0
	6-7	45-90	5-50	2-8	1.30-1.65	0.6-2.0	0.09-0.18	0.5-2.9	0.5-2.0
	7-9	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	9-19	45-85	20-50	4-10	1.35-1.70	0.6-2.0	0.11-0.17	0.5-2.9	0.5-5.0
	19-26	55-90	5-50	4-10	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	26-34	45-90	5-50	6-15	1.50-1.75	0.6-2.0	0.08-0.17	0.5-2.9	0.0-0.5
	34-80	45-85	20-50	6-14	1.60-1.80	0.6-2.0	0.11-0.16	0.5-2.9	0.0-0.5
Cookson-----	0-3	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	3-7	30-70	20-70	0-18	1.30-1.60	0.6-6.0	0.14-0.24	0.0-2.9	0.5-2.0
	7-11	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	2.0-5.0
	11-16	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.5-3.4
	16-21	50-85	10-50	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.3-1.0
	21-31	30-70	20-70	5-25	1.35-1.71	0.6-2.0	0.11-0.22	0.0-2.9	0.3-1.0
	31-36	30-70	20-70	0-25	1.60-1.80	0.6-2.0	0.10-0.22	0.0-2.9	0.1-0.5
	36-80	---	---	---	---	0.0-0.6	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455431: Rubicon, severely burned	0-3	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.06-0.12	0.0-0.0	0.1-1.0
	3-28	85-100	0-14	0-3	1.30-1.60	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	28-36	85-100	0-14	0-3	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
	36-80	85-100	0-14	0-3	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
1455432: Rubicon, severely burned	0-3	85-100	0-14	0-3	1.30-1.55	6.0-20.0	0.06-0.12	0.0-0.0	0.1-1.0
	3-28	85-100	0-14	0-3	1.30-1.60	6.0-20.0	0.05-0.08	0.0-0.0	0.5-3.0
	28-36	85-100	0-14	0-3	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
	36-80	85-100	0-14	0-3	1.50-1.60	6.0-20.0	0.02-0.07	0.0-0.0	0.1-0.5
1455433: Wurtsmith-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-4	70-100	0-15	0-5	1.30-1.55	6.0-20.0	0.06-0.12	0.0-0.0	0.5-2.0
	4-24	85-100	0-10	0-2	1.40-1.65	6.0-20.0	0.04-0.08	0.0-0.0	0.5-1.0
	24-80	85-100	0-10	0-2	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.1-0.5
Deford-----	0-4	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	75-90
	4-80	85-100	0-14	0-5	1.40-1.65	6.0-20.0	0.05-0.08	0.0-0.0	0.0-0.5
1455434: Shelldrake-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	3-4	90-100	0-10	0-2	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.0	2.0-6.0
	4-80	90-100	0-10	0-2	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455435: Shelldrake-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-3	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	3-4	90-100	0-10	0-2	1.30-1.55	6.0-20.0	0.07-0.09	0.0-0.0	2.0-6.0
	4-80	90-100	0-10	0-2	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455436: Cookson, dissected-----	0-3	---	---	---	0.05-0.15	6.0-20.0	0.55-0.65	---	50-90
	3-7	30-70	20-70	0-18	1.30-1.60	0.6-6.0	0.14-0.24	0.0-2.9	0.5-2.0
	7-11	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	2.0-5.0
	11-16	30-70	20-70	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.5-3.4
	16-21	50-85	10-50	0-18	1.35-1.70	0.6-6.0	0.15-0.24	0.0-2.9	0.3-1.0
	21-31	30-70	20-70	5-25	1.35-1.71	0.6-2.0	0.11-0.22	0.0-2.9	0.3-1.0
	31-36	30-70	20-70	0-25	1.60-1.80	0.6-2.0	0.10-0.22	0.0-2.9	0.1-0.5
	36-80	---	---	---	---	0.0-0.6	---	---	---
	---	---	---	---	---	---	---	---	---
Nykanen, dissected-----	0-4	45-85	20-50	3-10	1.35-1.60	0.6-2.0	0.14-0.22	0.0-2.0	2.0-8.0
	4-14	45-85	20-50	3-10	1.35-1.70	0.6-2.0	0.14-0.19	0.0-2.0	0.5-5.0
	14-25	---	---	---	---	0.2-0.6	---	---	---
	25-80	---	---	---	---	0.0-0.2	---	---	---

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1455437:									
Dillingham-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-8	70-90	5-20	1-5	1.30-1.60	2.0-6.0	0.10-0.12	0.0-1.0	0.5-2.0
	8-11	70-90	5-20	1-5	1.40-1.70	2.0-6.0	0.10-0.12	0.0-1.0	2.0-5.0
	11-21	70-90	5-20	1-5	1.40-1.70	2.0-6.0	0.10-0.12	0.0-1.0	0.5-3.0
	21-31	60-90	0-20	1-5	1.80-2.10	0.1-0.2	0.03-0.06	0.0-1.0	0.1-0.5
	31-80	80-100	0-10	0-5	1.55-1.75	2.0-6.0	0.02-0.04	0.0-1.0	0.1-0.5
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455438:									
Dillingham-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-8	70-90	5-20	1-5	1.30-1.60	2.0-6.0	0.10-0.12	0.0-1.0	0.5-2.0
	8-11	70-90	5-20	1-5	1.40-1.70	2.0-6.0	0.10-0.12	0.0-1.0	2.0-5.0
	11-21	70-90	5-20	1-5	1.40-1.70	2.0-6.0	0.10-0.12	0.0-1.0	0.5-3.0
	21-31	60-90	0-20	1-5	1.80-2.10	0.1-0.2	0.03-0.06	0.0-1.0	0.1-0.5
	31-80	80-100	0-10	0-5	1.55-1.75	2.0-6.0	0.02-0.04	0.0-1.0	0.1-0.5
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
1455439:									
Dillingham-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-8	70-90	5-20	1-5	1.30-1.60	2.0-6.0	0.10-0.12	0.0-1.0	0.5-2.0
	8-11	70-90	5-20	1-5	1.40-1.70	2.0-6.0	0.10-0.12	0.0-1.0	2.0-5.0
	11-21	70-90	5-20	1-5	1.40-1.70	2.0-6.0	0.10-0.12	0.0-1.0	0.5-3.0
	21-31	60-90	0-20	1-5	1.80-2.10	0.1-0.2	0.03-0.06	0.0-1.0	0.1-0.5
	31-80	80-100	0-10	0-5	1.55-1.75	2.0-6.0	0.02-0.04	0.0-1.0	0.1-0.5
Kalkaska-----	0-2	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	2-6	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	0.1-1.0
	6-8	85-100	0-14	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-0.0	2.0-5.0
	8-16	85-100	0-14	0-3	1.40-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.5-3.0
	16-26	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5
	26-80	85-100	0-14	0-3	1.55-1.65	6.0-20.0	0.05-0.07	0.0-0.0	0.1-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1671282:									
Stutts-----	0-0	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	0-2	45-85	20-50	1-10	1.30-1.60	2.0-6.0	0.12-0.18	0.0-2.0	2.0-8.0
	2-7	45-85	20-50	1-10	1.30-1.65	2.0-6.0	0.12-0.18	0.0-2.0	0.5-6.0
	7-9	45-85	10-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	2.0-6.0
	9-13	45-85	20-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	0.5-6.0
	13-19	45-85	20-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	0.5-3.0
	19-80	85-100	0-14	0-5	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.1-0.3
Kalkaska-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	80-90	5-15	3-8	1.35-1.65	6.0-20.0	0.10-0.12	0.0-1.0	0.5-2.0
	6-8	80-90	5-15	3-8	1.30-1.60	6.0-20.0	0.10-0.12	0.0-1.0	2.0-5.0
	8-12	80-95	10-20	1-8	1.30-1.70	6.0-20.0	0.06-0.11	0.0-1.0	0.5-3.0
	12-23	90-100	0-5	0-3	1.30-1.70	6.0-20.0	0.03-0.08	0.0-0.0	0.1-0.5
	23-38	90-100	0-5	0-3	1.30-1.70	6.0-20.0	0.03-0.08	0.0-0.0	0.1-0.3
	38-80	90-100	0-5	0-3	1.55-1.75	6.0-20.0	0.02-0.06	0.0-0.0	0.0-0.3
1671283:									
Stutts-----	0-0	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	0-2	45-85	20-50	1-10	1.30-1.60	2.0-6.0	0.12-0.18	0.0-2.0	2.0-8.0
	2-7	45-85	20-50	1-10	1.30-1.65	2.0-6.0	0.12-0.18	0.0-2.0	0.5-6.0
	7-9	45-85	10-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	2.0-6.0
	9-13	45-85	20-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	0.5-6.0
	13-19	45-85	20-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	0.5-3.0
	19-80	85-100	0-14	0-5	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.1-0.3
Kalkaska-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	80-90	5-15	3-8	1.35-1.65	6.0-20.0	0.10-0.12	0.0-1.0	0.5-2.0
	6-8	80-90	5-15	3-8	1.30-1.60	6.0-20.0	0.10-0.12	0.0-1.0	2.0-5.0
	8-12	80-95	10-20	1-8	1.30-1.70	6.0-20.0	0.06-0.11	0.0-1.0	0.5-3.0
	12-23	90-100	0-5	0-3	1.30-1.70	6.0-20.0	0.03-0.08	0.0-0.0	0.1-0.5
	23-38	90-100	0-5	0-3	1.30-1.70	6.0-20.0	0.03-0.08	0.0-0.0	0.1-0.3
	38-80	90-100	0-5	0-3	1.55-1.75	6.0-20.0	0.02-0.06	0.0-0.0	0.0-0.3
1671284:									
Stutts-----	0-0	---	---	---	0.20-0.30	0.2-6.0	0.35-0.45	---	50-90
	0-2	45-85	20-50	1-10	1.30-1.60	2.0-6.0	0.12-0.18	0.0-2.0	2.0-8.0
	2-7	45-85	20-50	1-10	1.30-1.65	2.0-6.0	0.12-0.18	0.0-2.0	0.5-6.0
	7-9	45-85	10-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	2.0-6.0
	9-13	45-85	20-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	0.5-6.0
	13-19	45-85	20-50	1-10	1.35-1.70	2.0-6.0	0.11-0.17	0.0-2.0	0.5-3.0
	19-80	85-100	0-14	0-5	1.55-1.65	6.0-20.0	0.04-0.07	0.0-0.0	0.1-0.3

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1671284: Kalkaska-----	0-1	---	---	---	0.10-0.20	0.6-6.0	0.45-0.55	---	50-90
	1-6	80-90	5-15	3-8	1.35-1.65	6.0-20.0	0.10-0.12	0.0-1.0	0.5-2.0
	6-8	80-90	5-15	3-8	1.30-1.60	6.0-20.0	0.10-0.12	0.0-1.0	2.0-5.0
	8-12	80-95	10-20	1-8	1.30-1.70	6.0-20.0	0.06-0.11	0.0-1.0	0.5-3.0
	12-23	90-100	0-5	0-3	1.30-1.70	6.0-20.0	0.03-0.08	0.0-0.0	0.1-0.5
	23-38	90-100	0-5	0-3	1.30-1.70	6.0-20.0	0.03-0.08	0.0-0.0	0.1-0.3
	38-80	90-100	0-5	0-3	1.55-1.75	6.0-20.0	0.02-0.06	0.0-0.0	0.0-0.3

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Table 16.-Erosion Properties

(Entries under "Erosion factors" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455241: Deer Park-----	0-2	---	---	5	1	220
	2-3	.15	.15			
	3-10	.15	.15			
	10-21	.15	.15			
	21-80	.15	.15			
1455242: Deer Park-----	0-2	---	---	5	1	220
	2-3	.15	.15			
	3-10	.15	.15			
	10-21	.15	.15			
	21-80	.15	.15			
1455243: Deer Park-----	0-2	---	---	5	1	220
	2-3	.15	.15			
	3-10	.15	.15			
	10-21	.15	.15			
	21-80	.15	.15			
1455244: Rubicon-----	0-2	---	---	5	1	220
	2-7	.15	.15			
	7-32	.15	.15			
	32-40	.15	.15			
	40-80	.15	.15			
1455245: Rubicon-----	0-2	---	---	5	1	220
	2-7	.15	.15			
	7-32	.15	.15			
	32-40	.15	.15			
	40-80	.15	.15			
1455246: Rubicon-----	0-2	---	---	5	1	220
	2-7	.15	.15			
	7-32	.15	.15			
	32-40	.15	.15			
	40-80	.15	.15			
1455247: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1455248: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455249: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1455250: Crowell-----	0-2	---	---	5	1	220
	2-6	.15	.15			
	6-15	.15	.15			
	15-22	.15	.15			
	22-80	.15	.15			
1455251: Paquin-----	0-2	---	---	2	1	220
	2-12	.15	.15			
	12-14	.15	.15			
	14-17	.15	.15			
	17-27	.15	.15			
	27-34	.15	.15			
	34-80	.15	.15			
1455252: Au Gres-----	0-2	---	---	5	1	220
	2-7	.15	.15			
	7-17	.15	.15			
	17-28	.15	.15			
	28-80	.15	.15			
1455253: Kinross-----	0-3	---	---	3	2	134
	3-14	.15	.15			
	14-22	.15	.15			
	22-35	.15	.15			
	35-80	.15	.15			
1455254: Deford-----	0-4	---	---	5	2	134
	4-80	.15	.15			
1455255: Ingalls-----	0-4	---	---	5	2	134
	4-5	.15	.15			
	5-14	.15	.15			
	14-16	.15	.15			
	16-35	.15	.15			
	35-80	.43	.43			
1455257: Munising-----	0-1	---	---	4	2	134
	1-2	.24	.24			
	2-10	.17	.17			
	10-14	.24	.24			
	14-22	.24	.24			
	22-49	.24	.24			
	49-63	.24	.24			
	63-80	.20	.24			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455257: Yalmer-----	0-1	---	---	4	2	134
	1-3	.15	.17			
	3-8	.15	.17			
	8-11	.15	.15			
	11-24	.15	.15			
	24-40	.15	.17			
	40-66	.17	.24			
	66-80	.17	.24			
1455262: Ensley-----	0-5	---	---	4	2	134
	5-7	.32	.37			
	7-19	.20	.28			
	19-80	.15	.28			
1455263: Munising, calcareous substratum-----	0-1	---	---	4	2	134
	1-3	.20	.24			
	3-6	.20	.24			
	6-23	.20	.24			
	23-38	.15	.17			
	38-50	.20	.24			
	50-63	.15	.24			
	63-80	.15	.24			
Yalmer, calcareous substratum-----	0-1	---	---	4	2	134
	1-2	.17	.17			
	2-5	.15	.15			
	5-16	.15	.17			
	16-28	.10	.17			
	28-36	.15	.17			
	36-62	.20	.24			
	62-80	.15	.24			
Frohling, calcareous substratum-----	0-2	---	---	5	3	86
	2-5	.20	.24			
	5-24	.20	.24			
	24-73	.20	.24			
	73-80	.15	.24			
1455266: Grand Sable-----	0-1	---	---	4	4	134
	1-4	.17	.17			
	4-30	.17	.17			
	30-32	.15	.15			
	32-43	.10	.15			
	43-55	.15	.15			
	55-80	.15	.15			
1455267: Grand Sable-----	0-1	---	---	4	4	134
	1-4	.17	.17			
	4-30	.17	.17			
	30-32	.15	.15			
	32-43	.10	.15			
	43-55	.15	.15			
	55-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455268:						
Rhody-----	0-19	.28	.28	4	5	56
	19-36	.28	.28			
	36-41	---	---			
	41-80	---	---			
Towes-----	0-19	.28	.28	4	5	56
	19-22	.15	.15			
	22-26	.15	.15			
	26-37	---	---			
	37-80	---	---			
1455269:						
Waiska, very stony-----	0-1	---	---	5	3	86
	1-4	.15	.15			
	4-8	.05	.10			
	8-18	.05	.10			
	18-80	.02	.10			
1455273:						
Deerton-----	0-1	.02	.02	4	2	134
	1-9	.15	.15			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
Au Train-----	0-2	---	---	2	1	180
	2-9	.15	.15			
	9-14	.15	.15			
	14-32	---	---			
	32-80	---	---			
1455274:						
Deerton-----	0-1	.02	.02	4	2	134
	1-9	.15	.15			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
Au Train-----	0-2	---	---	2	1	180
	2-9	.15	.15			
	9-14	.15	.15			
	14-32	---	---			
	32-80	---	---			
1455276:						
Cookson-----	0-3	---	---	4	5	56
	3-7	.20	.24			
	7-11	.28	.28			
	11-16	.43	.43			
	16-21	.24	.24			
	21-31	.32	.32			
	31-36	.24	.24			
	36-80	---	---			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455277:						
Nahma-----	0-11	---	---	4	2	134
	11-14	.43	.43			
	14-17	.43	.43			
	17-19	.43	.43			
	19-24	.24	.28			
	24-80	---	---			
Ruse-----	0-7	.28	.28	2	5	56
	7-11	.24	.24			
	11-15	.24	.24			
	15-80	---	---			
1455278:						
Summerville-----	0-3	.32	.32	4	3	86
	3-13	.43	.43			
	13-80	---	---			
1455281:						
Carbondale-----	0-38	---	---	5	8	0
	38-80	---	---			
Lupton-----	0-4	.02	.02	2	7	38
	4-80	.02	.02			
Tawas-----	0-26	---	---	4	8	0
	26-80	.15	.15			
1455282:						
Dawson-----	0-10	---	---	4	8	0
	10-19	---	---			
	19-38	---	---			
	38-80	.15	.15			
Greenwood-----	0-65	.02	.02	2	5	56
	65-80	.02	.02			
Loxley-----	0-8	---	---	5	8	0
	8-80	---	---			
1455283:						
Chippeny-----	0-20	---	---	4	2	134
	20-28	.43	.43			
	28-80	---	---			
Nahma-----	0-11	---	---	4	2	134
	11-14	.43	.43			
	14-17	.43	.43			
	17-19	.43	.43			
	19-24	.24	.28			
	24-80	---	---			
1455284:						
Histosols-----	0-91	---	---	5	8	0
Aquents.						
1455285.						
Pits						

