Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1975; USDA, 1992). 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. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. 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. The last syllable in the name of a suborder indicates the order. An example is Orthod (*Orth*, meaning the common ones, 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; and base status. 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 Haplorthods (*Hapl*, meaning minimal horizonation, plus *orthod*, the suborder of the Spodosols that has a horizon characterized by an accumulation of aluminum, iron, and organic carbon in which no one of the elements dominates).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. 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 known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Alfic 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 are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-loamy, mixed, frigid Alfic Haplorthods.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1975). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Alcona Series

The Alcona series consists of moderately well drained and well drained, moderately permeable soils on lake terraces, dissected lake plains, and deltas. These soils formed in stratified sandy and loamy lacustrine and glaciofluvial deposits. Slopes range from 0 to 60 percent.

Typical pedon of Alcona loamy very fine sand, in an area of Zimmerman-Alcona, moderately wet, complex, 6 to 18 percent slopes, 800 feet north and 1,885 feet east of the southwest corner of sec. 9, T. 25 N., R. 9 E.

A—0 to 1 inch; black (N 2/0) loamy very fine sand, dark gray (N 4/0) dry; weak medium granular structure; friable; many clean very fine sand grains; many fine roots; very strongly acid; abrupt smooth boundary.

E—1 to 3 inches; grayish brown (10YR 5/2) loamy very fine sand, light gray (10YR 7/2) dry; weak fine subangular blocky structure; very friable; common fine roots; moderately acid; abrupt wavy boundary.

Bs1—3 to 8 inches; dark brown (7.5YR 4/4) loamy very fine sand; moderate fine subangular blocky structure; very friable; common fine roots; moderately acid; clear wavy boundary.

Bs2—8 to 12 inches; yellowish brown (10YR 5/6) loamy very fine sand; weak fine subangular blocky structure; very friable; common fine roots; moderately acid; clear wavy boundary.

E´—12 to 16 inches; brown (10YR 5/3) loamy very fine sand, very pale brown (10YR 8/3) dry; weak medium subangular blocky structure; friable; few fine roots; moderately acid; clear broken boundary.

B/E—16 to 21 inches; about 80 percent brown (7.5YR 5/4) loam (Bt); moderate medium subangular blocky structure; firm; few fine roots; common discontinuous faint brown (7.5YR 5/4) clay films on faces of peds; surrounded and coated by light yellowish brown (10YR 6/4) very fine sandy loam, very pale brown (10YR 7/4) dry (E); few fine distinct strong brown (7.5YR 5/6) mottles; many very fine vesicular pores; about 2 percent gravel; moderately acid; clear wavy boundary.

Bt—21 to 41 inches; dark brown (7.5YR 4/4) loam; common fine distinct strong brown (7.5YR 5/6) mottles; moderate fine angular blocky structure; firm; few fine roots; many very fine vesicular pores; common continuous faint dark brown (7.5YR 3/4) clay films on faces of peds; about 2 percent gravel; slightly acid; abrupt wavy boundary.

C—41 to 60 inches; light yellowish brown (10YR 6/4) loamy very fine sand; common fine prominent yellowish brown (10YR 5/8) mottles; weak medium platy structure inherent from deposition; friable; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 30 to 50 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The A horizon has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. It is dominantly loamy very fine sand, but the range includes loamy fine sand, very fine sandy loam, or fine sandy loam.

The E horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 1 to 3. It is loamy very fine sand, loamy fine sand, or fine sandy loam.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It is loamy very fine sand, loamy fine sand, very fine sandy loam, or fine sandy loam.

The E´ horizon and the E part of the B/E horizon have hue of 10YR, value of 5 or 6, and chroma of 3 or 4. They are loamy fine sand, fine sandy loam, or very fine sandy loam.

The Bt part of the B/E horizon and the Bt horizon have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. They are fine sandy loam, very fine sandy loam, or loam.

The C horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 or 4. It is dominantly loamy very fine sand, but in some pedons it has thin strata of loam, very fine sand, and silty clay loam.

Alfic Haplaquods

These soils are classified as mixed, frigid Alfic Haplaquods. Alfic Haplaquods consist of somewhat poorly drained, rapidly permeable soils on outwash plains and lake plains. These soils formed in sandy outwash or lacustrine materials. Slopes range from 0 to 4 percent.

Typically, the A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 to 3. It is sand.

The Bs horizons have hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 3 to 6. They are sand or loamy sand.

The E´ horizon has colors similar to those of the E horizon. It is sand.

The Bt horizon has hue of 7.5YR or 10YR, value of

4 to 6, and chroma of 3 to 6. It is loamy sand.

The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 6. It is sand or loamy sand.

Alfic Haplorthods, sandy

These soils are classified as sandy, mixed, frigid Alfic Haplorthods. They are well drained, rapidly permeable soils on end moraines and ground moraines. They formed in sandy and loamy glacial till. Slopes range from 0 to 30 percent.

Reference pedon of Alfic Haplorthods, sandy, in an area of Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, rolling, approximately 1,150 feet west and 200 feet south of the center of sec. 19, T. 27 N., R. 5 E.

Oe—0 to 2 inches; black (10YR 2/1), partially decomposed hardwood leaf litter.
A—2 to 4 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable; many very fine and fine roots; moderately acid; clear irregular boundary.
E—4 to 7 inches; grayish brown (10YR 5/2) sand, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; many fine roots; moderately acid; clear irregular boundary.
Bs1—7 to 11 inches; dark brown (7.5YR 4/4) sand; weak medium subangular blocky structure; friable; moderately acid; gradual wavy boundary.
Bs2—11 to 32 inches; strong brown (7.5YR 5/6) sand; weak fine subangular blocky structure; very friable; moderately acid; gradual wavy boundary.
Bw—32 to 37 inches; reddish yellow (7.5YR 6/6) sand; single grain; loose; moderately acid; clear irregular boundary.
2Bt—37 to 42 inches; dark brown (7.5YR 4/4) sandy loam; weak medium subangular blocky structure; very friable; slightly acid; clear wavy boundary.
3C1—42 to 77 inches; reddish yellow (7.5YR 6/6) sand; single grain; loose; neutral; gradual wavy boundary.
3C2—77 to 180 inches; brownish yellow (10YR 6/6) sand; single grain; loose; neutral.

The depth to loamy material ranges from 20 to 45 inches. The content of gravel ranges from 0 to 15 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is dominantly loamy sand, but the range includes sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 or 3. It is sand or loamy sand. Some pedons have discontinuous E horizons.

The Bs horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. It is sand or loamy sand. The Bw horizon also is sand or loamy sand.

The 2Bt horizon has hue of 5YR or 7.5YR and value and chroma of 3 to 6. It is sandy loam, fine sandy loam, sandy clay loam, or silt loam. If the 2Bt horizon is above a depth of 40 inches, it is less than 6 inches thick. If it is below a depth of 40 inches, the thickness ranges to 30 inches.

The 3C horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 3 to 6. It is sand, coarse sand, or loamy sand. Some pedons have bands, less than 6 inches thick, of sandy loam, sandy clay loam, fine sandy loam, silt loam, or silty clay loam.

Alfic Haplorthods, sandy over loamy

These soils are classified as sandy over loamy, mixed, frigid Alfic Haplorthods. They are well drained sandy material overlying loamy and sandy material on ice-contact end moraines and ground moraines. They formed in sandy and loamy glacial till. Permeability is rapid in the sandy material and moderate or moderately slow in the loamy material. Slopes range from 0 to 30 percent.

Reference pedon of Alfic Haplorthods, sandy over loamy, in an area of Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, rolling, 400 feet north of the center of the NW¼ of sec. 8, T. 26 N., R. 5 E.

Oe—0 to 2 inches; black (10YR 2/1), partially decomposed hardwood leaf litter.
A—2 to 4 inches; black (10YR 2/1) sand; weak fine granular structure; very friable; many very fine and fine and common medium roots; moderately acid; clear wavy boundary.
E—4 to 6 inches; dark grayish brown (10YR 4/2) sand, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; many very fine and few medium and coarse roots; moderately acid; clear wavy boundary.
Bs1—6 to 9 inches; dark brown (7.5YR 4/4) sand; weak medium granular structure; very friable; many fine and few medium and coarse roots; strongly acid; clear smooth boundary.
Bs2—9 to 27 inches; strong brown (7.5YR 5/6) sand; weak fine granular structure; friable; many very fine and fine and few medium and coarse roots; moderately acid; gradual wavy boundary.
2Bt—27 to 44 inches; brown (7.5YR 5/4) sandy clay loam; moderate medium subangular blocky structure; firm; dark brown (7.5YR 4/4) clay films on faces of peds; common fine roots; neutral; abrupt wavy boundary.

3C1—44 to 52 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure; very friable; neutral; gradual wavy boundary.
3C2—52 to 120 inches; brownish yellow (10YR 6/6) sand; single grain; loose; neutral.

The thickness of the solum ranges from 20 to 50 inches. The thickness of the sandy deposits ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent in the sandy material and from 0 to 15 percent in the Bt and C horizons.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is dominantly sand, but the range includes loamy sand.

The E horizon has hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 2 to 4. It is sand or loamy sand.

The Bs horizon has hue of 7.5YR or 5YR and value and chroma of 3 to 6. It is sand or loamy sand. Some pedons have a BC horizon of loamy sand or sand as much as 10 inches thick.

The 2Bt horizon has hue of 5YR or 7.5YR and value and chroma of 3 to 6. It is sandy clay loam, clay loam, silt loam, or silty clay loam.

The 3C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 6. It is sand, loamy sand, loamy fine sand, fine sand, or sandy loam. Some pedons have strata of sandy clay loam, silt loam, or silty clay loam less than 3 inches thick.

Algonquin Series

The Algonquin series consists of somewhat poorly drained, very slowly permeable soils on lake plains. These soils formed in stratified silty and clayey lacustrine deposits. Slopes range from 0 to 6 percent.

Typical pedon of Algonquin silt loam, in an area of Algonquin-Springport complex, 0 to 6 percent slopes, 1,320 feet south and 150 feet east of the northwest corner of sec. 24, T. 26 N., R. 8 E.

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; few fine prominent strong brown (7.5YR 5/6) mottles; weak very thick platy structure parting to moderate very fine angular blocky; friable; many very fine and common fine roots; many very fine tubular pores; neutral; abrupt smooth boundary.
Bt1—7 to 11 inches; reddish brown (5YR 4/4) silty clay; common fine prominent gray (10YR 6/1) and strong brown (7.5YR 5/6) mottles; strong very coarse prismatic structure parting to strong fine angular blocky; firm; very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; thin patchy pale brown (10YR 6/3) silt coatings on faces of peds; many very fine and common fine roots; many very fine and common medium discontinuous tubular pores; many continuous prominent dark brown (7.5YR 4/2) clay films on faces of peds; slightly alkaline; clear wavy boundary.
Bt2—11 to 14 inches; reddish brown (5YR 5/3) silty clay loam; many medium prominent reddish yellow (7.5YR 6/8) and many medium distinct gray (5YR 6/1) mottles; strong very coarse prismatic structure parting to moderate medium angular blocky; firm; very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; few very fine roots; common discontinuous prominent dark brown (10YR 4/3) clay films on faces of peds; slight effervescence; moderately alkaline; clear wavy boundary.
Bt3—14 to 29 inches; light reddish brown (5YR 6/4) silty clay; many medium prominent reddish yellow (7.5YR 6/8) and greenish gray (5GY 6/1) mottles; strong very coarse prismatic structure parting to strong thick platy; firm; very dark grayish brown (10YR 3/2) organic coatings 1 millimeter thick on vertical faces of peds; common prominent dark brown (10YR 4/3) clay films on faces of peds; common white (10YR 8/1) lime or carbonate coatings on faces of peds; strong effervescence; moderately alkaline; clear wavy boundary.
BC—29 to 60 inches; light reddish brown (5YR 6/4) silty clay loam; many medium prominent reddish yellow (7.5YR 6/8) and greenish gray (5GY 6/1) mottles; moderate thick platy structure parting to moderate fine angular blocky; firm; common white (10YR 8/1) lime or carbonate coatings on faces of peds; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 35 to more than 60 inches. The depth to free carbonates ranges from 11 to 15 inches. The content of gravel ranges from 0 to 1 percent throughout the profile.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 1 to 3.

The Bt horizon has hue of 5YR or 7.5YR, value of 3 to 6, and chroma of 3 or 4. It is silty clay or silty clay loam.

The BC horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4. It is silty clay or silty clay loam, or it is stratified with these textures.

Allendale Series

The Allendale series consists of somewhat poorly drained soils on lake terraces. These soils formed in

sandy and clayey lacustrine deposits. Permeability is rapid in the sandy material and very slow in the clayey deposits. Slopes range from 0 to 3 percent.

Typical pedon of Allendale loamy sand, 0 to 3 percent slopes, 675 feet north and 750 feet west of the southeast corner of sec. 7, T. 28 N., R. 8 E.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) loamy sand, light brownish gray (10YR 6/2) dry; weak coarse granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

E—11 to 13 inches; pale brown (10YR 6/3) sand, very pale brown (10YR 7/3) dry; common coarse distinct dark yellowish brown (10YR 4/4) mottles; single grain; loose; few fine roots; common medium cylindrical wormcasts; moderately acid; abrupt broken boundary.

Bs—13 to 20 inches; dark brown (7.5YR 4/4) sand; many medium distinct strong brown (7.5YR 5/8) and common medium prominent grayish brown (10YR 5/2) mottles; weak thick platy structure; friable; few fine roots; few patchy prominent black (N 2/0) manganese or iron-manganese coatings on rock fragments; about 2 percent gravel; moderately acid; abrupt smooth boundary.

E′—20 to 22 inches; yellowish brown (10YR 5/4) sand, very pale brown (10YR 7/4) dry; common medium distinct dark yellowish brown (10YR 4/6) and common medium faint brown (10YR 5/3) mottles; massive; friable; few fine roots; moderately acid; abrupt smooth boundary.

Bt1—22 to 25 inches; reddish brown (5YR 4/4) sandy loam; common medium prominent strong brown (7.5YR 4/6) mottles; massive; friable; few fine roots; many continuous distinct dark brown (7.5YR 4/4) clay bridges between sand grains; slightly acid; abrupt smooth boundary.

2Bt2—25 to 31 inches; reddish brown (5YR 4/3) silty clay; common fine prominent greenish gray (5G 6/1) and strong brown (7.5YR 5/6) mottles; strong medium angular blocky structure; firm; common continuous faint reddish brown (5YR 4/3) clay films on faces of peds; strong effervescence; moderately alkaline; abrupt smooth boundary.

2Bt3—31 to 44 inches; reddish brown (5YR 5/3) silty clay; common fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common discontinuous prominent white (5YR 8/1) carbonate coatings on faces of peds; common discontinuous prominent greenish gray (5GY 6/1) clay films on faces of peds; strong effervescence; moderately alkaline; clear smooth boundary.

2BC—44 to 60 inches; reddish brown (5YR 5/3) silty clay; common fine prominent strong brown (7.5YR 5/6) and common fine prominent greenish gray (5GY 6/1) mottles; weak fine angular blocky structure; firm; common discontinuous prominent white (5YR 8/1) carbonate coatings on faces of peds; about 1 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum is greater than 60 inches. The depth to free carbonates ranges from 20 to 45 inches. The thickness of the sandy material ranges from 20 to 40 inches. The content of gravel ranges from 0 to 2 percent throughout the profile.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Some pedons have an A horizon. This horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 or 1. It is loamy sand or sand.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. It is loamy sand or sand.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It is loamy sand or sand.

The E′ horizon has hue of 10YR, value of 5 or 6, and chroma of 4.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4. It is loamy sand or sandy loam.

The 2Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. It is clay or silty clay.

Aquents

These soils are classified as mixed, frigid Aquents. They are very poorly drained, rapidly permeable to slowly permeable soils on lake plains, outwash plains, and moraines. They formed in sandy to clayey glaciofluvial material. Slopes are 0 to 1 percent.

The surface layer is typically black (10YR 2/1) muck or mucky peat 3 to 16 inches thick.

The upper part of the mineral layers has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. The lower part has hue of 5YR to 5Y, value of 5 or 6, and chroma of 1 to 3.

The mineral layers range from sand to clay.

Arenic Eutroboralfs

These soils are classified as mixed Arenic Eutroboralfs. They are well drained, moderately permeable or moderately slowly permeable soils on moraines and outwash plains. They formed in sandy and loamy glacial till or outwash material. Slopes range from 0 to 18 percent.

These soils typically have a sandy cap, 20 to 40

inches thick, overlying loamy materials. Stratified materials are commonly below the loamy materials. The content of gravel ranges from 0 to 10 percent.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 1. It is sand or loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3. It is sand or loamy sand.

The Bs horizons have hue of 7.5YR or 10YR and value and chroma of 4 to 6. They are sand or loamy sand.

The 2Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. It is sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam.

The 2C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. It is sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam.

The 3C horizons are variable in color and texture and are commonly stratified sands, loamy sands, or loams.

Au Gres Series

The Au Gres series consists of somewhat poorly drained, rapidly permeable soils on wave-built terraces and stream terraces. Clayey substratum phases are very slowly permeable in the clayey material. The Au Gres soils formed in sandy glaciofluvial and lacustrine deposits. Slopes range from 0 to 4 percent.

Typical pedon of Au Gres sand (fig. 17), in an area of Tawas-Au Gres complex, 0 to 4 percent slopes, 2,420 feet south and 2,200 feet east of the northwest corner of sec. 3, T. 28 N., R. 9 E.

A—0 to 3 inches; black (N 2/0) sand, black (N 2/0) dry; many pinkish gray (7.5YR 6/2) uncoated sand grains; weak granular structure; very friable; many fine and common medium roots; strongly acid; abrupt smooth boundary.

E—3 to 10 inches; pinkish gray (7.5YR 6/2) sand, pinkish white (7.5YR 8/2) dry; single grain; loose; many fine and common medium roots; strongly acid; abrupt wavy boundary.

Bs1—10 to 14 inches; dark brown (7.5YR 4/4) sand; many fine distinct reddish yellow (7.5YR 6/8) mottles; weak coarse subangular blocky structure; friable; about 40 percent weakly cemented chunks of dark brown (7.5YR 3/4) ortstein; common fine and few medium roots; moderately acid; clear irregular boundary.

Bs2—14 to 27 inches; dark yellowish brown (10YR 4/6) sand; many fine prominent reddish yellow (7.5YR 6/6) and few fine prominent brown (7.5YR 5/2) mottles; single grain; loose; common fine roots; moderately acid; gradual smooth boundary.

BC—27 to 33 inches; yellowish brown (10YR 5/4) sand; common medium distinct brownish yellow (10YR 6/6) and common fine faint brown (10YR 5/3) mottles; single grain; loose; moderately acid; gradual smooth boundary.

C—33 to 60 inches; pale brown (10YR 6/3) sand; few fine prominent reddish yellow (7.5YR 6/8) and few fine faint brown (10YR 5/3) mottles; single grain; loose; neutral.

The thickness of the solum ranges from 20 to 45 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The A horizon has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 5YR to 10YR, value of 5 to 7, and chroma of 1 or 2. It is sand or loamy sand.

The Bs horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 4 to 6. It is sand or loamy sand. The content of ortstein ranges from 0 to 50 percent.

The C horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 1 to 4.

Silty clay or clay occurs below a depth of 40 inches in the clayey substratum phase. The material has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4.

Ausable Series

The Ausable series consists of very poorly drained soils on flood plains. These soils formed in organic material underlain by sandy alluvial deposits. Permeability is moderate or moderately rapid in the organic part and rapid in the sandy part. Slopes range from 0 to 2 percent.

Typical pedon of Ausable muck, frequently flooded (fig. 18), 10 feet south and 1,660 feet east of the northwest corner of sec. 19, T. 25 N., R. 8 E.

Oa—0 to 8 inches; muck, black (N 2/0) broken face and rubbed; about 10 percent fiber, less than 5 percent rubbed; moderate medium granular structure; friable; primarily herbaceous fibers; many clean sand grains; many fine and medium roots; slightly acid; abrupt smooth boundary.

Cg1—8 to 17 inches; dark grayish brown (2.5Y 4/2) loamy sand; many fine distinct light olive brown (2.5Y 5/6) and common fine distinct dark gray (5Y 4/1) mottles; massive; very friable; bands of black (N 2/0) muck 1/16 to 1/8 inch thick; few fine roots; about 5 percent gravel; neutral; abrupt smooth boundary.

Cg2—17 to 35 inches; olive (5Y 5/3) loamy sand; few fine prominent greenish gray (5GY 5/1) mottles; single grain; loose; about 5 percent gravel; neutral; gradual smooth boundary.
Cg3—35 to 80 inches; olive gray (5Y 5/2) sand; single grain; loose; about 5 percent gravel; slight effervescence; slightly alkaline.

Bands of organic material less than 1 inch thick occur within the control section. The content of gravel ranges from 0 to 10 percent throughout the profile.

The Oa horizon and the organic bands have hue of 5YR to 10YR or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 2, unrubbed.

The Cg horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 3. It is sand or loamy sand.

Bamfield Series

The Bamfield series consists of well drained and moderately well drained, very slowly permeable soils on disintegration moraines and ground moraines. These soils formed in loamy glacial till. Slopes range from 0 to 45 percent.

Typical pedon of Bamfield fine sandy loam, in an area of Bamfield-Lupton complex, 0 to 45 percent slopes, 2,580 feet south and 500 feet east of the northwest corner of sec. 9, T. 25 N., R. 6 E.

Oe—0 to 1 inch; partially decomposed forest litter; abrupt smooth boundary.
A—1 to 6 inches; very dark grayish brown (10YR 3/2) fine sandy loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; many fine roots; about 5 percent gravel; very strongly acid; abrupt wavy boundary.
Bw—6 to 11 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; common fine tubular pores; about 5 percent gravel; strongly acid; clear wavy boundary.
Ex—11 to 18 inches; pinkish gray (7.5YR 6/2) fine sandy loam, pinkish white (7.5YR 8/2) dry; massive; firm; slightly brittle; few fine roots; common fine tubular pores; about 5 percent gravel; strongly acid; abrupt irregular boundary.
B/E—18 to 21 inches; about 80 percent reddish brown (5YR 4/4) clay loam (Bt); moderate medium subangular blocky structure; firm; few faint dark reddish brown (5YR 3/4) clay films on faces of peds; penetrated by tongues of pinkish gray (7.5YR 6/2) fine sandy loam, pinkish white (7.5YR 8/2) dry (E); moderate medium subangular blocky structure; firm; slightly brittle; few fine roots; about 5 percent gravel; moderately acid; clear irregular boundary.
Bt1—21 to 27 inches; reddish brown (5YR 4/4) clay loam; strong fine angular blocky structure; firm; few fine roots; many faint dark reddish brown (5YR 3/4) clay films on faces of peds; about 5 percent gravel; neutral; abrupt irregular boundary.
Bt2—27 to 31 inches; reddish brown (5YR 5/4) clay loam; weak medium subangular blocky structure; firm; common faint reddish brown (5YR 4/3) clay films on vertical faces of peds; about 5 percent gravel; slight effervescence; moderately alkaline; clear wavy boundary.
BC—31 to 60 inches; light reddish brown (5YR 6/4) clay loam; weak medium subangular blocky structure; very firm; many discontinuous prominent pinkish gray (7.5YR 7/2) calcium carbonate coatings on faces of peds; about 5 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum is greater than 60 inches. The depth to free carbonates ranges from 20 to 35 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. Some pedons have an E horizon. This horizon is fine sandy loam or sandy loam.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam or sandy loam.