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455289:						
Jeske, bedrock terrace--	0-3	---	---	2	1	220
	3-21	.15	.15			
	21-31	---	---			
	31-80	---	---			
Gongeau, bedrock terrace	0-5	---	---	2	2	134
	5-7	.17	.17			
	7-18	.15	.15			
	18-29	---	---			
	29-80	---	---			
Deerton, bedrock terrace	0-1	---	---	4	2	134
	1-9	.15	.15			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
1455290:						
Jeske, bedrock terrace--	0-3	---	---	2	1	220
	3-21	.15	.15			
	21-31	---	---			
	31-80	---	---			
Gongeau, bedrock terrace	0-5	---	---	2	2	134
	5-7	.17	.17			
	7-18	.15	.15			
	18-29	---	---			
	29-80	---	---			
Deerton, bedrock terrace	0-1	---	---	5	1	220
	1-9	.15	.15			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
1455291:						
Ruse, bedrock terrace---	0-10	.28	.28	2	5	56
	10-13	.43	.43			
	13-19	---	---			
	19-80	---	---			
Ensign, bedrock terrace-	0-10	.37	.37	2	3	86
	10-14	.37	.37			
	14-18	---	---			
	18-80	---	---			
Nykanen, bedrock terrace	0-4	.37	.37	2	3	86
	4-14	.28	.37			
	14-25	---	---			
	25-80	---	---			
1455292:						
Ruse, bedrock terrace---	0-10	.28	.28	2	5	56
	10-13	.43	.43			
	13-19	---	---			
	19-80	---	---			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455292:						
Ensign, bedrock terrace-	0-10	.37	.37	2	3	86
	10-14	.37	.37			
	14-18	---	---			
	18-80	---	---			
Nykanen, bedrock terrace	0-4	.37	.37	2	3	86
	4-14	.28	.37			
	14-25	---	---			
	25-80	---	---			
1455295:						
Evart-----	0-10	.32	.32	3	5	56
	10-18	.17	.17			
	18-80	.15	.15			
Sturgeon-----	0-6	.32	.32	3	5	56
	6-16	.28	.28			
	16-80	.15	.15			
1455296:						
Deerton, dissected-----	0-1	.02	.02	5	1	220
	1-9	.15	.15			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
Tokiahok, dissected-----	0-2	---	---	4	2	134
	2-11	.15	.17			
	11-15	.15	.17			
	15-24	.15	.17			
	24-59	.20	.24			
	59-80	.20	.24			
Trout Bay, dissected-----	0-19	---	---	4	8	0
	19-34	---	---			
	34-80	---	---			
1455298:						
Garlic, dissected-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			
Blue Lake, dissected-----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
Voelker, dissected-----	0-1	---	---	5	1	250
	1-5	.15	.15			
	5-11	.15	.15			
	11-15	.15	.15			
	15-31	.15	.15			
	31-39	.24	.24			
	39-80	.24	.24			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455299:						
Garlic, dissected-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			
Blue Lake, dissected----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
Voelker, dissected-----	0-1	---	---	5	1	250
	1-5	.15	.15			
	5-11	.15	.15			
	11-15	.15	.15			
	15-31	.15	.15			
	31-39	.24	.24			
	39-80	.24	.24			
1455300:						
Garlic, dissected-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			
Blue Lake, dissected----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
Voelker, dissected-----	0-1	---	---	5	1	250
	1-5	.15	.15			
	5-11	.15	.15			
	11-15	.15	.15			
	15-31	.15	.15			
	31-39	.24	.24			
	39-80	.24	.24			
1455302:						
Garlic-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			
Blue Lake-----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455302: Voelker-----	0-1	---	---	5	1	250
	1-5	.15	.15			
	5-11	.15	.15			
	11-15	.15	.15			
	15-31	.15	.15			
	31-39	.24	.24			
	39-80	.24	.24			
1455304: Cathro-----	0-34	---	---	5	2	134
	34-80	.15	.24			
Ensley-----	0-5	---	---	4	2	134
	5-7	.32	.37			
	7-19	.20	.28			
	19-80	.15	.28			
1455305: Tawas-----	0-26	---	---	4	2	134
	26-80	.15	.15			
Deford-----	0-4	---	---	5	2	134
	4-80	.15	.15			
1455308: Fence, dissected-----	0-3	.37	.37	5	3	86
	3-7	.37	.37			
	7-11	.37	.37			
	11-19	.43	.43			
	19-42	.43	.43			
	42-80	.43	.43			
1455310: Rousseau-----	0-1	---	---	5	1	250
	1-4	.15	.15			
	4-20	.15	.15			
	20-33	.15	.15			
	33-66	.15	.15			
	66-80	.15	.15			
Dawson-----	0-10	---	---	4	8	0
	10-19	---	---			
	19-38	---	---			
	38-80	.15	.15			
1455318: Munising, calcareous substratum-----	0-1	---	---	4	2	134
	1-3	.20	.24			
	3-6	.20	.24			
	6-23	.20	.24			
	23-38	.15	.17			
	38-50	.20	.24			
	50-63	.15	.24			
	63-80	.15	.24			
Ensley-----	0-5	---	---	4	2	134
	5-7	.32	.37			
	7-19	.20	.28			
	19-80	.15	.28			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455319: Munising, dissected, very stony-----	0-1	---	---	4	4	86
	1-2	.24	.24			
	2-10	.17	.17			
	10-14	.24	.24			
	14-22	.24	.24			
	22-49	.24	.24			
	49-63	.24	.24			
	63-80	.20	.24			
Yalmer, dissected, very stony-----	0-1	---	---	4	4	86
	1-3	.15	.17			
	3-8	.15	.17			
	8-11	.15	.15			
	11-24	.15	.15			
	24-40	.15	.17			
	40-66	.17	.24			
	66-80	.17	.24			
1455320: Munising, stony-----	0-1	---	---	4	2	134
	1-2	.24	.24			
	2-10	.17	.17			
	10-14	.24	.24			
	14-22	.24	.24			
	22-49	.24	.24			
	49-63	.24	.24			
	63-80	.20	.24			
Skanee, stony-----	0-2	---	---	4	2	134
	2-8	.20	.24			
	8-14	.20	.24			
	14-31	.20	.24			
	31-42	.32	.37			
	42-80	.20	.24			
1455324: Zeba, very stony-----	0-2	.15	.24	4	5	56
	2-5	.15	.24			
	5-13	.15	.24			
	13-33	.20	.24			
	33-80	---	---			
Jacobsville, very stony-	0-5	.02	.02	4	5	56
	5-9	.20	.24			
	9-23	.20	.24			
	23-36	.20	.24			
	36-80	---	---			
1455326: Munising, dissected, stony-----	0-1	---	---	4	2	134
	1-2	.24	.24			
	2-10	.17	.17			
	10-14	.24	.24			
	14-22	.24	.24			
	22-49	.24	.24			
	49-63	.24	.24			
	63-80	.20	.24			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455326: Abbaye, dissected, stony	0-2	---	---	4	3	86
	2-4	.20	.24			
	4-13	.15	.17			
	13-25	.24	.24			
	25-32	.20	.24			
	32-80	---	---			
1455327: Paquin-----	0-2	---	---	2	1	220
	2-12	.15	.15			
	12-14	.15	.15			
	14-17	.15	.15			
	17-27	.15	.15			
	27-34	.15	.15			
	34-80	.15	.15			
Finch-----	0-1	---	---	2	1	220
	1-11	.15	.15			
	11-42	.15	.15			
	42-80	.15	.15			
1455339: Crowell-----	0-2	---	---	5	1	220
	2-6	.15	.15			
	6-15	.15	.15			
	15-22	.15	.15			
	22-80	.15	.15			
Kinross-----	0-3	---	---	3	2	134
	3-14	.15	.15			
	14-22	.15	.15			
	22-35	.15	.15			
	35-80	.15	.15			
1455340: Frohling, dissected, stony-----	0-1	---	---	3	5	56
	1-2	.17	.24			
	2-7	.17	.24			
	7-9	.17	.24			
	9-16	.17	.24			
	16-34	.15	.17			
	34-80	.20	.24			
Tokiahok, dissected, stony-----	0-2	---	---	4	3	86
	2-11	.15	.17			
	11-15	.15	.17			
	15-24	.15	.17			
	24-59	.20	.24			
	59-80	.20	.24			
1455341: McMaster-----	0-2	---	---	3	3	56
	2-4	.10	.24			
	4-8	.10	.17			
	8-11	.10	.24			
	11-24	.10	.17			
	24-39	.02	.10			
	39-80	.02	.10			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455344: Reade-----	0-4	---	---	4	5	56
	4-7	.32	.37			
	7-9	.24	.32			
	9-15	.17	.24			
	15-20	.15	.24			
	20-28	.15	.24			
	28-80	---	---			
1455353: Charlevoix-----	0-2	---	---	5	4L	86
	2-5	.28	.37			
	5-7	.37	.43			
	7-12	.37	.43			
	12-16	.17	.24			
	16-27	.17	.24			
	27-80	.15	.28			
Ensley-----	0-5	---	---	4	2	134
	5-7	.32	.37			
	7-19	.20	.28			
	19-80	.15	.28			
1455359: Munising-----	0-1	---	---	4	2	134
	1-2	.24	.24			
	2-10	.17	.17			
	10-14	.24	.24			
	14-22	.24	.24			
	22-49	.24	.24			
	49-63	.24	.24			
	63-80	.20	.24			
Abbaye-----	0-2	---	---	4	3	86
	2-4	.20	.24			
	4-13	.15	.17			
	13-25	.24	.24			
	25-32	.20	.24			
	32-80	---	---			
1455360: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
Blue Lake-----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
1455361: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455361: Blue Lake-----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
1455362: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
Blue Lake-----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
1455363: Jeske-----	0-3	---	---	2	1	220
	3-21	.15	.15			
	21-31	---	---			
	31-80	---	---			
Au Train-----	0-2	---	---	2	1	180
	2-9	.15	.15			
	9-14	.15	.15			
	14-32	---	---			
	32-80	---	---			
Gongeau-----	0-5	---	---	2	2	134
	5-7	.17	.17			
	7-18	.15	.15			
	18-29	---	---			
	29-80	---	---			
1455365: Cusino-----	0-2	---	---	5	2	134
	2-8	.15	.17			
	8-10	.15	.17			
	10-17	.15	.15			
	17-80	.10	.10			
1455366: Cusino-----	0-2	---	---	5	2	134
	2-8	.15	.17			
	8-10	.15	.17			
	10-17	.15	.15			
	17-80	.10	.10			
1455367: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455367: Cusino-----	0-2	---	---	5	2	134
	2-8	.15	.17			
	8-10	.15	.17			
	10-17	.15	.15			
	17-80	.10	.10			
1455368: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
Cusino-----	0-2	---	---	5	2	134
	2-8	.15	.17			
	8-10	.15	.17			
	10-17	.15	.15			
	17-80	.10	.10			
1455369: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
Cusino-----	0-2	---	---	5	2	134
	2-8	.15	.17			
	8-10	.15	.17			
	10-17	.15	.15			
	17-80	.10	.10			
1455370: Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
Cusino-----	0-2	---	---	5	2	134
	2-8	.15	.17			
	8-10	.15	.17			
	10-17	.15	.15			
	17-80	.10	.10			
1455371: Halfaday-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-10	.15	.15			
	10-35	.15	.15			
	35-80	.15	.15			
1455372: Shelldrake-----	0-1	---	---	5	1	220
	1-3	---	---			
	3-4	.15	.15			
	4-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455380:						
Trout Bay-----	0-19	---	---	4	8	0
	19-34	---	---			
	34-80	---	---			
Gongeau-----	0-5	---	---	2	2	134
	5-7	.17	.17			
	7-18	.15	.15			
	18-29	---	---			
	29-80	---	---			
Shingleton-----	0-1	.17	.17	4	2	134
	1-7	.17	.17			
	7-8	.17	.17			
	8-11	.17	.17			
	11-80	---	---			
Rock outcrop.						
1455382:						
Kalkaska, severely burned-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1455383:						
Kalkaska, severely burned-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1455386:						
Trout Bay-----	0-19	---	---	4	8	0
	19-34	---	---			
	34-80	---	---			
Lupton-----	0-4	---	---	5	8	0
	4-80	---	---			
Gongeau-----	0-5	---	---	2	2	134
	5-7	.17	.17			
	7-18	.15	.15			
	18-29	---	---			
	29-80	---	---			
1455387:						
Garlic-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455388: Garlic-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			
1455389: Garlic-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			
1455390: Escanaba-----	0-1	.02	.02	5	1	220
	1-3	.15	.17			
	3-6	.15	.17			
	6-26	.15	.17			
	26-35	.24	.28			
	35-42	.24	.28			
	42-80	.17	.28			
Greylock-----	0-1	---	---	5	3	86
	1-6	.20	.24			
	6-7	.20	.24			
	7-9	.20	.24			
	9-19	.20	.24			
	19-26	.24	.28			
	26-34	.24	.28			
	34-80	.17	.28			
1455391: Escanaba-----	0-1	.02	.02	5	1	220
	1-3	.15	.17			
	3-6	.15	.17			
	6-26	.15	.17			
	26-35	.24	.28			
	35-42	.24	.28			
	42-80	.17	.28			
Greylock-----	0-1	---	---	5	3	86
	1-6	.20	.24			
	6-7	.20	.24			
	7-9	.20	.24			
	9-19	.20	.24			
	19-26	.24	.28			
	26-34	.24	.28			
	34-80	.17	.28			
1455392: Escanaba-----	0-1	.02	.02	5	1	220
	1-3	.15	.17			
	3-6	.15	.17			
	6-26	.15	.17			
	26-35	.24	.28			
	35-42	.24	.28			
	42-80	.17	.28			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455392: Greylock-----	0-1	---	---	5	3	86
	1-6	.20	.24			
	6-7	.20	.24			
	7-9	.20	.24			
	9-19	.20	.24			
	19-26	.24	.28			
	26-34	.24	.28			
	34-80	.17	.28			
1455395: Greylock-----	0-1	---	---	5	3	86
	1-6	.20	.24			
	6-7	.20	.24			
	7-9	.20	.24			
	9-19	.20	.24			
	19-26	.24	.28			
	26-34	.24	.28			
	34-80	.17	.28			
1455396: Greylock-----	0-1	---	---	5	3	86
	1-6	.20	.24			
	6-7	.20	.24			
	7-9	.20	.24			
	9-19	.20	.24			
	19-26	.24	.28			
	26-34	.24	.28			
	34-80	.17	.28			
1455397: Finch-----	0-1	---	---	2	1	220
	1-11	.15	.15			
	11-42	.15	.15			
	42-80	.15	.15			
Kinross-----	0-3	---	---	3	2	134
	3-14	.15	.15			
	14-22	.15	.15			
	22-35	.15	.15			
	35-80	.15	.15			
1455402: Kalkaska, dissected----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
Blue Lake, dissected----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
1455403: Kalkaska, dissected----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455403: Blue Lake, dissected----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
1455404: Kalkaska, dissected----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
Blue Lake, dissected----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
1455408: Spot-----	0-2	---	---	2	7	38
	2-8	.15	.15			
	8-10	.15	.15			
	10-18	.15	.15			
	18-80	.15	.15			
Finch-----	0-1	---	---	2	1	220
	1-11	.15	.15			
	11-42	.15	.15			
	42-80	.15	.15			
1455409: Finch-----	0-1	---	---	2	1	220
	1-11	.15	.15			
	11-42	.15	.15			
	42-80	.15	.15			
1455410: Munising, calcareous substratum, dissected--	0-1	---	---	4	2	134
	1-3	.20	.24			
	3-6	.20	.24			
	6-23	.20	.24			
	23-38	.15	.17			
	38-50	.20	.24			
	50-63	.15	.24			
	63-80	.15	.24			
Frohling, calcareous substratum, dissected--	0-2	---	---	5	3	86
	2-5	.20	.24			
	5-24	.20	.24			
	24-73	.20	.24			
	73-80	.15	.24			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455410: Cookson, dissected-----	0-3	---	---	4	5	56
	3-7	.20	.24			
	7-11	.28	.28			
	11-16	.43	.43			
	16-21	.24	.24			
	21-31	.32	.32			
	31-36	.24	.24			
	36-80	---	---			
1455411: Frohling, calcareous substratum, dissected--	0-2	---	---	5	3	86
	2-5	.20	.24			
	5-24	.20	.24			
	24-73	.20	.24			
	73-80	.15	.24			
Garlic, dissected-----	0-2	---	---	5	1	220
	2-9	.15	.15			
	9-11	.15	.15			
	11-20	.15	.15			
	20-29	.15	.15			
	29-80	.15	.15			
Cookson, dissected-----	0-3	---	---	4	3	86
	3-7	.20	.24			
	7-11	.28	.28			
	11-16	.43	.43			
	16-21	.24	.24			
	21-31	.32	.32			
	31-36	.24	.24			
	36-80	---	---			
1455412: Munising, calcareous substratum, dissected--	0-1	---	---	4	2	134
	1-3	.20	.24			
	3-6	.20	.24			
	6-23	.20	.24			
	23-38	.15	.17			
	38-50	.20	.24			
	50-63	.15	.24			
	63-80	.15	.24			
Yalmer, calcareous substratum, dissected--	0-1	---	---	4	2	134
	1-2	.17	.17			
	2-5	.15	.15			
	5-16	.15	.17			
	16-28	.10	.17			
	28-36	.15	.17			
	36-62	.20	.24			
	62-80	.15	.24			
Frohling, calcareous substratum, dissected--	0-2	---	---	5	3	86
	2-5	.20	.24			
	5-24	.20	.24			
	24-73	.20	.24			
	73-80	.15	.24			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455413: Munising, calcareous substratum-----	0-1	---	---	4	2	134
	1-3	.20	.24			
	3-6	.20	.24			
	6-23	.20	.24			
	23-38	.15	.17			
	38-50	.20	.24			
	50-63	.15	.24			
	63-80	.15	.24			
Cookson-----	0-3	---	---	4	5	56
	3-7	.20	.24			
	7-11	.28	.28			
	11-16	.43	.43			
	16-21	.24	.24			
	21-31	.32	.32			
	31-36	.24	.24			
	36-80	---	---			
1455416: Furlong-----	0-1	---	---	4	1	220
	1-2	.15	.15			
	2-5	.15	.15			
	5-7	.15	.15			
	7-19	.15	.15			
	19-22	.15	.15			
	22-80	---	---			
Shingleton-----	0-1	.17	.17	4	2	134
	1-7	.17	.17			
	7-8	.17	.17			
	8-11	.17	.17			
	11-80	---	---			
1455417: Furlong-----	0-1	---	---	4	1	220
	1-2	.15	.15			
	2-5	.15	.15			
	5-7	.15	.15			
	7-19	.15	.15			
	19-22	.15	.15			
	22-80	---	---			
Shingleton-----	0-1	.17	.17	4	2	134
	1-7	.17	.17			
	7-8	.17	.17			
	8-11	.17	.17			
	11-80	---	---			
1455421: Steuben-----	0-2	---	---	3	3	86
	2-8	.24	.24			
	8-16	.24	.24			
	16-21	.24	.24			
	21-40	.17	.24			
	40-45	.15	.15			
	45-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455421:						
Blue Lake-----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1455422:						
Steuben-----	0-2	---	---	3	3	86
	2-8	.24	.24			
	8-16	.24	.24			
	16-21	.24	.24			
	21-40	.17	.24			
	40-45	.15	.15			
	45-80	.15	.15			
Blue Lake-----	0-2	.02	.02	5	1	220
	2-7	.17	.17			
	7-9	.20	.20			
	9-27	.24	.24			
	27-80	.20	.20			
Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1455425:						
Greylock-----	0-1	---	---	5	3	86
	1-6	.20	.24			
	6-7	.20	.24			
	7-9	.20	.24			
	9-19	.20	.24			
	19-26	.24	.28			
	26-34	.24	.28			
	34-80	.17	.28			
Cookson-----	0-3	---	---	4	5	56
	3-7	.20	.24			
	7-11	.28	.28			
	11-16	.43	.43			
	16-21	.24	.24			
	21-31	.32	.32			
	31-36	.24	.24			
	36-80	---	---			
1455431:						
Rubicon, severely burned	0-3	.15	.15	5	1	220
	3-28	.15	.15			
	28-36	.15	.15			
	36-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455432: Rubicon, severely burned	0-3	.15	.15	5	1	220
	3-28	.15	.15			
	28-36	.15	.15			
	36-80	.15	.15			
1455433: Wurtsmith-----	0-1	---	---	5	1	220
	1-4	.15	.15			
	4-24	.15	.15			
	24-80	.15	.15			
Deford-----	0-4	---	---	5	2	134
	4-80	.15	.15			
1455434: Shelldrake-----	0-1	---	---	5	1	250
	1-3	---	---			
	3-4	.15	.15			
	4-80	.15	.15			
1455435: Shelldrake-----	0-1	---	---	5	1	250
	1-3	---	---			
	3-4	.15	.15			
	4-80	.15	.15			
Dune land-----	0-80	---	---	5	1	220
1455436: Cookson, dissected-----	0-3	---	---	4	3	86
	3-7	.20	.24			
	7-11	.28	.28			
	11-16	.43	.43			
	16-21	.24	.24			
	21-31	.32	.32			
	31-36	.24	.24			
	36-80	---	---			
Nykanen, dissected-----	0-4	.37	.37	2	3	86
	4-14	.28	.37			
	14-25	---	---			
	25-80	---	---			
1455437: Dillingham-----	0-1	---	---	5	2	134
	1-8	.17	.17			
	8-11	.17	.17			
	11-21	.17	.17			
	21-31	.17	.17			
	31-80	.17	.17			
Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1455438:						
Dillingham-----	0-1	---	---	4	2	134
	1-8	.17	.17			
	8-11	.17	.17			
	11-21	.17	.17			
	21-31	.17	.17			
	31-80	.17	.17			
Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1455439:						
Dillingham-----	0-1	---	---	4	2	134
	1-8	.17	.17			
	8-11	.17	.17			
	11-21	.17	.17			
	21-31	.17	.17			
	31-80	.17	.17			
Kalkaska-----	0-2	.15	.15	5	1	220
	2-6	.15	.15			
	6-8	.15	.15			
	8-16	.15	.15			
	16-26	.15	.15			
	26-80	.15	.15			
1671074:						
Udipsamments-----	0-80	.15	.15	5	1	250
Udorthents.						
1671282:						
Stutts-----	0-0	---	---	5	2	134
	0-2	.24	.24			
	2-7	.24	.24			
	7-9	.24	.24			
	9-13	.24	.24			
	13-19	.24	.24			
	19-80	.15	.15			
Kalkaska-----	0-1	---	---	5	2	134
	1-6	.17	.17			
	6-8	.17	.17			
	8-12	.17	.17			
	12-23	.15	.15			
	23-38	.15	.15			
	38-80	.15	.15			
1671283:						
Stutts-----	0-0	---	---	5	2	134
	0-2	.24	.24			
	2-7	.24	.24			
	7-9	.24	.24			
	9-13	.24	.24			
	13-19	.24	.24			
	19-80	.15	.15			

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1671283: Kalkaska-----	0-1	---	---	5	2	134
	1-6	.17	.17			
	6-8	.17	.17			
	8-12	.17	.17			
	12-23	.15	.15			
	23-38	.15	.15			
	38-80	.15	.15			
1671284: Stutts-----	0-0	---	---	5	2	134
	0-2	.24	.24			
	2-7	.24	.24			
	7-9	.24	.24			
	9-13	.24	.24			
	13-19	.24	.24			
	19-80	.15	.15			
Kalkaska-----	0-1	---	---	5	2	134
	1-6	.17	.17			
	6-8	.17	.17			
	8-12	.17	.17			
	12-23	.15	.15			
	23-38	.15	.15			
	38-80	.15	.15			
1693163. Water						

# Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 17.—Total Soil Carbon

(This table displays soil organic carbon (SOC) and soil inorganic carbon (SIC) in kilograms per square meter to a depth of 2 meters or to the representative top depth of any kind of bedrock or any cemented soil horizon. SOC and SIC are reported on a volumetric whole soil basis, corrected for representative rock fragments indicated in the database. SOC is converted from horizon soil organic matter of the fraction of the soil less than 2 mm in diameter. If soil organic matter indicated in the database is NULL, SOC is assumed to be zero. SIC is converted from horizon calcium carbonate content fraction of the soil less than 2 mm in diameter. If horizon calcium carbonate indicated in the database is NULL, SIC is assumed to be zero. A weighted average of all horizons is used in the calculations. Only major components of a map unit are displayed in this table)