The Ex horizon and the E part of the B/E horizon have hue of 7.5YR or 10YR, value of 6, and chroma of 2 to 4. They are fine sandy loam or sandy loam. Some pedons have mottles in the E part of the B/E horizon, but mottles of low chroma are not present.

The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4.

The BC horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4.

Battlefield Series

The Battlefield series consists of somewhat poorly drained soils on lake terraces and outwash plains. These soils formed in sandy and gravelly beach and outwash deposits. Permeability is rapid in the upper part and very rapid in the lower part. Slopes range from 0 to 3 percent.

Typical pedon of Battlefield sand, 0 to 3 percent

slopes, 340 feet north and 2,070 feet west of the southeast corner of sec. 10, T. 25 N., R. 9 E.

A—0 to 6 inches; black (N 2/0) sand, gray (10YR 5/1) dry; many pinkish gray (7.5YR 6/2) uncoated sand grains; weak fine granular structure; very friable; many fine roots; about 2 percent gravel; slightly acid; abrupt smooth boundary.

E—6 to 9 inches; pinkish gray (7.5YR 6/2) sand, pinkish white (7.5YR 8/2) dry; single grain; loose; many fine and few medium roots; about 2 percent gravel; moderately acid; abrupt wavy boundary.

Bs1—9 to 10 inches; dark brown (7.5YR 4/4) sand; weak medium subangular blocky structure; friable; common medium and fine roots; about 2 percent gravel; moderately acid; abrupt broken boundary.

Bs2—10 to 12 inches; strong brown (7.5YR 4/6) sand; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; many fine and common medium roots; about 5 percent gravel; moderately acid; gradual smooth boundary.

Bs3—12 to 26 inches; strong brown (7.5YR 5/6) sand; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; many fine roots; about 5 percent gravel; slightly acid; gradual smooth boundary.

BC—26 to 33 inches; brown (10YR 5/3) sand; common fine faint dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; massive; slightly brittle; few fine roots; about 7 percent gravel; neutral; abrupt smooth boundary.

2C—33 to 60 inches; brown (10YR 5/3) gravelly coarse sand; single grain; loose; few fine roots in mat at top of horizon; about 20 percent gravel; violent effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 27 to 35 inches. The content of gravel ranges from 0 to 5 percent in the solum and from 15 to 25 percent in the substratum. The content of cobbles ranges from 0 to 3 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 or 1.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2. It is loamy sand or sand.

The Bs horizon has hue of 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is loamy sand or sand.

The 2C horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. It is gravelly sand or gravelly coarse sand.

Borosaprists

Borosaprists consist of very poorly drained, moderately rapidly permeable to moderately slowly permeable soils on lake plains, outwash plains, and moraines. These soils formed in organic material. Slopes are 0 to 1 percent.

The thickness of the organic materials ranges from 16 to more than 50 inches. The soils are dysic or euic.

The surface texture is typically muck or mucky peat in euic areas and peat in dysic areas. Subsurface layers are dominantly muck. The organic layers have hue of 5YR, 7.5YR, or 10YR, value of 2 to 4, and chroma of 1 to 4. Euic areas have colors that are dominantly black or dark reddish brown. Dysic areas are generally dark brown.

Mineral layers in the substratum have hue of 5YR to 5Y, value of 5 or 6, and chroma of 1 to 3. Textures range from sand to sandy clay loam.

Chinwhisker Series

The Chinwhisker series consists of moderately well drained, rapidly permeable soils on stream terraces, outwash plains, and lake terraces. These soils formed in sandy glaciofluvial and lacustrine deposits. Slopes range from 0 to 4 percent.

Typical pedon of Chinwhisker sand, 0 to 4 percent slopes, 160 feet north and 490 feet east of the southwest corner of sec. 6, T. 28 N., R. 6 E.

A—0 to 2 inches; black (N 2/0) sand, gray (N 5/0) dry; weak fine granular structure; friable; many fine and common medium roots; strongly acid; abrupt smooth boundary.

E—2 to 3 inches; dark grayish brown (10YR 4/2) sand, light gray (10YR 7/2) dry; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

Bs1—3 to 8 inches; dark brown (7.5YR 3/4) sand; weak medium subangular blocky structure; friable; common fine and medium roots; about 1 percent gravel; strongly acid; clear smooth boundary.

Bs2—8 to 21 inches; yellowish brown (10YR 5/6) sand; weak fine subangular blocky structure; friable; few fine roots; about 1 percent gravel; moderately acid; abrupt wavy boundary.

E′1—21 to 25 inches; light yellowish brown (10YR 6/4) sand, yellow (10YR 7/6) dry; single grain; loose; few fine roots; moderately acid; abrupt broken boundary.

E′2—25 to 36 inches; light yellowish brown (10YR

6/4) sand, yellow (10YR 7/6) dry; common fine distinct yellowish brown (10YR 5/6) mottles; single grain; loose; few fine roots; moderately acid; abrupt smooth boundary.

E and Bt—36 to 80 inches; pale brown (10YR 6/3) sand, light gray (10YR 7/2) dry (E); dark brown (7.5YR 4/4) loamy sand (Bt) occurring as bands 1/16 to 3/4 inch thick with a total accumulation of 4 inches; common fine prominent strong brown (7.5YR 5/8) mottles; single grain; loose; about 1 percent gravel; slightly acid.

The thickness of the solum ranges from 40 to more than 80 inches. The depth to mottles ranges from 20 to 40 inches. The content of gravel ranges from 0 to 15 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 2.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. It is sand or loamy sand

The E′ horizon and the E part of the E and Bt horizon have hue of 10YR, value of 5 to 7, and chroma of 3 or 4.

The Bt part of the E and Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It occurs as lamellae 1/16 inch to 2 inches in thickness with a total accumulation of 5 inches or less to a depth of 80 inches.

Colonville Series

The Colonville series consists of somewhat poorly drained, moderately rapidly permeable soils on flood plains. These soils formed in stratified loamy and sandy alluvium. Slopes range from 0 to 3 percent.

The Colonville soils in Alcona County are taxadjuncts because they do not have mottles in the lower part of the A horizon. This difference does not significantly affect use and management.

Typical pedon of Colonville very fine sandy loam, occasionally flooded, 1,975 feet north and 190 feet west of the southeast corner of sec. 15, T. 25 N., R. 8 E.

A—0 to 11 inches; very dark gray (10YR 3/1) very fine sandy loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; many fine and medium roots; slight effervescence; moderately alkaline; clear smooth boundary.

C—11 to 22 inches; yellowish brown (10YR 5/4) and very dark grayish brown (10YR 3/2), stratified loamy fine sand and fine sandy loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium platy fragments; very friable; common medium roots; slight effervescence; moderately alkaline; clear wavy boundary.

Cg1—22 to 38 inches; dark gray (10YR 4/1) and brown (10YR 5/3), stratified fine sandy loam and loamy fine sand; many medium prominent strong brown (7.5YR 5/8) mottles; weak thick platy fragments; very friable; many fine roots; slight effervescence; slightly alkaline; abrupt wavy boundary.

Cg2—38 to 52 inches; very dark grayish brown (10YR 3/2) very fine sand; many medium prominent dark red (2.5YR 3/6) mottles; weak thick platy fragments; friable; many medium roots; many patchy prominent very dark gray (N 3/0) organic coatings throughout; neutral; abrupt wavy boundary.

2Cg3—52 to 60 inches; gray (5Y 6/1) silt loam; many medium prominent yellowish red (5YR 4/6) mottles; massive; friable; neutral.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The C horizons have hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 1 to 6. They are stratified fine sandy loam, sandy loam, and loamy fine sand. Thin layers of silt loam are in most pedons.

Croswell Series

The Croswell series consists of moderately well drained, rapidly permeable soils on stream terraces and lake terraces. Loamy substratum phases have moderately slow permeability in the loamy material. The Croswell soils formed in sandy glaciofluvial and lacustrine deposits. Slopes range from 0 to 6 percent.

Typical pedon of Croswell sand, 0 to 6 percent slopes, 1,330 feet south and 150 feet east of the northwest corner of sec. 28, T. 25 N., R. 9 E.

Oe—0 to 1 inch; black (N 2/0), well decomposed forest litter, black (N 2/0) dry; many fine and medium roots; extremely acid; abrupt smooth boundary.

E—1 to 4 inches; dark grayish brown (10YR 4/2) sand, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; very friable; many fine and medium roots; about 1 percent gravel; very strongly acid; abrupt wavy boundary.

Bs1—4 to 10 inches; dark brown (7.5YR 4/4) sand; weak medium subangular blocky structure;

friable; many fine and common medium roots; about 8 percent gravel; very strongly acid; clear wavy boundary.

Bs2—10 to 20 inches; strong brown (7.5YR 5/6) sand; weak coarse subangular blocky structure; very friable; common fine roots; about 3 percent gravel; moderately acid; clear wavy boundary.

BC—20 to 29 inches; brownish yellow (10YR 6/6) sand; many fine faint yellowish brown (10YR 5/6) mottles; single grain; loose; few fine roots; about 3 percent gravel; moderately acid; clear smooth boundary.

C1—29 to 47 inches; yellowish brown (10YR 5/4) sand; many fine and medium prominent strong brown (7.5YR 5/8) mottles; single grain; loose; few medium roots; about 3 percent gravel; slightly acid; abrupt smooth boundary.

C2—47 to 80 inches; light yellowish brown (10YR 6/4) sand; few fine distinct yellowish brown (10YR 5/6) mottles; single grain; loose; about 7 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 35 inches. The content of gravel ranges from 0 to 10 percent throughout the profile. The depth to mottles ranges from 20 to 40 inches.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2. Some pedons have an A horizon.

The Bs horizon has hue of 7.5YR, value of 3 to 5, and chroma of 3 to 6. It is sand or loamy sand.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 4.

The loamy substratum phase has stratified sandy loam to silty clay loam below a depth of 40 inches. The material has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4.

Dorval Series

The Dorval series consists of very poorly drained soils on lake plains. These soils formed in decomposed organic material and in the underlying clayey lacustrine deposits. Permeability is moderately rapid or moderate in the organic material and very slow in the clayey deposits. Slopes range from 0 to 2 percent.

Typical pedon of Dorval muck, 1,500 feet south and 50 feet west of the northeast corner of sec. 19, T. 25 N., R. 9 E.

Oa1—0 to 6 inches; muck, black (N 2/0) broken face and rubbed; about 20 percent fiber, 5 percent rubbed; weak fine granular structure; friable; many fine roots; about 5 percent woody fragments; neutral; abrupt smooth boundary.

Oa2—6 to 21 inches; muck, black (N 2/0) broken face and dark reddish brown (5YR 2.5/2) rubbed; about 30 percent fiber, 5 percent rubbed; moderate very thick platy structure; friable; about 15 percent woody fragments; neutral; abrupt smooth boundary.

Oa3—21 to 27 inches; muck, black (N 2/0) broken face and black (5YR 2.5/1) rubbed; about 15 percent fiber, less than 5 percent rubbed; weak thick platy structure; friable; about 5 percent woody fragments; slightly acid; abrupt smooth boundary.

Cg—27 to 60 inches; brown (7.5YR 5/2) silty clay; many fine prominent greenish gray (5G 6/1) and common medium prominent olive brown (2.5Y 4/4) mottles; massive; sticky; about 1 percent gravel; strong effervescence; moderately alkaline.

The depth to the clayey mineral layer ranges from 16 to 45 inches.

The organic material has hue of 5YR or is neutral in hue. It has value of 2, 2.5, or 3 and chroma of 0 to 2.

The Cg horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 1 or 2. It is silty clay or clay.

East Lake Series

The East Lake series consists of somewhat excessively drained soils on lake terraces and outwash plains. These soils formed in sandy and gravelly beach and outwash deposits. Permeability is rapid in the upper part and very rapid in the lower part. Slopes range from 0 to 35 percent.

Typical pedon of East Lake sand, 0 to 6 percent slopes, 2,640 feet north and 525 feet east of the southwest corner of sec. 32, T. 25 N., R. 9 E.

A—0 to 4 inches; black (N 2/0) sand, gray (N 5/0) dry; weak medium granular structure; friable; many fine roots; about 3 percent gravel; slightly acid; abrupt smooth boundary.

E—4 to 7 inches; grayish brown (10YR 5/2) sand, light gray (10YR 7/2) dry; weak medium granular structure; very friable; few medium roots; about 3 percent gravel; slightly acid; clear smooth boundary.

Bs1—7 to 12 inches; dark brown (7.5YR 4/4) loamy sand; weak medium subangular blocky structure; very friable; many fine and common medium roots; about 10 percent gravel and 1 percent cobbles; slightly acid; clear wavy boundary.

Bs2—12 to 20 inches; strong brown (7.5YR 4/6) loamy sand; weak medium subangular blocky structure; very friable; many fine and common medium roots; about 10 percent gravel and 1 percent cobbles; slightly acid; clear wavy boundary.
Bs3—20 to 30 inches; strong brown (7.5YR 5/6) sand; weak medium subangular blocky structure; very friable; common fine and few medium roots; about 12 percent gravel and 1 percent cobbles; neutral; abrupt smooth boundary.
2C—30 to 60 inches; brown (10YR 5/3), stratified sand and very gravelly loamy coarse sand; loose; common fine roots in mat at top of horizon; about 25 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 25 to 40 inches. The content of gravel ranges from 0 to 15 percent in the solum and from 15 to 35 percent in the substratum. The content of cobbles ranges from 0 to 10 percent in the A and E horizons and from 0 to 2 percent throughout the rest of the pedon.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is sand or loamy sand.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It is sand or loamy sand.

The 2C horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is stratified sand to very gravelly loamy coarse sand.

Eastport Series

The Eastport series consists of excessively drained, rapidly permeable soils on beach ridges. These soils formed in sandy beach deposits. Slopes range from 0 to 6 percent.

Typical pedon of Eastport sand, 0 to 6 percent slopes, 1,600 feet north and 550 feet west of the southeast corner of sec. 4, T. 28 N., R. 9 E.

A—0 to 1 inch; black (10YR 2/1) sand, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; common medium and fine roots; moderately acid; abrupt smooth boundary.
E—1 to 8 inches; grayish brown (10YR 5/2) sand, light gray (10YR 7/2) dry; weak medium granular structure; very friable; common medium and fine roots; strongly acid; clear smooth boundary.
Bs1—8 to 14 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; very friable; common medium and fine roots; few chunks of dark brown (7.5YR 3/4), weakly cemented ortstein; moderately acid; clear irregular boundary.
Bs2—14 to 23 inches; yellowish brown (10YR 5/6) sand; moderate medium subangular blocky structure; friable; few medium and fine roots; moderately acid; gradual wavy boundary.
BC—23 to 29 inches; very pale brown (10YR 7/4) sand; weak medium subangular blocky structure; friable; slightly acid; gradual wavy boundary.
C—29 to 80 inches; very pale brown (10YR 7/3) sand; single grain; loose; neutral.

The thickness of the solum ranges from 25 to 35 inches. The content of gravel ranges from 0 to 5 percent throughout the pedon.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2.

The Bs horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 5 or 6.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4.

Ensley Series

The Ensley series consists of poorly drained, moderately permeable soils on till plains and wave-cut platforms. These soils formed in loamy glacial till. Slopes range from 0 to 2 percent.

Typical pedon of Ensley mucky sandy loam, 2,360 feet north and 500 feet west of the southeast corner of sec. 13, T. 28 N., R. 7 E.

A—0 to 8 inches; black (N 2/0) mucky sandy loam, dark gray (N 4/0) dry; weak coarse granular structure; friable; many fine and common medium roots; about 2 percent gravel and 1 percent cobbles; neutral; abrupt smooth boundary.
Bw1—8 to 15 inches; grayish brown (10YR 5/2) sandy loam; many medium prominent yellowish brown (10YR 5/8) and few fine faint gray (10YR 5/1) mottles; weak very thick platy structure parting to weak medium subangular blocky; friable; many fine and common medium roots; many continuous distinct very dark grayish brown (10YR 3/2) organic coatings throughout; about 7 percent gravel and 1 percent cobbles; neutral; abrupt smooth boundary.
Bw2—15 to 29 inches; light reddish brown (5YR 6/3) sandy loam; few fine prominent strong brown (7.5YR 5/6) and many medium prominent light

greenish gray (5GY 7/1) mottles; weak very thick platy structure parting to weak medium subangular blocky; friable; common fine and medium roots; about 7 percent gravel and 1 percent cobbles; moderately alkaline; gradual wavy boundary.

Cg1—29 to 42 inches; pinkish gray (7.5YR 6/2) sandy loam; many coarse prominent yellowish brown (10YR 5/6) mottles; massive; friable; common medium and fine roots; about 5 percent gravel and 1 percent cobbles; slight effervescence; moderately alkaline; gradual wavy boundary.

Cg2—42 to 60 inches; gray (10YR 5/1) sandy loam; massive; friable; few fine roots; about 5 percent gravel and 3 percent cobbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 30 inches. The content of rock fragments ranges from 1 to 10 percent in the solum and from 5 to 15 percent in the substratum.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 or 1.

The Bw horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 2 or 3.

The Cg horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2.

Entic Haplorthods

These soils are classified as sandy, mixed, frigid Entic Haplorthods. They are excessively drained, rapidly permeable soils on outwash plains, lake plains, and moraines. They formed in sandy glacial drift. Slopes range from 0 to 45 percent.

Reference pedon of Entic Haplorthods, sandy, in an area of Entic Haplorthods, sandy-Alfic Haplorthods, sandy, complex, rolling, 500 feet west and 10 feet south of the northeast corner of sec. 22, T. 26 N., R. 5 E.

Oe—0 to 1 inch; partially decomposed hardwood and coniferous leaf litter.

A—1 to 3 inches; black (10YR 2/1) sand; weak fine granular structure; very friable; many very fine and fine roots; strongly acid; clear wavy boundary.

E—3 to 7 inches; brown (7.5YR 5/3) sand, pinkish gray (7.5YR 6/2) dry; weak fine granular structure; very friable; many very fine, common fine, and few medium roots; strongly acid; clear wavy boundary.

Bs1—7 to 11 inches; dark brown (7.5YR 4/4) sand; weak medium granular structure; very friable; many fine and few medium and coarse roots; strongly acid; clear smooth boundary.

Bs2—11 to 23 inches; strong brown (7.5YR 4/6) sand; weak medium granular structure; very friable; common fine and medium and few coarse roots; strongly acid; clear smooth boundary.

BC—23 to 30 inches; brownish yellow (10YR 6/6) sand; weak fine subangular blocky structure; strongly acid; gradual smooth boundary.

C1—30 to 66 inches; very pale brown (10YR 7/4) sand; single grain; loose; few medium roots; moderately acid; gradual wavy boundary.

C2—66 to 180 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; moderately acid.

The thickness of the solum ranges from 20 to 50 inches. The content of gravel ranges from 0 to 10 percent throughout the solum.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is dominantly sand, but the range includes fine sand and loamy sand.

The E horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 2 to 4. It has textures similar to those of the A horizon.

The Bs horizon has hue of 7.5YR or 5YR, value of 3 to 5, and chroma of 4 to 6. It is sand, loamy sand, or fine sand.

The BC horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 6.

The C horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 4 to 6. It is sand or coarse sand. Loamy sand or sandy loam bands are below a depth of 40 inches in the banded substratum phase. Sandy clay loam or clay loam bands are below a depth of 40 inches in the fine-loamy banded substratum phase. Sandy clay loam or clay loam is below a depth of 40 inches in the loamy substratum phase. The gravelly analogs of all of these textures are in some pedons. Mottles are below a depth of 5 feet in the very deep water table phase.

Fluvaquents

These soils are classified as mixed, frigid Fluvaquents. They are poorly drained, rapidly permeable soils on flood plains of lake plains and outwash plains. They formed in sandy alluvial materials. Slopes are 0 to 1 percent.

An organic layer, 2 to 6 inches thick, is typically on the surface. It is typically muck or mucky peat. It has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is sand, loamy sand, or sandy loam.

The C or Cg horizon has hue of 10YR, 2.5YR, or 5Y, value of 4 to 6, and chroma of 2 to 4. It is sand or loamy sand and is commonly stratified with finer textured material.

Glennie Series

The Glennie series consists of well drained and moderately well drained soils on ground moraines. These soils formed in loamy glacial till. Permeability is moderately rapid in the upper part and very slow in the lower part. Slopes range from 0 to 35 percent.

Typical pedon of Glennie loamy sand, moderately wet, 0 to 6 percent slopes, 1,885 feet south and 1,850 feet west of the northeast corner of sec. 13, T. 25 N., R. 6 E.

Oe—0 to 2 inches; partially decomposed forest litter; abrupt smooth boundary.

A—2 to 3 inches; black (10YR 2/1) loamy sand, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; many fine roots; about 5 percent gravel; neutral; abrupt smooth boundary.

E—3 to 7 inches; grayish brown (10YR 5/2) loamy sand, light gray (10YR 7/2) dry; weak medium subangular blocky structure; friable; common fine and medium roots; about 5 percent gravel; slightly acid; abrupt broken boundary.

Bt1—7 to 11 inches; dark brown (7.5YR 3/4) sandy loam; moderate medium subangular blocky structure; friable; many fine roots; clay coatings on sand grains and clay bridges between sand grains; about 5 percent gravel and 1 percent cobbles; neutral; abrupt broken boundary.

Bt2—11 to 20 inches; strong brown (7.5YR 4/6) loamy sand; weak medium subangular blocky structure; friable; common fine roots; clay coatings on sand grains and clay bridges between sand grains; about 5 percent gravel; neutral; clear wavy boundary.

(E/B)x—20 to 40 inches; about 60 percent brown (10YR 5/3) loamy sand, very pale brown (10YR 7/3) dry (E); surrounding peds of reddish brown (5YR 5/3) loam (Bt); massive; firm; brittle; few fine roots in cracks; common fine vesicular pores; about 5 percent gravel; neutral; clear irregular boundary.

(B/E)x—40 to 46 inches; about 70 percent reddish brown (5YR 4/4) sandy clay loam (Bt); few faint dark reddish brown (5YR 3/4) clay films; surrounded by brown (10YR 5/3) sandy loam, very pale brown (10YR 7/3) dry (E); few fine prominent strong brown (7.5YR 5/6) mottles; weak thick platy structure; very firm; brittle; common fine roots in cracks; common fine vesicular pores; about 5 percent gravel; slightly acid; clear irregular boundary.

B´t1—46 to 56 inches; dark reddish brown (5YR 3/4) clay; few fine prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; very firm; common fine roots between peds; many faint dark reddish brown (5YR 3/4) clay films 1 to 4 millimeters thick on vertical faces of peds; about 5 percent gravel; neutral; clear irregular boundary.

B´t2—56 to 85 inches; reddish brown (5YR 4/4) sandy clay loam; weak medium angular blocky structure; very firm; common faint dark reddish brown (5YR 3/4) clay films on faces of peds; about 8 percent gravel; slight effervescence; slightly alkaline; clear wavy boundary.

Cd—85 to 99 inches; reddish brown (5YR 5/3) sandy clay loam; massive; firm; about 8 percent gravel; strong effervescence; slightly alkaline.

The thickness of the solum is greater than 60 inches. Depth to the fragipan is about 20 to 40 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 7 percent. Some pedons do not have mottles in the profile.

The A horizon has hue of 10YR or 7.5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. Pedons in cultivated areas have an Ap horizon 6 to 9 inches thick. This horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 5 or 6 and chroma of 0 to 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 8. It is sandy loam or loamy sand.

The E part of the (E/B)x and (B/E)x horizons has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 2 to 4. It is loamy sand or sandy loam.

The Bt part of the (E/B)x and (B/E)x horizons has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. It is loam or sandy clay loam.

The B´t horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. It is clay loam, sandy clay loam, or clay.

The Cd horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. It is sandy clay loam, clay loam, or loam.

Glossic Eutroboralfs

These soils are classified as mixed Glossic Eutroboralfs. They are well drained, moderately

permeable soils on moraines. They formed in loamy and sandy glacial till. Slopes range from 0 to 30 percent.

Typically, the A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. It is dominantly sandy loam, but the range includes loamy sand.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is sandy loam or loamy sand.

The E part of the B/E horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 or 3. It is sandy loam or loamy sand.

The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4. They are sandy clay loam, sandy loam, loam, or clay loam.

The C or 2C horizon has hue of 5YR, 7.5YR, or 10YR, value of 5 or 6, and chroma of 4 to 6. It is loamy sand, sandy loam, loam, sandy clay loam, or clay loam and is commonly stratified.

Graycalm Series

The Graycalm series consists of somewhat excessively drained, rapidly permeable soils on outwash plains and stream terraces. These soils formed in sandy outwash deposits. Slopes range from 0 to 35 percent.

Typical pedon of Graycalm sand, 0 to 6 percent slopes, 2,375 feet north and 150 feet west of the southeast corner of sec. 16, T. 25 N., R. 5 E.

A—0 to 1 inch; black (N 2/0) sand, very dark gray (N 3/0) dry; weak coarse granular structure; friable; many fine roots; about 3 percent gravel; very strongly acid; abrupt smooth boundary.

Bw1—1 to 4 inches; strong brown (7.5YR 4/6) sand; weak fine subangular blocky structure; friable; many fine roots; about 3 percent gravel; very strongly acid; clear wavy boundary.

Bw2—4 to 14 inches; strong brown (7.5YR 5/6) loamy sand; weak fine subangular blocky structure; friable; many fine and common medium roots; about 3 percent gravel; very strongly acid; gradual smooth boundary.

Bw3—14 to 46 inches; strong brown (7.5YR 5/6) loamy sand; weak medium subangular blocky structure; friable; common fine roots; about 3 percent gravel; strongly acid; diffuse smooth boundary.

E and Bt—46 to 80 inches; light yellowish brown (10YR 6/4) sand, very pale brown (10YR 7/4) dry (E); single grain; loose; lamellae of brown (7.5YR 5/4) loamy sand (Bt); clay coatings on sand grains in lamellae; lamellae are 1/4 to 1/2 inch in thickness with a total accumulation of 3 inches; slightly acid.

The thickness of the solum is greater than 60 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1.

The Bw horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is sand or loamy sand.

The E part of the E and Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

The Bt part of the E and Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4. It consists of lamellae 1/4 inch to 2 inches thick. The total accumulation within a depth of 80 inches is less than 6 inches.

Grayling Series

The Grayling series consists of excessively drained, rapidly permeable soils on outwash plains and deltas. These soils formed in sandy glaciofluvial deposits. Slopes range from 0 to 35 percent.

Typical pedon of Grayling sand, 0 to 6 percent slopes, 1,100 feet south and 2,000 feet west of the northeast corner of sec. 10, T. 28 N., R. 5 E.

A—0 to 2 inches; black (10YR 2/1) sand, dark gray (10YR 4/1) dry; weak fine granular structure; friable; many fine roots; about 1 percent gravel; very strongly acid; abrupt smooth boundary.

Bw1—2 to 4 inches; dark yellowish brown (10YR 4/4) sand; very weak medium subangular blocky structure; friable; many fine and common medium roots; about 1 percent gravel; very strongly acid; clear wavy boundary.

Bw2—4 to 19 inches; yellowish brown (10YR 5/4) sand; very weak medium subangular blocky structure; very friable; common fine roots; about 1 percent gravel; strongly acid; clear wavy boundary.

BC—19 to 29 inches; yellowish brown (10YR 5/4) sand; single grain; loose; few fine roots; about 1 percent gravel; strongly acid; clear wavy boundary.

C1—29 to 63 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; about 3 percent gravel; moderately acid; abrupt wavy boundary.

C2—63 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; about 3 percent gravel; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 35 inches. Some areas do not have free carbonates

within a depth of 180 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 or 1.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is sand or stratified sand and coarse sand.

Thin lamellae or bands of loamy sand or loamy fine sand occur below a depth of 60 inches in the banded substratum phase.

Haplaquods

These soils are classified as mixed, frigid Haplaquods. They are poorly drained, rapidly permeable soils on lake plains and outwash plains. They formed in sandy lacustrine or outwash material. Slopes range from 0 to 2 percent.

An organic surface layer, 1 to 4 inches thick, is typically on the surface. It is dominantly muck or mucky peat. It has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is sand or loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2. It is sand or loamy sand.

The B horizons have hue of 5YR to 10YR, value of 3 or 4, and chroma of 3 to 6. They are sand or loamy sand.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 4. It is sand or loamy sand.

Histosols

Histosols consist of very poorly drained, moderately rapidly permeable to moderately slowly permeable soils on lake plains, outwash plains, and moraines. These soils formed in organic material. Slopes are 0 to 1 percent.

The thickness of the organic material ranges from 16 to more than 50 inches. Surface horizons are dominantly muck or mucky peat, but the range includes peat. Subsurface horizons are dominantly muck, but the range includes mucky peat. The organic material typically has hue of 5YR, 7.5YR, or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. The mineral horizons in the substratum range from sand to clay. They have hue of 5YR to 5Y, value of 5 or 6, and chroma of 1 to 3.

Hoist Series

The Hoist series consists of moderately well drained and well drained soils on till plains and drumlins. These soils formed in loamy glacial till. Permeability is moderately rapid in the upper part of the profile, moderately slow in the next part, and very slow in the lower part. Slopes range from 0 to 18 percent.

Typical pedon of Hoist sandy loam, moderately wet, 6 to 12 percent slopes, 2,300 feet south and 360 feet west of the northeast corner of sec. 7, T. 27 N., R. 9 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) sandy loam, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; friable; many fine roots; about 5 percent gravel and 2 percent cobbles; slightly acid; abrupt smooth boundary.

Bw—9 to 14 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; friable; many fine roots; about 5 percent gravel and 2 percent cobbles; neutral; clear wavy boundary.

E/B—14 to 21 inches; about 60 percent brown (7.5YR 5/4) sandy loam, pinkish gray (7/5YR 7/2) dry (E); occurring as tongues extending into and surrounding peds of reddish brown (5YR 4/4) sandy loam (Bt); moderate medium subangular blocky structure; friable; many fine roots; about 5 percent gravel and 2 percent cobbles; neutral; clear wavy boundary.

Bt1—21 to 27 inches; reddish brown (5YR 4/4) loam; strong medium subangular blocky structure; firm; few fine roots between peds; common faint dark reddish brown (5YR 3/4) clay films on faces of peds; about 2 percent gravel and 2 percent cobbles; slightly alkaline; abrupt wavy boundary.

Bt2—27 to 49 inches; light reddish brown (5YR 6/3) sandy loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak thick platy structure; firm; few fine roots between peds; common very fine vesicular pores; few distinct reddish brown (5YR 5/4) clay films on vertical faces of peds; about 7 percent gravel; strong effervescence; moderately alkaline; gradual wavy boundary.

Cd—49 to 80 inches; light reddish brown (5YR 6/3) sandy loam; massive; weakly expressed plates inherited from the parent material; very firm; about 7 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to dense

glacial till range from 40 to 50 inches. The content of gravel ranges from 2 to 10 percent in the solum and from 5 to 10 percent in the substratum. The content of cobbles ranges from 0 to 5 percent throughout the profile. Some pedons do not have high-chroma mottles in the profile.

The Ap horizon has hue of 7.5YR or 10YR, value of 3, and chroma of 1 or 2. Some pedons have an A horizon. This horizon has hue of 5YR to 10YR or is neutral in hue. It has value of 3 and chroma of 0 to 2.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6.

The E part of the E/B horizon has hue of 10YR, 7.5YR, or 5YR, value of 5 or 6, and chroma of 2 to 4. It is loamy sand or sandy loam.

The Bt part of the E/B horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. They are sandy loam or loam.

The Cd horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4.

Kawkawlin Series

The Kawkawlin series consists of somewhat poorly drained, slowly permeable soils on till plains. These soils formed in loamy glacial till. Slopes range from 1 to 4 percent.

Typical pedon of Kawkawlin loam, 1 to 4 percent slopes, 340 feet south and 675 feet east of the northwest corner of sec. 15, T. 28 N., R. 8 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; moderate medium subangular blocky structure; friable; about 5 percent gravel; neutral; abrupt smooth boundary.

B/E—10 to 13 inches; about 80 percent dark brown (7.5YR 4/4) clay loam (Bt); surrounded by brown (10YR 5/3) loam, very pale brown (10YR 7/3) dry (E); common fine distinct strong brown (7.5YR 5/6) and few fine prominent grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few patchy faint dark brown (7.5YR 4/4) clay flows; about 5 percent gravel; common very dark grayish brown (10YR 3/2) wormcasts; common fine roots; neutral; abrupt broken boundary.

Bt—13 to 16 inches; strong brown (7.5YR 4/6) clay loam; many fine faint strong brown (7.5YR 5/6) and common fine prominent grayish brown (10YR 5/2) mottles; strong fine angular blocky structure; firm; many fine roots between peds; many continuous distinct brown (7.5YR 5/2) clay films on faces of peds; many continuous distinct dark brown (7.5YR 4/4) clay films on faces of peds; many medium cylindrical wormcasts; about 5 percent gravel; neutral; clear smooth boundary.

BC—16 to 30 inches; strong brown (7.5YR 4/6) clay loam; many fine faint strong brown (7.5YR 5/6) and common fine prominent grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; friable; few fine roots between peds; about 5 percent gravel; slightly alkaline; abrupt smooth boundary.

C—30 to 60 inches; reddish brown (5YR 5/3) clay loam; common coarse prominent strong brown (7.5YR 5/6) and common coarse prominent light greenish gray (5GY 7/1) mottles; weak medium prismatic structure; very firm; about 5 percent gravel and 1 percent cobbles; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 20 to 35 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The Ap horizon has hue of 10YR, value of 3, and chroma of 2.

The E part of the B/E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3.

The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4, and chroma of 4 to 6. They are clay loam or clay.

The C horizon has hue of 5YR, value of 5 or 6, and chroma of 3. It is clay loam or loam.

Killmaster Series

The Killmaster series consists of somewhat poorly drained soils on ground moraines and drumlins. These soils formed in loamy glacial till. Permeability is moderate in the solum and very slow in the substratum. Slopes range from 0 to 3 percent.

Typical pedon of Killmaster sandy loam, 0 to 3 percent slopes, 2,220 feet north and 200 feet east of the southwest corner of sec. 9, T. 27 N., R. 9 E.

Ap—0 to 8 inches; dark brown (10YR 3/3) sandy loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure; friable; common fine and medium roots; about 5 percent gravel and 2 percent cobbles; strongly acid; abrupt smooth boundary.

E—8 to 13 inches; brown (7.5YR 5/2) sandy loam, pinkish gray (7.5YR 7/2) dry; few medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; about 5 percent gravel and 2 percent cobbles; moderately acid; clear wavy boundary.

E/B—13 to 20 inches; about 60 percent brown (7.5YR

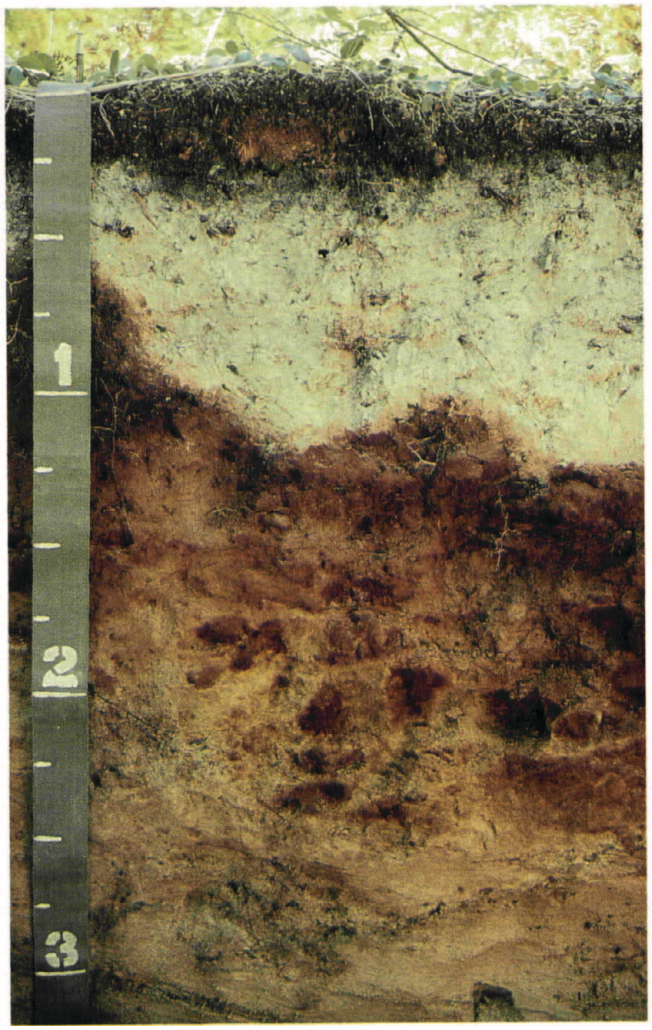

Figure 17.—Typical profile of Au Gres sand. The B horizon is mottled throughout. Depth is marked in feet.

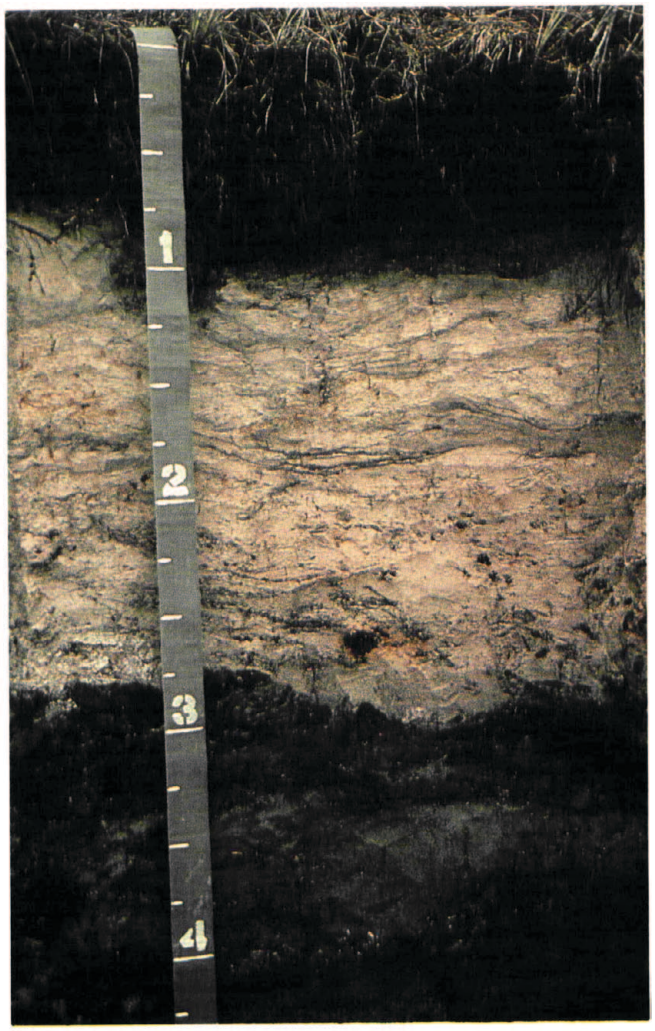

Figure 18.—Typical profile of Ausable muck. This soil formed in alternate layers of sand and muck on flood plains. Depth is marked in feet.

Figure 19.—Typical profile of Klacking loamy sand. The darker material below a depth of 2 feet is Bt material. The lighter colored material is E′ material. Depth is marked in feet.

Figure 20.—Typical profile of Leafriver muck. This soil has a histic epipedon. Depth is marked in feet.

Figure 21.—Typical profile of Mancelona loamy sand. The C horizon is at a depth of about 24 inches. Depth is marked in feet.

Figure 22.—Typical profile of Manistee loamy sand. The very slowly permeable clay causes a seasonally perched water table. Depth is marked in feet.

Figure 23.—Typical profile of McGinn loamy sand. The sandy cap is about 15 inches thick. Depth is marked in feet.

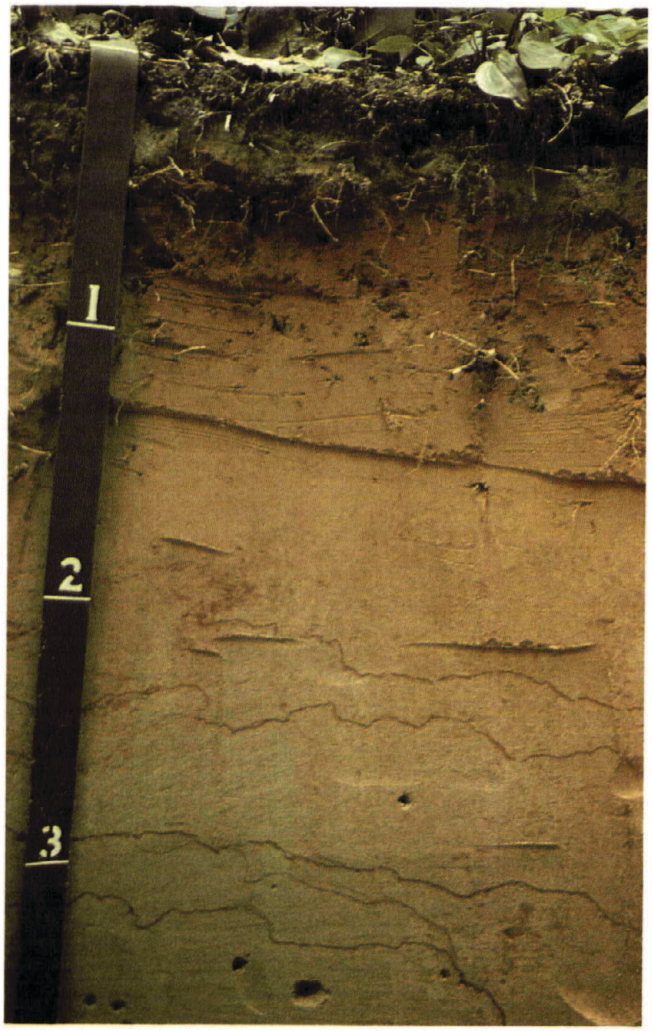

Figure 24.—Typical profile of Zimmerman loamy fine sand. Thin lamellae are below a depth of 24 inches. Depth is marked in feet.

5/2) loamy sand, pinkish gray (7.5YR 7/2) dry (E); surrounding peds of dark brown (7.5YR 4/4) sandy loam (Bt); few medium distinct strong brown (7.5YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; common distinct reddish brown (5YR 5/4) clay films on faces of peds; about 5 percent gravel and 2 percent cobbles; slightly acid; clear irregular boundary.

B/E—20 to 23 inches; about 70 percent dark brown (7.5YR 4/4) sandy loam (Bt); penetrated by tongues of brown (7.5YR 5/2) loamy sand, pinkish gray (7/5YR 7/2) dry (E); common medium distinct strong brown (7.5YR 5/6) and common fine prominent grayish brown (10YR 5/2) mottles; strong medium subangular blocky structure; firm; few fine and medium roots; common distinct dark reddish brown (5YR 3/3) clay films on faces of peds; about 5 percent gravel and 2 percent cobbles; slightly acid; clear irregular boundary.

Bt—23 to 32 inches; dark brown (7.5YR 4/4) sandy loam; few medium distinct strong brown (7.5YR 4/6) and few fine prominent brown (7.5YR 5/2) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; common faint dark brown (7.5YR 4/4) clay films on faces of peds; about 5 percent gravel and 2 percent cobbles; slightly acid; clear wavy boundary.

Cd—32 to 80 inches; brown (7.5YR 5/4) sandy loam; few medium distinct reddish yellow (7.5YR 6/6) mottles along fracture planes; massive with weakly expressed platiness inherited from the parent material; very firm; few patchy distinct pinkish gray (7.5YR 7/2) carbonate coatings along fracture planes; about 10 percent gravel and 5 percent cobbles; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to dense glacial till range from 20 to 40 inches. The depth to free carbonates also ranges from 20 to 40 inches. The content of gravel ranges from 2 to 10 percent in the solum and from 5 to 10 percent in the substratum. The content of cobbles ranges from 0 to 5 percent throughout the profile.

The Ap horizon has hue of 10YR, value of 3, and chroma of 2 or 3. Some pedons have an A horizon. This horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 or 1.