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m<sup>2</sup></u>	<u>kg/m<sup>2</sup></u>
1455241: Deer Park (90%) -----	14	0
1455242: Deer Park (95%) -----	14	0
1455243: Deer Park (98%) -----	16	0
1455244: Rubicon (90%) -----	17	0
1455245: Rubicon (95%) -----	17	0
1455246: Rubicon (95%) -----	17	0
1455247: Kalkaska (94%) -----	9	0
1455248: Kalkaska (96%) -----	9	0
1455249: Kalkaska (100%) -----	9	0
1455250: Crowell (92%) -----	10	0
1455251: Paquin (90%) -----	17	0
1455252: Au Gres (92%) -----	12	0
1455253: Kinross (92%) -----	26	0
1455254: Deford (92%) -----	16	0
1455255: Ingalls (90%) -----	24	0

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1455257:		
Munising (5%)-----	14	0
Yalmer (3%)-----	16	0
1455262:		
Ensley (9%)-----	26	35
1455263:		
Munising, calcareous substratum (4%)-----	15	8
Yalmer, calcareous substratum (3%)-----	17	9
Frohling, calcareous substratum (2%)-----	18	3
1455266:		
Grand Sable (9%)-----	15	0
1455267:		
Grand Sable (98%)-----	15	0
1455268:		
Rhody (6%)-----	43	0
Towes (3%)-----	17	0
1455269:		
Waiska, very stony (9%)-----	9	0
1455273:		
Deerton (5%)-----	12	0
Au Train (3%)-----	10	0
1455274:		
Deerton (5%)-----	12	0
Au Train (3%)-----	10	0
1455276:		
Cookson (9%)-----	15	2
1455277:		
Nahma (5%)-----	48	4
Ruse (4%)-----	32	2
1455278:		
Summerville (85%)-----	5	0
1455281:		
Carbondale (3%)-----	199	0
Lupton (3%)-----	211	0
Tawas (3%)-----	82	0

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1455282:		
Dawson (30%)-----	76	0
Greenwood (30%)-----	121	0
Loxley (30%)-----	239	0
1455283:		
Chippeny (55%)-----	61	4
Nahma (30%)-----	48	4
1455284:		
Histosols (50%)-----	191	0
Aquents (50%).		
1455285.		
Pits (100%)		
1455289:		
Jeske, bedrock terrace (45%)-----	10	0
Gongeau, bedrock terrace (25%)-----	28	0
Deerton, bedrock terrace (20%)-----	12	0
1455290:		
Jeske, bedrock terrace (45%)-----	10	0
Gongeau, bedrock terrace (25%)-----	28	0
Deerton, bedrock terrace (20%)-----	12	0
1455291:		
Ruse, bedrock terrace (40%)-----	43	1
Ensign, bedrock terrace (30%)-----	8	0
Nykanen, bedrock terrace (20%)-----	7	0
1455292:		
Ruse, bedrock terrace (40%)-----	42	0
Ensign, bedrock terrace (30%)-----	8	0
Nykanen, bedrock terrace (20%)-----	7	0
1455295:		
Ewart (70%)-----	19	0
Sturgeon (20%)-----	18	0
1455296:		
Deerton, dissected (40%)-----	12	0
Tokiahok, dissected (30%)-----	17	0
Trout Bay, dissected (15%)-----	57	0

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1455298:		
Garlic, dissected (40%)-----	13	0
Blue Lake, dissected (30%)-----	18	0
Voelker, dissected (20%)-----	23	0
1455299:		
Garlic, dissected (40%)-----	13	0
Blue Lake, dissected (30%)-----	18	0
Voelker, dissected (20%)-----	23	0
1455300:		
Garlic, dissected (40%)-----	13	0
Blue Lake, dissected (30%)-----	18	0
Voelker, dissected (20%)-----	23	0
1455302:		
Garlic (40%)-----	13	0
Blue Lake (30%)-----	18	0
Voelker (20%)-----	23	0
1455304:		
Cathro (55%)-----	96	39
Ensley (35%)-----	26	35
1455305:		
Tawas (70%)-----	82	0
Deford (20%)-----	16	0
1455308:		
Fence, dissected (90%)-----	12	0
1455310:		
Rousseau (50%)-----	11	0
Dawson (45%)-----	76	0
1455318:		
Munising, calcareous substratum (65%)-----	15	8
Ensley (25%)-----	26	35
1455319:		
Munising, dissected, very stony (50%)-----	14	0
Yalmer, dissected, very stony (35%)-----	15	0
1455320:		
Munising, stony (60%)-----	14	0
Skanee, stony (30%)-----	17	0

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1455324:		
Zeba, very stony (5%)-----	7	0
Jacobsville, very stony (3%)-----	19	0
1455326:		
Munising, dissected, stony (5%)-----	14	0
Abbaye, dissected, stony (35%)-----	11	0
1455327:		
Paquin (55%)-----	17	0
Finch (45%)-----	22	0
1455339:		
Croswell (50%)-----	10	0
Kinross (40%)-----	26	0
1455340:		
Frohling, dissected, stony (60%)-----	11	0
Tokiahok, dissected, stony (30%)-----	17	0
1455341:		
McMaster (90%)-----	11	21
1455344:		
Reade (85%)-----	16	0
1455353:		
Charlevoix (55%)-----	12	42
Ensley (30%)-----	26	35
1455359:		
Munising (55%)-----	14	0
Abbaye (35%)-----	11	0
1455360:		
Kalkaska (60%)-----	9	0
Blue Lake (30%)-----	18	0
1455361:		
Kalkaska (55%)-----	9	0
Blue Lake (35%)-----	18	0
1455362:		
Kalkaska (55%)-----	9	0
Blue Lake (35%)-----	18	0
1455363:		
Jeske (40%)-----	10	0
Au Train (30%)-----	10	0
Gongeau (20%)-----	28	0

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Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1455365: Cusino (95%)-----	13	0
1455366: Cusino (95%)-----	13	0
1455367: Kalkaska (50%)-----	9	0
Cusino (45%)-----	13	0
1455368: Kalkaska (50%)-----	9	0
Cusino (45%)-----	13	0
1455369: Kalkaska (50%)-----	9	0
Cusino (40%)-----	13	0
1455370: Kalkaska (50%)-----	9	0
Cusino (35%)-----	13	0
1455371: Halfaday (90%)-----	21	0
1455372: Shelldrake (90%)-----	13	0
1455380: Trout Bay (30%)-----	57	0
Gongeau (25%)-----	28	0
Shingleton (20%)-----	4	0
Rock outcrop (15%).		
1455382: Kalkaska, severely burned (95%)-----	9	0
1455383: Kalkaska, severely burned (95%)-----	9	0
1455386: Trout Bay (40%)-----	57	0
Lupton (30%)-----	246	0
Gongeau (20%)-----	28	0
1455387: Garlic (90%)-----	13	0
1455388: Garlic (90%)-----	13	0
1455389: Garlic (90%)-----	13	0

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Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1455390:		
Escanaba (50%)-----	16	30
Greylock (40%)-----	16	48
1455391:		
Escanaba (50%)-----	16	30
Greylock (40%)-----	16	48
1455392:		
Escanaba (50%)-----	16	30
Greylock (40%)-----	16	48
1455395:		
Greylock (90%)-----	16	48
1455396:		
Greylock (85%)-----	16	48
1455397:		
Finch (50%)-----	22	0
Kinross (40%)-----	26	0
1455402:		
Kalkaska, dissected (55%)-----	9	0
Blue Lake, dissected (35%)-----	18	0
1455403:		
Kalkaska, dissected (55%)-----	9	0
Blue Lake, dissected (35%)-----	18	0
1455404:		
Kalkaska, dissected (55%)-----	9	0
Blue Lake, dissected (35%)-----	18	0
1455408:		
Spot (50%)-----	16	0
Finch (40%)-----	22	0
1455409:		
Finch (85%)-----	22	0
1455410:		
Munising, calcareous substratum, dissected (40%)-----	15	8
Frohling, calcareous substratum, dissected (30%)-----	18	3
Cookson, dissected (20%)-----	15	2
1455411:		
Frohling, calcareous substratum, dissected (50%)-----	18	3
Garlic, dissected (20%)-----	13	0
Cookson, dissected (20%)-----	15	2

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Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1455412:		
Munising, calcareous substratum, dissected (40%)—	15	8
Yalmer, calcareous substratum, dissected (30%)---	17	9
Frohling, calcareous substratum, dissected (20%)—	18	3
1455413:		
Munising, calcareous substratum (50%)-----	15	8
Cookson (40%)-----	15	2
1455416:		
Furlong (50%)-----	10	0
Shingleton (40%)-----	4	0
1455417:		
Furlong (50%)-----	10	0
Shingleton (40%)-----	4	0
1455421:		
Steuben (40%)-----	16	0
Blue Lake (30%)-----	18	0
Kalkaska (20%)-----	9	0
1455422:		
Steuben (40%)-----	16	0
Blue Lake (25%)-----	18	0
Kalkaska (25%)-----	9	0
1455425:		
Greylock (50%)-----	16	48
Cookson (40%)-----	15	2
1455431:		
Rubicon, severely burned (95%)-----	14	0
1455432:		
Rubicon, severely burned (95%)-----	14	0
1455433:		
Wurtsmith (55%)-----	9	0
Deford (35%)-----	16	0
1455434:		
Shelldrake (99%)-----	13	0
1455435:		
Shelldrake (61%)-----	13	0
Dune land (38%) .		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m<sup>2</sup></u>	<u>kg/m<sup>2</sup></u>
1455436:		
Cookson, dissected (55%)-----	15	2
Nykanen, dissected (35%)-----	7	0
1455437:		
Dillingham (45%)-----	13	0
Kalkaska (40%)-----	9	0
1455438:		
Dillingham (52%)-----	13	0
Kalkaska (45%)-----	9	0
1455439:		
Dillingham (50%)-----	13	0
Kalkaska (40%)-----	9	0
1671074:		
Udipsamments (50%)-----	4	0
Udorthents (50%).		
1671282:		
Stutts (65%)-----	13	0
Kalkaska (35%)-----	8	0
1671283:		
Stutts (65%)-----	13	0
Kalkaska (25%)-----	8	0
1671284:		
Stutts (55%)-----	13	0
Kalkaska (45%)-----	8	0
1693163.		
Water (100%)		

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 18.—Chemical Soil Properties

(Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Depth		Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In		meq/100 g	meq/100 g	pH	Pct
1455241:						
Deer Park-----	0-2		---	13.9-80.2	3.5-6.0	0
	2-3		---	0.1-1.9	3.5-6.0	0
	3-10		---	0.0-1.9	3.5-6.0	0
	10-21		---	0.1-1.6	3.5-6.5	0
	21-80		---	0.0-0.8	3.5-6.5	0
1455242:						
Deer Park-----	0-2		---	13.9-80.2	3.5-6.0	0
	2-3		---	0.1-1.9	3.5-6.0	0
	3-10		---	0.0-1.9	3.5-6.0	0
	10-21		---	0.1-1.6	3.5-6.5	0
	21-80		---	0.0-0.8	3.5-6.5	0
1455243:						
Deer Park-----	0-2		---	13.9-80.2	3.5-6.0	0
	2-3		---	0.1-1.9	3.5-6.0	0
	3-10		---	0.0-1.9	3.5-6.0	0
	10-21		---	0.1-1.6	3.5-6.5	0
	21-80		---	0.0-0.8	3.5-6.5	0
1455244:						
Rubicon-----	0-2		---	23.8-61.3	4.5-5.5	0
	2-7		---	0.0-3.2	4.5-6.0	0
	7-32	0.0-3.8	---	---	4.5-6.0	0
	32-40	0.0-2.3	---	---	4.5-6.5	0
	40-80	0.0-2.3	---	---	4.5-6.5	0
1455245:						
Rubicon-----	0-2		---	23.8-61.3	4.5-5.5	0
	2-7		---	0.0-3.2	4.5-6.0	0
	7-32	0.0-3.8	---	---	4.5-6.0	0
	32-40	0.0-2.3	---	---	4.5-6.5	0
	40-80	0.0-2.3	---	---	4.5-6.5	0
1455246:						
Rubicon-----	0-2		---	23.8-61.3	4.5-5.5	0
	2-7		---	0.0-3.2	4.5-6.0	0
	7-32	0.0-3.8	---	---	4.5-6.0	0
	32-40	0.0-2.3	---	---	4.5-6.5	0
	40-80	0.0-2.3	---	---	4.5-6.5	0
1455247:						
Kalkaska-----	0-2		---	0.4-5.6	3.5-6.0	0
	2-6		---	0.0-2.2	4.5-6.0	0
	6-8		---	0.4-5.6	4.5-6.0	0
	8-16		---	0.2-4.2	4.5-6.0	0
	16-26		---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	---	4.5-6.5	0
1455248:						
Kalkaska-----	0-2		---	0.4-5.6	3.5-6.0	0
	2-6		---	0.0-2.2	4.5-6.0	0
	6-8		---	0.4-5.6	4.5-6.0	0
	8-16		---	0.2-4.2	4.5-6.0	0
	16-26		---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	---	4.5-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455249:					
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
1455250:					
Croswell-----	0-2	---	23.8-46.9	4.5-5.0	0
	2-6	---	0.0-2.2	3.5-6.0	0
	6-15	---	0.1-2.4	4.5-6.0	0
	15-22	0.0-2.3	---	5.1-6.5	0
	22-80	0.0-2.3	---	5.1-6.5	0
1455251:					
Paquin-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-12	---	0.0-2.3	3.5-5.5	0
	12-14	---	0.1-2.6	3.5-5.5	0
	14-17	---	0.1-2.6	3.5-5.5	0
	17-27	---	0.1-2.6	3.5-5.5	0
	27-34	---	0.1-0.9	4.5-6.0	0
	34-80	0.0-1.0	---	4.5-6.5	0
1455252:					
Au Gres-----	0-2	---	13.9-34.0	3.5-4.4	0
	2-7	---	0.0-2.2	3.5-6.0	0
	7-17	0.0-2.5	---	4.5-6.5	0
	17-28	---	0.0-1.4	4.5-6.5	0
	28-80	---	0.0-1.4	4.5-6.5	0
1455253:					
Kinross-----	0-3	---	17.5-46.9	3.4-5.0	0
	3-14	---	0.0-3.7	3.6-5.0	0
	14-22	0.5-3.9	---	3.6-6.0	0
	22-35	0.1-3.8	---	3.6-6.0	0
	35-80	0.0-1.0	---	4.5-6.5	0
1455254:					
Deford-----	0-4	---	31.6-80.2	4.5-6.0	0
	4-80	---	0.0-1.6	5.1-7.8	0
1455255:					
Ingalls-----	0-4	---	12.1-61.3	3.0-5.5	0
	4-5	---	0.0-1.9	3.5-5.5	0
	5-14	---	0.0-5.6	3.5-5.5	0
	14-16	---	0.0-2.5	3.5-6.0	0
	16-35	---	0.0-2.9	3.5-6.0	0
	35-80	---	---	5.6-7.8	0-20
1455257:					
Munising-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-2	---	0.0-2.5	4.5-6.0	0
	2-10	---	---	4.5-6.0	0
	10-14	---	0.8-2.5	4.5-6.0	0
	14-22	---	0.8-2.9	4.5-6.0	0
	22-49	---	2.2-5.1	4.5-6.0	0
	49-63	---	2.9-10.0	4.5-6.0	0
	63-80	3.2-6.4	---	5.6-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455257:					
Yalmer-----	0-1	---	13.9-80.2	3.5-6.0	0
	1-3	---	0.1-5.2	3.5-6.0	0
	3-8	---	0.0-6.4	3.5-6.0	0
	8-11	---	0.1-4.9	3.5-6.0	0
	11-24	---	0.1-4.2	3.5-6.0	0
	24-40	---	0.5-3.9	3.5-6.0	0
	40-66	---	0.8-4.9	3.5-6.0	0
	66-80	4.4-8.0	---	5.6-6.5	0
1455262:					
Ensley-----	0-5	107.9-173.6	---	6.1-7.8	0
	5-7	28.9-76.5	---	6.1-7.3	0
	7-19	3.8-10.7	---	6.6-7.8	0
	19-80	2.6-8.0	---	6.6-7.8	10-20
1455263:					
Munising, calcareous substratum-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-3	---	1.8-10.4	4.5-6.0	0
	3-6	---	1.0-2.5	4.5-6.0	0
	6-23	---	1.1-2.9	4.5-6.0	0
	23-38	1.6-4.3	---	5.1-6.0	0
	38-50	2.6-6.4	---	5.1-6.5	0
	50-63	4.1-8.0	---	5.0-6.0	0
	63-80	4.1-8.0	---	7.4-8.4	10-30
Yalmer, calcareous substratum-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-2	---	0.3-5.4	3.5-5.5	0
	2-5	---	0.0-6.9	3.5-5.5	0
	5-16	---	0.3-5.4	4.5-6.0	0
	16-28	2.0-5.5	---	4.5-6.0	0
	28-36	1.5-6.1	---	5.1-6.5	0
	36-62	1.5-7.1	---	5.1-6.5	0
	62-80	1.5-8.5	---	7.4-8.4	10-30
Frohling, calcareous substratum-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-5	---	0.7-9.0	4.5-5.5	0
	5-24	---	0.4-2.2	4.5-5.5	0
	24-73	2.1-6.4	---	5.1-6.0	0
	73-80	4.1-6.4	---	7.4-8.4	10-30
1455266:					
Grand Sable-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-4	---	1.8-9.9	4.5-5.5	0
	4-30	1.5-6.1	---	5.1-6.0	0
	30-32	1.5-7.8	---	5.1-6.0	0
	32-43	1.5-9.2	---	5.1-6.5	0
	43-55	0.5-3.3	---	5.1-6.5	0
	55-80	0.3-2.6	---	5.1-6.5	0
1455267:					
Grand Sable-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-4	---	1.8-9.9	4.5-5.5	0
	4-30	1.5-6.1	---	5.1-6.0	0
	30-32	1.5-7.8	---	5.1-6.0	0
	32-43	1.5-9.2	---	5.1-6.5	0
	43-55	0.5-3.3	---	5.1-6.5	0
	55-80	0.3-2.6	---	5.1-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455268:					
Rhody-----	0-19	0.0-3.4	---	5.6-6.5	0
	19-36	0.0-1.1	---	6.6-7.3	0
	36-41	---	---	---	---
	41-80	---	---	---	---
Towes-----	0-19	---	0.0-1.4	5.1-6.0	0
	19-22	0.0-1.1	---	5.6-6.5	0
	22-26	0.0-1.1	---	6.1-7.3	0
	26-37	---	---	---	---
	37-80	---	---	---	---
1455269:					
Waiska, very stony---	0-1	---	13.9-61.3	3.5-5.5	0
	1-4	---	0.2-6.4	3.5-6.0	0
	4-8	---	0.2-4.9	3.5-6.0	0
	8-18	---	0.1-1.8	3.5-6.0	0
	18-80	---	0.0-1.0	5.1-6.0	0
1455273:					
Deerton-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-9	---	0.0-1.9	3.5-6.0	0
	9-10	---	0.1-4.0	3.5-6.0	0
	10-25	---	0.1-3.4	3.5-6.0	0
	25-39	---	---	---	---
	39-80	---	---	---	---
Au Train-----	0-2	---	100.0-180.0	3.5-5.0	0
	2-9	---	0.0-3.2	3.5-5.0	0
	9-14	---	0.4-5.9	3.5-5.0	0
	14-32	---	---	---	0
	32-80	---	---	---	---
1455274:					
Deerton-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-9	---	0.0-1.9	3.5-6.0	0
	9-10	---	0.1-4.0	3.5-6.0	0
	10-25	---	0.1-3.4	3.5-6.0	0
	25-39	---	---	---	---
	39-80	---	---	---	---
Au Train-----	0-2	---	100.0-180.0	3.5-5.0	0
	2-9	---	0.0-3.2	3.5-5.0	0
	9-14	---	0.4-5.9	3.5-5.0	0
	14-32	---	---	---	0
	32-80	---	---	---	---
1455276:					
Cookson-----	0-3	---	---	4.5-6.0	0
	3-7	---	---	4.5-6.0	0
	7-11	---	---	4.5-6.0	0
	11-16	---	---	4.5-6.0	0
	16-21	---	---	5.6-7.3	0
	21-31	2.7-13.4	---	6.6-7.8	0-10
	31-36	---	---	7.4-8.4	0-30
	36-80	---	---	---	---