The E horizon and the E part of the E/B and B/E horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. They are sandy loam or loamy sand.

The Bt part of the E/B and B/E horizons and the Bt horizon have hue of 7.5YR, value of 4 or 5, and chroma of 4 to 6. They are sandy loam or loam.

The Cd horizon has hue of 7.5YR, 10YR, or 5YR, value of 5 or 6, and chroma of 3 or 4. This horizon limits the penetration of roots, except in fracture planes and cracks.

Kinross Series

The Kinross series consists of very poorly drained, rapidly permeable soils on lake plains and outwash plains. These soils formed in sandy lacustrine and outwash deposits. Slopes are 0 to 1 percent.

Typical pedon of Kinross muck, 580 feet south and 410 feet east of the northwest corner of sec. 31, T. 25 N., R. 9 E.

Oa—0 to 3 inches; black (N 2/0) muck; weak thick platy structure; friable; many fine and common medium roots; strongly acid; abrupt wavy boundary.

Eg—3 to 8 inches; pinkish gray (7.5YR 6/2) fine sand, pinkish white (7.5YR 8/2) dry; few fine prominent dark gray (10YR 4/1) mottles; single grain; nonsticky; many fine and few medium roots; strongly acid; clear wavy boundary.

Bhs—8 to 14 inches; dark reddish brown (5YR 3/2) fine sand; common fine distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; nonsticky; about 40 percent chunks of dark reddish brown (5YR 3/2), strongly cemented ortstein; few fine roots; very strongly acid; clear wavy boundary.

Bs1—14 to 22 inches; dark brown (7.5YR 3/4) fine sand; few medium distinct dark brown (7.5YR 3/2) mottles; weak medium subangular blocky structure; nonsticky; about 20 percent weakly cemented ortstein; few fine roots; strongly acid; gradual wavy boundary.

Bs2—22 to 26 inches; dark yellowish brown (10YR 4/6) fine sand; few medium prominent dark brown (7.5YR 4/2) mottles; single grain; nonsticky; moderately acid; gradual wavy boundary.

BC—26 to 30 inches; yellowish brown (10YR 5/6) fine sand; single grain; nonsticky; moderately acid; gradual wavy boundary.

Cg—30 to 60 inches; light brownish gray (10YR 6/2) fine sand; single grain; nonsticky; moderately acid.

The thickness of the solum ranges from 25 to 45 inches.

The Oa horizon has hue of 5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 7.5YR or 10YR, value of 6, and chroma of 2 or 3. It is fine sand or sand.

The Bhs horizon has hue of 5YR, 7.5YR, or 10YR and value and chroma of 2 or 3. It is fine sand or sand.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 4 to 6. It is fine sand or sand.

The Cg horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is fine sand or sand.

Klacking Series

The Klacking series consists of well drained, moderately rapidly permeable soils on disintegration moraines and outwash plains. These soils formed in sandy and loamy glacial drift. Slopes range from 0 to 50 percent.

Typical pedon of Klacking loamy sand (fig. 19), in an area of Klacking-McGinn loamy sands, 8 to 50 percent slopes, dissected, 710 feet south and 1,880 feet west of the northeast corner of sec. 20, T. 28 N., R. 7 E.

A—0 to 2 inches; black (N 2/0) loamy sand, dark gray (N 4/0) dry; weak fine granular structure; very friable; many fine and medium roots; about 5 percent gravel; strongly acid; abrupt smooth boundary.

E—2 to 3 inches; brown (10YR 5/3) loamy sand, light gray (10YR 7/2) dry; weak fine granular structure; very friable; many fine and medium roots; about 5 percent gravel; strongly acid; abrupt smooth boundary.

Bw1—3 to 19 inches; dark yellowish brown (10YR 4/6) loamy sand; weak medium subangular blocky structure; very friable; many fine and medium roots; about 5 percent gravel; moderately acid; gradual wavy boundary.

Bw2—19 to 27 inches; yellowish brown (10YR 5/6) loamy sand; weak medium granular structure; very friable; many fine and medium roots; about 5 percent gravel; moderately acid; gradual wavy boundary.

E and Bt—27 to 40 inches; light yellowish brown (10YR 6/4) loamy sand, very pale brown (10YR 7/4) dry (E); weak coarse granular structure; lamellae of dark brown (7.5YR 4/4) sandy loam (Bt) 1 to 2 inches thick with a total accumulation of 7 inches; moderate medium subangular blocky structure; friable; many fine roots; slightly acid; abrupt wavy boundary.

B/E—40 to 46 inches; about 60 percent dark brown (7.5YR 4/4) sandy loam (Bt); moderate medium subangular structure; surrounded by light yellowish brown (10YR 6/4) loamy sand, very pale brown (10YR 7/4) dry (E); weak coarse granular structure; friable; many fine roots; slightly acid; abrupt wavy boundary.

E′ and B′t—46 to 60 inches; light yellowish brown (10YR 6/4) loamy sand, very pale brown (10YR 7/4) dry (E′); weak coarse granular structure; lamellae of dark brown (7.5YR 4/4) sandy loam (B′t) ½ to 1 inch thick with a total accumulation of 4 inches; moderate medium subangular blocky structure; friable; many fine roots; slightly acid.

The thickness of the solum and the depth to free carbonates range from 40 to more than 60 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loamy sand or sand.

The E part of the E and Bt and B/E horizons has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is loamy sand or sand.

The Bt part of the E and Bt and B/E horizons has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6.

The C horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

Leafriver Series

The Leafriver series consists of very poorly drained, rapidly permeable soils on lake plains and outwash plains. These soils formed in sandy lacustrine and outwash deposits. Slopes are 0 to 1 percent.

Typical pedon of Leafriver muck (fig. 20), 1,860 feet east and 100 feet north of the southwest corner of sec. 14, T. 28 N., R. 9 E.

Oa—0 to 9 inches; muck, black (N 2/0) broken face, pressed, and rubbed; about 15 percent fiber, less than 5 percent rubbed; weak medium granular structure; friable; many fine and few medium roots; slightly acid; abrupt smooth boundary.

Bw—9 to 21 inches; brown (10YR 5/3) sand; common

medium distinct yellowish brown (10YR 5/6) mottles; single grain; loose; few fine roots; neutral; clear smooth boundary.

Cg1—21 to 27 inches; grayish brown (10YR 5/2) sand; common medium distinct yellowish brown (10YR 5/4) mottles; single grain; loose; about 10 percent gravel and 5 percent cobbles; strong effervescence; slightly alkaline; gradual wavy boundary.

Cg2—27 to 60 inches; dark grayish brown (10YR 4/2) sand; single grain; loose; strong effervescence; slightly alkaline.

The thickness of the solum ranges from 10 to 25 inches. The depth to free carbonates is greater than 20 inches. The content of gravel ranges from 0 to 15 percent throughout the profile.

The Oa horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 or 1.

The Bw horizon has hue of 10YR, value of 3 to 5, and chroma of 3. It is sand or loamy sand.

The Cg horizon has hue of 10YR, 5Y, 5GY, or 2.5Y, value of 4 to 6, and chroma of 1 or 2.

Loxley Series

The Loxley series consists of very poorly drained, moderately slowly permeable to moderately rapidly permeable soils in depressions on lake plains and outwash plains. These soils formed in organic soil material. Slopes are 0 to 1 percent.

Typical pedon of Loxley peat, 2,350 feet north and 410 feet west of the southeast corner of sec. 7, T. 27 N., R. 9 E.

Oi—0 to 18 inches; peat, dark brown (7.5YR 3/4) broken face, brown (10YR 5/3) rubbed; about 80 percent fiber, 45 percent rubbed; weak thick platy structure; friable; primarily herbaceous fibers; common medium roots; ultra acid; abrupt smooth boundary.

Oa1—18 to 28 inches; muck, dark brown (7.5YR 3/2) broken face, black (5YR 2.5/1) rubbed; about 65 percent fiber, 10 percent rubbed; weak thick platy structure; friable; primarily herbaceous fibers; ultra acid; abrupt smooth boundary.

Oa2—28 to 60 inches; muck, black (5YR 2.5/2) broken face and rubbed; about 40 percent fiber, 5 percent rubbed; weak thick platy structure; friable; primarily herbaceous fibers; 10 percent wood fragments; ultra acid.

The organic layers are 60 inches or more thick. The organic material has hue of 5YR, 7.5YR, or 10YR, value of 2 to 5, and chroma of 1 to 4.

Lupton Series

The Lupton series consists of very poorly drained, moderately slowly permeable to moderately rapidly permeable soils in depressions on lake plains, outwash plains, and till plains. These soils formed in organic soil material. Slopes range from 0 to 2 percent.

Typical pedon of Lupton muck, 150 feet north and 2,150 feet east of the southwest corner of sec. 16, T. 25 N., R. 9 E.

Oa1—0 to 5 inches; muck, black (N 2/0) broken face and rubbed; about 70 percent fiber, less than 5 percent rubbed; weak medium granular structure; friable; common fine roots; primarily woody fibers; about 20 percent wood fragments; slightly alkaline; abrupt smooth boundary.

Oa2—5 to 30 inches; muck, dark reddish brown (5YR 3/2) broken face and rubbed; about 60 percent fiber, about 7 percent rubbed; weak thick platy structure; friable; few fine roots; primarily woody fibers; about 10 percent wood fragments; slightly alkaline; abrupt smooth boundary.

Oa3—30 to 42 inches; muck, dark reddish brown (5YR 2.5/2) broken face and rubbed; about 10 percent fiber, less than 5 percent rubbed; massive; friable; primarily woody fibers; slightly alkaline; abrupt smooth boundary.

Oa4—42 to 60 inches; muck, dark reddish brown (5YR 3/2) broken face and rubbed; about 25 percent fiber, less than 5 percent rubbed; massive; friable; primarily herbaceous fibers; slightly alkaline.

The organic layers are more than 60 inches thick. The organic material has hue of 5YR, 7.5YR, or 10YR or is neutral in hue. It has value of 2, 2.5, or 3 and chroma of 0 to 3.

Mancelona Series

The Mancelona series consists of somewhat excessively drained soils on stream terraces and glacial drainageway terraces. These soils formed in sandy and loamy outwash materials underlain by stratified sandy and gravelly outwash deposits. Permeability is moderately rapid in the upper part of the profile and very rapid in the lower part. Slopes range from 0 to 35 percent.

Typical pedon of Mancelona loamy sand, 0 to 6 percent slopes (fig. 21), 2,490 feet north and 1,990 feet west of the southeast corner of sec. 16, T. 25 N., R. 5 E.

A—0 to 2 inches; black (N 2/0) loamy sand, very

dark gray (N 3/0) dry; weak coarse granular structure; friable; many fine and few medium roots; about 9 percent gravel; strongly acid; abrupt smooth boundary.

E—2 to 5 inches; dark grayish brown (10YR 4/2) loamy sand, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; many fine and few medium roots; about 9 percent gravel; very strongly acid; abrupt wavy boundary.

Bs1—5 to 16 inches; dark yellowish brown (10YR 4/4) loamy sand; weak medium subangular blocky structure; friable; many fine roots; about 9 percent gravel; moderately acid; clear wavy boundary.

Bs2—16 to 31 inches; yellowish brown (10YR 5/6) sand; weak fine subangular blocky structure; friable; common fine roots; about 9 percent gravel; slightly acid; abrupt smooth boundary.

2Bt1—31 to 36 inches; dark brown (7.5YR 4/4) very gravelly sandy loam; weak medium subangular blocky structure; friable; many fine roots; clay coatings on sand grains; about 40 percent gravel; neutral; abrupt wavy boundary.

2Bt2—36 to 39 inches; dark brown (7.5YR 4/4) very gravelly sandy clay loam; moderate fine subangular blocky structure; friable; many fine roots; clay bridges between sand grains; about 40 percent gravel; neutral; abrupt wavy boundary.

2C—39 to 60 inches; light yellowish brown (10YR 6/4), stratified very gravelly sand and sand; single grain; loose; about 40 percent gravel; strong effervescence; slightly alkaline.

The thickness of the solum and the depth to free carbonates range from 25 to 40 inches. The content of gravel ranges from 3 to 10 percent in the A, E, and Bs horizons and from 35 to 55 percent in the 2Bt and 2C horizons. The content of cobbles ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3.

The Bs horizon has hue of 5YR, 7.5YR, or 10YR and value and chroma of 4 to 6. It is loamy sand or sand.

The 2Bt horizon has hue of 7.5YR and value and chroma of 4 to 6. It is very gravelly sandy loam, very gravelly sandy clay loam, or very gravelly loam.

The 2C horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is stratified very gravelly sand, gravelly sand, coarse sand, gravelly coarse sand, and sand.

Manistee Series

The Manistee series consists of moderately well drained and well drained soils on lake plains and outwash plains. These soils formed in sandy lacustrine and outwash materials underlain by clayey lacustrine deposits. Permeability is rapid in the sandy part and very slow in the clayey part. Slopes range from 0 to 45 percent.

Typical pedon of Manistee loamy sand, moderately wet, 0 to 6 percent slopes (fig. 22), 1,500 feet north and 1,600 feet west of the southeast corner of sec. 20, T. 26 N., R. 8 E.

A—0 to 4 inches; black (N 2/0) loamy sand, dark gray (N 4/0) dry; weak medium granular structure; very friable; common coarse and many fine roots; about 1 percent gravel; moderately acid; abrupt smooth boundary.

E—4 to 6 inches; pinkish gray (7.5YR 6/2) loamy sand, pinkish white (7.5YR 8/2) dry; moderate medium subangular blocky structure; friable; common medium and fine roots; about 1 percent gravel; moderately acid; abrupt irregular boundary.

Bs1—6 to 17 inches; strong brown (7.5YR 4/6) loamy sand; weak coarse subangular blocky structure; friable; few medium and common fine roots; about 1 percent gravel; slightly acid; clear smooth boundary.

Bs2—17 to 24 inches; strong brown (7.5YR 5/6) loamy sand; single grain; loose; few fine roots; about 1 percent gravel; neutral; abrupt smooth boundary.

2B/E—24 to 27 inches; about 70 percent reddish brown (5YR 5/3) clay (Bt); surrounded by pinkish gray (7.5YR 6/2) sandy loam, pinkish gray (7.5YR 7/2) dry (E); common fine prominent yellowish red (5YR 4/6) mottles; strong coarse angular blocky structure; firm; few fine roots; many very fine vesicular pores; many continuous faint reddish brown (5YR 4/3) clay films on faces of peds; about 1 percent gravel; neutral; abrupt smooth boundary.

2Bt1—27 to 32 inches; reddish brown (5YR 4/4) clay; common fine distinct yellowish red (5YR 4/6) mottles; strong coarse angular blocky structure; firm; many fine roots between peds; many very fine vesicular pores; many continuous faint reddish brown (5YR 4/3) clay films on faces of peds; about 1 percent gravel; slightly alkaline; abrupt wavy boundary.

2Bt2—32 to 50 inches; reddish brown (5YR 5/3) clay; strong coarse angular blocky structure; firm; many fine roots between peds; many very fine

vesicular pores; many continuous faint reddish brown (5YR 4/4) clay films on faces of peds; about 1 percent gravel; strong effervescence; slightly alkaline; clear wavy boundary.

2C—50 to 60 inches; reddish brown (5YR 5/3) clay; massive; firm; about 1 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 30 to 50 inches. The content of gravel ranges from 0 to 5 percent in the sandy material.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It is loamy sand or sand.

The E part of the 2B/E horizon has hue of 5YR, 7.5YR, or 10YR, value of 6, and chroma of 2 or 3. It is sandy loam or loamy sand.

The Bt part of the 2B/E horizon and the 2Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. They are silty clay or clay.

The 2C horizon has hue of 5YR, 7.5YR, or 10YR, value of 5 or 6, and chroma of 3 or 4. It is clay or silty clay.

Markey Series

The Markey series consists of very poorly drained soils in depressions on lake plains. These soils formed in 16 to 50 inches of organic material underlain by sandy lacustrine deposits. Permeability is moderately slow to moderately rapid in the organic part and rapid in the sandy part. Slopes are 0 to 1 percent.

Typical pedon of Markey muck, 1,180 feet north and 1,350 feet west of the southeast corner of sec. 14, T. 28 N., R. 9 E.

Oa1—0 to 4 inches; muck, black (N 2/0) broken face, black (10YR 2/1) rubbed; about 45 percent fiber, 12 percent rubbed; weak thick platy structure; friable; primarily herbaceous fibers; many fine roots; slightly acid; clear smooth boundary.

Oa2—4 to 16 inches; muck, very dark brown (10YR 2/2) broken face, black (10YR 2/1) rubbed; about 45 percent fiber, 12 percent rubbed; weak thick platy structure; friable; primarily herbaceous fibers; few fine roots; neutral; clear smooth boundary.

Oa3—16 to 28 inches; muck, very dark brown (10YR 2/2) broken face, very dark brown (10YR 2/2) rubbed; about 30 percent fiber, less than 5 percent rubbed; weak thick platy structure; friable; primarily herbaceous fibers; neutral; gradual smooth boundary.

Cg—28 to 60 inches; grayish brown (10YR 5/2) sand; single grain; loose; neutral.

The depth to the sandy mineral layers ranges from 16 to 50 inches.

The Oa horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. Broken face, rubbed, and pressed colors are similar but may vary one unit in value, chroma, or both.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 1 to 3.

McGinn Series

The McGinn series consists of well drained, moderately permeable soils on ground moraines. These soils formed in sandy and loamy glacial till. Slopes range from 0 to 50 percent.

Typical pedon of McGinn loamy sand, 6 to 12 percent slopes (fig. 23), 150 feet south and 1,980 feet west of the northeast corner of sec. 23, T. 28 N., R. 6 E.

Oi—0 to 1 inch; black (5YR 2.5/1), partially decomposed forest litter; strongly acid; abrupt smooth boundary.

A—1 to 2 inches; black (N 2/0) loamy sand, very dark gray (N 3/0) dry; weak medium granular structure; friable; many fine roots; about 3 percent gravel and 1 percent cobbles; very strongly acid; abrupt broken boundary.

E—2 to 4 inches; light brownish gray (10YR 6/2) loamy sand, light gray (10YR 7/2) dry; weak fine subangular blocky structure; friable; common fine roots; about 3 percent gravel and 1 percent cobbles; very strongly acid; abrupt broken boundary.

Bw1—4 to 6 inches; strong brown (7.5YR 4/6) loamy sand; weak medium subangular blocky structure; friable; many fine and few medium roots; about 3 percent gravel and 1 percent cobbles; strongly acid; clear wavy boundary.

Bw2—6 to 16 inches; dark yellowish brown (10YR 4/4) loamy sand; moderate coarse subangular blocky structure; friable, about 10 percent of matrix is slightly brittle; common medium roots; about 3 percent gravel and 1 percent cobbles; strongly acid; abrupt wavy boundary.

E′—16 to 18 inches; grayish brown (10YR 5/2) loamy sand; weak thick platy structure; slightly brittle;

about 3 percent gravel and 1 percent cobbles; moderately acid; abrupt broken boundary.

E/B—18 to 21 inches; about 75 percent grayish brown (10YR 5/2) loamy sand, very pale brown (10YR 7/3) dry (E′); weak thick platy structure; surrounding peds of reddish brown (5YR 4/4) sandy loam (Bt); weak medium subangular blocky structure; slightly brittle; few medium roots; many very fine vesicular pores; few discontinuous faint reddish brown (5YR 4/4) clay films on faces of peds; about 3 percent gravel and 1 percent cobbles; moderately acid; abrupt irregular boundary.

2B/E—21 to 25 inches; about 80 percent reddish brown (5YR 4/4) sandy loam (Bt); many continuous distinct dark reddish brown (5YR 3/4) clay films on faces of peds; surrounded and coated by grayish brown (10YR 5/2) loamy sand, very pale brown (10YR 7/3) dry (E′); moderate medium subangular blocky structure; friable; few fine roots; many very fine vesicular pores; about 3 percent gravel and 1 percent cobbles; slightly acid; abrupt irregular boundary.

2Bt—25 to 35 inches; reddish brown (5YR 4/4) sandy loam; moderate medium subangular blocky structure; friable; common fine roots; many very fine vesicular pores; many distinct dark reddish brown (5YR 3/4) clay films on faces of peds; about 3 percent gravel and 1 percent cobbles; slightly acid; clear wavy boundary.

2C—35 to 80 inches; light reddish brown (5YR 6/3) sandy loam; massive with weakly expressed thick platiness inherited from the parent material; friable; few fine roots in vertical fractures; few continuous prominent white (10YR 8/2) lime or carbonate coatings in vertical fractures; about 5 percent gravel and 1 percent cobbles; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 24 to 40 inches. The thickness of the sandy upper part of the profile ranges from 14 to 20 inches. The content of gravel ranges from 2 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 5 percent.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Ap horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6.

The E′ horizon and the E part of the E/B and B/E horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2.

The Bt part of the E/B and B/E horizons and the 2Bt horizon have hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4. They are sandy loam or loam.

The 2C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4.

Negwegon Series

The Negwegon series consists of well drained and moderately well drained, very slowly permeable soils on dissected lake plains. These soils formed in stratified loamy and clayey lacustrine deposits. Slopes range from 2 to 45 percent.

Typical pedon of Negwegon silt loam, moderately wet, 6 to 12 percent slopes, 1,280 feet south and 1,280 feet west of the northeast corner of sec. 10, T. 27 N., R. 9 E.

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine angular blocky structure; friable; about 2 percent gravel; slightly acid; abrupt wavy boundary.

B/E—8 to 16 inches; about 80 percent reddish brown (5YR 4/4) silty clay loam (Bt); penetrated by tongues of brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry (E); few fine distinct strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure parting to moderate fine angular blocky; firm; common dark brown (10YR 4/3) worm channels and wormcasts; about 2 percent gravel; slightly acid; clear wavy boundary.

Bt1—16 to 24 inches; reddish brown (5YR 4/4) clay; thin strata of yellowish brown (10YR 5/4) silt loam throughout; moderate fine angular blocky structure; firm; common dark brown (10YR 4/3) worm channels and wormcasts; many faint reddish brown (5YR 4/4) clay films on faces of peds; about 1 percent gravel; slightly acid; abrupt wavy boundary.

Bt2—24 to 46 inches; reddish brown (5YR 4/4) silty clay; moderate medium prismatic structure; firm; common faint brown (7.5YR 5/4) clay films on faces of peds; about 1 percent gravel; neutral; abrupt wavy boundary.

C—46 to 60 inches; stratified brown (5YR 5/4) silty clay loam and yellowish brown (7.5YR 5/4) silt loam; massive; friable; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 25 to 50 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The Ap horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. It is silt loam or silty clay loam. Some pedons have an A horizon. This horizon is very dark grayish brown (10YR 3/2) silt loam. It is 1 to 3 inches thick.