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455277:					
Nahma-----	0-11	138.7-168.8	---	6.1-7.3	0
	11-14	18.9-50.0	---	6.1-7.8	0
	14-17	1.7-11.0	---	6.1-7.8	0-5
	17-19	1.6-10.7	---	6.1-7.8	0-5
	19-24	1.6-10.6	---	6.6-8.4	10-30
	24-80	---	---	---	---
Ruse-----	0-7	26.5-50.0	---	6.1-7.8	0-5
	7-11	0.6-11.0	---	6.1-8.4	0-20
	11-15	0.6-10.7	---	6.1-8.4	0-20
	15-80	---	---	---	---
1455278:					
Summerville-----	0-3	1.1-6.7	---	6.1-8.4	0
	3-13	1.1-5.4	---	6.1-8.4	0-20
	13-80	---	---	---	---
1455281:					
Carbondale-----	0-38	136.7-178.2	---	5.1-7.3	0
	38-80	125.4-134.7	---	5.1-7.3	0
Lupton-----	0-4	92.0-99.6	---	4.5-7.8	0
	4-80	174.2-211.8	---	4.5-7.8	0
Tawas-----	0-26	---	66.7-272.1	4.5-6.5	0
	26-80	0.0-3.4	---	5.1-6.5	0
1455282:					
Dawson-----	0-10	---	18.1-42.7	3.0-4.4	0
	10-19	---	18.9-42.7	3.0-4.4	0
	19-38	---	17.4-42.7	3.0-4.4	0
	38-80	---	0.2-7.0	3.0-6.5	0
Greenwood-----	0-65	---	16.5-41.1	3.5-4.4	0
	65-80	---	16.5-41.1	3.5-4.4	0
Loxley-----	0-8	---	23.9-42.7	3.5-5.0	0
	8-80	---	22.9-42.7	3.5-5.0	0
1455283:					
Chippeny-----	0-20	161.6-199.2	---	5.6-7.8	0
	20-28	2.6-15.4	---	6.6-9.0	0-30
	28-80	---	---	---	---
Nahma-----	0-11	138.7-168.8	---	6.1-7.3	0
	11-14	18.9-50.0	---	6.1-7.8	0
	14-17	1.7-11.0	---	6.1-7.8	0-5
	17-19	1.6-10.7	---	6.1-7.8	0-5
	19-24	1.6-10.6	---	6.6-8.4	10-30
	24-80	---	---	---	---
1455289:					
Jeske, bedrock terrace-----	0-3	---	13.9-46.9	3.5-5.0	0
	3-21	---	---	4.5-5.5	0
	21-31	---	---	5.1-6.0	---
	31-80	---	---	---	---

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455289: Gongeau, bedrock terrace-----	0-5	---	18.4-46.9	3.5-5.0	0
	5-7	---	0.2-11.8	4.5-6.0	0
	7-18	0.0-4.0	---	4.5-6.0	0
	18-29	---	---	4.5-6.0	---
	29-80	---	---	---	---
Deerton, bedrock terrace-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-9	---	0.0-1.9	3.5-6.0	0
	9-10	---	0.1-4.0	3.5-6.0	0
	10-25	---	0.1-3.4	3.5-6.0	0
	25-39	---	---	---	---
	39-80	---	---	---	---
1455290: Jeske, bedrock terrace-----	0-3	---	13.9-46.9	3.5-5.0	0
	3-21	---	---	4.5-5.5	0
	21-31	---	---	5.1-6.0	---
	31-80	---	---	---	---
Gongeau, bedrock terrace-----	0-5	---	18.4-46.9	3.5-5.0	0
	5-7	---	0.2-11.8	4.5-6.0	0
	7-18	0.0-4.0	---	4.5-6.0	0
	18-29	---	---	4.5-6.0	---
	29-80	---	---	---	---
Deerton, bedrock terrace-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-9	---	0.0-1.9	3.5-6.0	0
	9-10	---	0.1-4.0	3.5-6.0	0
	10-25	---	0.1-3.4	3.5-6.0	0
	25-39	---	---	---	---
	39-80	---	---	---	---
1455291: Ruse, bedrock terrace	0-10	0.4-33.0	---	6.1-7.8	0-5
	10-13	0.6-11.0	---	6.1-7.8	0-20
	13-19	---	---	---	---
	19-80	---	---	---	---
Ensign, bedrock terrace-----	0-10	4.0-9.5	---	6.1-7.8	0
	10-14	3.8-9.3	---	6.1-7.8	0-5
	14-18	---	---	---	---
	18-80	---	---	---	---
Nykanen, bedrock terrace-----	0-4	---	5.1-10.8	4.5-5.5	0
	4-14	---	3.2-10.8	5.1-6.0	0
	14-25	---	---	---	---
	25-80	---	---	---	---

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455292:					
Ruse, bedrock terrace	0-10	0.4-33.0	---	6.1-7.8	0-5
	10-13	0.6-11.0	---	6.1-7.8	0-20
	13-19	---	---	---	---
	19-80	---	---	---	---
Ensign, bedrock terrace-----	0-10	4.0-9.5	---	6.1-7.8	0
	10-14	3.8-9.3	---	6.1-7.8	0-5
	14-18	---	---	---	---
	18-80	---	---	---	---
Nykanen, bedrock terrace-----	0-4	---	5.1-10.8	4.5-5.5	0
	4-14	---	3.2-10.8	5.1-6.0	0
	14-25	---	---	---	---
	25-80	---	---	---	---
1455295:					
Evert-----	0-10	2.8-12.8	---	6.1-7.8	0
	10-18	1.0-6.4	---	6.1-7.8	0
	18-80	0.0-1.6	---	6.1-8.4	0-10
Sturgeon-----	0-6	4.0-9.6	---	4.5-6.5	0
	6-16	3.8-9.1	---	4.5-6.5	0
	16-80	0.0-3.9	---	4.5-6.5	0
1455296:					
Deerton, dissected---	0-1	---	13.9-46.9	3.5-5.0	0
	1-9	---	0.0-1.9	3.5-6.0	0
	9-10	---	0.1-4.0	3.5-6.0	0
	10-25	---	0.1-3.4	3.5-6.0	0
	25-39	---	---	---	---
	39-80	---	---	---	---
Tokiahok, dissected--	0-2	---	23.8-61.3	4.5-5.5	0
	2-11	---	0.3-7.4	4.5-5.5	0
	11-15	---	0.3-5.7	4.5-5.5	0
	15-24	---	0.2-4.9	4.5-5.5	0
	24-59	1.6-8.5	---	5.1-6.5	0
	59-80	1.6-8.5	---	5.6-6.5	0
Trout Bay, dissected-	0-19	132.7-160.2	---	4.5-6.0	0
	19-34	---	---	---	---
	34-80	---	---	---	---
1455298:					
Garlic, dissected----	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0
Blue Lake, dissected-	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
		meq/100 g	meq/100 g	pH	Pct
1455299:					
Garlic, dissected----	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0
Blue Lake, dissected-	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
	Voelker, dissected---	0-1	---	23.8-61.3	4.5-5.5
1-5		---	0.1-4.0	4.5-5.5	0
5-11		---	0.0-4.4	4.5-5.5	0
11-15		---	0.1-4.0	4.5-5.5	0
15-31		---	0.1-4.0	4.5-5.5	0
31-39		1.0-8.5	---	5.1-6.0	0
39-80		1.0-8.5	---	5.1-6.0	0
1455300:					
Garlic, dissected----	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0
Blue Lake, dissected-	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
	Voelker, dissected---	0-1	---	23.8-61.3	4.5-5.5
1-5		---	0.1-4.0	4.5-5.5	0
5-11		---	0.0-4.4	4.5-5.5	0
11-15		---	0.1-4.0	4.5-5.5	0
15-31		---	0.1-4.0	4.5-5.5	0
31-39		1.0-8.5	---	5.1-6.0	0
39-80		1.0-8.5	---	5.1-6.0	0
1455302:					
Garlic-----	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0
Blue Lake-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455302:					
Voelker-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-5	---	0.1-4.0	4.5-5.5	0
	5-11	---	0.0-4.4	4.5-5.5	0
	11-15	---	0.1-4.0	4.5-5.5	0
	15-31	---	0.1-4.0	4.5-5.5	0
	31-39	1.0-8.5	---	5.1-6.0	0
	39-80	1.0-8.5	---	5.1-6.0	0
1455304:					
Cathro-----	0-34	92.5-173.6	---	4.5-7.8	0
	34-80	1.5-8.8	---	5.6-8.4	10-30
Ensley-----	0-5	107.9-173.6	---	6.1-7.8	0
	5-7	28.9-76.5	---	6.1-7.3	0
	7-19	3.8-10.7	---	6.6-7.8	0
	19-80	2.6-8.0	---	6.6-7.8	10-20
1455305:					
Tawas-----	0-26	---	66.7-272.1	4.5-6.5	0
	26-80	0.0-3.4	---	5.1-6.5	0
Deford-----	0-4	---	31.6-80.2	4.5-6.0	0
	4-80	---	0.0-1.6	5.1-7.8	0
1455308:					
Fence, dissected----	0-3	---	1.3-6.1	3.5-6.0	0
	3-7	2.0-9.1	---	3.5-6.0	0
	7-11	2.1-9.5	---	3.5-6.0	0
	11-19	2.0-9.1	---	4.5-6.0	0
	19-42	4.3-16.2	---	4.5-6.5	0
	42-80	1.9-16.2	---	5.1-7.8	0-10
1455310:					
Rousseau-----	0-1	---	13.9-80.2	3.5-6.0	0
	1-4	---	0.0-3.2	3.5-6.0	0
	4-20	---	0.1-3.1	3.5-6.5	0
	20-33	---	0.0-0.7	3.5-6.5	0
	33-66	---	---	3.5-6.5	0
	66-80	---	---	3.5-6.5	0
Dawson-----	0-10	---	18.1-42.7	3.0-4.4	0
	10-19	---	18.9-42.7	3.0-4.4	0
	19-38	---	17.4-42.7	3.0-4.4	0
	38-80	---	0.2-7.0	3.0-6.5	0
1455318:					
Munising, calcareous substratum-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-3	---	1.8-10.4	4.5-6.0	0
	3-6	---	1.0-2.5	4.5-6.0	0
	6-23	---	1.1-2.9	4.5-6.0	0
	23-38	1.6-4.3	---	5.1-6.0	0
	38-50	2.6-6.4	---	5.1-6.5	0
	50-63	4.1-8.0	---	5.0-6.0	0
	63-80	4.1-8.0	---	7.4-8.4	10-30

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455318:					
Ensley-----	0-5	107.9-173.6	---	6.1-7.8	0
	5-7	28.9-76.5	---	6.1-7.3	0
	7-19	3.8-10.7	---	6.6-7.8	0
	19-80	2.6-8.0	---	6.6-7.8	10-20
1455319:					
Munising, dissected, very stony-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-2	---	0.0-2.5	4.5-6.0	0
	2-10	---	---	4.5-6.0	0
	10-14	---	0.8-2.5	4.5-6.0	0
	14-22	---	0.8-2.9	4.5-6.0	0
	22-49	---	2.2-5.1	4.5-6.0	0
	49-63	---	2.9-10.0	4.5-6.0	0
	63-80	3.2-6.4	---	5.6-6.5	0
Yalmer, dissected, very stony-----	0-1	---	13.9-80.2	3.5-6.0	0
	1-3	---	0.1-4.9	3.5-6.0	0
	3-8	---	0.0-6.4	3.5-6.0	0
	8-11	---	0.1-4.9	3.5-6.0	0
	11-24	---	0.1-4.2	3.5-6.0	0
	24-40	---	0.5-3.9	3.5-6.0	0
	40-66	---	0.8-4.9	3.5-6.0	0
	66-80	4.4-8.0	---	5.6-6.5	0
1455320:					
Munising, stony-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-2	---	0.0-2.5	4.5-6.0	0
	2-10	---	---	4.5-6.0	0
	10-14	---	0.8-2.5	4.5-6.0	0
	14-22	---	0.8-2.9	4.5-6.0	0
	22-49	---	2.2-5.1	4.5-6.0	0
	49-63	---	2.9-10.0	4.5-6.0	0
	63-80	3.2-6.4	---	5.6-6.5	0
Skanee, stony-----	0-2	---	13.9-61.3	3.5-5.5	0
	2-8	---	1.3-14.9	3.5-5.5	0
	8-14	---	0.3-2.5	3.5-6.0	0
	14-31	---	1.0-4.3	3.5-6.0	0
	31-42	2.6-15.8	---	4.5-6.0	0
	42-80	2.1-6.4	---	4.5-6.0	0
1455324:					
Zeba, very stony-----	0-2	---	1.0-3.9	4.5-6.0	0
	2-5	---	1.2-10.4	4.5-6.0	0
	5-13	2.7-6.6	---	4.5-6.0	0
	13-33	---	0.5-5.6	4.5-6.5	0
	33-80	---	---	---	---
Jacobsville, very stony-----	0-5	---	24.1-61.3	4.0-5.5	0
	5-9	---	0.9-12.5	4.5-6.5	0
	9-23	2.7-8.1	---	5.1-6.5	0
	23-36	2.6-8.0	---	5.1-6.5	0
	36-80	---	---	---	---

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455326: Munising, dissected, stony-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-2	---	0.0-2.5	4.5-6.0	0
	2-10	---	---	4.5-6.0	0
	10-14	---	0.8-2.5	4.5-6.0	0
	14-22	---	0.8-2.9	4.5-6.0	0
	22-49	---	2.2-5.1	4.5-6.0	0
	49-63	---	2.9-10.0	4.5-6.0	0
	63-80	3.2-6.4	---	5.6-6.5	0
Abbaye, dissected, stony-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-4	---	0.3-2.5	4.5-6.0	0
	4-13	---	0.9-9.6	4.5-6.0	0
	13-25	2.2-5.5	---	4.5-6.0	0
	25-32	4.2-8.0	---	4.5-6.0	0
	32-80	---	---	---	---
1455327: Paquin-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-12	---	0.0-2.3	3.5-5.5	0
	12-14	---	0.1-2.6	3.5-5.5	0
	14-17	---	0.1-2.6	3.5-5.5	0
	17-27	---	0.1-2.6	3.5-5.5	0
	27-34	---	0.1-0.9	4.5-6.0	0
	34-80	0.0-1.0	---	4.5-6.5	0
Finch-----	0-1	---	13.9-64.7	3.5-5.6	0
	1-11	---	0.0-1.9	3.5-6.0	0
	11-42	---	0.1-1.9	3.5-6.0	0
	42-80	0.0-3.5	---	5.1-6.5	0
1455339: Croswell-----	0-2	---	23.8-46.9	4.5-5.0	0
	2-6	---	0.0-2.2	3.5-6.0	0
	6-15	---	0.1-2.4	4.5-6.0	0
	15-22	0.0-2.3	---	5.1-6.5	0
	22-80	0.0-2.3	---	5.1-6.5	0
Kinross-----	0-3	---	17.5-46.9	3.4-5.0	0
	3-14	---	0.0-3.7	3.6-5.0	0
	14-22	0.5-3.9	---	3.6-6.0	0
	22-35	0.1-3.8	---	3.6-6.0	0
	35-80	0.0-1.0	---	4.5-6.5	0
1455340: Frohling, dissected, stony-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-2	---	0.2-2.5	4.5-5.5	0
	2-7	---	0.6-9.7	4.5-5.5	0
	7-9	---	0.2-2.5	4.5-5.5	0
	9-16	---	0.2-2.9	4.5-5.5	0
	16-34	---	0.2-2.7	5.1-6.0	0
	34-80	---	0.7-6.9	5.1-6.0	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455340: Tokiahok, dissected, stony-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-11	---	0.3-7.4	4.5-5.5	0
	11-15	---	0.3-5.7	4.5-5.5	0
	15-24	---	0.2-4.9	4.5-5.5	0
	24-59	1.6-8.5	---	5.1-6.5	0
	59-80	1.6-8.5	---	5.6-6.5	0
1455341: McMaster-----	0-2	100.0-180.0	---	4.5-5.5	0
	2-4	---	6.0-18.0	4.5-5.5	0
	4-8	---	0.5-4.9	4.5-5.5	0
	8-11	---	4.0-20.0	4.5-6.0	0
	11-24	1.0-10.0	---	6.1-7.3	0
	24-39	0.0-4.0	---	7.4-8.4	5-25
	39-80	0.0-4.0	---	7.3-8.4	5-25
1455344: Reade-----	0-4	---	13.9-61.3	3.5-5.5	0
	4-7	---	0.6-16.3	3.5-5.5	0
	7-9	---	0.7-8.7	4.5-5.5	0
	9-15	1.1-13.4	---	4.5-6.5	0
	15-20	1.8-14.7	---	6.6-7.8	0
	20-28	1.8-14.7	---	6.6-8.4	0-5
	28-80	---	---	---	---
1455353: Charlevoix-----	0-2	---	13.9-80.2	3.5-6.0	0
	2-5	---	1.4-13.6	3.5-6.0	0
	5-7	---	0.3-1.9	3.5-6.0	0
	7-12	0.8-3.8	---	3.5-6.0	0
	12-16	1.4-4.3	---	5.6-7.3	0
	16-27	2.1-5.7	---	5.6-8.4	0
	27-80	1.4-5.4	---	7.4-8.4	0-30
Ensley-----	0-5	107.9-173.6	---	6.1-7.8	0
	5-7	28.9-76.5	---	6.1-7.3	0
	7-19	3.8-10.7	---	6.6-7.8	0
	19-80	2.6-8.0	---	6.6-7.8	10-20
1455359: Munising-----	0-1	---	23.8-61.3	4.5-5.5	0
	1-2	---	0.0-2.5	4.5-6.0	0
	2-10	---	---	4.5-6.0	0
	10-14	---	0.8-2.5	4.5-6.0	0
	14-22	---	0.8-2.9	4.5-6.0	0
	22-49	---	2.2-5.1	4.5-6.0	0
	49-63	---	2.9-10.0	4.5-6.0	0
	63-80	3.2-6.4	---	5.6-6.5	0
Abbaye-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-4	---	0.3-2.5	4.5-6.0	0
	4-13	---	0.9-9.6	4.5-6.0	0
	13-25	2.2-5.5	---	4.5-6.0	0
	25-32	4.2-8.0	---	4.5-6.0	0
	32-80	---	---	---	---

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455360:					
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Blue Lake-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
	1455361:				
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Blue Lake-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
	1455362:				
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Blue Lake-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
	1455363:				
Jeske-----	0-3	---	13.9-46.9	3.5-5.0	0
	3-21	---	---	4.5-5.5	0
	21-31	---	---	5.1-6.0	---
	31-80	---	---	---	---
Au Train-----	0-2	---	100.0-180.0	3.5-5.0	0
	2-9	---	0.0-3.2	3.5-5.0	0
	9-14	---	0.4-5.9	3.5-5.0	0
	14-32	---	---	---	0
	32-80	---	---	---	---
Gongeau-----	0-5	---	18.4-46.9	3.5-5.0	0
	5-7	---	0.2-11.8	4.5-6.0	0
	7-18	0.0-4.0	---	4.5-6.0	0
	18-29	---	---	4.5-6.0	---
	29-80	---	---	---	---

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455365:					
Cusino-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-8	---	0.3-6.9	3.5-5.0	0
	8-10	---	0.4-8.5	3.5-5.5	0
	10-17	---	0.2-5.0	3.5-5.5	0
	17-80	---	0.0-1.2	4.5-6.0	0
1455366:					
Cusino-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-8	---	0.3-6.9	3.5-5.0	0
	8-10	---	0.4-8.5	3.5-5.5	0
	10-17	---	0.2-5.0	3.5-5.5	0
	17-80	---	0.0-1.2	4.5-6.0	0
1455367:					
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Cusino-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-8	---	0.3-6.9	3.5-5.0	0
	8-10	---	0.4-8.5	3.5-5.5	0
	10-17	---	0.2-5.0	3.5-5.5	0
	17-80	---	0.0-1.2	4.5-6.0	0
1455368:					
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Cusino-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-8	---	0.3-6.9	3.5-5.0	0
	8-10	---	0.4-8.5	3.5-5.5	0
	10-17	---	0.2-5.0	3.5-5.5	0
	17-80	---	0.0-1.2	4.5-6.0	0
1455369:					
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Cusino-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-8	---	0.3-6.9	3.5-5.0	0
	8-10	---	0.4-8.5	3.5-5.5	0
	10-17	---	0.2-5.0	3.5-5.5	0
	17-80	---	0.0-1.2	4.5-6.0	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455370:					
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Cusino-----	0-2	---	13.9-46.9	3.5-5.0	0
	2-8	---	0.3-6.9	3.5-5.0	0
	8-10	---	0.4-8.5	3.5-5.5	0
	10-17	---	0.2-5.0	3.5-5.5	0
	17-80	---	0.0-1.2	4.5-6.0	0
1455371:					
Halfaday-----	0-2	---	23.8-46.9	4.5-5.0	0
	2-9	---	0.0-4.8	3.5-6.0	0
	9-10	---	0.1-4.0	3.5-6.0	0
	10-35	---	0.1-2.6	3.5-6.0	0
	35-80	0.0-1.7	---	5.1-6.5	0
1455372:					
Shelldrake-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-3	---	13.9-46.9	3.5-5.0	0
	3-4	---	0.1-2.0	3.5-6.0	0
	4-80	---	0.0-0.8	3.5-6.0	0
1455380:					
Trout Bay-----	0-19	132.7-160.2	---	4.5-6.0	0
	19-34	---	---	---	---
	34-80	---	---	---	---
Gongeau-----	0-5	---	18.4-46.9	3.5-5.0	0
	5-7	---	0.2-11.8	4.5-6.0	0
	7-18	0.0-4.0	---	4.5-6.0	0
	18-29	---	---	4.5-6.0	---
	29-80	---	---	---	---
Shingleton-----	0-1	---	0.2-7.0	4.5-6.0	0
	1-7	---	0.0-7.3	4.5-6.0	0
	7-8	---	0.4-8.5	4.5-6.0	0
	8-11	---	0.2-7.0	4.5-6.0	0
	11-80	---	---	---	---
1455382:					
Kalkaska, severely burned-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
1455383:					
Kalkaska, severely burned-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455386:					
Trout Bay-----	0-19	132.7-160.2	---	4.5-6.0	0
	19-34	---	---	---	---
	34-80	---	---	---	---
Lupton-----	0-4	92.0-99.6	---	4.5-7.8	0
	4-80	174.2-211.8	---	4.5-7.8	0
Gongeau-----	0-5	---	18.4-46.9	3.5-5.0	0
	5-7	---	0.2-11.8	4.5-6.0	0
	7-18	0.0-4.0	---	4.5-6.0	0
	18-29	---	---	4.5-6.0	---
	29-80	---	---	---	---
1455387:					
Garlic-----	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0
1455388:					
Garlic-----	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0
1455389:					
Garlic-----	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0
1455390:					
Escanaba-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-3	0.1-6.1	---	5.1-6.0	0
	3-6	0.1-5.8	---	5.1-6.0	0
	6-26	0.1-5.9	---	5.1-6.0	0
	26-35	4.8-12.5	---	6.1-7.3	0
	35-42	7.6-14.7	---	6.1-7.3	0
	42-80	4.8-11.7	---	6.6-7.8	10-30
Greylock-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-6	1.1-4.4	---	5.1-6.0	0
	6-7	1.1-4.4	---	5.1-6.0	0
	7-9	2.2-5.5	---	5.1-6.0	0
	9-19	2.2-5.5	---	5.1-6.0	0
	19-26	2.1-5.4	---	6.1-7.3	0
	26-34	3.1-8.0	---	6.1-7.3	0
	34-80	3.1-7.5	---	7.4-8.4	10-30