The E part of the B/E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. Some pedons have an E horizon.

The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 3 or 4. They are silty clay loam, silty clay, or clay.

The C horizon has hue of 5YR, 7.5YR, or 10YR, value of 3 to 6, and chroma of 3 or 4. It is stratified silty clay, silt loam, or silty clay loam.

Nester Series

The Nester series consists of well drained and moderately well drained, slowly permeable soils on till plains and moraines. These soils formed in loamy glacial till. Slopes range from 0 to 45 percent.

Typical pedon of Nester loam, moderately wet, 6 to 12 percent slopes, 150 feet north and 2,125 feet east of the southwest corner of sec. 17, T. 25 N., R. 6 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; moderate fine subangular blocky structure; friable; many very fine roots; about 5 percent gravel and 1 percent cobbles; slightly acid; abrupt wavy boundary.

E/B—9 to 14 inches; about 70 percent brown (10YR 5/3) sandy loam, pale brown (10YR 6/3) dry (E); surrounding peds of reddish brown (5YR 4/4) clay loam (Bt); many fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common very fine roots; about 10 percent gravel and 1 percent cobbles; slightly acid; clear wavy boundary.

B/E—14 to 19 inches; about 85 percent reddish brown (5YR 4/4) clay loam (Bt); surrounded by brown (10YR 5/3) sandy loam, pale brown (10YR 6/3) dry (E); many medium prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common very fine roots; many very fine vesicular pores; about 10 percent gravel and 1 percent cobbles; slightly acid; abrupt wavy boundary.

Bt1—19 to 25 inches; reddish brown (5YR 4/4) clay loam; few fine distinct yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many very fine vesicular pores; many continuous faint reddish brown (5YR 4/3) clay films on faces of peds; about 10 percent gravel and 1 percent cobbles; neutral; gradual wavy boundary.

Bt2—25 to 40 inches; reddish brown (5YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few very fine roots between peds; many very fine vesicular pores; common discontinuous faint reddish brown (5YR 4/3) clay films on vertical faces of peds; about 10 percent gravel and 1 percent cobbles; slight effervescence; slightly alkaline; clear wavy boundary.

C—40 to 60 inches; light reddish brown (5YR 6/4) clay loam; massive with weakly expressed thick plates inherited from the parent material; firm; common patchy prominent white (10YR 8/1) calcium carbonate coatings on faces of plates; about 10 percent gravel and 1 percent cobbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 50 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

The Ap horizon has hue of 10YR, value of 3, and chroma of 1 or 2.

The E part of the E/B and B/E horizons has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 or 3. It is sandy loam or loam.

The Bt part of the E/B and B/E horizons and the Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. They are clay loam, silty clay loam, or clay.

The C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4. It is clay loam or silty clay loam.

Richter Series

The Richter series consists of somewhat poorly drained, moderately permeable soils on lake plains and in glacial drainageways. These soils formed in stratified sandy and loamy lacustrine and glaciofluvial sediments. Slopes range from 0 to 3 percent.

Typical pedon of Richter loamy fine sand, 0 to 3 percent slopes, 30 feet south and 1,200 feet west of the northeast corner of sec. 10, T. 26 N., R. 8 E.

A—0 to 8 inches; black (10YR 2/1) loamy fine sand, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; very friable; many fine and common medium roots; strongly acid; abrupt wavy boundary.

E—8 to 12 inches; light gray (10YR 7/2) loamy sand, white (10YR 8/2) dry; weak medium subangular blocky structure; very friable; common fine roots; moderately acid; clear broken boundary.

Bs—12 to 18 inches; dark brown (7.5YR 4/4) loamy sand; many coarse distinct strong brown (7.5YR 4/6) and dark reddish brown (5YR 3/3) mottles; weak thick platy structure parting to weak fine subangular blocky; friable; common fine roots; common patchy distinct dark brown (10YR 4/3) organic coatings; moderately acid; abrupt wavy boundary.

B/E—18 to 26 inches; about 80 percent brown (7.5YR 5/4) sandy loam (Bt); surrounded by pale brown (10YR 6/3) loamy sand, very pale brown (10YR 7/3) dry (E); common medium distinct pinkish gray (7.5YR 6/2) and common medium distinct strong brown (7.5YR 5/8) mottles; moderate thick platy structure parting to moderate medium subangular blocky; friable; few fine roots; moderately acid; clear wavy boundary.

Bt—26 to 37 inches; brown (7.5YR 5/4) and reddish brown (5YR 5/4), stratified fine sandy loam and clay loam; common fine prominent greenish gray (5GY 5/1) and common medium prominent strong brown (7.5YR 5/8) mottles; weak thick platy structure parting to moderate fine angular blocky; friable; few fine roots; common discontinuous faint reddish brown (5YR 5/3) clay films on faces of peds; neutral; abrupt smooth boundary.

C—37 to 60 inches; pinkish gray (7.5YR 6/2) and reddish brown (5YR 5/3), stratified loamy sand and silt loam; few medium prominent greenish gray (5GY 6/1) and few medium prominent strong brown (7.5YR 5/8) mottles; massive; friable; about 5 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 22 to 40 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The E horizon has hue of 10YR or 7.5YR, value of 6 or 7, and chroma of 1 or 2. It is loamy sand or very fine sandy loam.

The Bs horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is loamy sand or sandy loam.

The E part of the B/E horizon has hue of 10YR, value of 6 or 7, and chroma of 2 to 4. It is loamy sand, fine sandy loam, or very fine sandy loam.

The Bt part of the B/E horizon and the Bt horizon have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. They are stratified fine sandy loam to clay loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is stratified loamy sand to silt loam.

Rondeau Series

The Rondeau series consists of very poorly drained soils on lake plains. These soils formed in highly decomposed organic soil materials and in the underlying marl. Permeability is moderately slow to moderately rapid in the organic layers and slow or very slow in the marl layers. Slopes are 0 to 1 percent.

Typical pedon of Rondeau muck, 420 feet north and 550 feet west of the southeast corner of sec. 35, T. 25 N., R. 6 E.

Oa1—0 to 6 inches; muck, black (N 2/0) broken face and black (10YR 2/1) rubbed; about 60 percent fiber, 15 percent rubbed; weak medium subangular blocky structure; friable; common very fine and many fine roots; many fine continuous tubular pores; neutral; clear smooth boundary.

Oa2—6 to 19 inches; muck, dark reddish brown (5YR 2.5/2) broken face and black (10YR 2/1) rubbed; about 50 percent fiber, less than 10 percent rubbed; weak medium subangular blocky structure; friable; common fine and few medium roots; many very fine continuous tubular pores; neutral; abrupt smooth boundary.

Cg—19 to 60 inches; light gray (10YR 7/1) marl; friable; common fine and few medium roots; violent effervescence; moderately alkaline.

The depth to the marl layer ranges from 16 to 49 inches. The surface tier and the organic portion of the lower tiers are muck.

The Oa horizon has hue of 5YR or is neutral in hue. It has value of 2 or 2.5 and chroma of 0 to 2.

The Cg horizon has hue of 10YR, value of 7, and chroma of 1 or 2.

Springport Series

The Springport series consists of poorly drained, very slowly permeable soils on lake plains. These soils formed in stratified loamy and clayey lacustrine deposits. Slopes range from 0 to 2 percent.

Typical pedon of Springport clay loam, 1,000 feet north and 675 feet east of the southwest corner of sec. 18, T. 25 N., R. 9 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) clay loam, grayish brown (10YR 5/2) dry; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable; many fine and medium roots between peds; about 1 percent gravel; neutral; abrupt smooth boundary.

Bg—8 to 12 inches; grayish brown (2.5Y 5/2) clay;

many coarse prominent yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm; common fine and medium roots between peds; about 1 percent gravel; slight effervescence; slightly alkaline; clear wavy boundary.

Bt—12 to 27 inches; reddish brown (5YR 4/3) silty clay; many coarse prominent yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles; very coarse prismatic structure parting to moderate medium subangular blocky; firm; common fine roots between peds; few prominent greenish gray (5GY 6/1) lime or carbonate coatings on vertical and horizontal faces of peds; few thin prominent very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; few distinct greenish gray (5GY 5/1) clay films on faces of peds; about 1 percent gravel; strong effervescence; moderately alkaline; gradual wavy boundary.

C—27 to 60 inches; reddish brown (5YR 5/3) silty clay; common medium prominent strong brown (7.5YR 5/8) mottles; weak very thick platy fragments; firm; common patchy prominent greenish gray (5GY 6/1) lime or carbonate coatings throughout; about 1 percent gravel; violent effervescence; moderately alkaline.

The depth to carbonates ranges from 7 to 15 inches. The content of gravel is 0 to 1 percent.

The Ap horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is dominantly clay loam, but the range includes silt loam.

The Bg horizon has hue of 5Y, 2.5Y, or 10YR, value of 5 or 6, and chroma of 1 or 2. It is clay or silty clay.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. It is silty clay or silty clay loam.

The C horizon has hue of 5YR, value of 4 to 6, and chroma of 2 to 4. It is silty clay or silty clay loam or is stratified with these textures.

Sprinkler Series

The Sprinkler series consists of somewhat poorly drained, moderately slowly permeable soils on ground moraines. These soils formed in loamy glacial till. Slopes range from 0 to 3 percent.

Typical pedon of Sprinkler sandy loam, 0 to 3 percent slopes, 2,565 feet south and 2,565 feet west of the northeast corner of sec. 14, T. 25 N., R. 6 E.

A—0 to 5 inches; very dark gray (10YR 3/1) sandy loam, gray (10YR 5/1) dry; weak medium subangular blocky structure; friable; many fine and medium roots; about 2 percent gravel; strongly acid; abrupt smooth boundary.

E—5 to 13 inches; brown (10YR 5/3) sandy loam, very pale brown (10YR 7/3) dry; common fine distinct yellowish brown (10YR 5/6) and common fine prominent strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; common fine roots in worm channels; common fine vesicular pores; about 2 percent gravel; strongly acid; clear wavy boundary.

(E/B)x—13 to 23 inches; about 70 percent brown (10YR 5/3) sandy loam, very pale brown (10YR 7/3) dry (E); occurring as tongues surrounding peds of brown (7.5YR 5/4) loam (Bt); common fine prominent strong brown (7.5YR 5/6) and grayish brown (10YR 5/2) mottles; weak very thick platy structure; firm; slightly brittle; few fine roots between peds; many fine vesicular pores; about 2 percent gravel; strongly acid; clear irregular boundary.

(B/E)x—23 to 28 inches; about 70 percent brown (7.5YR 5/4) loam (Bt); surrounded by brown (10YR 5/3) sandy loam, very pale brown (10YR 7/3) dry (E); common fine prominent yellowish brown (10YR 5/6) and prominent grayish brown (10YR 5/2) mottles; weak very coarse prismatic structure parting to weak very thick platy; firm; slightly brittle; few fine roots between peds; many fine vesicular pores; about 2 percent gravel; strongly acid; clear wavy boundary.

Bt1—28 to 35 inches; dark brown (7.5YR 4/4) loam; common medium prominent yellowish brown (10YR 5/6) mottles on faces of peds and few fine prominent grayish brown (10YR 5/2) mottles in clay films and near roots; weak very thick platy structure; firm; few fine roots between peds; many fine vesicular pores; common faint brown (7.5YR 5/4) clay films more than 1 millimeter thick in vertical cracks between peds; about 5 percent gravel; strongly acid; clear wavy boundary.

Bt2—35 to 44 inches; brown (7.5YR 5/4) loam; few fine prominent gray (N 6/0) and common fine distinct strong brown (7.5YR 5/6) mottles; weak very thick platy structure; firm; few patchy faint brown (7.5YR 5/4) clay films on faces of peds; about 5 percent gravel; slight effervescence; moderately alkaline; clear wavy boundary.

C—44 to 60 inches; brown (7.5YR 5/3) loam; common fine distinct strong brown (7.5YR 5/6) mottles; massive; friable; about 5 percent gravel; slight effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 30 to 50 inches. The content of gravel ranges from 1 to 5 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 3 and chroma of 0 or 1.

The E horizon has hue of 2.5Y or 10YR, value of 5, and chroma of 2 or 3.

The E part of the (E/B)x and (B/E)x horizons has hue of 5YR, 7.5YR, or 10YR or is neutral in hue. It has value of 5 or 6 and chroma of 0 to 3. The (E/B)x and (B/E)x horizons are slightly brittle but do not qualify as fragipans.

The Bt part of the (E/B)x and (B/E)x horizons has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is loam or clay loam.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is loam or clay loam.

The C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. It is loam or clay loam.

Tawas Series

The Tawas series consists of very poorly drained soils on lake terraces. These soils formed in 16 to 50 inches of organic material underlain by sandy lacustrine deposits. Permeability is moderately slow to moderately rapid in the organic part and rapid in the sandy part. Slopes range from 0 to 2 percent.

Typical pedon of Tawas muck, in an area of Tawas-Au Gres complex, 0 to 4 percent slopes, 2,270 feet south and 820 feet west of the northeast corner of sec. 34, T. 25 N., R. 9 E.

Oa1—0 to 5 inches; muck, black (N 2/0) broken face and rubbed; about 80 percent fiber, less than 15 percent rubbed; weak thick platy structure; friable; primarily woody fibers; moderately acid; clear smooth boundary.

Oa2—5 to 17 inches; muck, black (N 2/0) broken face and rubbed; about 40 percent fiber, 10 percent rubbed; weak thick platy structure; friable; primarily woody fibers; about 30 percent chunks of wood; neutral; abrupt smooth boundary.

C1—17 to 18 inches; brown (10YR 5/3) sand; single grain; nonsticky; slightly alkaline; clear smooth boundary.

C2—18 to 60 inches; dark brown (10YR 4/3) sand; single grain; nonsticky; slightly alkaline.

The depth to the sandy mineral layers ranges from 16 to 50 inches. The content of gravel in the mineral layers ranges from 0 to 5 percent.

The organic material has hue of 5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. Broken face, rubbed, and pressed colors are similar but may vary one unit in value, chroma, or both.

The C horizon has hue of 10YR or 7.5YR or is neutral in hue. It has value of 4 or 5 and chroma of 0 to 3.

Tonkey Series

The Tonkey series consists of poorly drained, moderately permeable soils on lake plains, on outwash plains, and in glacial drainageways. These soils formed in stratified loamy and silty lacustrine and glaciofluvial deposits. Slopes range from 0 to 2 percent.

The Tonkey soils in Alcona County are taxadjuncts because they have higher chroma and a slightly higher silt content in the subsoil than are defined as the range for the series. These differences do not significantly affect use and management.

Typical pedon of Tonkey silt loam, 1,690 feet south and 1,010 feet east of the northwest corner of sec. 10, T. 26 N., R. 9 E.

A—0 to 6 inches; black (10YR 2/1) silt loam, grayish brown (10YR 5/2) dry; common fine faint dark gray (10YR 4/1) mottles; weak fine granular structure; friable; many fine and common medium roots; slightly acid; abrupt wavy boundary.

Bg—6 to 12 inches; pinkish gray (7.5YR 6/2) very fine sandy loam; common fine prominent greenish gray (5GY 6/1) and distinct strong brown (7.5YR 5/6) mottles; weak fine angular blocky structure; friable; common fine roots; common continuous prominent black (10YR 2/1) organic coatings on faces of peds; neutral; abrupt smooth boundary.

Bw—12 to 26 inches; brown (10YR 5/3), stratified very fine sandy loam and silt loam; many medium distinct yellowish brown (10YR 5/6) and fine faint grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure; friable; slightly alkaline; clear smooth boundary.

Cg—26 to 60 inches; brown (7.5YR 5/2), stratified silt loam, very fine sandy loam, and silt; many medium prominent strong brown (7.5YR 5/8) and common medium faint pinkish gray (7.5YR 6/2) mottles; massive; friable; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 25 to 35 inches. The content of gravel ranges from 0 to 2 percent in the solum.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1.

The Bg and Bw horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 to 3. They are stratified very fine sandy loam to silt loam.

The Cg horizon has hue of 7.5YR, value of 5 or 6, and chroma of 2.

Typic Haplaquods

These soils are classified as mixed, frigid Typic Haplaquods. They are very poorly drained, rapidly permeable soils on lake plains and outwash plains. They formed in sandy lacustrine or outwash material. Slopes range from 0 to 2 percent.

An organic surface layer, 4 to 7 inches thick, is typically on the surface. It is dominantly muck or mucky peat. It has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2. It is sand, loamy sand, or fine sand.

The Bhs horizon has hue of 5YR or 7.5YR and value and chroma of 2 or 3. It is sand, loamy sand, or fine sandy loam.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 6.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 4. It is sand, loamy sand, or fine sand.

Typic Udipsamments

These soils are classified as mixed, frigid Typic Udipsamments. They are moderately well drained and excessively drained, rapidly permeable soils on outwash plains, stream terraces, and overwashed moraines. They formed in sandy glaciofluvial material. Slopes range from 0 to 50 percent.

Reference pedon of Typic Udipsamments, nearly level and undulating, 2,620 feet north and 20 feet east of the southwest corner of sec. 4, T. 26 N., R. 5 E.

Oi—1 inch to 0; undecomposed hardwood and coniferous leaf litter.

A—0 to 2 inches; very dark gray (10YR 3/1) sand, dark grayish brown (10YR 4/2) dry; weak medium granular structure; very friable; many very fine and fine roots; strongly acid; abrupt wavy boundary.

E—2 to 4 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; weak medium subangular blocky structure; very friable; strongly acid; abrupt wavy boundary.

Bw—4 to 22 inches; dark yellowish brown (10YR 4/4) sand; weak coarse subangular blocky structure; very friable; strongly acid; clear wavy boundary.

BC—22 to 40 inches; yellowish brown (10YR 5/6) sand; single grain; loose; strongly acid; gradual wavy boundary.

C—40 to 180 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; strongly acid.

The thickness of the solum ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. It is sand or loamy sand. Some pedons do not have an E horizon.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is sand or loamy sand.

The C horizon has hue of 10YR or 7.5YR, value of 6 or 7, and chroma of 4 to 6. It is sand or coarse sand. Loamy sand, coarse loamy sand, and gravelly loamy sand may occur below a depth of 60 inches. Banded substratum phases have thin bands of loamy sand or sandy loam below a depth of 60 inches. Loamy substratum phases have sandy loam to sandy clay loam below a depth of 40 inches. A seasonal high water table is below a depth of 3 feet in some pedons.

Udipsamments

These soils are classified as mixed, frigid Udipsamments. They are excessively drained, rapidly permeable soils on outwash plains. They formed in sands. Slopes range from 0 to 40 percent.

These soils are on the bottoms and sides of borrow pits or in areas of sandy filled land. They have hue of 10YR, value of 5 to 7, and chroma of 3 or 4. They are sand.

Udorthents

These soils are classified as mixed, frigid Udorthents. They are well drained, moderately permeable or moderately slowly permeable soils on moraines. They formed in loamy glacial till. Slopes range from 0 to 12 percent.

These soils are on the bottoms and sides of borrow pits or in areas of loamy filled land. They have hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 3 or 4. Textures include sandy loam, loam, and clay loam.

Wakeley Series

The Wakeley series consists of very poorly drained soils on lake terraces. These soils formed in sandy lacustrine materials underlain by clayey lacustrine deposits. Permeability is rapid in the sandy part and very slow in the clayey part. Slopes range from 0 to 2 percent.

Typical pedon of Wakeley mucky sand, in an area of Au Gres, clayey substratum-Wakeley complex, 0 to 4 percent slopes, 50 feet south and 2,550 feet west of the northeast corner of sec. 20, T. 25 N., R. 8 E.

A—0 to 6 inches; black (N 2/0) mucky sand, very dark gray (N 3/0) dry; common fine distinct dark gray (N 4/0) mottles; weak medium subangular blocky structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Cg1—6 to 12 inches; gray (10YR 5/1) sand; single grain; nonsticky; common fine roots; common discontinuous faint dark gray (10YR 4/1) organic coatings throughout; slightly acid; clear smooth boundary.

Cg2—12 to 24 inches; grayish brown (10YR 5/2) sand; many medium prominent weak red (2.5YR 5/2) mottles; single grain; nonsticky; neutral; clear smooth boundary.

Cg3—24 to 29 inches; grayish brown (10YR 5/2), stratified sand and loamy sand; common medium distinct yellowish brown (10YR 5/6) and common medium prominent greenish gray (5GY 5/1) mottles; single grain; nonsticky; neutral; abrupt smooth boundary.

2Cg4—29 to 34 inches; pinkish gray (7.5YR 6/2) clay; many medium prominent yellowish brown (10YR 5/6) and many fine prominent greenish gray (5G 6/1) mottles; massive; firm; few fine roots; slight effervescence; moderately alkaline; clear wavy boundary.

2Cg5—34 to 60 inches; pinkish gray (7.5YR 6/2), stratified clay and silty clay; many coarse prominent yellowish brown (10YR 5/6) and many medium prominent greenish gray (5G 6/1) mottles; massive; firm; strong effervescence; moderately alkaline.

The thickness of the upper sandy layers ranges from 20 to 40 inches. The content of gravel ranges from 0 to 3 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 1 to 3. It is sand or loamy sand.

The 2C horizon has hue of 7.5YR or 5YR, value of 5 or 6, and chroma of 1 to 3. It is clay, silty clay loam, or silty clay.

Waucedah Series

The Waucedah series consists of very poorly drained soils on flood plains. These soils formed in stratified sandy to silty alluvium over clayey lacustrine deposits. Permeability is moderate in the alluvium and very slow in the clayey material. Slopes are 0 to 1 percent.

Typical pedon of Waucedah muck, frequently flooded, 140 feet south and 2,210 feet west of the northeast corner of sec. 22, T. 27 N., R. 9 E.

Oa—0 to 9 inches; muck, very dark gray (10YR 3/1) broken face and black (10YR 2/1) rubbed; about 30 percent fiber, 5 percent rubbed; weak fine granular structure; friable; many fine roots; herbaceous and woody fiber; about 15 percent mineral material; slightly acid; abrupt smooth boundary.

A—9 to 13 inches; black (10YR 2/1) silt loam, very dark gray (10YR 3/1) dry; common fine prominent yellowish red (5YR 4/6) and dark reddish brown (5YR 3/4) mottles; moderate medium subangular blocky structure; friable; many fine roots; slightly acid; abrupt smooth boundary.

Cg1—13 to 18 inches; dark gray (10YR 4/1) silt loam; common fine prominent strong brown (7.5YR 4/6) mottles; weak medium platy structure; friable; neutral; abrupt smooth boundary.