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455391:					
Escanaba-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-3	0.1-6.1	---	5.1-6.0	0
	3-6	0.1-5.8	---	5.1-6.0	0
	6-26	0.1-5.9	---	5.1-6.0	0
	26-35	4.8-12.5	---	6.1-7.3	0
	35-42	7.6-14.7	---	6.1-7.3	0
	42-80	4.8-11.7	---	6.6-7.8	10-30
Greylock-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-6	1.1-4.4	---	5.1-6.0	0
	6-7	1.1-4.4	---	5.1-6.0	0
	7-9	2.2-5.5	---	5.1-6.0	0
	9-19	2.2-5.5	---	5.1-6.0	0
	19-26	2.1-5.4	---	6.1-7.3	0
	26-34	3.1-8.0	---	6.1-7.3	0
	34-80	3.1-7.5	---	7.4-8.4	10-30
1455392:					
Escanaba-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-3	0.1-6.1	---	5.1-6.0	0
	3-6	0.1-5.8	---	5.1-6.0	0
	6-26	0.1-5.9	---	5.1-6.0	0
	26-35	4.8-12.5	---	6.1-7.3	0
	35-42	7.6-14.7	---	6.1-7.3	0
	42-80	4.8-11.7	---	6.6-7.8	10-30
Greylock-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-6	1.1-4.4	---	5.1-6.0	0
	6-7	1.1-4.4	---	5.1-6.0	0
	7-9	2.2-5.5	---	5.1-6.0	0
	9-19	2.2-5.5	---	5.1-6.0	0
	19-26	2.1-5.4	---	6.1-7.3	0
	26-34	3.1-8.0	---	6.1-7.3	0
	34-80	3.1-7.5	---	7.4-8.4	10-30
1455395:					
Greylock-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-6	1.1-4.4	---	5.1-6.0	0
	6-7	1.1-4.4	---	5.1-6.0	0
	7-9	2.2-5.5	---	5.1-6.0	0
	9-19	2.2-5.5	---	5.1-6.0	0
	19-26	2.1-5.4	---	6.1-7.3	0
	26-34	3.1-8.0	---	6.1-7.3	0
	34-80	3.1-7.5	---	7.4-8.4	10-30
1455396:					
Greylock-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-6	1.1-4.4	---	5.1-6.0	0
	6-7	1.1-4.4	---	5.1-6.0	0
	7-9	2.2-5.5	---	5.1-6.0	0
	9-19	2.2-5.5	---	5.1-6.0	0
	19-26	2.1-5.4	---	6.1-7.3	0
	26-34	3.1-8.0	---	6.1-7.3	0
	34-80	3.1-7.5	---	7.4-8.4	10-30

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455397:					
Finch-----	0-1	---	13.9-64.7	3.5-5.6	0
	1-11	---	0.0-1.9	3.5-6.0	0
	11-42	---	0.1-1.9	3.5-6.0	0
	42-80	0.0-3.5	---	5.1-6.5	0
Kinross-----	0-3	---	17.5-46.9	3.4-5.0	0
	3-14	---	0.0-3.7	3.6-5.0	0
	14-22	0.5-3.9	---	3.6-6.0	0
	22-35	0.1-3.8	---	3.6-6.0	0
	35-80	0.0-1.0	---	4.5-6.5	0
1455402:					
Kalkaska, dissected--	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Blue Lake, dissected-	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
1455403:					
Kalkaska, dissected--	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Blue Lake, dissected-	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
1455404:					
Kalkaska, dissected--	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
Blue Lake, dissected-	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
1455408:					
Spot-----	0-2	---	20.1-63.7	3.5-5.5	0
	2-8	---	0.1-2.8	3.5-6.0	0
	8-10	---	0.1-3.4	3.5-6.0	0
	10-18	---	0.1-2.9	3.5-6.0	0
	18-80	0.0-3.5	---	3.5-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455408:					
Finch-----	0-1	---	13.9-64.7	3.5-5.6	0
	1-11	---	0.0-1.9	3.5-6.0	0
	11-42	---	0.1-1.9	3.5-6.0	0
	42-80	0.0-3.5	---	5.1-6.5	0
1455409:					
Finch-----	0-1	---	13.9-64.7	3.5-5.6	0
	1-11	---	0.0-1.9	3.5-6.0	0
	11-42	---	0.1-1.9	3.5-6.0	0
	42-80	0.0-3.5	---	5.1-6.5	0
1455410:					
Munising, calcareous substratum, dissected-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-3	---	1.8-10.4	4.5-6.0	0
	3-6	---	1.0-2.5	4.5-6.0	0
	6-23	---	1.1-2.9	4.5-6.0	0
	23-38	1.6-4.3	---	5.1-6.0	0
	38-50	2.6-6.4	---	5.1-6.5	0
	50-63	4.1-8.0	---	5.0-6.0	0
	63-80	4.1-8.0	---	7.4-8.4	10-30
Frohling, calcareous substratum, dissected-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-5	---	0.7-9.0	4.5-5.5	0
	5-24	---	0.4-2.2	4.5-5.5	0
	24-73	2.1-6.4	---	5.1-6.0	0
	73-80	4.1-6.4	---	7.4-8.4	10-30
Cookson, dissected---	0-3	---	---	4.5-6.0	0
	3-7	---	---	4.5-6.0	0
	7-11	---	---	4.5-6.0	0
	11-16	---	---	4.5-6.0	0
	16-21	---	---	5.6-7.3	0
	21-31	2.7-13.4	---	6.6-7.8	0-10
	31-36	---	---	7.4-8.4	0-30
	36-80	---	---	---	---
1455411:					
Frohling, calcareous substratum, dissected-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-5	---	0.7-9.0	4.5-5.5	0
	5-24	---	0.4-2.2	4.5-5.5	0
	24-73	2.1-6.4	---	5.1-6.0	0
	73-80	4.1-6.4	---	7.4-8.4	10-30
Garlic, dissected---	0-2	---	13.9-64.7	3.5-5.6	0
	2-9	---	0.0-6.6	3.5-5.5	0
	9-11	---	0.1-3.4	3.5-5.5	0
	11-20	---	0.1-2.9	3.5-5.5	0
	20-29	0.0-2.3	---	5.1-6.0	0
	29-80	0.0-2.3	---	5.1-6.0	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455411:					
Cookson, dissected---	0-3	---	---	4.5-6.0	0
	3-7	---	---	4.5-6.0	0
	7-11	---	---	4.5-6.0	0
	11-16	---	---	4.5-6.0	0
	16-21	---	---	5.6-7.3	0
	21-31	2.7-13.4	---	6.6-7.8	0-10
	31-36	---	---	7.4-8.4	0-30
	36-80	---	---	---	---
1455412:					
Munising, calcareous substratum, dissected-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-3	---	1.8-10.4	4.5-6.0	0
	3-6	---	1.0-2.5	4.5-6.0	0
	6-23	---	1.1-2.9	4.5-6.0	0
	23-38	1.6-4.3	---	5.1-6.0	0
	38-50	2.6-6.4	---	5.1-6.5	0
	50-63	4.1-8.0	---	5.0-6.0	0
	63-80	4.1-8.0	---	7.4-8.4	10-30
Yalmer, calcareous substratum, dissected-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-2	---	0.3-5.4	3.5-5.5	0
	2-5	---	0.0-6.9	3.5-5.5	0
	5-16	---	0.3-5.4	4.5-6.0	0
	16-28	2.0-5.5	---	4.5-6.0	0
	28-36	1.5-6.1	---	5.1-6.5	0
	36-62	1.5-7.1	---	5.1-6.5	0
	62-80	1.5-8.5	---	7.4-8.4	10-30
Frohling, calcareous substratum, dissected-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-5	---	0.7-9.0	4.5-5.5	0
	5-24	---	0.4-2.2	4.5-5.5	0
	24-73	2.1-6.4	---	5.1-6.0	0
	73-80	4.1-6.4	---	7.4-8.4	10-30
1455413:					
Munising, calcareous substratum-----	0-1	---	13.9-61.3	3.5-5.5	0
	1-3	---	1.8-10.4	4.5-6.0	0
	3-6	---	1.0-2.5	4.5-6.0	0
	6-23	---	1.1-2.9	4.5-6.0	0
	23-38	1.6-4.3	---	5.1-6.0	0
	38-50	2.6-6.4	---	5.1-6.5	0
	50-63	4.1-8.0	---	5.0-6.0	0
	63-80	4.1-8.0	---	7.4-8.4	10-30
Cookson-----	0-3	---	---	4.5-6.0	0
	3-7	---	---	4.5-6.0	0
	7-11	---	---	4.5-6.0	0
	11-16	---	---	4.5-6.0	0
	16-21	---	---	5.6-7.3	0
	21-31	2.7-13.4	---	6.6-7.8	0-10
	31-36	---	---	7.4-8.4	0-30
	36-80	---	---	---	---

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455416:					
Furlong-----	0-1	---	18.2-61.3	4.0-5.5	0
	1-2	---	0.1-3.7	4.0-5.5	0
	2-5	---	0.0-6.6	4.0-5.5	0
	5-7	---	0.1-5.4	4.0-5.5	0
	7-19	---	0.1-4.6	4.0-5.5	0
	19-22	0.0-3.5	---	6.6-8.0	0-10
	22-80	---	---	---	---
Shingleton-----	0-1	---	0.2-7.0	4.5-6.0	0
	1-7	---	0.0-7.3	4.5-6.0	0
	7-8	---	0.4-8.5	4.5-6.0	0
	8-11	---	0.2-7.0	4.5-6.0	0
	11-80	---	---	---	---
1455417:					
Furlong-----	0-1	---	18.2-61.3	4.0-5.5	0
	1-2	---	0.1-3.7	4.0-5.5	0
	2-5	---	0.0-6.6	4.0-5.5	0
	5-7	---	0.1-5.4	4.0-5.5	0
	7-19	---	0.1-4.6	4.0-5.5	0
	19-22	0.0-3.5	---	6.6-8.0	0-10
	22-80	---	---	---	---
Shingleton-----	0-1	---	0.2-7.0	4.5-6.0	0
	1-7	---	0.0-7.3	4.5-6.0	0
	7-8	---	0.4-8.5	4.5-6.0	0
	8-11	---	0.2-7.0	4.5-6.0	0
	11-80	---	---	---	---
1455421:					
Steuben-----	0-2	---	23.8-80.2	4.5-6.0	0
	2-8	---	2.0-9.2	4.5-6.0	0
	8-16	---	1.2-3.6	4.5-6.0	0
	16-21	---	1.3-4.3	4.5-6.0	0
	21-40	---	1.3-5.3	4.5-6.0	0
	40-45	1.0-2.7	---	5.1-6.0	0
	45-80	0.0-1.1	---	5.1-6.5	0
Blue Lake-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
1455422:					
Steuben-----	0-2	---	23.8-80.2	4.5-6.0	0
	2-8	---	2.0-9.2	4.5-6.0	0
	8-16	---	1.2-3.6	4.5-6.0	0
	16-21	---	1.3-4.3	4.5-6.0	0
	21-40	---	1.3-5.3	4.5-6.0	0
	40-45	1.0-2.7	---	5.1-6.0	0
	45-80	0.0-1.1	---	5.1-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455422:					
Blue Lake-----	0-2	---	23.8-61.3	4.5-5.5	0
	2-7	---	0.1-3.6	4.5-6.0	0
	7-9	---	0.3-3.2	4.5-6.0	0
	9-27	---	0.2-2.8	4.5-6.0	0
	27-80	---	0.1-2.3	4.5-6.5	0
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
1455425:					
Greylock-----	0-1	---	32.8-80.2	5.1-6.0	0
	1-6	1.1-4.4	---	5.1-6.0	0
	6-7	1.1-4.4	---	5.1-6.0	0
	7-9	2.2-5.5	---	5.1-6.0	0
	9-19	2.2-5.5	---	5.1-6.0	0
	19-26	2.1-5.4	---	6.1-7.3	0
	26-34	3.1-8.0	---	6.1-7.3	0
	34-80	3.1-7.5	---	7.4-8.4	10-30
Cookson-----	0-3	---	---	4.5-6.0	0
	3-7	---	---	4.5-6.0	0
	7-11	---	---	4.5-6.0	0
	11-16	---	---	4.5-6.0	0
	16-21	---	---	5.6-7.3	0
	21-31	2.7-13.4	---	6.6-7.8	0-10
	31-36	---	---	7.4-8.4	0-30
	36-80	---	---	---	---
1455431:					
Rubicon, severely burned-----	0-3	---	0.0-2.2	4.5-6.0	0
	3-28	0.0-2.5	---	4.5-6.0	0
	28-36	0.0-2.3	---	4.5-6.5	0
	36-80	0.0-2.3	---	4.5-6.5	0
1455432:					
Rubicon, severely burned-----	0-3	---	0.0-2.2	4.5-6.0	0
	3-28	0.0-2.5	---	4.5-6.0	0
	28-36	0.0-2.3	---	4.5-6.5	0
	36-80	0.0-2.3	---	4.5-6.5	0
1455433:					
Wurtsmith-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-4	---	0.1-4.3	3.5-6.0	0
	4-24	---	0.1-1.0	3.5-6.0	0
	24-80	---	0.0-0.8	3.5-6.0	0
Deford-----	0-4	---	31.6-80.2	4.5-6.0	0
	4-80	---	0.0-1.6	5.1-7.8	0
1455434:					
Shelldrake-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-3	---	13.9-46.9	3.5-5.0	0
	3-4	---	0.1-2.0	3.5-6.0	0
	4-80	---	0.0-0.8	3.5-6.0	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455435: Shell Drake-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-3	---	13.9-46.9	3.5-5.0	0
	3-4	---	0.1-2.0	3.5-6.0	0
	4-80	---	0.0-0.8	3.5-6.0	0
1455436: Cookson, dissected---	0-3	---	---	4.5-6.0	0
	3-7	---	---	4.5-6.0	0
	7-11	---	---	4.5-6.0	0
	11-16	---	---	4.5-6.0	0
	16-21	---	---	5.6-7.3	0
	21-31	2.7-13.4	---	6.6-7.8	0-10
	31-36	---	---	7.4-8.4	0-30
	36-80	---	---	---	---
Nykanen, dissected---	0-4	---	5.1-10.8	4.5-5.5	0
	4-14	---	3.2-10.8	5.1-6.0	0
	14-25	---	---	---	---
	25-80	---	---	---	---
1455437: Dillingham-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-8	---	0.0-6.0	3.5-5.0	0
	8-11	---	0.0-6.0	3.5-5.5	0
	11-21	---	0.0-6.0	3.5-5.5	0
	21-31	---	0.0-2.0	3.5-5.5	0
	31-80	---	0.0-0.5	3.5-5.9	0
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
1455438: Dillingham-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-8	---	0.0-6.0	3.5-5.0	0
	8-11	---	0.0-6.0	3.5-5.5	0
	11-21	---	0.0-6.0	3.5-5.5	0
	21-31	---	0.0-2.0	3.5-5.5	0
	31-80	---	0.0-0.5	3.5-5.9	0
Kalkaska-----	0-2	---	0.4-5.9	3.5-6.0	0
	2-6	---	---	4.5-6.0	0
	6-8	---	0.4-5.9	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
1455439: Dillingham-----	0-1	---	13.9-46.9	3.5-5.0	0
	1-8	---	0.0-6.0	3.5-5.0	0
	8-11	---	0.0-6.0	3.5-5.5	0
	11-21	---	0.0-6.0	3.5-5.5	0
	21-31	---	0.0-2.0	3.5-5.5	0
	31-80	---	0.0-0.5	3.5-5.9	0

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1455439:					
Kalkaska-----	0-2	---	0.4-5.6	3.5-6.0	0
	2-6	---	0.0-2.2	4.5-6.0	0
	6-8	---	0.4-5.6	4.5-6.0	0
	8-16	---	0.2-4.2	4.5-6.0	0
	16-26	---	0.1-2.1	4.5-6.5	0
	26-80	0.4-4.0	---	4.5-6.5	0
1671282:					
Stutts-----	0-0	---	13.9-46.9	3.5-5.0	0
	0-2	---	3.5-13.9	3.5-5.5	0
	2-7	---	0.6-15.9	3.5-5.5	0
	7-9	---	2.6-12.2	3.5-5.5	0
	9-13	---	1.7-12.2	4.5-6.0	0
	13-19	---	1.7-9.3	4.5-6.0	0
	19-80	0.3-4.3	---	4.5-6.5	0
Kalkaska-----	0-1	---	14.7-46.9	3.6-5.0	0
	1-6	---	0.8-5.6	3.6-5.5	0
	6-8	---	2.3-6.6	3.6-5.5	0
	8-12	---	1.3-6.0	4.5-6.0	0
	12-23	---	0.1-1.4	4.5-6.0	0
	23-38	---	0.1-1.2	4.5-6.0	0
	38-80	---	0.0-1.2	4.5-6.5	0
1671283:					
Stutts-----	0-0	---	13.9-46.9	3.5-5.0	0
	0-2	---	3.5-13.9	3.5-5.5	0
	2-7	---	0.6-15.9	3.5-5.5	0
	7-9	---	2.6-12.2	3.5-5.5	0
	9-13	---	1.7-12.2	4.5-6.0	0
	13-19	---	1.7-9.3	4.5-6.0	0
	19-80	0.3-4.3	---	4.5-6.5	0
Kalkaska-----	0-1	---	14.7-46.9	3.6-5.0	0
	1-6	---	0.8-5.6	3.6-5.5	0
	6-8	---	2.3-6.6	3.6-5.5	0
	8-12	---	1.3-6.0	4.5-6.0	0
	12-23	---	0.1-1.4	4.5-6.0	0
	23-38	---	0.1-1.2	4.5-6.0	0
	38-80	---	0.0-1.2	4.5-6.5	0
1671284:					
Stutts-----	0-0	---	13.9-46.9	3.5-5.0	0
	0-2	---	3.5-13.9	3.5-5.5	0
	2-7	---	0.6-15.9	3.5-5.5	0
	7-9	---	2.6-12.2	3.5-5.5	0
	9-13	---	1.7-12.2	4.5-6.0	0
	13-19	---	1.7-9.3	4.5-6.0	0
	19-80	0.3-4.3	---	4.5-6.5	0
Kalkaska-----	0-1	---	14.7-46.9	3.6-5.0	0
	1-6	---	0.8-5.6	3.6-5.5	0
	6-8	---	2.3-6.6	3.6-5.5	0
	8-12	---	1.3-6.0	4.5-6.0	0
	12-23	---	0.1-1.4	4.5-6.0	0
	23-38	---	0.1-1.2	4.5-6.0	0
	38-80	---	0.0-1.2	4.5-6.5	0

Table 19.-Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455241: Deer Park-----	A	Jan-Dec	---	---	---	---	None	---	None
1455242: Deer Park-----	A	Jan-Dec	---	---	---	---	None	---	None
1455243: Deer Park-----	A	Jan-Dec	---	---	---	---	None	---	None
1455244: Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
1455245: Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
1455246: Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
1455247: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1455248: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1455249: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455250: Croswell-----	A	January	5.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	3.5	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	4.5	>6.0	---	---	None	---	None
		October	3.0	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None
1455251: Paquin-----	A	January	5.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	3.5	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	4.5	>6.0	---	---	None	---	None
		October	3.0	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None
1455252: Au Gres-----	B	January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	---	None
		March	1.0	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	0.5	>6.0	---	---	None	---	None
		June	1.0	>6.0	---	---	None	---	None
		July	2.0	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.0	>6.0	---	---	None	---	None
		October	1.0	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	1.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455253: Kinross-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.5	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.5	>6.0	---	---	None	---	None
		July	1.5	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455254: Deford-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	>6.0	---	---	None	---	None
		July	1.5	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455255: Ingalls-----	C	January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	---	None
		March	1.0	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	0.5	>6.0	---	---	None	---	None
		June	1.0	>6.0	---	---	None	---	None
		July	2.0	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.0	>6.0	---	---	None	---	None
		October	1.0	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	1.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455257: Munising-----	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Yalmer-----	B	March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
1455262: Ensley-----	B/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	>6.0	0.5-0.5	Brief	Occasional	---	None
		July	1.0	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.5	>6.0	---	---	None	---	None
		October	0.5	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455263: Munising, calcareous substratum	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Yalmer, calcareous substratum--	B	March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
Frohling, calcareous substratum	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455266: Grand Sable-----	A	Jan-Dec	---	---	---	---	None	---	None
1455267: Grand Sable-----	A	Jan-Dec	---	---	---	---	None	---	None
1455268: Rhody-----	D	January	0.0	3.0	---	---	None	---	None
		February	0.0	3.0	---	---	None	---	None
		March	0.0	3.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	3.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	3.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	3.0	---	---	None	---	None
		July	1.0	3.0	---	---	None	---	None
		August	2.0	3.0	---	---	None	---	None
		September	1.5	3.0	---	---	None	---	None
		October	0.0	3.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	3.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	3.0	---	---	None	---	None
Towes-----	C	January	2.0	2.2	---	---	None	---	None
		February	2.0	2.2	---	---	None	---	None
		March	1.5	2.2	---	---	None	---	None
		April	1.0	2.2	---	---	None	---	None
		May	0.5	2.2	---	---	None	---	None
		June	2.0	2.2	---	---	None	---	None
		October	1.0	2.2	---	---	None	---	None
		November	1.0	2.2	---	---	None	---	None
		December	1.5	2.2	---	---	None	---	None
1455269: Waiska, very stony-----	A	Jan-Dec	---	---	---	---	None	---	None
1455273: Deerton-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455273: Au Train-----	D	February	1.5	2.7	---	---	None	---	None
		March	1.5	2.7	---	---	None	---	None
		April	1.0	2.7	---	---	None	---	None
		May	1.5	2.7	---	---	None	---	None
		September	1.5	2.7	---	---	None	---	None
		October	1.5	2.7	---	---	None	---	None
		November	1.0	2.7	---	---	None	---	None
		December	1.5	2.7	---	---	None	---	None
1455274: Deerton-----	A	Jan-Dec	---	---	---	---	None	---	None
Au Train-----	D	February	1.5	2.7	---	---	None	---	None
		March	1.5	2.7	---	---	None	---	None
		April	1.0	2.7	---	---	None	---	None
		May	1.5	2.7	---	---	None	---	None
		September	1.5	2.7	---	---	None	---	None
		October	1.5	2.7	---	---	None	---	None
		November	1.0	2.7	---	---	None	---	None
		December	1.5	2.7	---	---	None	---	None
1455276: Cookson-----	B	Jan-Dec	---	---	---	---	None	---	None
1455277: Nahma-----	D	January	0.0	2.5	---	---	None	---	None
		February	0.0	2.5	---	---	None	---	None
		March	0.0	2.5	0.5-0.5	Brief	Occasional	---	None
		April	0.0	2.5	0.5-0.5	Long	Frequent	---	None
		May	0.0	2.5	0.5-0.5	Long	Frequent	---	None
		June	0.5	2.5	---	---	None	---	None
		July	1.0	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	1.5	2.5	---	---	None	---	None
		October	0.0	2.5	0.5-0.5	Brief	Frequent	---	None
		November	0.0	2.5	0.5-0.5	Brief	Frequent	---	None
		December	0.0	2.5	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455277: Ruse-----	D	January	0.0	1.2	---	---	None	---	None
		February	0.0	1.2	---	---	None	---	None
		March	0.0	1.2	0.5-0.5	Brief	Occasional	---	None
		April	0.0	1.2	0.5-0.5	Long	Frequent	---	None
		May	0.0	1.2	0.5-0.5	Long	Frequent	---	None
		June	0.5	1.2	---	---	None	---	None
		July	1.0	1.2	---	---	None	---	None
		October	0.0	1.2	0.5-0.5	Brief	Frequent	---	None
		November	0.0	1.2	0.5-0.5	Brief	Frequent	---	None
		December	0.0	1.2	---	---	None	---	None
1455278: Summerville-----	D	Jan-Dec	---	---	---	---	None	---	None
1455281: Carbondale-----	D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	1.0	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
Lupton-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	1.0	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455281: Tawas-----	D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	1.0	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455282: Dawson-----	D	January	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		February	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		December	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
Greenwood-----	A/D	January	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		February	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		December	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455282: Loxley-----	D	January	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		February	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		December	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
1455283: Chippeny-----	B/D	January	0.0	2.3	---	---	None	---	None
		February	0.0	2.3	---	---	None	---	None
		March	0.0	2.3	0.0-0.5	Brief	Occasional	---	None
		April	0.0	2.3	0.0-0.5	Long	Frequent	---	None
		May	0.0	2.3	0.0-0.5	Long	Frequent	---	None
		June	0.5	2.3	---	---	None	---	None
		July	1.0	2.3	---	---	None	---	None
		August	2.0	2.3	---	---	None	---	None
		September	1.5	2.3	---	---	None	---	None
		October	0.0	2.3	0.0-0.5	Brief	Frequent	---	None
		November	0.0	2.3	0.0-0.5	Brief	Frequent	---	None
		December	0.0	2.3	---	---	None	---	None
Nahma-----	D	January	0.0	2.5	---	---	None	---	None
		February	0.0	2.5	---	---	None	---	None
		March	0.0	2.5	0.5-0.5	Brief	Occasional	---	None
		April	0.0	2.5	0.5-0.5	Long	Frequent	---	None
		May	0.0	2.5	0.5-0.5	Long	Frequent	---	None
		June	0.5	2.5	---	---	None	---	None
		July	1.0	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	1.5	2.5	---	---	None	---	None
		October	0.0	2.5	0.5-0.5	Brief	Frequent	---	None
		November	0.0	2.5	0.5-0.5	Brief	Frequent	---	None
		December	0.0	2.5	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455284: Histosols-----	D	January	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
Aquents-----	D	January	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
1455285. Pits									
1455289: Jeske, bedrock terrace-----	D	January	1.0	1.7	---	---	None	---	None
		February	0.5	1.7	---	---	None	---	None
		March	0.5	1.7	---	---	None	---	None
		April	0.0	1.7	---	---	None	---	None
		May	0.5	1.7	---	---	None	---	None
		June	1.5	1.7	---	---	None	---	None
		September	1.5	1.7	---	---	None	---	None
		October	1.0	1.7	---	---	None	---	None
		November	0.5	1.7	---	---	None	---	None
		December	1.0	1.7	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455289: Gongeau, bedrock terrace-----	D	January	0.0	1.5	---	---	None	---	None
		February	0.0	1.5	---	---	None	---	None
		March	0.0	1.5	---	---	None	---	None
		April	0.0	1.5	---	---	None	---	None
		May	0.0	1.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		July	1.0	1.5	---	---	None	---	None
		October	0.0	1.5	---	---	None	---	None
		November	0.0	1.5	---	---	None	---	None
		December	0.0	1.5	---	---	None	---	None
Deerton, bedrock terrace-----	A	Jan-Dec	---	---	---	---	None	---	None
1455290: Jeske, bedrock terrace-----	D	January	1.0	1.7	---	---	None	---	None
		February	0.5	1.7	---	---	None	---	None
		March	0.5	1.7	---	---	None	---	None
		April	0.0	1.7	---	---	None	---	None
		May	0.5	1.7	---	---	None	---	None
		June	1.5	1.7	---	---	None	---	None
		September	1.5	1.7	---	---	None	---	None
		October	1.0	1.7	---	---	None	---	None
		November	0.5	1.7	---	---	None	---	None
		December	1.0	1.7	---	---	None	---	None
Gongeau, bedrock terrace-----	D	January	0.0	1.5	---	---	None	---	None
		February	0.0	1.5	---	---	None	---	None
		March	0.0	1.5	---	---	None	---	None
		April	0.0	1.5	---	---	None	---	None
		May	0.0	1.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		July	1.0	1.5	---	---	None	---	None
		October	0.0	1.5	---	---	None	---	None
		November	0.0	1.5	---	---	None	---	None
		December	0.0	1.5	---	---	None	---	None
Deerton, bedrock terrace-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455291: Ruse, bedrock terrace-----	D	January	0.0	1.1	---	---	None	---	None
		February	0.0	1.1	---	---	None	---	None
		March	0.0	1.1	---	---	None	---	None
		April	0.0	1.1	---	---	None	---	None
		May	0.0	1.1	---	---	None	---	None
		June	0.5	1.1	---	---	None	---	None
		July	1.0	1.1	---	---	None	---	None
		October	0.0	1.1	---	---	None	---	None
		November	0.0	1.1	---	---	None	---	None
		December	0.0	1.1	---	---	None	---	None
Ensign, bedrock terrace-----	D	April	1.0	1.2	---	---	None	---	None
		May	0.5	1.2	---	---	None	---	None
		October	1.0	1.2	---	---	None	---	None
		November	1.0	1.2	---	---	None	---	None
Nykanen, bedrock terrace-----	D	April	1.0	1.2	---	---	None	---	None
		July	1.0	1.2	---	---	None	---	None
		October	1.0	1.2	---	---	None	---	None
1455292: Ruse, bedrock terrace-----	D	January	0.0	1.1	---	---	None	---	None
		February	0.0	1.1	---	---	None	---	None
		March	0.0	1.1	---	---	None	---	None
		April	0.0	1.1	---	---	None	---	None
		May	0.0	1.1	---	---	None	---	None
		June	0.5	1.1	---	---	None	---	None
		July	1.0	1.1	---	---	None	---	None
		October	0.0	1.1	---	---	None	---	None
		November	0.0	1.1	---	---	None	---	None
		December	0.0	1.1	---	---	None	---	None
Ensign, bedrock terrace-----	D	April	1.0	1.2	---	---	None	---	None
		May	0.5	1.2	---	---	None	---	None
		October	1.0	1.2	---	---	None	---	None
		November	1.0	1.2	---	---	None	---	None
Nykanen, bedrock terrace-----	D	April	1.0	1.2	---	---	None	---	None
		July	1.0	1.2	---	---	None	---	None
		October	1.0	1.2	---	---	None	---	None

Table 19.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455295: Ewart-----	D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	Very brief	Rare
		March	0.0	>6.0	0.5-0.5	Brief	Frequent	Brief	Occasional
		April	0.0	>6.0	0.5-0.5	Long	Frequent	Long	Frequent
		May	0.0	>6.0	0.5-0.5	Long	Frequent	Long	Frequent
		June	0.0	>6.0	0.5-0.5	Brief	Frequent	Brief	Occasional
		July	0.5	>6.0	---	---	None	---	None
		August	1.0	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	Brief	Occasional
		October	0.0	>6.0	0.5-0.5	Brief	Frequent	Brief	Occasional
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	Very brief	Rare
		December	0.0	>6.0	---	---	None	---	None
Sturgeon-----	C	January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	Very brief	Rare
		March	1.5	>6.0	---	---	None	Brief	Occasional
		April	0.5	>6.0	---	---	None	Long	Frequent
		May	0.5	>6.0	---	---	None	Long	Frequent
		June	2.0	>6.0	---	---	None	Brief	Occasional
		July	2.5	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.5	>6.0	---	---	None	Brief	Occasional
		October	1.5	>6.0	---	---	None	Brief	Occasional
		November	1.0	>6.0	---	---	None	Very brief	Rare
		December	1.0	>6.0	---	---	None	---	None
1455296: Deerton, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Tokiahok, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455296: Trout Bay, dissected-----	D	January	0.0	1.6	---	---	None	---	None
		February	0.0	1.6	---	---	None	---	None
		March	0.0	1.6	---	---	None	---	None
		April	0.0	1.6	---	---	None	---	None
		May	0.0	1.6	---	---	None	---	None
		June	0.0	1.6	---	---	None	---	None
		July	0.5	1.6	---	---	None	---	None
		August	1.0	1.6	---	---	None	---	None
		September	0.5	1.6	---	---	None	---	None
		October	0.0	1.6	---	---	None	---	None
		November	0.0	1.6	---	---	None	---	None
		December	0.0	1.6	---	---	None	---	None
1455298: Garlic, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Voelker, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None
1455299: Garlic, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Voelker, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None
1455300: Garlic, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Voelker, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455302: Garlic-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	---	---	---	---	None	---	None
Voelker-----	B	Jan-Dec	---	---	---	---	None	---	None
1455304: Cathro-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	1.0	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
Ensley-----	B/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	>6.0	0.5-0.5	Brief	Occasional	---	None
		July	1.0	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.5	>6.0	---	---	None	---	None
		October	0.5	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455305: Tawas-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	1.0	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
Deford-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	>6.0	---	---	None	---	None
		July	1.5	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455308: Fence, dissected-----	B	January	5.5	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	3.0	>6.0	---	---	None	---	None
		April	1.5	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	4.5	>6.0	---	---	None	---	None
		July	6.0	>6.0	---	---	None	---	None
		September	6.0	>6.0	---	---	None	---	None
		October	5.0	>6.0	---	---	None	---	None
		November	4.5	>6.0	---	---	None	---	None
		December	5.0	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455310: Rousseau-----	A	Jan-Dec	---	---	---	---	None	---	None
Dawson-----	D	January	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		February	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		December	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
1455318: Munising, calcareous substratum	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Ensley-----	B/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	>6.0	0.5-0.5	Brief	Occasional	---	None
		July	1.0	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.5	>6.0	---	---	None	---	None
		October	0.5	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455319: Munising, dissected, very stony	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455319: Yalmer, dissected, very stony--	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
1455320: Munising, stony-----	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Skanee, stony * -----	C	January	5.5	>6.0	---	---	None	---	None
		February	5.5	>6.0	---	---	None	---	None
		March	5.0	>6.0	---	---	None	---	None
		April	0.5	1.2	---	---	None	---	None
		May	4.5	>6.0	---	---	None	---	None
		June	1.0	1.2	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		July	5.5	>6.0	---	---	None	---	None
		October	5.5	>6.0	---	---	None	---	None
		November	5.5	>6.0	---	---	None	---	None
		December	5.5	>6.0	---	---	None	---	None
1455324: Zeba, very stony-----	C	January	2.0	2.8	---	---	None	---	None
		February	2.0	2.8	---	---	None	---	None
		March	1.5	2.8	---	---	None	---	None
		April	1.0	2.8	---	---	None	---	None
		May	0.5	2.8	---	---	None	---	None
		June	2.0	2.8	---	---	None	---	None
		July	2.5	2.8	---	---	None	---	None
		September	2.5	2.8	---	---	None	---	None
		October	1.0	2.8	---	---	None	---	None
		November	1.0	2.8	---	---	None	---	None
		December	1.5	2.8	---	---	None	---	None

See footnote at end of table.