Cg2—18 to 55 inches; dark grayish brown (10YR 4/2) and black (10YR 2/1) loamy sand and sandy loam; massive; friable; neutral; abrupt smooth boundary.

2Cg3—55 to 60 inches; brown (7.5YR 5/2) silty clay; massive; firm; strong effervescence; moderately alkaline.

The depth to carbonates ranges from 40 to 60 inches.

The Oa horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1.

The C horizon has hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 1 to 3. It is stratified loamy sand to silt loam. Silty clay is below a depth of 40 inches.

Wheatley Series

The Wheatley series consists of very poorly drained soils on lake terraces and in glacial

drainageways. These soils formed in sandy and gravelly lacustrine and glaciofluvial deposits. Permeability is rapid in the upper part and very rapid in the lower part. Slopes are 0 to 1 percent.

The Wheatley soils in Alcona County are taxadjuncts because they have higher chroma above a depth of 20 inches and do not have a dark mineral surface layer. These differences do not significantly affect use and management.

Typical pedon of Wheatley muck, 1,210 feet south and 900 feet east of the northwest corner of sec. 15, T. 25 N., R. 9 E.

Oa—0 to 5 inches; black (N 2/0) muck, black (N 2/0) dry; weak fine granular structure; friable; about 20 percent light gray (N 7/0) sand; many fine roots; slightly acid; abrupt smooth boundary.

Cg—5 to 9 inches; gray (5Y 5/1) sand; common medium prominent very dark gray (N 3/0) mottles; single grain; loose; about 10 percent gravel; neutral; abrupt smooth boundary.

C—9 to 34 inches; brown (10YR 5/3) sand; few fine prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; about 10 percent gravel; neutral; abrupt smooth boundary.

2Cg—34 to 60 inches; greenish gray (5GY 5/1) gravelly sand; single grain; nonsticky; about 30 percent gravel; violent effervescence; moderately alkaline.

The depth to carbonates ranges from 20 to 40 inches. The content of gravel ranges from 5 to 10 percent in the upper part and from 15 to 35 percent in the lower part.

The Oa horizon has hue of 10YR or is neutral in hue. It has value of 1 or 2 and chroma of 0 to 2.

The C horizons have hue of 5Y to 10YR, value of 4 to 6, and chroma of 1 to 3. They are sand or loamy sand.

The 2Cg horizon has hue of 5GY to 10YR or is neutral in hue. It has value of 4 to 6 and chroma of 0 or 1. It is gravelly sand or gravelly loamy sand.

Zimmerman Series

The Zimmerman series consists of excessively drained, rapidly permeable soils on lake terraces, dissected lake plains, and deltas. These soils formed in sandy lacustrine deposits. Slopes range from 0 to 60 percent.

Typical pedon of Zimmerman loamy fine sand (fig. 24), in an area of Zimmerman-Alcona, moderately wet, complex, 6 to 18 percent slopes, 500 feet north and 170 feet west of the southeast corner of sec. 9, T. 25 N., R. 9 E.

A—0 to 2 inches; black (N 2/0) loamy fine sand, dark gray (N 4/0) dry; weak medium granular structure; friable; many fine and common medium roots; moderately acid; abrupt smooth boundary.

E—2 to 4 inches; grayish brown (10YR 5/2) loamy fine sand, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; very friable; many fine and common medium roots; moderately acid; abrupt smooth boundary.

Bw1—4 to 7 inches; strong brown (7.5YR 4/6) loamy fine sand; weak medium subangular blocky structure; very friable; many fine and common medium roots; about 1 percent gravel; moderately acid; clear wavy boundary.

Bw2—7 to 24 inches; yellowish brown (10YR 5/6) loamy fine sand; weak medium subangular blocky structure; very friable; few fine roots; slightly acid; clear wavy boundary.

E and Bt—24 to 80 inches; yellowish brown (10YR 5/4) fine sand, very pale brown (10YR 7/4) dry (E); weak medium platy structure; very friable; lamellae of strong brown (7.5YR 4/6) loamy fine sand (Bt) 1/4 inch in thickness with a total accumulation of 2 1/2 inches; neutral.

The thickness of the solum and the depth to free carbonates range from 60 to more than 80 inches. The content of gravel ranges from 0 to 3 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon and the E part of the E and Bt horizon have hue of 10YR, value of 5 to 7, and chroma of 2 to 4. They are fine sand or loamy fine sand.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6.

The Bt part of the E and Bt horizon consists of one or more thin lamellae that begin at depths of 24 to 60 inches and range from 1/2 inch to less than 6 inches in combined thickness. The lamellae have hue of 7.5YR, value of 4 or 5, and chroma of 3 to 6. They are loamy fine sand or fine sandy loam.

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in the survey area. It also describes the processes of soil formation.

Factors of Soil Formation

Soil forms through the interaction of five major factors. These are the physical, chemical, and mineral composition of the parent material; the climate under which the soil material has accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or topography; and the length of time that the processes of soil formation have acted on the parent material (Jenny, 1941).

Climate and plant and animal life are the active forces of soil formation. They slowly change the parent material into a natural body of soil that has genetically related layers, called horizons. The effects of climate and plant and animal life are conditioned by relief. The nature of the parent material affects the kind of soil profile that is formed and, in extreme cases, determines it almost entirely. Finally, time changes the parent material into a soil. Generally, a long time is required for the formation of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made about the effect of any one factor unless conditions are specified for the other four. Many of the processes of soil formation are unknown.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. The parent material of the soils in Alcona County was deposited by glaciers or by meltwater from the glaciers. Some of this material was subsequently reworked by water and wind. The glaciers covered the county about 12,000 years ago. Parent material determines the chemical and mineralogical composition of the soil. Although the soils in the county have parent material of common glacial origin, the properties of the parent material vary greatly, sometimes within a small area, depending on how the material was deposited. The dominant parent materials in Alcona County were deposited as glacial till, outwash material, lake sediment, alluvium, or organic material.

Glacial till is material that was deposited directly by glaciers with a minimum of water action. It consists of a mixture of particles of different sizes. The small pebbles in glacial till have sharp corners, indicating that they have not been worn by water. The glacial till in Alcona County generally is calcareous sandy loam and loam. Hoist soils formed in glacial till. Typically, they are loamy and have moderately developed structure.

Outwash material was deposited by running water from melting glaciers. The size of the particles that make up outwash material depends on the speed of the water that carried them. When the water slows down, the coarser particles are deposited. The finer particles, such as very fine sand, silt, and clay, are carried by slowly moving water. Outwash deposits generally consist of layers of particles of similar size, such as sand, coarse sand, and gravel. Mancelona soils are examples of soils that formed in outwash material.

Lake sediment is material that settled from still or slowly moving, deep lake water and from shallow, high-energy water near shorelines. Lake sediments are well sorted, and the size of the particles depends on the speed of the water that suspends them. Au Gres soils are examples of sandy soils that formed in parent material deposited in sandbars on a shallow lake bottom. Springport soils are examples of fine textured soils that formed in parent material deposited on a deep lake bottom.

Alluvial material has been deposited by floodwater of present streams in recent time. The texture of this material depends on the speed of the water that deposited the material. Ausable soils are alluvial soils.

Organic material is made up of plant remains. After the glaciers receded from the area, water was left standing in depressions on outwash plains, flood plains, and till plains. Grasses and sedges that grew around the edge of these depressions died. Because

of the wetness, when the plants died their remains did not decompose but accumulated around the edge of the depressions. Later, water-tolerant trees grew in these areas. As these trees died, their residue became part of the organic accumulation. Consequently, the depressions were eventually filled with organic material and developed into areas of muck. Lupton soils are examples of soils that formed in organic material.

Plant and Animal life

Green plants have been the principal organism influencing the soils in Alcona County. Bacteria, fungi, earthworms, and humans also have been important. The chief contribution of plant and animal life is the addition of organic matter and nitrogen to the soil. The kind of organic matter on and in the soil depends on the kinds of plants that grew on the soil. The residue of these plants accumulates on the surface of the soil. It decays and eventually becomes organic matter. Plant roots provide channels for the downward movement of water through the soil and add organic matter to the soil as they decay. Bacteria in the soil help to break down the organic matter into a form that can be used by plants.

The vegetation in Alcona County was a mixture of coniferous and deciduous forest. Differences in natural soil drainage and changes in parent material affect the composition of forests.

In general, the well drained upland soils, such as McGinn and Glennie soils, were covered with red oak and white pine. Grayling soils were covered with northern pin oak and jack pine. The very poorly drained soils were covered with cedar, black spruce, and aspen. Kinross and Wakeley soils, which formed under wet conditions, contain a considerable amount of organic matter.

Climate

Climate is important in the formation of soils. It determines the kind of plant and animal life on and in the soil and determines the amount of water available for the weathering of minerals and the transporting of soil materials. Through its influence on soil temperature, climate determines the rate of chemical reactions in the soil. These climatic influences generally affect areas larger than a county.

The climate in Alcona County is cool and humid. Presumably, it is similar to the climate under which the soils formed. The soils in Alcona County differ from soils that formed in a dry, warm climate or from those that formed in a moist, hot climate. Climate is uniform throughout the county, but its effect is modified locally by the proximity to Lake Huron. The minor differences in the soils in Alcona County are partially the result of climatic differences.

Relief

Relief, or topography, has had a marked influence on the formation of the soils in Alcona County through its influence on natural drainage, erosion, plant cover, and soil temperature. In this county, slopes range from 0 to 60 percent. Natural drainage ranges from excessively drained on hilltops to very poorly drained in depressions.

Relief influences the formation of soils by affecting runoff and drainage. Drainage in turn, through its effect on aeration of the soil, determines the color of the soil. Runoff is most rapid on the steeper slopes, but in low areas, water can be temporarily ponded.

Water and air move freely through well drained soils but slowly through very poorly drained soils. In soils that are well aerated, the iron and aluminum compounds that give most soils their color are brightly colored and are oxidized. Poorly aerated soils are dull gray and mottled. Manistee soils are examples of well drained, well aerated soils; Wakeley soils are examples of poorly drained, poorly aerated soils. Both soils formed in similar parent material.

Time

Generally, a long time is required for the development of distinct horizons in a soil. The differences in the length of time that the parent material has been in place are commonly reflected in the degree of development of the soil profile. Some soils form rapidly; others form slowly.

The soils of Alcona County range from young to mature. The glacial deposits in which many of the soils formed have been exposed to soil-forming factors long enough for distinct horizons to develop. Some soils forming in recent alluvial sediment have not been in place long enough for the development of distinct horizons. Ausable soils, which formed in alluvial material, are young soils. Glennie soils show the effects of leaching of lime from the soil, which has taken place over a long period of time.

Processes of Soil Formation

The process responsible for the development of the soil horizons from unconsolidated parent material is referred to as soil genesis. Soil morphology

describes the physical, chemical, and biological properties of these horizons.

Several processes were involved in the development of soil horizons in Alcona County. They include the accumulation of organic matter; the leaching of lime (calcium carbonate) and other bases; the reduction and transfer of iron; and the formation and translocation of clay minerals. In most soils, more than one of these processes have been active in the development of horizons.

Organic matter accumulates at the surface to form an A horizon. If the soil is plowed, the A horizon is mixed into a plow layer, or Ap horizon. In the soils of Alcona County, the content of organic matter in the surface layer ranges from high to low. For example, Leafriver soils have a high content of organic matter in the surface layer; Grayling soils have a low content of organic matter.

Leaching of carbonates and other bases has occurred in most of the soils. Soil scientists generally agree that leaching of bases in soils precedes the translocation of clay minerals. Many of the soils in Alcona County are moderately or strongly leached. McGinn soils are leached of carbonates to a depth of 20 to 40 inches. Grayling soils are leached to a depth of more than 60 inches. This difference in the depth of leaching is a result of time, relief, and parent material.

The reduction and transfer of iron, a process called gleying, is evident in the somewhat poorly drained, poorly drained, and very poorly drained soils. The gray or dull color in the subsoil indicates the reduction and loss of iron. Wakeley soils are examples of soils in which the gleying processes are evident.

Translocation of clay minerals has contributed to horizon development. An eluviated, or leached, E horizon above an illuviated B horizon has a lower content of clay than the B horizon and typically is lighter in color. The B horizon typically has an accumulation of clay and clay films in pores and on the faces of peds. The soils displaying this translocation of clay were probably leached of carbonates and soluble salts to a considerable extent before the translocation of clay took place. Leaching of bases and translocation of clays are among the more important processes in horizon differentiation. Negwegon soils have translocated clay in the form of clay films accumulated in the B horizon.

In some soils, iron, aluminum, and humus have moved from the surface layer to the B horizon. The B horizon in such soils commonly is dark brown or dark reddish brown. Au Gres and Kinross soils are examples of soils in which translocated iron, aluminum, and humus have affected the B horizon.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

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

Bar. A ridgelike accumulation of sand, gravel, or other alluvial material that has formed in the channel, along the banks, or at the mouth of a stream where a decrease in velocity induces deposition.

Basal till. Compact glacial till deposited beneath the ice.

Beach ridge. A low, essentially continuous mound of beach or beach-and-dune material heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves or the reach of ordinary tides, and occurring singly or as one of a series of approximately parallel deposits. The ridges are roughly parallel to the shoreline and represent successive positions of an advancing shoreline.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A general term for a small saucer-, cup-, or trough-shaped hollow or depression formed by wind erosion, or a pre-existing dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Channel. The hollow bed where a natural body of surface water flows or may flow. The deepest or central part of the bed of a stream, containing the main current and occupied more or less continuously by water.

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.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles 2 millimeters to 38 centimeters (15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil 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 are somewhat similar in all areas.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective

amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

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.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium, nearly flat and fan shaped, deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression. Any relatively sunken part of the earth's surface; especially a low-lying area surrounded by higher ground. A closed depression has no natural outlet for surface drainage, for example, a karstic sinkhole.

Disintegration moraine. A drift topography characterized by chaotic mounds and pits, generally randomly oriented, which formed in superglacial drift by collapse and flow as the underlying stagnant ice melted. Slopes may be steep and unstable, and used and unused stream courses and lake depressions are interspersed with the morainic ridges. Consequently, there will be rapid or abrupt changes between materials of differing lithology.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed

slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a channel or course along which water moves in draining an area.

Drift. A general term applied to all rock material (clay, silt, sand, gravel, boulders) transported by a glacier and deposited directly by or from the ice or by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified glaciofluvial deposits that form outwash plains, eskers, kames, varves, and glaciolacustrine sediments.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

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.

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, for example, fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting.

Esker (geology). A long, narrow, sinuous, steep-sided ridge of irregularly stratified sand and gravel that was deposited by a subglacial or supraglacial stream flowing between ice walls or in an ice tunnel of a retreating glacier and that was left behind when the ice melted.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

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.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

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. Normally a constructional

landform built of sediment deposited during overflow and lateral migration of the streams.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial. Of or relating to the presence and activities of ice and glaciers, as glacial erosion. Pertaining to distinctive features and materials produced by or derived from glaciers and ice sheets, as glacial lakes. Pertaining to an ice age or region of glaciation.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glacier. A large mass of ice formed, at least in part, on land by the compaction and recrystallization of snow, moving slowly by creep downslope or outward in all directions due to the stress of its own weight and surviving from year to year.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated with varves.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground moraine. An extensive, fairly even layer of till having an undulating surface; a deposit of rock debris dragged along, in, on, and beneath a glacier and emplaced by processes including basal lodgment and release from downwasting stagnant ice.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, generally of restricted summit area (relative to a tableland) and having a well defined outline; slopes generally are more than 15 percent.

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. The major horizons 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, any plowed or disturbed surface layer.
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 O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon 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) granular, 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 horizon. 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.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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 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.

Interfluve. The relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. Any elevated area between two drainageways that sheds water to those drainageways.

Kame (geology). A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Kame terrace. A terrace-like ridge consisting of stratified sand and gravel that was deposited by a meltwater stream flowing between a melting glacier and a higher valley wall or lateral moraine and that was left standing after the ice disappeared. It is commonly pitted with "kettles" and has an irregular ice-contact slope.

Kettle. A steep-sided, bowlshaped depression without surface drainage. It is in glacial drift deposits and is believed to have formed by the melting of a large, detached block of stagnant ice buried in the glacial drift.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit (geology). Sediments and chemical precipitates deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A nearly level surface marking the floor of an extinct lake filled in by well sorted, fine textured, stratified sediments.

Lake terrace. A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level fell.

Landform. Any physical, recognizable form or feature on the earth's surface having a characteristic shape and produced by natural causes. It

includes major forms, such as a plain, plateau, or mountain, and minor forms, such as a hill, valley, slope, esker, or dune.

Landscape. The distinct association of landforms, especially as modified by geologic forces, that can be seen in a single view.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

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.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions (35 to 65 percent of each). It formed primarily under freshwater lacustrine conditions, but varieties associated with more saline environments also occur.

Marsh. A water-saturated, poorly drained area, intermittently or permanently covered with water, having aquatic and grasslike vegetation, essentially without the formation of peat.

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.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

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.

Moraine (geology). An accumulation of drift, with an initial topographic expression of its own, built chiefly by the direct action of glacial ice. Examples are end, round, lateral, recessional, and terminal moraines.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Highly decomposed organic material in which the original plant parts are not recognizable. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Mucky peat. Organic soil material intermediate in degree of decomposition between the less decomposed peat and the more decomposed muck.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 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.

Outwash. Stratified detritus (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 an active glacier. The coarser material is deposited nearer to the ice. Also, the meltwater of a glacier.

Outwash plain. An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Outwash terrace. A valley train deposit extending along a valley downstream from an outwash plain or terminal moraine; a flat-topped bank of outwash with an abrupt outer face.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. The least decomposed of all organic material. Peat contains a large amount of well preserved

fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

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.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 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 thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitted outwash. Outwash with pits or kettles, produced by the partial or complete burial of glacial ice by outwash and the subsequent thaw of the ice and collapse of the surficial materials.

Plain. An extensive lowland area that ranges from level to gently sloping or undulating. A plain has few or no prominent hills or valleys and typically occurs at low elevations relative to the surrounding areas. Where dissected, remnants of a plain can form the local uplands.

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.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

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.

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.

Proglacial lake. A lake occupying a basin in front of a glacier, generally in direct contact with the ice.

Ravine. A small stream channel that is narrow, steep sided, and commonly V-shaped in cross-section and is larger than a gully.

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	below 3.5
Extremely acid	3.5 to 4.5
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

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits. Soil scientists regard as soil only that part of the regolith that is modified by organisms and other soil-forming forces. Most engineers describe the whole regolith, even to a great depth, as soil.

Relief. The elevations or inequalities of a land surface, considered collectively.

Ridge. A long, narrow elevation of the land surface, typically sharp crested with steep sides and forming an extended upland between valleys.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

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.

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.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Scarp. An escarpment, cliff, or steep slope of some extent along the margin of a plateau, mesa, terrace, or bench. A scarp may be of any height.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the substratum. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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.

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. For map units 11B through 111B in this survey, the slope classes are defined as follows:

A—Nearly level	0 to 3 percent
B—Nearly level and undulating	0 to 6 percent
B—Undulating	2 to 6 percent
B—Nearly level and gently undulating	0 to 4 percent
C—Gently rolling	6 to 12 percent
D—Hilly	12 to 18 percent
E—Steep	18 to 35 percent
F—Very steep	35 percent and higher

For map units 209B through 282, the slope classes are defined as follows:

A—Nearly level	0 to 3 percent
B—Nearly level and undulating	0 to 6 percent
C—Gently rolling and rolling	6 to 18 percent
D—Hilly and steep	18 to 30 percent
E—Very steep	30 to 50 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

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 substratum. The living roots and plant and animal activities are largely confined to the solum.

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.

Stratified. Formed, arranged, or laid down in layers. The term refers to geologic deposits. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream and representing the dissected remnants of an abandoned flood plain, stream bed, or valley floor produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing and water erosion.

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 grain* (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.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 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. It includes all subdivisions of these horizons.

Swale. A slight depression, sometimes swampy, in the midst of generally level land, or a shallow depression in an undulating ground moraine caused by uneven glacial deposition. Also, a long, narrow, generally shallow, trough-like depression between two beach ridges and aligned roughly parallel to the coastline.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace (geologic). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or sea shore. The term is usually applied to both the relatively flat summit surface (platform, tread), cut or built by stream or wave action, and the steeper descending slope (scarp, riser), graded to a lower base level of erosion.

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."

Thin layer (in tables). A layer of otherwise suitable soil material that is too thin for the specified use.

Till. Dominantly unsorted and unstratified drift deposited by a glacier and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

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 (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley train. A long narrow body of outwash confined within a valley beyond a glacier; it may or may not emerge from the valley and join an outwash plain.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, 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.

Wave-built terrace. A gently sloping coastal feature at the seaward or lakeward edge of a wave-cut platform, constructed by sediment brought by rivers or drifted along the shore or across the platform and deposited in the deeper water beyond.