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455324: Jacobsville, very stony-----	D	January	0.0	3.0	---	---	None	---	None
		February	0.0	3.0	---	---	None	---	None
		March	0.0	3.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	3.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	3.0	0.0-0.5	Long	Frequent	---	None
		June	0.5	3.0	---	---	None	---	None
		July	1.0	3.0	---	---	None	---	None
		August	2.0	3.0	---	---	None	---	None
		September	1.5	3.0	---	---	None	---	None
		October	0.0	3.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	3.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	3.0	---	---	None	---	None
1455326: Munising, dissected, stony-----	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Abbaye, dissected, stony-----	B	March	2.0	2.7	---	---	None	---	None
		April	1.0	2.7	---	---	None	---	None
		May	2.0	2.7	---	---	None	---	None
		October	1.0	2.7	---	---	None	---	None
		November	2.0	2.7	---	---	None	---	None
1455327: Paquin-----	A	January	5.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	3.5	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	4.5	>6.0	---	---	None	---	None
		October	3.0	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455327: Finch-----	C								
		January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	---	None
		March	1.0	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	0.5	>6.0	---	---	None	---	None
		June	1.0	>6.0	---	---	None	---	None
		July	2.0	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.0	>6.0	---	---	None	---	None
		October	1.0	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	1.5	>6.0	---	---	None	---	None
1455339: Croswell-----	A								
		January	5.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	3.5	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	4.5	>6.0	---	---	None	---	None
		October	3.0	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None
Kinross-----	A/D								
		January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.5	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.5	>6.0	---	---	None	---	None
		July	1.5	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455340: Frohling, dissected, stony-----	B	Jan-Dec	---	---	---	---	None	---	None
Tokiahok, dissected, stony-----	A	Jan-Dec	---	---	---	---	None	---	None
1455341: McMaster-----	B	January	5.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	3.5	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	4.5	>6.0	---	---	None	---	None
		October	3.0	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None
1455344: Reade-----	B	March	2.0	2.3	---	---	None	---	None
		April	1.0	2.3	---	---	None	---	None
		May	2.0	2.3	---	---	None	---	None
		July	1.0	2.3	---	---	None	---	None
		October	1.0	2.3	---	---	None	---	None
		November	2.0	2.3	---	---	None	---	None
1455353: Charlevoix-----	C	January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	---	None
		March	1.5	>6.0	---	---	None	---	None
		April	1.0	>6.0	---	---	None	---	None
		May	0.5	>6.0	---	---	None	---	None
		June	2.0	>6.0	---	---	None	---	None
		July	2.5	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.5	>6.0	---	---	None	---	None
		October	1.5	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	1.0	>6.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455353: Ensley-----	B/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	>6.0	0.5-0.5	Brief	Occasional	---	None
		July	1.0	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.5	>6.0	---	---	None	---	None
		October	0.5	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455359: Munising-----	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Abbaye-----	B	March	2.0	2.7	---	---	None	---	None
		April	1.0	2.7	---	---	None	---	None
		May	2.0	2.7	---	---	None	---	None
		October	1.0	2.7	---	---	None	---	None
		November	2.0	2.7	---	---	None	---	None
1455360: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	---	---	---	---	None	---	None
1455361: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455362: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	---	---	---	---	None	---	None
1455363: Jeske-----	D	January	1.0	1.7	---	---	None	---	None
		February	0.5	1.7	---	---	None	---	None
		March	0.5	1.7	---	---	None	---	None
		April	0.0	1.7	---	---	None	---	None
		May	0.5	1.7	---	---	None	---	None
		June	1.5	1.7	---	---	None	---	None
		September	1.5	1.7	---	---	None	---	None
		October	1.0	1.7	---	---	None	---	None
		November	0.5	1.7	---	---	None	---	None
		December	1.0	1.7	---	---	None	---	None
Au Train-----	D	February	1.5	2.7	---	---	None	---	None
		March	1.5	2.7	---	---	None	---	None
		April	1.0	2.7	---	---	None	---	None
		May	1.5	2.7	---	---	None	---	None
		September	1.5	2.7	---	---	None	---	None
		October	1.5	2.7	---	---	None	---	None
		November	1.0	2.7	---	---	None	---	None
		December	1.5	2.7	---	---	None	---	None
Gongeau-----	D	January	0.0	1.5	---	---	None	---	None
		February	0.0	1.5	---	---	None	---	None
		March	0.0	1.5	0.5-0.5	Brief	Occasional	---	None
		April	0.0	1.5	0.5-0.5	Long	Frequent	---	None
		May	0.0	1.5	0.5-0.5	Long	Frequent	---	None
		June	0.5	1.5	---	---	None	---	None
		July	1.0	1.5	---	---	None	---	None
		October	0.0	1.5	0.5-0.5	Brief	Frequent	---	None
		November	0.0	1.5	0.5-0.5	Brief	Frequent	---	None
		December	0.0	1.5	---	---	None	---	None
1455365: Cusino-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455366: Cusino-----	A	Jan-Dec	---	---	---	---	None	---	None
1455367: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
Cusino-----	A	Jan-Dec	---	---	---	---	None	---	None
1455368: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
Cusino-----	A	Jan-Dec	---	---	---	---	None	---	None
1455369: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
Cusino-----	A	Jan-Dec	---	---	---	---	None	---	None
1455370: Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
Cusino-----	A	Jan-Dec	---	---	---	---	None	---	None
1455371: Halfaday-----	B	January	5.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	3.5	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	4.5	>6.0	---	---	None	---	None
		October	3.0	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455372: Shelldrake-----	A	Jan-Dec	---	---	---	---	None	---	None
1455380: Trout Bay-----	D	January	0.0	1.6	---	---	None	---	None
		February	0.0	1.6	---	---	None	---	None
		March	0.0	1.6	---	---	None	---	None
		April	0.0	1.6	---	---	None	---	None
		May	0.0	1.6	---	---	None	---	None
		June	0.0	1.6	---	---	None	---	None
		July	0.5	1.6	---	---	None	---	None
		August	1.0	1.6	---	---	None	---	None
		September	0.5	1.6	---	---	None	---	None
		October	0.0	1.6	---	---	None	---	None
		November	0.0	1.6	---	---	None	---	None
		December	0.0	1.6	---	---	None	---	None
Gongeau-----	D	January	0.0	1.5	---	---	None	---	None
		February	0.0	1.5	---	---	None	---	None
		March	0.0	1.5	---	---	None	---	None
		April	0.0	1.5	---	---	None	---	None
		May	0.0	1.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		July	1.0	1.5	---	---	None	---	None
		October	0.0	1.5	---	---	None	---	None
		November	0.0	1.5	---	---	None	---	None
		December	0.0	1.5	---	---	None	---	None
Shingleton-----	A	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop.									
1455382: Kalkaska, severely burned-----	A	Jan-Dec	---	---	---	---	None	---	None
1455383: Kalkaska, severely burned-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455386: Trout Bay-----	D	January	0.0	1.6	---	---	None	---	None
		February	0.0	1.6	---	---	None	---	None
		March	0.0	1.6	0.5-0.5	Brief	Frequent	---	None
		April	0.0	1.6	0.5-0.5	Long	Frequent	---	None
		May	0.0	1.6	0.5-0.5	Long	Frequent	---	None
		June	0.0	1.6	0.5-0.5	Brief	Frequent	---	None
		July	0.5	1.6	---	---	None	---	None
		August	1.0	1.6	---	---	None	---	None
		September	0.5	1.6	---	---	None	---	None
		October	0.0	1.6	0.5-0.5	Brief	Frequent	---	None
		November	0.0	1.6	0.5-0.5	Brief	Frequent	---	None
		December	0.0	1.6	---	---	None	---	None
Lupton-----	D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	1.0	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
Gongeau-----	D	January	0.0	1.5	---	---	None	---	None
		February	0.0	1.5	---	---	None	---	None
		March	0.0	1.5	0.5-0.5	Brief	Occasional	---	None
		April	0.0	1.5	0.5-0.5	Long	Frequent	---	None
		May	0.0	1.5	0.5-0.5	Long	Frequent	---	None
		June	0.5	1.5	---	---	None	---	None
		July	1.0	1.5	---	---	None	---	None
		October	0.0	1.5	0.5-0.5	Brief	Frequent	---	None
		November	0.0	1.5	0.5-0.5	Brief	Frequent	---	None
		December	0.0	1.5	---	---	None	---	None
1455387: Garlic-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
1455388: Garlic-----	A	Jan-Dec	---	---	---	---	None	---	None
1455389: Garlic-----	A	Jan-Dec	---	---	---	---	None	---	None
1455390: Escanaba-----	A	Jan-Dec	---	---	---	---	None	---	None
Greylock-----	B	Jan-Dec	---	---	---	---	None	---	None
1455391: Escanaba-----	A	Jan-Dec	---	---	---	---	None	---	None
Greylock-----	B	Jan-Dec	---	---	---	---	None	---	None
1455392: Escanaba-----	A	Jan-Dec	---	---	---	---	None	---	None
Greylock-----	B	Jan-Dec	---	---	---	---	None	---	None
1455395: Greylock-----	B	Jan-Dec	---	---	---	---	None	---	None
1455396: Greylock-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455397: Finch-----	C	January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	---	None
		March	1.0	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	0.5	>6.0	---	---	None	---	None
		June	1.0	>6.0	---	---	None	---	None
		July	2.0	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.0	>6.0	---	---	None	---	None
		October	1.0	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	1.5	>6.0	---	---	None	---	None
Kinross-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.5	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.5	>6.0	---	---	None	---	None
		July	1.5	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455402: Kalkaska, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
1455403: Kalkaska, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455404: Kalkaska, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
1455408: Spot-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.5	>6.0	---	---	None	---	None
		July	1.5	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
Finch-----	C	January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	---	None
		March	1.0	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	0.5	>6.0	---	---	None	---	None
		June	1.0	>6.0	---	---	None	---	None
		July	2.0	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.0	>6.0	---	---	None	---	None
		October	1.0	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	1.5	>6.0	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455409: Finch-----	C	January	1.5	>6.0	---	---	None	---	None
		February	1.5	>6.0	---	---	None	---	None
		March	1.0	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	0.5	>6.0	---	---	None	---	None
		June	1.0	>6.0	---	---	None	---	None
		July	2.0	>6.0	---	---	None	---	None
		August	3.0	>6.0	---	---	None	---	None
		September	2.0	>6.0	---	---	None	---	None
		October	1.0	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	1.5	>6.0	---	---	None	---	None
1455410: Munising, calcareous substratum, dissected-----	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Frohling, calcareous substratum, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None
Cookson, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None
1455411: Frohling, calcareous substratum, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None
Garlic, dissected-----	A	Jan-Dec	---	---	---	---	None	---	None
Cookson, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455412: Munising, calcareous substratum, dissected-----	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Yalmer, calcareous substratum, dissected-----	B	March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
Frohling, calcareous substratum, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None
1455413: Munising, calcareous substratum	B	March	1.5	2.0	---	---	None	---	None
		April	1.0	2.0	---	---	None	---	None
		May	1.5	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.5	2.0	---	---	None	---	None
Cookson-----	B	Jan-Dec	---	---	---	---	None	---	None
1455416: Furlong-----	A	Jan-Dec	---	---	---	---	None	---	None
Shingleton-----	A	Jan-Dec	---	---	---	---	None	---	None
1455417: Furlong-----	A	Jan-Dec	---	---	---	---	None	---	None
Shingleton-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455421: Steuben-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1455422: Steuben-----	A	Jan-Dec	---	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1455425: Greylock-----	B	Jan-Dec	---	---	---	---	None	---	None
Cookson-----	B	Jan-Dec	---	---	---	---	None	---	None
1455431: Rubicon, severely burned-----	A	Jan-Dec	---	---	---	---	None	---	None
1455432: Rubicon, severely burned-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455433: Wurtsmith-----	B	January	5.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.0	>6.0	---	---	None	---	None
		June	3.5	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	4.5	>6.0	---	---	None	---	None
		October	3.0	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None
Deford-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	>6.0	---	---	None	---	None
		July	1.5	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	1.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	None	---	None
1455434: Shell Drake-----	A	Jan-Dec	---	---	---	---	None	---	None
1455435: Shell Drake-----	A	Jan-Dec	---	---	---	---	None	---	None
Dune land-----	A	---	---	---	---	---	---	---	---
1455436: Cookson, dissected-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1455436: Nykanen, dissected-----	D	April	1.0	1.2	---	---	None	---	None
		July	1.0	1.2	---	---	None	---	None
		October	1.0	1.2	---	---	None	---	None
1455437: Dillingham-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1455438: Dillingham-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1455439: Dillingham-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1671074: Udipsamments-----	A	Jan-Dec	---	---	---	---	None	---	None
Udorthents-----	A	Jan-Dec	---	---	---	---	None	---	None
1671282: Stutts-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1671283: Stutts-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None

Table 19.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
1671284: Stutts-----	A	Jan-Dec	---	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	---	---	---	---	None	---	None
1693163. Water									

\* The soil has a perched high water table above a fragipan for the specified months.

Table 20.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
1455241: Deer Park-----	---	---	---	---	Low	Low	Low
1455242: Deer Park-----	---	---	---	---	Low	Low	Low
1455243: Deer Park-----	---	---	---	---	Low	Low	Low
1455244: Rubicon-----	---	---	---	---	Low	Low	High
1455245: Rubicon-----	---	---	---	---	Low	Low	High
1455246: Rubicon-----	---	---	---	---	Low	Low	High
1455247: Kalkaska-----	---	---	---	---	Low	Low	High
1455248: Kalkaska-----	---	---	---	---	Low	Low	High
1455249: Kalkaska-----	---	---	---	---	Low	Low	High
1455250: Crowell-----	---	---	---	---	Low	Low	Moderate
1455251: Paquin-----	Ortstein	10-16	10-20	Strongly cemented	Low	Low	High
1455252: Au Gres-----	---	---	---	---	Moderate	Low	Moderate
1455253: Kinross-----	---	---	---	---	Moderate	High	Moderate
1455254: Deford-----	---	---	---	---	Moderate	High	Moderate
1455255: Ingalls-----	---	---	---	---	Moderate	Low	High

Table 20.--Soil Features--Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1455257: Munising-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Moderate	High
Yalmer-----	Fragipan	20-40	13-29	Strongly cemented	Low	Low	High
1455262: Ensley-----	---	---	---	---	High	Low	Moderate
1455263: Munising, calcareous substratum-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Low	High
Yalmer, calcareous substratum-----	Fragipan	20-40	13-45	Strongly cemented	Low	Low	Moderate
Frohling, calcareous substratum-----	Fragipan	15-25	24-65	Strongly cemented	Moderate	Low	Moderate
1455266: Grand Sable-----	---	---	---	---	Low	Low	Moderate
1455267: Grand Sable-----	---	---	---	---	Low	Low	Moderate
1455268: Rhody-----	Paralithic bedrock	20-40	---	Strongly cemented	High	High	Moderate
	Lithic bedrock	20-50	30-60	Indurated			
Towes-----	Paralithic bedrock	20-30	---	Strongly cemented	High	High	Moderate
	Lithic bedrock	20-45	35-60	Indurated			
1455269: Waiska, very stony-----	---	---	---	---	Low	Low	High
1455273: Deerton-----	Paralithic bedrock	20-40	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
Au Train-----	Paralithic bedrock	10-20	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			

Table 20.--Soil Features--Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1455274: Deerton-----	Paralithic bedrock	20-40	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
Au Train-----	Paralithic bedrock	10-20	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
1455276: Cookson-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Low
1455277: Nahma-----	Lithic bedrock	20-40	40-60	Indurated	High	High	Low
Ruse-----	Lithic bedrock	4-20	60-76	Indurated	High	High	Low
1455278: Summerville-----	Lithic bedrock	10-20	60-70	Indurated	Moderate	Low	Low
1455281: Carbondale-----	---	---	---	---	High	Moderate	Moderate
Lupton-----	---	---	---	---	High	High	Low
Tawas-----	---	---	---	---	High	Moderate	Moderate
1455282: Dawson-----	---	---	---	---	High	Moderate	High
Greenwood-----	---	---	---	---	High	High	High
Loxley-----	---	---	---	---	High	Moderate	High
1455283: Chippeny-----	Lithic bedrock	16-51	29-64	Indurated	High	Moderate	Low
Nahma-----	Lithic bedrock	20-40	40-60	Indurated	High	High	Low
1455284: Histosols-----	---	---	---	---	High	High	Moderate
Aquents-----	---	---	---	---	High	High	Moderate
1455285. Pits							

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1455289:							
Jeske, bedrock terrace-----	Paralithic bedrock	10-23	---	Strongly cemented	Moderate	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
Gongeau, bedrock terrace-----	Paralithic bedrock	10-20	---	Strongly cemented	High	High	High
	Lithic bedrock	20-30	50-60	Indurated			
Deerton, bedrock terrace-----	Paralithic bedrock	20-40	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
1455290:							
Jeske, bedrock terrace-----	Paralithic bedrock	10-23	---	Strongly cemented	Moderate	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
Gongeau, bedrock terrace-----	Paralithic bedrock	10-20	---	Strongly cemented	High	High	High
	Lithic bedrock	20-30	50-60	Indurated			
Deerton, bedrock terrace-----	Paralithic bedrock	20-40	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
1455291:							
Ruse, bedrock terrace-----	Lithic bedrock	10-20	60-70	Indurated	High	High	Low
	Paralithic bedrock	10-20	---	Strongly cemented			
Ensign, bedrock terrace-----	Paralithic bedrock	10-20	---	Strongly cemented	Moderate	High	Low
	Lithic bedrock	10-20	60-70	Indurated			
Nykanen, bedrock terrace-----	Lithic bedrock	10-32	48-70	Indurated	Moderate	Moderate	Moderate
	Paralithic bedrock	10-20	---	Strongly cemented			
1455292:							
Ruse, bedrock terrace-----	Paralithic bedrock	10-20	---	Strongly cemented	High	High	Low
	Lithic bedrock	10-20	60-70	Indurated			
Ensign, bedrock terrace-----	Lithic bedrock	10-20	60-70	Indurated	Moderate	High	Low
	Paralithic bedrock	10-20	---	Strongly cemented			

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
1455292: Nykanen, bedrock terrace-----	Lithic bedrock	10-32	48-70	Indurated	Moderate	Moderate	Moderate
	Paralithic bedrock	10-20	---	Strongly cemented			
1455295: Ewart-----	---	---	---	---	High	High	Moderate
Sturgeon-----	---	---	---	---	High	High	Moderate
1455296: Deerton, dissected-----	Paralithic bedrock	20-40	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
Tokiahok, dissected-----	Fragipan	20-40	6-60	Strongly cemented	Low	Low	Moderate
Trout Bay, dissected-----	Paralithic bedrock	16-50	---	Moderately cemented	High	Moderate	Moderate
	Lithic bedrock	17-51	29-63	Indurated			
1455298: Garlic, dissected-----	---	---	---	---	Low	Low	High
Blue Lake, dissected-----	---	---	---	---	---	Moderate	High
Voelker, dissected-----	Ortstein	10-20	13-26	Strongly cemented	Low	Low	Moderate
1455299: Garlic, dissected-----	---	---	---	---	Low	Low	High
Blue Lake, dissected-----	---	---	---	---	---	Moderate	High
Voelker, dissected-----	Ortstein	10-20	13-26	Strongly cemented	Low	Low	Moderate
1455300: Garlic, dissected-----	---	---	---	---	Low	Low	High
Blue Lake, dissected-----	---	---	---	---	---	Moderate	High
Voelker, dissected-----	Ortstein	10-20	13-26	Strongly cemented	Low	Low	Moderate

Table 20.--Soil Features--Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1455302:							
Garlic-----	---	---	---	---	Low	Low	High
Blue Lake-----	---	---	---	---	---	Moderate	High
Voelker-----	Ortstein	10-20	13-26	Strongly cemented	Low	Low	Moderate
1455304:							
Cathro-----	---	---	---	---	High	Moderate	Moderate
Ensley-----	---	---	---	---	High	Low	Moderate
1455305:							
Tawas-----	---	---	---	---	High	High	Moderate
Deford-----	---	---	---	---	Moderate	High	Moderate
1455308:							
Fence, dissected-----	---	---	---	---	High	Low	High
1455310:							
Rousseau-----	---	---	---	---	Low	Low	Moderate
Dawson-----	---	---	---	---	High	Moderate	High
1455318:							
Munising, calcareous substratum-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Low	High
Ensley-----	---	---	---	---	High	Low	Moderate
1455319:							
Munising, dissected, very stony-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Moderate	High
Yalmer, dissected, very stony-----	Fragipan	20-40	13-29	Strongly cemented	Low	Low	High
1455320:							
Munising, stony-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Moderate	High
Skanee, stony-----	Fragipan	12-20	6-30	Strongly cemented	High	High	Moderate
1455324:							
Zeba, very stony-----	Lithic bedrock	20-40	40-60	Indurated	High	Moderate	Moderate
Jacobsville, very stony-----	Lithic bedrock	20-39	---	Indurated	High	High	Moderate

Table 20.--Soil Features--Continued

Map unit symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion		
	Kind	Depth to top	Thickness		Hardness	Uncoated steel	Concrete
1455326: Munising, dissected, stony-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Moderate	High
Abbaye, dissected, stony-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Moderate
1455327: Paquin-----	Ortstein	10-16	10-20	Strongly cemented	Low	Low	High
Finch-----	Ortstein	7-13	24-40	Strongly cemented	Low	High	Moderate
1455339: Crowell-----	---	---	---	---	Low	Low	Moderate
Kinross-----	---	---	---	---	Moderate	High	Moderate
1455340: Frohling, dissected, stony-----	Fragipan	15-25	24-65	Strongly cemented	Moderate	Low	Moderate
Tokiahok, dissected, stony-----	Fragipan	20-40	6-60	Strongly cemented	Low	Low	Moderate
1455341: McMaster-----	---	---	---	---	Low	Moderate	Moderate
1455344: Reade-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Moderate
1455353: Charlevoix-----	---	---	---	---	High	High	Moderate
Ensley-----	---	---	---	---	High	Low	Moderate
1455359: Munising-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Moderate	High
Abbaye-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Moderate
1455360: Kalkaska-----	---	---	---	---	Low	Low	High
Blue Lake-----	---	---	---	---	---	Moderate	High
1455361: Kalkaska-----	---	---	---	---	Low	Low	High
Blue Lake-----	---	---	---	---	---	Moderate	High

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1455362: Kalkaska-----	---	---	---	---	Low	Low	High
Blue Lake-----	---	---	---	---	---	Moderate	High
1455363: Jeske-----	Paralithic bedrock	10-23	---	Strongly cemented	Moderate	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
Au Train-----	Paralithic bedrock	10-20	---	Moderately cemented	Low	Low	High
	Lithic bedrock	20-40	40-60	Indurated			
Gongeau-----	Paralithic bedrock	10-20	---	Strongly cemented	High	High	High
	Lithic bedrock	20-30	50-60	Indurated			
1455365: Cusino-----	---	---	---	---	Low	Low	High
1455366: Cusino-----	---	---	---	---	Low	Low	High
1455367: Kalkaska-----	---	---	---	---	Low	Low	High
Cusino-----	---	---	---	---	Low	Low	High
1455368: Kalkaska-----	---	---	---	---	Low	Low	High
Cusino-----	---	---	---	---	Low	Low	High
1455369: Kalkaska-----	---	---	---	---	Low	Low	High
Cusino-----	---	---	---	---	Low	Low	High
1455370: Kalkaska-----	---	---	---	---	Low	Low	High
Cusino-----	---	---	---	---	Low	Low	High
1455371: Halfaday-----	---	---	---	---	Low	Low	High

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1455372: Shelldrake-----	---	---	---	---	Low	Low	High
1455380: Trout Bay-----	Paralithic bedrock	16-50	---	Moderately cemented	High	Moderate	Moderate
	Lithic bedrock	17-51	29-63	Indurated			
Gongeau-----	Paralithic bedrock	10-20	---	Strongly cemented	High	High	High
	Lithic bedrock	20-30	50-60	Indurated			
Shingleton----- Rock outcrop.	Lithic bedrock	10-20	60-70	Indurated	Low	Low	High
1455382: Kalkaska, severely burned-----	---	---	---	---	Low	Low	High
1455383: Kalkaska, severely burned-----	---	---	---	---	Low	Low	High
1455386: Trout Bay-----	Paralithic bedrock	16-50	---	Moderately cemented	High	Moderate	Moderate
	Lithic bedrock	17-51	29-63	Indurated			
Lupton-----	---	---	---	---	High	Moderate	Low
Gongeau-----	Paralithic bedrock	10-20	---	Strongly cemented	High	High	High
	Lithic bedrock	20-30	50-60	Indurated			
1455387: Garlic-----	---	---	---	---	Low	Low	High
1455388: Garlic-----	---	---	---	---	Low	Low	High
1455389: Garlic-----	---	---	---	---	Low	Low	High
1455390: Escanaba-----	---	---	---	---	Low	Low	Moderate
Greylock-----	---	---	---	---	Moderate	Low	Moderate

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top	In				
1455391:							
Escanaba-----	---	---	---	---	Low	Low	Moderate
Greylock-----	---	---	---	---	Moderate	Low	Moderate
1455392:							
Escanaba-----	---	---	---	---	Low	Low	Moderate
Greylock-----	---	---	---	---	Moderate	Low	Moderate
1455395:							
Greylock-----	---	---	---	---	Moderate	Low	Moderate
1455396:							
Greylock-----	---	---	---	---	Moderate	Low	Moderate
1455397:							
Finch-----	Ortstein	7-13	24-40	Strongly cemented	Low	High	Moderate
Kinross-----	---	---	---	---	Moderate	High	Moderate
1455402:							
Kalkaska, dissected-----	---	---	---	---	Low	Low	High
Blue Lake, dissected-----	---	---	---	---	---	Moderate	High
1455403:							
Kalkaska, dissected-----	---	---	---	---	Low	Low	High
Blue Lake, dissected-----	---	---	---	---	---	Moderate	High
1455404:							
Kalkaska, dissected-----	---	---	---	---	Low	Low	High
Blue Lake, dissected-----	---	---	---	---	---	Moderate	High
1455408:							
Spot-----	Ortstein	8-12	2-15	Strongly cemented	Moderate	High	High
Finch-----	Ortstein	7-13	24-40	Strongly cemented	Low	High	Moderate
1455409:							
Finch-----	Ortstein	7-13	24-40	Strongly cemented	Low	High	Moderate