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

Table 1.--Temperature and Precipitation

(Recorded in the period 1951-80 at East Tawas and Hale, Michigan)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
EAST TAWAS:											
January	28.9	11.0	20.0	47	-17	0	1.62	0.78	2.35	5	13.4
February	31.4	11.3	21.4	48	-17	0	1.27	.68	1.79	4	10.2
March	39.4	20.5	30.0	64	-6	1	1.99	1.24	2.67	5	8.9
April	53.2	31.9	42.6	81	12	34	2.64	1.83	3.38	7	2.3
May	65.4	41.3	53.4	89	24	169	2.86	1.64	3.93	6	.1
June	75.0	50.9	63.0	93	33	384	3.17	1.85	4.35	7	.0
July	79.9	55.8	67.9	94	40	560	2.94	1.56	4.15	6	.0
August	78.2	54.7	66.5	93	38	518	3.08	1.65	4.33	6	.0
September	70.7	47.7	59.2	90	28	296	2.94	1.42	4.28	6	.0
October	59.6	38.6	49.1	80	18	89	2.31	1.06	3.38	5	.0
November	45.4	28.8	37.1	67	7	5	2.43	1.63	3.16	6	3.3
December	33.7	18.1	25.9	55	-6	0	2.21	1.16	3.14	6	11.3
Yearly:											
Average	55.1	34.2	44.6	---	---	---	---	---	---	---	---
Extreme	---	---	---	97	-19	---	---	---	---	---	---
Total	---	---	---	---	---	2,056	29.46	26.18	33.07	69	49.5
HALE:											
January	27.3	7.9	17.6	48	-23	0	1.52	0.74	2.19	4	12.6
February	30.1	7.7	18.9	50	-24	0	1.22	.66	1.72	4	9.3
March	39.6	17.3	28.5	65	-15	1	1.84	1.10	2.50	5	10.5
April	54.0	30.2	42.1	81	10	34	2.53	1.70	3.29	6	2.9
May	66.9	40.3	53.6	88	24	177	2.75	1.53	3.83	6	.1
June	76.1	50.0	63.1	92	33	400	2.76	1.43	3.92	6	.0
July	80.3	54.7	67.5	93	40	550	3.12	1.85	4.26	6	.0
August	78.1	53.5	65.8	92	38	498	3.06	1.72	4.24	6	.0
September	69.9	46.2	58.1	89	29	264	2.95	1.52	4.19	6	.0
October	59.3	36.9	48.1	81	19	84	2.25	.99	3.32	6	.2
November	44.2	27.7	36.0	68	5	6	2.26	1.49	2.96	6	4.1
December	32.0	15.8	23.9	56	-15	0	1.79	.93	2.54	5	11.1
Yearly:											
Average	54.8	32.4	43.6	---	---	---	---	---	---	---	---
Extreme	---	---	---	95	-27	---	---	---	---	---	---
Total	---	---	---	---	---	2,014	28.05	24.79	31.18	66	50.8

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1951-80 at East Tawas and Hale, Michigan)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
EAST TAWAS:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 4	May 27	June 4
2 years in 10 later than--	Apr. 29	May 21	May 30
5 years in 10 later than--	Apr. 19	May 8	May 20
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 5	Sept. 30	Sept. 16
2 years in 10 earlier than--	Oct. 12	Oct. 4	Sept. 20
5 years in 10 earlier than--	Oct. 24	Oct. 13	Sept. 29
HALE:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 4	May 19	June 4
2 years in 10 later than--	Apr. 30	May 16	May 30
5 years in 10 later than--	Apr. 21	May 9	May 20
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 9	Sept. 25	Sept. 16
2 years in 10 earlier than--	Oct. 15	Sept. 30	Sept. 20
5 years in 10 earlier than--	Oct. 26	Oct. 10	Sept. 28

Table 3.--Growing Season

(Recorded in the period 1951-80 at East Tawas and Hale, Michigan)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
EAST TAWAS:			
9 years in 10	166	132	110
8 years in 10	173	140	117
5 years in 10	187	157	131
2 years in 10	201	173	145
1 year in 10	209	182	152
HALE:			
9 years in 10	167	133	108
8 years in 10	174	140	115
5 years in 10	187	153	130
2 years in 10	200	165	144
1 year in 10	207	172	152

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
11B	Eastport sand, 0 to 6 percent slopes	392	0.1
12B	Tawas-Au Gres complex, 0 to 4 percent slopes	5,984	1.3
16B	Graycalm sand, 0 to 6 percent slopes	5,700	1.3
16C	Graycalm sand, 6 to 12 percent slopes	4,329	1.0
16D	Graycalm sand, 12 to 18 percent slopes	4,230	1.0
16E	Graycalm sand, 18 to 35 percent slopes	1,562	0.4
17B	Croswell sand, 0 to 6 percent slopes	2,532	0.6
18A	Au Gres sand, 0 to 3 percent slopes	5,481	1.2
19	Leafriver muck	3,657	0.8
26B	Croswell sand, loamy substratum, 0 to 6 percent slopes	2,465	0.6
27A	Au Gres sand, clayey substratum, 0 to 3 percent slopes	2,098	0.5
28B	East Lake sand, 0 to 6 percent slopes	2,283	0.5
28C	East Lake sand, 6 to 12 percent slopes	283	0.1
28E	East Lake sand, 12 to 35 percent slopes	132	*
29A	Battlefield sand, 0 to 3 percent slopes	2,502	0.6
30	Wheatley muck	1,734	0.4
31B	Klacking loamy sand, 0 to 6 percent slopes	6,111	1.4
31C	Klacking loamy sand, 6 to 12 percent slopes	10,094	2.3
31D	Klacking loamy sand, 12 to 18 percent slopes	4,112	0.9
31E	Klacking loamy sand, 18 to 35 percent slopes	247	0.1
33B	Mancelona loamy sand, 0 to 6 percent slopes	3,670	0.8
33C	Mancelona loamy sand, 6 to 12 percent slopes	1,906	0.4
33D	Mancelona loamy sand, 12 to 18 percent slopes	1,711	0.4
33E	Mancelona loamy sand, 18 to 35 percent slopes	756	0.2
35	Kinross muck	225	0.1
36B	Alcona loamy very fine sand, moderately wet, 0 to 6 percent slopes	4,933	1.1
36C	Alcona loamy very fine sand, moderately wet, 6 to 12 percent slopes	2,385	0.5
37A	Richter loamy fine sand, 0 to 3 percent slopes	5,394	1.2
38	Tonkey silt loam	2,997	0.7
39B	Glennie loamy sand, moderately wet, 0 to 6 percent slopes	6,218	1.4
39C	Glennie loamy sand, moderately wet, 6 to 12 percent slopes	3,361	0.8
40A	Sprinkler sandy loam, 0 to 3 percent slopes	1,299	0.3
41B	McGinn loamy sand, 0 to 6 percent slopes	5,673	1.3
41C	McGinn loamy sand, 6 to 12 percent slopes	15,746	3.5
41D	McGinn loamy sand, 12 to 18 percent slopes	5,925	1.3
42A	Killmaster sandy loam, 0 to 3 percent slopes	4,860	1.1
43	Wakeley mucky sand	2,680	0.6
44B	Bamfield fine sandy loam, moderately wet, 0 to 6 percent slopes	3,343	0.8
45B	Hoist sandy loam, moderately wet, 0 to 6 percent slopes	7,373	1.7
45C	Hoist sandy loam, moderately wet, 6 to 12 percent slopes	3,976	0.9
46	Ensley mucky sandy loam	1,981	0.4
53B	Negwegon silt loam, moderately wet, 2 to 6 percent slopes	5,078	1.1
53C	Negwegon silt loam, moderately wet, 6 to 12 percent slopes	3,105	0.7
54A	Algonquin silt loam, 0 to 3 percent slopes	9,169	2.1
55	Springport clay loam	3,715	0.8
56B	Nester loam, moderately wet, 0 to 6 percent slopes	2,436	0.5
56C	Nester loam, moderately wet, 6 to 12 percent slopes	2,551	0.6
57B	Kawkawlin loam, 1 to 4 percent slopes	2,736	0.6
59B	Algonquin-Springport complex, 0 to 6 percent slopes	7,211	1.6
60D	Glennie loamy sand, 12 to 18 percent slopes	1,709	0.4
60E	Glennie loamy sand, 18 to 35 percent slopes	277	0.1
61C	Manistee loamy sand, 6 to 12 percent slopes	662	0.1
61D	Manistee loamy sand, 12 to 18 percent slopes	194	*
61F	Manistee loamy sand, 25 to 45 percent slopes	158	*
62A	Allendale loamy sand, 0 to 3 percent slopes	3,089	0.7
63C	Bamfield fine sandy loam, 6 to 12 percent slopes	3,292	0.7
63D	Bamfield fine sandy loam, 12 to 18 percent slopes	1,815	0.4
63F	Bamfield fine sandy loam, 25 to 45 percent slopes	929	0.2
66D	Alcona loamy very fine sand, 12 to 18 percent slopes	642	0.1
66E	Alcona loamy very fine sand, 18 to 35 percent slopes	204	*
68	Rondeau muck	73	*
69	Loxley peat	993	0.2

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
70	Lupton muck	17,342	3.9
71	Tawas muck	9,003	2.0
72	Dorval muck	1,297	0.3
73	Markey muck	144	*
74C2	Negwegon silty clay loam, moderately wet, 6 to 12 percent slopes, eroded	260	0.1
77	Waucedah muck, frequently flooded	2,183	0.5
78	Pits, borrow	614	0.1
80F	Zimmerman-Alcona complex, 25 to 60 percent slopes	1,315	0.3
81B	Grayling sand, 0 to 6 percent slopes	2,639	0.6
81C	Grayling sand, 6 to 12 percent slopes	367	0.1
81E	Grayling sand, 18 to 35 percent slopes	581	0.1
82C	Udorthents, loamy, nearly level to gently rolling	207	*
83F	Udipsamments, nearly level to very steep	105	*
84B	Zimmerman loamy fine sand, 0 to 6 percent slopes	1,408	0.3
84C	Zimmerman loamy fine sand, 6 to 12 percent slopes	1,533	0.3
84D	Zimmerman loamy fine sand, 12 to 18 percent slopes	670	0.2
85B	Zimmerman-Alcona, moderately wet, complex, 0 to 6 percent slopes	2,724	0.6
85D	Zimmerman-Alcona, moderately wet, complex, 6 to 18 percent slopes	5,890	1.3
86	Histosols and Aquents, ponded	3,380	0.8
87	Ausable muck, frequently flooded	2,442	0.5
88D	Hoist sandy loam, 12 to 18 percent slopes	851	0.2
89F	Bamfield-Lupton complex, 0 to 45 percent slopes	3,633	0.8
90B	Chinwhisker sand, 0 to 4 percent slopes	5,744	1.3
91E	Glennie-Lupton complex, 0 to 35 percent slopes	4,062	0.9
92B	Klacking-McGinn loamy sands, 0 to 6 percent slopes	2,445	0.5
93B	Au Gres, clayey substratum-Wakeley complex, 0 to 4 percent slopes	16,040	3.6
94F	Klacking-McGinn loamy sands, 8 to 50 percent slopes, dissected	24,690	5.5
96D2	Negwegon silty clay loam, 12 to 18 percent slopes, eroded	115	*
97	Colonville very fine sandy loam, occasionally flooded	335	0.1
98C	Graycalm sand, pitted outwash, 0 to 12 percent slopes	906	0.2
102D	Nester loam, 12 to 18 percent slopes	629	0.1
102E	Nester loam, 18 to 25 percent slopes	232	0.1
102F	Nester loam, 25 to 45 percent slopes	471	0.1
110D	Negwegon silt loam, 12 to 18 percent slopes	946	0.2
110F	Negwegon silt loam, 25 to 45 percent slopes	537	0.1
111B	Manistee loamy sand, moderately wet, 0 to 6 percent slopes	1,340	0.3
209B	Grayling sand, calcareous substratum, nearly level and undulating	10,867	2.4
210B	Grayling sand, nearly level and undulating	5,042	1.1
210C	Grayling sand, rolling	1,580	0.4
210D	Grayling sand, hilly	472	0.1
211B	Grayling sand, banded substratum, nearly level and undulating	5,581	1.3
211C	Grayling sand, banded substratum, rolling	949	0.2
212B	Grayling sand, very deep water table, nearly level and undulating	734	0.2
213B	Graycalm sand, nearly level and undulating	673	0.2
213C	Graycalm sand, rolling	272	0.1
215C	Typic Udipsamments, loamy substratum, rolling	89	*
220B	Typic Udipsamments, nearly level and undulating	2,351	0.5
220C	Typic Udipsamments, rolling	816	0.2
220D	Typic Udipsamments, hilly	184	*
220E	Typic Udipsamments, steep	154	*
221B	Typic Udipsamments, banded substratum, nearly level and undulating	5,700	1.3
221C	Typic Udipsamments, banded substratum, rolling	4,725	1.1
221D	Typic Udipsamments, banded substratum, hilly	398	0.1
222B	Typic Udipsamments, very deep water table, nearly level and undulating	2,142	0.5
223B	Graycalm-Grayling sands, nearly level and undulating	3,474	0.8
223C	Graycalm-Grayling sands, rolling	4,431	1.0
223D	Graycalm-Grayling sands, hilly	187	*
224B	Croswell sand, nearly level and undulating	2,787	0.6
225B	Entic Haplorthods, sandy, loamy substratum, nearly level and undulating	897	0.2
225C	Entic Haplorthods, sandy, loamy substratum, rolling	1,335	0.3
230C	Entic Haplorthods, sandy-Alfic Haplorthods, sandy, complex, rolling	599	0.1

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
231B	Entic Haplorthods, sandy, banded substratum-Alfic Haplorthods, sandy, complex, nearly level and undulating	1,412	0.3
231C	Entic Haplorthods, sandy, banded substratum-Alfic Haplorthods, sandy, complex, rolling	1,364	0.3
231D	Entic Haplorthods, sandy, banded substratum-Alfic Haplorthods, sandy, complex, hilly	656	0.1
232B	Entic Haplorthods, sandy-Alfic Haplorthods, sandy, complex, very deep water table, nearly level and undulating	1,812	0.4
233B	Alfic Haplorthods, sandy-Entic Haplorthods, sandy, fine-loamy banded substratum, complex, nearly level and undulating	1,631	0.4
233C	Alfic Haplorthods, sandy-Entic Haplorthods, sandy, fine-loamy banded substratum, complex, rolling	3,182	0.7
233D	Alfic Haplorthods, sandy-Entic Haplorthods, sandy, fine-loamy banded substratum, complex, hilly	528	0.1
235B	Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, nearly level and undulating	4,708	1.1
235C	Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, rolling	10,103	2.3
235D	Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, hilly	2,721	0.6
236B	Arenic Eutroboralfs, nearly level and undulating	91	*
236C	Arenic Eutroboralfs, rolling	673	0.2
237B	Glossic Eutroboralfs, nearly level and undulating	1,713	0.4
237C	Glossic Eutroboralfs, rolling	2,915	0.7
237D	Glossic Eutroboralfs, hilly	435	0.1
247B	Glennie-Bamfield complex, nearly level and undulating	375	0.1
247C	Glennie-Bamfield complex, rolling	1,489	0.3
247D	Glennie-Bamfield complex, hilly	157	*
250D	Glossic Eutroboralfs-Borosaprists, euic, complex, nearly level to hilly	715	0.2
252A	Borosaprists, euic-Au Gres complex, nearly level	274	0.1
253A	Au Gres-Allendale-Croswell sands, nearly level	1,921	0.4
262A	Au Gres sand, nearly level	1,363	0.3
263A	Alfic Haplaquods, nearly level	2,099	0.5
264A	Allendale loamy sand, nearly level	261	0.1
272	Haplaquods-Fluvaquents complex	1,519	0.3
273	Leafriver-Wakeley complex	2,084	0.5
274	Typic Haplaquods	567	0.1
280	Aquents and Histosols, ponded	447	0.1
281	Borosaprists, dysic	1,473	0.3
282	Borosaprists, euic	5,690	1.3
	Water areas less than 40 acres in size	4,291	1.0
	Water areas more than 40 acres in size	10,560	2.4
	Total	445,126	100.0

* Less than 0.05 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
36B	Alcona loamy very fine sand, moderately wet, 0 to 6 percent slopes
37A	Richter loamy fine sand, 0 to 3 percent slopes (where drained)
38	Tonkey silt loam (where drained)
40A	Sprinkler sandy loam, 0 to 3 percent slopes (where drained)
41B	McGinn loamy sand, 0 to 6 percent slopes
42A	Killmaster sandy loam, 0 to 3 percent slopes (where drained)
44B	Bamfield fine sandy loam, moderately wet, 0 to 6 percent slopes
45B	Hoist sandy loam, moderately wet, 0 to 6 percent slopes
46	Ensley mucky sandy loam (where drained)
53B	Negwegon silt loam, moderately wet, 2 to 6 percent slopes
54A	Algonquin silt loam, 0 to 3 percent slopes (where drained)
55	Springport clay loam (where drained)
56B	Nester loam, moderately wet, 0 to 6 percent slopes
57B	Kawkawlin loam, 1 to 4 percent slopes (where drained)
59B	Algonquin-Springport complex, 0 to 6 percent slopes (where drained)
97	Colonville very fine sandy loam, occasionally flooded (where drained)

Table 6.--Land Capability and Yields per Acre of Crops

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
11B Eastport	VIs	---	---	---	---	---
12B Tawas-Au Gres	VIw	---	---	---	---	---
16B Graycalm	IVs	---	---	---	---	---
16C, 16D Graycalm	VIs	---	---	---	2.3	---
16E Graycalm	VIIs	---	---	---	---	---
17B Croswell	IVs	50	9	50	2.5	25
18A Au Gres	IVw	55	10	45	---	25
19 Leafriver	VIw	---	---	---	---	---
26B Croswell	IVs	---	---	50	2.5	25
27A Au Gres	IVw	---	---	---	---	---
28B East Lake	IVs	---	---	---	---	---
28C East Lake	VIs	---	---	---	---	---
28E East Lake	VIIs	---	---	---	---	---
29A Battlefield	IVw	---	---	---	---	---
30 Wheatley	Vw	---	---	---	---	---
31B Klacking	IIIs	---	11	60	3.0	---
31C Klacking	IIIe	---	---	---	---	---
31D Klacking	IVe	---	---	---	---	---
31E Klacking	VIIe	---	---	---	---	---
33B Mancelona	IIIs	65	12	60	2.8	28

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
33C---------- Mancelona	IIIe	60	11	55	2.4	24
33D---------- Mancelona	IVe	---	---	---	---	---
33E---------- Mancelona	VIIe	---	---	---	---	---
35---------- Kinross	VIw	---	---	---	---	---
36B---------- Alcona	IIe	85	13	75	3.5	35
36C---------- Alcona	IIIe	75	11	65	3.2	30
37A---------- Richter	IIw	85	14	80	3.5	35
38---------- Tonkey	Vw	---	---	---	---	---
39B---------- Glennie	IIIs	75	12	---	3.5	---
39C---------- Glennie	IIIe	70	11	---	3.2	---
40A---------- Sprinkler	IIw	80	13	80	---	---
41B---------- McGinn	IIIs	65	11	60	3.0	---
41C---------- McGinn	IIIe	60	11	55	2.6	---
41D---------- McGinn	IVe	---	---	---	---	---
42A---------- Killmaster	IIw	---	14	80	---	35
43---------- Wakeley	Vw	---	---	---	---	---
44B---------- Bamfield	IIe	85	14	76	4.0	---
45B---------- Hoist	IIe	80	15	75	3.8	---
45C---------- Hoist	IIIe	75	13	70	3.6	---
46---------- Ensley	Vw	---	---	---	---	---
53B---------- Negwegon	IIIe	75	12	70	3.5	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
53C---------- Negwegon	IIIe	68	10	65	3.1	---
54A---------- Algonquin	IIIw	80	13	75	3.5	---
55---------- Springport	IIIw	85	14	75	3.5	---
56B---------- Nester	IIe	80	14	75	3.7	40
56C---------- Nester	IIIe	70	13	70	3.5	36
57B---------- Kawkawlin	IIe	85	16	80	3.8	42
59B---------- Algonquin-Springport	IIIe	56	9	52	2.5	---
60D---------- Glennie	IVe	---	---	---	---	---
60E---------- Glennie	VIIe	---	---	---	---	---
61C---------- Manistee	IIIe	65	12	65	3.2	30
61D---------- Manistee	IVe	---	---	---	---	---
61F---------- Manistee	VIIe	---	---	---	---	---
62A---------- Allendale	IIIw	85	14	75	3.5	40
63C---------- Bamfield	IIIe	80	13	75	3.5	---
63D---------- Bamfield	IVe	---	---	---	---	---
63F---------- Bamfield	VIIe	---	---	---	---	---
66D---------- Alcona	IVe	---	---	---	---	---
66E---------- Alcona	VIIe	---	---	---	---	---
68---------- Rondeau	VIw	---	---	---	---	---
69---------- Loxley	VIIw	---	---	---	---	---
70---------- Lupton	VIw	---	---	---	---	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
71--Tawas	VIw	---	---	---	---	---
72--Dorval	Vw	---	---	---	---	---
73--Markey	Vw	---	---	---	---	---
74C2--Negwegon	IIIe	65	9	60	3.0	---
77--Waucedah	Vw	---	---	---	---	---
78 Pits						
80F--Zimmerman-Alcona	VIIe	---	---	---	---	---
81B, 81C--Grayling	VIs	---	---	---	---	---
81E--Grayling	VIIs	---	---	---	---	---
82C. Udorthents						
83F. Udipsamments						
84B--Zimmerman	IVs	---	---	---	---	---
84C, 84D--Zimmerman	VIs	---	---	---	---	---
85B--Zimmerman-Alcona	IVs	66	12	56	---	---
85D--Zimmerman-Alcona	VIs	---	---	---	---	---
86. Histosols and Aquents						
87--Ausable	VIIw	---	---	---	---	---
88D--Hoist	IVe	70	11	60	3.4	---
89F--Bamfield-Lupton	VIIe	---	---	---	---	---
90B--Chinwhisker	IVs	---	---	---	---	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
91E---------- Glennie-Lupton	VIe	---	---	---	---	---
92B---------- Klacking-McGinn	IIIs	---	---	---	---	---
93B---------- Au Gres-Wakeley	IVw	---	---	---	---	---
94F---------- Klacking-McGinn	VIIe	---	---	---	---	---
96D2---------- Negwegon	IVe	---	---	---	2.8	---
97---------- Colonville	Vw	---	---	---	---	---
98C---------- Graycalm	VIs	---	---	---	---	---
102D---------- Nester	IVe	60	11	65	3.1	32
102E---------- Nester	VIe	---	---	---	2.7	---
102F---------- Nester	VIIe	---	---	---	---	---
110D---------- Negwegon	IVe	---	---	---	2.8	---
110F---------- Negwegon	VIIe	---	---	---	---	---
111B---------- Manistee	IIIs	75	12	70	3.5	35
209B, 210B---------- Grayling	VIs	---	---	---	---	---
210C---------- Grayling	VIIs	---	---	---	---	---
210D---------- Grayling	VIIs	---	---	---	---	---
211B---------- Grayling	VIs	---	---	---	---	---
211C---------- Grayling	VIIs	---	---	---	---	---
212B---------- Grayling	VIs	---	---	---	---	---
213B---------- Graycalm	IVs	---	---	---	---	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
213C---------- Graycalm	VIs	---	---	---	2.3	---
215C---------- Typic Udipsamments	VIIs	---	---	---	---	---
220B---------- Typic Udipsamments	VIs	---	---	---	---	---
220C---------- Typic Udipsamments	VIIs	---	---	---	---	---
220D, 220E---------- Typic Udipsamments	VIIs	---	---	---	---	---
221B---------- Typic Udipsamments	VIs	---	---	---	---	---
221C, 221D---------- Typic Udipsamments	VIIs	---	---	---	---	---
222B---------- Typic Udipsamments	VIs	---	---	---	---	---
223B---------- Graycalm-Grayling	IVs	---	---	---	---	---
223C---------- Graycalm-Grayling	VIs	---	---	---	---	---
223D---------- Graycalm-Grayling	VIIs	---	---	---	---	---
224B---------- Croswell	IVs	---	---	---	---	---
225B---------- Entic Haplorthods	VIs	---	---	---	---	---
225C---------- Entic Haplorthods	VIIs	---	---	---	---	---
230C---------- Entic Haplorthods-Alfic Haplorthods	VIIs	---	---	---	---	---
231B---------- Entic Haplorthods-Alfic Haplorthods	VIs	---	---	---	---	---
231C, 231D---------- Entic Haplorthods-Alfic Haplorthods	VIIs	---	---	---	---	---
232B---------- Entic Haplorthods-Alfic Haplorthods	VIs	---	---	---	---	---
233B---------- Alfic Haplorthods-Entic Haplorthods	IIIs	---	---	---	---	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
233C---------- Alfic Haplorthods-Entic Haplorthods	IVe	---	---	---	---	---
233D---------- Alfic Haplorthods-Entic Haplorthods	VIIe	---	---	---	---	---
235B---------- Alfic Haplorthods-Alfic Haplorthods	IIIs	---	---	---	---	---
235C---------- Alfic Haplorthods-Alfic Haplorthods	IVe	---	---	---	---	---
235D---------- Alfic Haplorthods-Alfic Haplorthods	VIIe	---	---	---	---	---
236B, 236C. Arenic Eutroboralfs						
237B, 237C, 237D. Glossic Eutroboralfs						
247B---------- Glennie-Bamfield	IIIs	---	---	---	---	---
247C---------- Glennie-Bamfield	IVe	---	---	---	---	---
247D---------- Glennie-Bamfield	VIe	---	---	---	---	---
250D. Glossic Eutroboralfs-Borosaprists						
252A. Borosaprists-Au Gres						
253A---------- Au Gres-Allendale-Croswell	IVw	---	---	---	---	---
262A---------- Au Gres	IVw	---	---	---	---	---
263A. Alfic Haplaquods						
264A---------- Allendale	IIIw	---	---	---	---	---
272. Haplaquods-Fluvaquents						
273---------- Leafriver-Wakeley	VIw	---	---	---	---	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Corn	Corn, silage	Oats	Alfalfa hay	Winter wheat
		Bu	Tons	Bu	Tons	Bu
274. Typic Haplaquods						
280. Aquents and Histosols						
281, 282. Borosaprists						