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1455410: Munising, calcareous substratum, dissected-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Low	High
Frohling, calcareous substratum, dissected-----	Fragipan	15-25	24-65	Strongly cemented	Moderate	Low	Moderate
Cookson, dissected-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Low
1455411: Frohling, calcareous substratum, dissected-----	Fragipan	15-25	24-65	Strongly cemented	Moderate	Low	Moderate
Garlic, dissected-----	---	---	---	---	Low	Low	High
Cookson, dissected-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Low
1455412: Munising, calcareous substratum, dissected-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Low	High
Yalmer, calcareous substratum, dissected-----	Fragipan	20-40	13-45	Strongly cemented	Low	Low	Moderate
Frohling, calcareous substratum, dissected-----	Fragipan	15-25	24-65	Strongly cemented	Moderate	Low	Moderate
1455413: Munising, calcareous substratum-----	Fragipan	15-25	25-43	Strongly cemented	Moderate	Low	High
Cookson-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Low
1455416: Furlong-----	Lithic bedrock	20-40	40-70	Indurated	Low	Low	High
Shingleton-----	Lithic bedrock	10-20	60-70	Indurated	Low	Low	High
1455417: Furlong-----	Lithic bedrock	20-40	40-70	Indurated	Low	Low	High
Shingleton-----	Lithic bedrock	10-20	60-70	Indurated	Low	Low	High
1455421: Steuben-----	Fragipan	17-26	6-27	Strongly cemented	Moderate	Low	High
Blue Lake-----	---	---	---	---	---	Moderate	High
Kalkaska-----	---	---	---	---	Low	Low	High

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		In to top					
1455422: Steuben-----	Fragipan	17-26	6-27	Strongly cemented	Moderate	Low	High
Blue Lake-----	---	---	---	---	---	Moderate	High
Kalkaska-----	---	---	---	---	Low	Low	High
1455425: Greylock-----	---	---	---	---	Moderate	Low	Moderate
Cookson-----	Lithic bedrock	20-40	---	Indurated	Moderate	Moderate	Low
1455431: Rubicon, severely burned-----	---	---	---	---	Low	Low	High
1455432: Rubicon, severely burned-----	---	---	---	---	Low	Low	High
1455433: Wurtsmith-----	---	---	---	---	Low	Low	High
Deford-----	---	---	---	---	Moderate	High	Moderate
1455434: Shelldrake-----	---	---	---	---	Low	Low	High
1455435: Shelldrake-----	---	---	---	---	Low	Low	High
Dune land-----	---	---	---	---	Low	Low	High
1455436: Cookson, dissected-----	Lithic bedrock	20-40	40-60	Indurated	Moderate	Moderate	Low
Nykanen, dissected-----	Lithic bedrock Paralithic bedrock	10-32 10-20	48-70 ---	Indurated Strongly cemented	Moderate	Moderate	Moderate
1455437: Dillingham-----	Fragipan	16-28	8-16	Strongly cemented	Low	Low	High
Kalkaska-----	---	---	---	---	Low	Low	High
1455438: Dillingham-----	Fragipan	16-28	8-16	Strongly cemented	Low	Low	High
Kalkaska-----	---	---	---	---	Low	Low	High

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top	In				
1455439: Dillingham-----	Fragipan	16-28	8-16	Strongly cemented	Low	Low	High
Kalkaska-----	---	---	---	---	Low	Low	High
1671074: Udipsamments-----	---	---	---	---	---	---	---
Udorthents-----	---	---	---	---	---	---	---
1671282: Stutts-----	---	---	---	---	Low	Low	High
Kalkaska-----	---	---	---	---	Low	Low	High
1671283: Stutts-----	---	---	---	---	Low	Low	High
Kalkaska-----	---	---	---	---	Low	Low	High
1671284: Stutts-----	---	---	---	---	Low	Low	High
Kalkaska-----	---	---	---	---	Low	Low	High
1693163. Water							

Soil Survey of Pictured Rocks National Lakeshore, Michigan

Table 21.—Taxonomic Classification of the Soils

Soil name	Family or higher taxonomic class
Abbaye-----	Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods
Alcona-----	Coarse-loamy, mixed, active, frigid Alfic Haplorthods
Aquents-----	Aquents
Au Gres-----	Sandy, mixed, frigid Typic Endoaquods
Au Train-----	Sandy, isotic, frigid, shallow Oxyaquic Haplorthods
Blue Lake-----	Sandy, mixed, frigid Lamellic Haplorthods
Carbondale-----	Euic, frigid Hemic Haplosaprists
Cathro-----	Loamy, mixed, euic, frigid Terric Haplosaprists
Charlevoix-----	Coarse-loamy, mixed, semiactive, frigid Argic Endoaquods
Chatham-----	Loamy-skeletal, mixed, active, frigid Typic Dystrudepts
Chippeny-----	Euic, frigid Lithic Haplosaprists
Chocolay-----	Loamy-skeletal, mixed, superactive, frigid Oxyaquic Haplorthods
Cookson-----	Coarse-loamy, mixed, active, frigid Alfic Haplorthods
Croswell-----	Sandy, mixed, frigid Oxyaquic Haplorthods
Cusino-----	Sandy, isotic, frigid Typic Haplorthods
Davies-----	Sandy-skeletal, mixed, frigid Typic Endoaquepts
Dawson-----	Sandy or sandy-skeletal, mixed, dysic, frigid Terric Haplosaprists
Deer Park-----	Mixed, frigid Spodic Udipsamments
Deerton-----	Sandy, mixed, frigid Typic Haplorthods
Deford-----	Mixed, frigid Typic Psammaquents
Dillingham-----	Sandy, isotic, frigid Typic Fragiorthods
Eben-----	Sandy-skeletal, mixed, frigid Pachic Hapludolls
Ensign-----	Loamy, mixed, superactive, frigid Lithic Eutrudepts
Ensley-----	Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquents
Escanaba-----	Sandy over loamy, mixed, superactive, frigid Alfic Haplorthods
Evart-----	Sandy, mixed, frigid Fluvaquentic Endoaquolls
Fence-----	Coarse-silty, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
Finch-----	Sandy, mixed, frigid, shallow, ortstein Typic Duraquods
Frohling-----	Coarse-loamy, mixed, active, frigid Alfic Fragiorthods
Furlong-----	Sandy, mixed, frigid Typic Haplorthods
Garlic-----	Sandy, mixed, frigid, ortstein Typic Haplorthods
Gay-----	Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquepts
Gongeau-----	Siliceous, acid, frigid, shallow Typic Psammaquents
Grand Sable-----	Sandy over loamy, aniso, isotic, nonacid, frigid Typic Udorthents
Greenwood-----	Dysic, frigid Typic Haplohemists
Greylock-----	Coarse-loamy, mixed, active, frigid Alfic Haplorthods
Halfaday-----	Sandy, mixed, frigid Oxyaquic Haplorthods
Histosols-----	Histosols
Ingalls-----	Sandy over loamy, mixed, active, frigid Typic Endoaquods
Jacobsville-----	Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquepts
Jeske-----	Siliceous, acid, frigid, shallow Typic Psammaquents
Kalkaska-----	Sandy, isotic, frigid Typic Haplorthods
Kinross-----	Sandy, mixed, frigid Typic Endoaquods
Kiva-----	Sandy, mixed, frigid Entic Haplorthods
Longrie-----	Coarse-loamy, mixed, superactive, frigid Typic Haplorthods
Loxley-----	Dysic, frigid Typic Haplosaprists
Lupton-----	Euic, frigid Typic Haplosaprists
McMaster-----	Sandy-skeletal, mixed, frigid Oxyaquic Haplorthods
McMillan-----	Sandy, mixed, frigid Lamellic Haplorthods
Meehan-----	Mixed, frigid Aquic Udipsamments
Munising-----	Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods
Nahma-----	Coarse-loamy, mixed, active, nonacid, frigid Histic Humaquepts
Namur-----	Loamy, mixed, active, frigid Lithic Hapludolls
Nykanen-----	Coarse-loamy, isotic, frigid Oxyaquic Eutrudepts
Okeefe-----	Sandy over loamy, isotic, frigid Typic Haplorthods
Paavola-----	Sandy-skeletal, mixed, frigid Alfic Oxyaquic Fragiorthods
Paquin-----	Sandy, isotic, frigid, shallow, ortstein Typic Durorthods
Pelkie-----	Mixed, frigid Oxyaquic Udipsamments
Reade-----	Coarse-loamy, mixed, superactive, frigid Aqualfic Haplorthods
Rhody-----	Coarse-silty over sandy or sandy-skeletal, mixed, active, frigid Typic Endoaquolls
Rousseau-----	Sandy, mixed, frigid Entic Haplorthods

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Table 21.—Taxonomic Classification of the Soils—Continued

Soil name	Family or higher taxonomic class
Rubicon-----	Sandy, mixed, frigid Entic Haplorthods
Ruse-----	Loamy, mixed, active, frigid Lithic Endoaquolls
Shag-----	Coarse-silty, mixed, active, frigid Typic Endoaquolls
Shelldrake-----	Frigid, uncoated Typic Quartzipsamments
Shingleton-----	Sandy, isotic, frigid Lithic Haplorthods
Shoepac-----	Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
Skandia-----	Dysic, frigid Lithic Haplosaprists
Skanee-----	Coarse-loamy, mixed, active, frigid Argic Fragiaquods
Spear-----	Coarse-silty, mixed, superactive, frigid Aquic Glossudalfs
Sporley-----	Coarse-silty, mixed, active, frigid Alfic Haplorthods
Spot-----	Sandy, mixed, frigid, shallow, ortstein Typic Duraquods
Steuben-----	Coarse-loamy, mixed, active, frigid Alfic Fragiorthods
Sturgeon-----	Coarse-silty over sandy or sandy-skeletal, mixed, superactive, nonacid, frigid Aquic Udifluvents
Stutts-----	Sandy, isotic, frigid Typic Haplorthods
Summerville-----	Loamy, mixed, active, frigid Lithic Eutrudepts
Tawas-----	Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists
Tokiahok-----	Sandy, mixed, frigid Alfic Fragiorthods
Towes-----	Coarse-silty over sandy or sandy-skeletal, mixed, active, frigid Typic Endoaquolls
Traunik-----	Sandy-skeletal, mixed, frigid Typic Haplorthods
Trenary-----	Coarse-loamy, mixed, semiactive, frigid Alfic Haplorthods
Trout Bay-----	Euic, frigid Lithic Haplosaprists
Udipsamments-----	Udipsamments
Udorthents-----	Udorthents
Voelker-----	Sandy, mixed, frigid, shallow, ortstein Typic Durorthods
Waiska-----	Sandy-skeletal, mixed, frigid Typic Haplorthods
Wallace-----	Sandy, mixed, frigid, shallow, ortstein Typic Durorthods
Wurtsmith-----	Mixed, frigid Oxyaquic Udipsamments
Yalmer-----	Sandy, mixed, frigid Alfic Oxyaquic Fragiorthods
Zeba-----	Coarse-loamy, mixed, active, frigid Argic Endoaquods

Table 22.--Soil Classification Key

ORDER	Suborder	Great Group	Subgroup	Series or Higher Category
ALFISOLS	Udalfs	Glossudalfs	Aquic Glossudalfs	Spear-----Coarse-silty, mixed, superactive, frigid Aquic Glossudalfs
ENTISOLS	Aquents			Aquents-----Aquents
	Psammaquents	Typic Psammaquents		Deford-----Mixed, frigid Typic Psammaquents
			Gongeau-----Siliceous, acid, frigid, shallow Typic Psammaquents	
			Jeske-----Siliceous, acid, frigid, shallow Typic Psammaquents	
	Endoaquents	Aeric Endoaquents		Ensley-----Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquents
	Fluvents	Udifluvents	Aquic Udifluvents	Sturgeon-----Coarse-silty over sandy or sandy-skeletal, mixed, superactive, nonacid, frigid Aquic Udifluvents
	Orthents	Udorthents		Udorthents-----Udorthents
		Typic Udorthents		Grand Sable-----Sandy over loamy, aniso, isotic, nonacid, frigid Typic Udorthents
	Psamments	Quartzipsamments	Typic Quartzipsamments	Shell Drake-----Frigid, uncoated Typic Quartzipsamments
		Udipsamments		Udipsamments-----Udipsamments
		Aquic Udipsamments		Meehan-----Mixed, frigid Aquic Udipsamments
		Oxyaquic Udipsamments		Pelkie-----Mixed, frigid Oxyaquic Udipsamments
				Wurtsmith-----Mixed, frigid Oxyaquic Udipsamments
		Spodic Udipsamments		Deer Park-----Mixed, frigid Spodic Udipsamments

Table 22.—Soil Classification Key—Continued

ORDER	Suborder	Great Group	Subgroup	Series or Higher Category
<b>HISTOSOLS</b>				
		Histosols-----Histosols		
	<b>Hemists</b>			
	<b>Haplohemists</b>			
		Typic Haplohemists		
		Greenwood-----	Dysic, frigid Typic Haplohemists	
	<b>Saprists</b>			
	<b>Haplosaprists</b>			
		Typic Haplosaprists		
		Loxley-----	Dysic, frigid Typic Haplosaprists	
		Lupton-----	Euic, frigid Typic Haplosaprists	
		Lithic Haplosaprists		
		Skandia-----	Dysic, frigid Lithic Haplosaprists	
		Chippeny-----	Euic, frigid Lithic Haplosaprists	
		Trout Bay-----	Euic, frigid Lithic Haplosaprists	
		Terric Haplosaprists		
		Cathro-----	Loamy, mixed, euic, frigid Terric Haplosaprists	
		Dawson-----	Sandy or sandy-skeletal, mixed, dysic, frigid Terric Haplosaprists	
		Tawas-----	Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists	
		Hemic Haplosaprists		
		Carbondale-----	Euic, frigid Hemic Haplosaprists	
<b>INCEPTISOLS</b>				
	<b>Aquepts</b>			
	<b>Humaquepts</b>			
		Histic Humaquepts		
		Nahma-----	Coarse-loamy, mixed, active, nonacid, frigid Histic Humaquepts	
		Endoaquepts		
		Typic Endoaquepts		
		Davies-----	Sandy-skeletal, mixed, frigid Typic Endoaquepts	
		Aeric Endoaquepts		
		Gay-----	Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquepts	
		Jacobsville-----	Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquepts	
	<b>Udepts</b>			
	<b>Dystrudepts</b>			
		Typic Dystrudepts		
		Chatham-----	Loamy-skeletal, mixed, active, frigid Typic Dystrudepts	
		Eutrudepts		
		Lithic Eutrudepts		
		Summerville-----	Loamy, mixed, active, frigid Lithic Eutrudepts	
		Ensign-----	Loamy, mixed, superactive, frigid Lithic Eutrudepts	
		Oxyaquic Eutrudepts		
		Nykanen-----	Coarse-loamy, isotic, frigid Oxyaquic Eutrudepts	

Table 22.—Soil Classification Key—Continued

ORDER	Suborder	Great Group	Subgroup	Series or Higher Category
MOLLISOLS				
	Aquolls			
	Endoaquolls			
	Typic Endoaquolls			
		Rhody-----		Coarse-silty over sandy or sandy-skeletal, mixed, active, frigid Typic Endoaquolls
		Towes-----		Coarse-silty over sandy or sandy-skeletal, mixed, active, frigid Typic Endoaquolls
		Shag-----		Coarse-silty, mixed, active, frigid Typic Endoaquolls
	Fluvaquentic Endoaquolls			
		Ewart-----		Sandy, mixed, frigid Fluvaquentic Endoaquolls
	Lithic Endoaquolls			
		Ruse-----		Loamy, mixed, active, frigid Lithic Endoaquolls
	Udolls			
	Hapludolls			
	Lithic Hapludolls			
		Namur-----		Loamy, mixed, active, frigid Lithic Hapludolls
	Pachic Hapludolls			
		Eben-----		Sandy-skeletal, mixed, frigid Pachic Hapludolls
SPODOSOLS				
	Aquods			
	Duraquods			
	Typic Duraquods			
		Finch-----		Sandy, mixed, frigid, shallow, ortstein Typic Duraquods
		Spot-----		Sandy, mixed, frigid, shallow, ortstein Typic Duraquods
	Fragiaquods			
	Argic Fragiaquods			
		Skanee-----		Coarse-loamy, mixed, active, frigid Argic Fragiaquods
	Endoaquods			
	Typic Endoaquods			
		Ingalls-----		Sandy over loamy, mixed, active, frigid Typic Endoaquods
		Au Gres-----		Sandy, mixed, frigid Typic Endoaquods
		Kinross-----		Sandy, mixed, frigid Typic Endoaquods
	Argic Endoaquods			
		Zeba-----		Coarse-loamy, mixed, active, frigid Argic Endoaquods
		Charlevoix-----		Coarse-loamy, mixed, semiactive, frigid Argic Endoaquods
	Orthods			
	Fragiorthods			
	Typic Fragiorthods			
		Dillingham-----		Sandy, isotic, frigid Typic Fragiorthods
	Alfic Fragiorthods			
		Frohling-----		Coarse-loamy, mixed, active, frigid Alfic Fragiorthods
		Steuben-----		Coarse-loamy, mixed, active, frigid Alfic Fragiorthods
		Tokiahok-----		Sandy, mixed, frigid Alfic Fragiorthods
	Alfic Oxyaquic Fragiorthods			
		Munising-----		Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods
		Yalmer-----		Sandy, mixed, frigid Alfic Oxyaquic Fragiorthods
		Paavola-----		Sandy-skeletal, mixed, frigid Alfic Oxyaquic Fragiorthods

Table 22.—Soil Classification Key—Continued

ORDER	Suborder	Great Group	Subgroup	Series or Higher Category
SPodosols				
Haplorthods, Orthods—Continued				
Typic Haplorthods				
	Longrie	Coarse-loamy, mixed, superactive, frigid	Typic Haplorthods	
	Okeefe	Sandy over loamy, isotic, frigid	Typic Haplorthods	
	Cusino	Sandy, isotic, frigid	Typic Haplorthods	
	Kalkaska	Sandy, isotic, frigid	Typic Haplorthods	
	Stutts	Sandy, isotic, frigid	Typic Haplorthods	
	Deerton	Sandy, mixed, frigid	Typic Haplorthods	
	Furlong	Sandy, mixed, frigid	Typic Haplorthods	
	Garlic	Sandy, mixed, frigid, ortstein	Typic Haplorthods	
	Traunik	Sandy-skeletal, mixed, frigid	Typic Haplorthods	
	Waiska	Sandy-skeletal, mixed, frigid	Typic Haplorthods	
Alfic Haplorthods				
	Alcona	Coarse-loamy, mixed, active, frigid	Alfic Haplorthods	
	Cookson	Coarse-loamy, mixed, active, frigid	Alfic Haplorthods	
	Greylock	Coarse-loamy, mixed, active, frigid	Alfic Haplorthods	
	Trenary	Coarse-loamy, mixed, semiaactive, frigid	Alfic Haplorthods	
	Sporley	Coarse-silty, mixed, active, frigid	Alfic Haplorthods	
	Escanaba	Sandy over loamy, mixed, superactive, frigid	Alfic Haplorthods	
Aqualfic Haplorthods				
	Reade	Coarse-loamy, mixed, superactive, frigid	Aqualfic Haplorthods	
Entic Haplorthods				
	Kiva	Sandy, mixed, frigid	Entic Haplorthods	
	Rousseau	Sandy, mixed, frigid	Entic Haplorthods	
	Rubicon	Sandy, mixed, frigid	Entic Haplorthods	
Lithic Haplorthods				
	Shingleton	Sandy, isotic, frigid	Lithic Haplorthods	
Oxyaquic Haplorthods				
	Chocolatey	Loamy-skeletal, mixed, superactive, frigid	Oxyaquic Haplorthods	
	Au Train	Sandy, isotic, frigid, shallow	Oxyaquic Haplorthods	
	Croswell	Sandy, mixed, frigid	Oxyaquic Haplorthods	
	Halfaday	Sandy, mixed, frigid	Oxyaquic Haplorthods	
	McMaster	Sandy-skeletal, mixed, frigid	Oxyaquic Haplorthods	
Alfic Oxyaquic Haplorthods				
	Abbaye	Coarse-loamy, mixed, active, frigid	Alfic Oxyaquic Haplorthods	
	Shoepac	Coarse-loamy, mixed, superactive, frigid	Alfic Oxyaquic Haplorthods	
	Fence	Coarse-silty, mixed, superactive, frigid	Alfic Oxyaquic Haplorthods	
Lamellic Haplorthods				
	Blue Lake	Sandy, mixed, frigid	Lamellic Haplorthods	
	McMillan	Sandy, mixed, frigid	Lamellic Haplorthods	
Durorthods				
Typic Durorthods				
	Paquin	Sandy, isotic, frigid, shallow, ortstein	Typic Durorthods	
	Voelker	Sandy, mixed, frigid, shallow, ortstein	Typic Durorthods	
	Wallace	Sandy, mixed, frigid, shallow, ortstein	Typic Durorthods	

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Table 23.-Lab-Sampled Pedons

Current soil name	Pedon type	User site ID	User pedon ID	Lab source*	Lab pedon number
GONGEAU-LIKE	PEDON	H00MI003-5	00MI003005	KSSL	01P0285
GRAND SABLE	OSD PEDON	02MI003001	02MI003001	KSSL	03N0276
SHINGLETON-LIKE	PEDON	H00MI003-4	00MI003004	KSSL	01P0284
TOWES	OSD PEDON	93BMI2007- 1MI003OSD	93BMI2007- 1MI003OSD	KSSL	03N0278

\* KSSL indicates the Kellogg Soil Survey Laboratory in Lincoln, Nebraska.

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