Table 7.--Capability Classes and Subclasses

(Miscellaneous areas and taxonomic units mapped above the family level are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	---	---	---	---
II	40,678	29,125	11,553	---
III	101,439	62,716	13,145	25,578
IV	90,871	31,676	29,405	29,790
V	7,661	---	7,661	---
VI	105,142	4,294	38,368	62,480
VII	54,368	36,623	1,962	15,783
VIII	---	---	---	---

Table 8.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
11B---------- Eastport	5S	Slight	Moderate	Moderate	Slight	Red pine----------	47	69	Red pine, jack pine, eastern white pine.
						Jack pine----------	---	---	
						Quaking aspen-------	---	---	
						Eastern white pine--	---	---	
						Paper birch---------	---	---	
						Red maple----------	---	---	
12B:									
Tawas----------	5W	Slight	Severe	Severe	Severe	Balsam fir----------	40	71	---
						Northern whitecedar-	---	---	
						Quaking aspen-------	---	---	
						Black ash----------	---	---	
						Red maple----------	---	---	
Au Gres--------	6W	Slight	Severe	Moderate	Severe	Quaking aspen-------	70	81	White spruce, red pine, eastern white pine, Norway spruce.
						Bigtooth aspen------	---	---	
						Balsam fir----------	---	---	
						Paper birch---------	---	---	
						Red maple----------	65	40	
						Eastern white pine--	---	---	
						Northern whitecedar-	---	---	
						Jack pine----------	51	69	
						Red pine----------	61	104	
16B, 16C, 16D--- Graycalm	6S	Slight	Moderate	Moderate	Slight	Bigtooth aspen------	70	81	Red pine, eastern white pine.
						Northern red oak----	62	54	
						Jack pine----------	56	78	
						Red pine----------	61	104	
						Eastern white pine--	---	---	
						Quaking aspen-------	60	64	
16E---------- Graycalm	6R	Moderate	Moderate	Moderate	Slight	Bigtooth aspen------	70	81	Red pine, eastern white pine.
						Northern red oak----	62	54	
						Jack pine----------	56	78	
						Red pine----------	61	104	
						Eastern white pine--	---	---	
						Quaking aspen-------	60	64	
17B---------- Croswell	5S	Slight	Moderate	Moderate	Moderate	Quaking aspen-------	68	78	Red pine, eastern white pine, white spruce.
						Red pine----------	55	88	
						Jack pine----------	53	73	
						Northern red oak----	---	---	
						Black cherry--------	---	---	
						Eastern white pine--	---	---	
						Bigtooth aspen------	69	80	
						Red maple----------	---	---	
						Paper birch---------	54	55	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
18A---------- Au Gres	6W	Slight	Severe	Moderate	Severe	Quaking aspen-------	70	81	White spruce, red pine, eastern white pine, Norway spruce.
						Bigtooth aspen------	---	---	
						Balsam fir----------	---	---	
						Paper birch---------	---	---	
						Red maple-----------	65	40	
						Eastern white pine--	---	---	
						Northern whitecedar-	---	---	
						Jack pine-----------	51	69	
						Red pine------------	61	104	
19---------- Leafriver	2W	Slight	Severe	Severe	Severe	Quaking aspen-------	45	32	---
						Northern whitecedar-	---	---	
						Tamarack------------	---	---	
						Black spruce--------	---	---	
26B---------- Croswell	7S	Slight	Moderate	Moderate	Slight	Red pine------------	60	107	Red pine, eastern white pine, jack pine.
						Jack pine-----------	---	---	
						Eastern white pine--	---	---	
						Northern pin oak----	---	---	
						Quaking aspen-------	---	---	
						Bigtooth aspen------	---	---	
						Northern red oak----	---	---	
						Red maple-----------	---	---	
						American basswood---	---	---	
						Paper birch---------	---	---	
27A---------- Au Gres	7W	Slight	Severe	Moderate	Moderate	Red pine------------	58	96	Red pine, eastern white pine, white spruce.
						Eastern white pine--	---	---	
						Paper birch---------	---	---	
						Quaking aspen-------	---	---	
28B, 28C-------- East Lake	2S	Slight	Moderate	Moderate	Slight	Red maple-----------	53	34	Red pine, jack pine, eastern white pine.
						Northern red oak----	---	---	
						Quaking aspen-------	---	---	
						Red pine------------	55	88	
						Jack pine-----------	---	---	
						Paper birch---------	---	---	
28E---------- East Lake	2R	Moderate	Moderate	Moderate	Slight	Red maple-----------	53	34	Red pine, jack pine, eastern white pine.
						Northern red oak----	---	---	
						Quaking aspen-------	---	---	
						Red pine------------	55	88	
						Jack pine-----------	---	---	
						Paper birch---------	---	---	
29A---------- Battlefield	5W	Slight	Severe	Moderate	Severe	Quaking aspen-------	68	78	White spruce.
						Red maple-----------	---	---	
						Balsam fir----------	---	---	
						Paper birch---------	---	---	
30---------- Wheatley	2W	Slight	Severe	Severe	Severe	Quaking aspen-------	45	32	White spruce, Norway spruce, eastern white pine.
						Balsam fir----------	40	71	
						Northern whitecedar-	15	18	
						Black spruce--------	15	23	
						Red maple-----------	40	24	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
31B, 31C, 31D---Klacking	6S	Slight	Slight	Moderate	Slight	Bigtooth aspen	70	81	Eastern white pine, red pine.
						White oak	57	46	
						Northern red oak	60	51	
						Red maple	---	---	
						Paper birch	---	---	
31E---Klacking	6R	Moderate	Moderate	Moderate	Slight	Bigtooth aspen	70	81	Eastern white pine, red pine.
						White oak	57	46	
						Northern red oak	60	51	
						Red maple	---	---	
						Paper birch	---	---	
33B, 33C, 33D---Mancelona	3A	Slight	Slight	Slight	Slight	Northern red oak	55	42	Red pine, eastern white pine, jack pine.
						Red pine	---	---	
						Jack pine	---	---	
						Eastern white pine	---	---	
						White oak	---	---	
33E---Mancelona	3R	Moderate	Moderate	Slight	Slight	Northern red oak	55	42	Red pine, eastern white pine, jack pine.
						Red pine	---	---	
						Jack pine	---	---	
						Eastern white pine	---	---	
						White oak	---	---	
35---Kinross	2W	Slight	Severe	Severe	Severe	Quaking aspen	45	32	---
						Black spruce	---	---	
						Tamarack	---	---	
						Balsam fir	---	---	
						Red maple	---	---	
						Jack pine	---	---	
						Eastern white pine	---	---	
						Paper birch	---	---	
36B, 36C---Alcona	3L	Slight	Moderate	Slight	Slight	Sugar maple	61	38	White spruce, red pine, eastern white pine.
						Red maple	---	---	
						American basswood	---	---	
						American beech	---	---	
						Northern red oak	---	---	
						Eastern white pine	---	---	
						White ash	---	---	
						Red pine	---	---	
37A---Richter	3W	Slight	Severe	Moderate	Severe	Red maple	65	40	White spruce, northern whitecedar, eastern white pine.
						Balsam fir	---	---	
						Black ash	---	---	
						Eastern white pine	---	---	
						Paper birch	65	73	
						Quaking aspen	---	---	
38---Tonkey	5W	Slight	Severe	Severe	Severe	Quaking aspen	61	66	---
						Balsam fir	---	---	
						Northern whitecedar	---	---	
						Red maple	---	---	
						Black ash	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
39B, 39C--Glennie	5D	Slight	Moderate	Slight	Moderate	Northern red oak	72	69	White spruce, red pine, eastern white pine.
						Red maple	---	---	
						Bigtooth aspen	---	---	
						Paper birch	---	---	
						American beech	---	---	
						Balsam fir	---	---	
						Eastern white pine	---	---	
						White ash	---	---	
40A--Sprinkler	3W	Slight	Severe	Moderate	Severe	Red maple	60	38	White spruce, eastern white pine.
						Paper birch	---	---	
						Bigtooth aspen	---	---	
						Quaking aspen	---	---	
						Black ash	---	---	
						Eastern white pine	---	---	
						Balsam fir	---	---	
41B, 41C, 41D--McGinn	4S	Slight	Slight	Slight	Slight	Northern red oak	67	61	Red pine, white spruce.
						Red pine	---	---	
						White oak	65	59	
						Bigtooth aspen	---	---	
42A--Killmaster	4W	Slight	Severe	Slight	Moderate	Bigtooth aspen	60	64	Eastern white pine, white ash, white spruce.
						Paper birch	---	---	
						White spruce	---	---	
						Northern red oak	---	---	
						White ash	---	---	
						American basswood	---	---	
						Balsam fir	---	---	
						Red maple	---	---	
43--Wakeley	3W	Slight	Severe	Severe	Severe	Quaking aspen	50	48	Northern whitecedar.
						Black spruce	---	---	
						Balsam fir	---	---	
						Northern whitecedar	---	---	
44B--Bamfield	3L	Slight	Moderate	Slight	Moderate	Sugar maple	61	38	White spruce, red pine, eastern white pine, Norway spruce.
						Northern red oak	---	---	
						Bigtooth aspen	---	---	
						American basswood	---	---	
						Paper birch	---	---	
						American beech	---	---	
						White ash	---	---	
						Eastern hemlock	---	---	
45B, 45C--Hoist	3L	Slight	Moderate	Slight	Slight	Sugar maple	66	41	White spruce, red pine, eastern white pine.
						Northern red oak	74	72	
						Quaking aspen	---	---	
						Eastern white pine	---	---	
						Red pine	---	---	
						White ash	---	---	
						American basswood	---	---	
						Paper birch	---	---	
						Balsam fir	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
46--Ensley	3W	Slight	Severe	Severe	Severe	Red maple	62	39	Green ash, white spruce.
						Balsam fir	60	118	
						White spruce	---	---	
						White ash	---	---	
						Yellow birch	---	---	
						Black ash	---	---	
53B, 53C--Negwegon	3L	Slight	Moderate	Slight	Moderate	Sugar maple	62	39	White spruce, eastern white pine.
						Bigtooth aspen	---	---	
						White ash	---	---	
						Northern red oak	---	---	
						Balsam fir	---	---	
						Eastern hemlock	---	---	
						American beech	---	---	
54A--Algonquin	6W	Slight	Severe	Moderate	Severe	Balsam fir	45	83	White spruce, eastern white pine, northern whitecedar.
						Quaking aspen	---	---	
						Balsam poplar	---	---	
						Paper birch	---	---	
						Black ash	---	---	
						Red maple	---	---	
						Northern whitecedar	---	---	
55--Springport	6W	Slight	Severe	Severe	Severe	Balsam fir	45	83	White spruce, eastern white pine, northern whitecedar.
						Quaking aspen	---	---	
						Northern whitecedar	---	---	
						Paper birch	---	---	
						Black ash	---	---	
						Balsam poplar	---	---	
56B, 56C--Nester	3L	Slight	Moderate	Slight	Slight	Sugar maple	61	38	White spruce, red pine, eastern white pine.
						Quaking aspen	---	---	
						White ash	---	---	
						American basswood	---	---	
						Northern red oak	---	---	
						White oak	---	---	
						American beech	---	---	
57B--Kawkawlin	3W	Slight	Severe	Slight	Moderate	Sugar maple	60	38	White spruce, red pine, Norway spruce, eastern white pine.
						Red maple	---	---	
						White ash	---	---	
						American basswood	---	---	
						Quaking aspen	---	---	
						Bigtooth aspen	---	---	
59B:									
Algonquin	6W	Slight	Severe	Moderate	Severe	Balsam fir	45	83	White spruce, eastern white pine, northern whitecedar.
						Quaking aspen	---	---	
						Balsam poplar	---	---	
						Paper birch	---	---	
						Black ash	---	---	
						Red maple	---	---	
						Northern whitecedar	---	---	
Springport	6W	Slight	Severe	Severe	Severe	Balsam fir	45	83	White spruce, eastern white pine, northern whitecedar.
						Quaking aspen	---	---	
						Northern whitecedar	---	---	
						Paper birch	---	---	
						Black ash	---	---	
						Balsam poplar	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
60D---------- Glennie	5D	Slight	Moderate	Slight	Moderate	Northern red oak----	72	69	White spruce, red pine, eastern white pine.
						Red maple----------	---	---	
						Bigtooth aspen------	---	---	
						Paper birch---------	---	---	
						American beech------	---	---	
						Balsam fir----------	---	---	
						Eastern white pine--	---	---	
						White ash----------	---	---	
60E---------- Glennie	5R	Moderate	Moderate	Slight	Moderate	Northern red oak----	72	69	White spruce, red pine, eastern white pine.
						Red maple----------	---	---	
						Bigtooth aspen------	---	---	
						Paper birch---------	---	---	
						American beech------	---	---	
						Balsam fir----------	---	---	
						Eastern white pine--	---	---	
						White ash----------	---	---	
61C, 61D-------- Manistee	3A	Slight	Slight	Slight	Slight	Sugar maple---------	67	41	Red pine, eastern white pine.
						Eastern white pine--	---	---	
						Red maple----------	---	---	
						Red pine-----------	---	---	
						American basswood---	---	---	
						Northern red oak----	56	44	
						White ash----------	---	---	
						Bigtooth aspen------	74	86	
61F---------- Manistee	3R	Severe	Severe	Slight	Slight	Sugar maple---------	67	41	Red pine, eastern white pine.
						Eastern white pine--	---	---	
						Red maple----------	---	---	
						Red pine-----------	---	---	
						American basswood---	---	---	
						Northern red oak----	56	44	
						White ash----------	---	---	
						Bigtooth aspen------	74	86	
62A---------- Allendale	4W	Slight	Severe	Slight	Moderate	Quaking aspen-------	60	64	White spruce, eastern white pine.
						Eastern white pine--	---	---	
						White spruce--------	---	---	
						Paper birch---------	---	---	
						Balsam fir----------	---	---	
						Red maple----------	---	---	
						Black ash----------	---	---	
63C, 63D-------- Bamfield	3L	Slight	Moderate	Slight	Slight	Sugar maple---------	61	38	Red pine, white spruce, eastern white pine, Norway spruce.
						Northern red oak----	---	---	
						Bigtooth aspen------	---	---	
						American basswood---	---	---	
						Paper birch---------	---	---	
						American beech------	---	---	
						White ash----------	---	---	
						Eastern hemlock-----	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
63F Bamfield	3R	Severe	Severe	Slight	Slight	Sugar maple Northern red oak Bigtooth aspen American basswood Paper birch American beech White ash Eastern hemlock	61 --- --- --- --- --- --- ---	38 --- --- --- --- --- --- ---	Red pine, white spruce, eastern white pine, Norway spruce.
66D Alcona	3L	Slight	Moderate	Slight	Slight	Sugar maple Red maple American basswood American beech Northern red oak Eastern white pine White ash Red pine	61 --- --- --- --- --- --- ---	38 --- --- --- --- --- --- ---	White spruce, red pine, eastern white pine.
66E Alcona	3R	Moderate	Moderate	Slight	Slight	Sugar maple Red maple American basswood American beech Northern red oak Eastern white pine White ash Red pine	61 --- --- --- --- --- --- ---	38 --- --- --- --- --- --- ---	White spruce, red pine, eastern white pine.
69 Loxley	2W	Slight	Severe	Severe	Severe	Black spruce Tamarack Balsam fir	15 --- ---	23 --- ---	---
70 Lupton	2W	Slight	Severe	Severe	Severe	Black spruce Balsam fir Black ash Northern whitecedar Paper birch Tamarack Red maple Quaking aspen White spruce	20 46 --- --- --- --- --- --- ---	29 86 --- --- --- --- --- --- ---	---
71 Tawas	5W	Slight	Severe	Severe	Severe	Balsam fir Northern whitecedar Quaking aspen Black ash Red maple Black spruce	40 --- --- --- --- ---	71 --- --- --- --- ---	---
72 Dorval	2W	Slight	Severe	Severe	Severe	Red maple White ash American elm Northern whitecedar	50 --- --- ---	32 --- --- ---	Northern whitecedar, white spruce.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
77--------- Waucedah	3W	Slight	Severe	Severe	Severe	Northern whitecedar	30	42	---
						Balsam fir	40	71	
						Black ash	---	---	
						Quaking aspen	40	22	
						Red maple	---	---	
						Black spruce	---	---	
80F:									
Zimmerman------	8R	Severe	Severe	Moderate	Slight	Red pine	64	112	Red pine, jack pine, eastern white pine, white spruce.
						Quaking aspen	70	81	
						Red maple	---	---	
						Paper birch	---	---	
						Eastern white pine	---	---	
Alcona---------	3R	Severe	Severe	Slight	Slight	Sugar maple	61	38	White spruce, red pine, eastern white pine.
						Red maple	---	---	
						American basswood	---	---	
						American beech	---	---	
						Northern red oak	---	---	
						Eastern white pine	---	---	
						White ash	---	---	
						Red pine	---	---	
81B, 81C-------- Grayling	4S	Slight	Moderate	Moderate	Slight	Jack pine	48	63	Jack pine, red pine.
						Northern pin oak	43	28	
						White oak	---	---	
						Red pine	---	---	
						Quaking aspen	---	---	
81E---------- Grayling	4R	Moderate	Moderate	Moderate	Slight	Jack pine	48	63	Jack pine, red pine.
						Northern pin oak	43	28	
						White oak	---	---	
						Red pine	---	---	
						Quaking aspen	---	---	
84B, 84C, 84D--- Zimmerman	8S	Slight	Moderate	Moderate	Slight	Red pine	64	112	Red pine, jack pine, eastern white pine, white spruce.
						Quaking aspen	70	81	
						Red maple	---	---	
						Jack pine	65	94	
						Paper birch	---	---	
85B, 85D:									
Zimmerman------	8S	Slight	Moderate	Moderate	Slight	Red pine	64	112	Red pine, jack pine, eastern white pine, white spruce.
						Quaking aspen	70	81	
						Red maple	---	---	
						Paper birch	---	---	
						Eastern white pine	---	---	
Alcona---------	3L	Slight	Moderate	Slight	Slight	Sugar maple	61	38	White spruce, red pine, eastern white pine.
						Red maple	---	---	
						American basswood	---	---	
						American beech	---	---	
						Northern red oak	---	---	
						Eastern white pine	---	---	
						White ash	---	---	
						Red pine	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
87---------- Ausable	2W	Slight	Severe	Severe	Severe	Northern whitecedar-	15	25	---
						Balsam poplar-------	---	---	
						Paper birch---------	---	---	
						Black ash-----------	---	---	
88D---------- Hoist	3L	Slight	Moderate	Slight	Slight	Sugar maple---------	66	41	White spruce,
						Northern red oak----	74	72	red pine,
						Quaking aspen-------	---	---	eastern white
						Eastern white pine--	---	---	pine.
						Red pine------------	---	---	
						White ash-----------	---	---	
						American beech------	---	---	
						American basswood---	---	---	
						Paper birch---------	---	---	
89F:									
Bamfield-------	3R	Moderate	Moderate	Slight	Slight	Sugar maple---------	61	38	Red pine, white
						Northern red oak----	---	---	spruce,
						Bigtooth aspen------	---	---	eastern white
						American basswood---	---	---	pine, Norway
						Paper birch---------	---	---	spruce.
						American beech------	---	---	
						White ash-----------	---	---	
						Eastern hemlock-----	---	---	
Lupton.									
90B---------- Chinwhisker	6S	Slight	Moderate	Moderate	Slight	Bigtooth aspen------	70	81	Jack pine,
						Quaking aspen-------	---	---	eastern white
						Jack pine-----------	56	78	pine, white
						Paper birch---------	---	---	spruce.
						Red maple-----------	---	---	
91E:									
Glennie--------	5R	Moderate	Moderate	Slight	Moderate	Northern red oak----	72	69	White spruce,
						Red maple-----------	---	---	red pine,
						Bigtooth aspen------	---	---	eastern white
						Paper birch---------	---	---	pine.
						American beech------	---	---	
						Balsam fir----------	---	---	
						Eastern white pine--	---	---	
						White ash-----------	---	---	
Lupton.									
92B:									
Klacking-------	6S	Slight	Slight	Moderate	Slight	Bigtooth aspen------	70	81	Eastern white
						White oak-----------	57	46	pine, red
						Northern red oak----	60	51	pine.
						Red maple-----------	---	---	
						Paper birch---------	---	---	
McGinn---------	4S	Slight	Slight	Slight	Slight	Northern red oak----	67	61	Red pine, white
						Red pine------------	---	---	spruce.
						White oak-----------	65	59	
						Bigtooth aspen------	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
93B:									
Au Gres	7W	Slight	Severe	Moderate	Moderate	Red pine	58	96	Red pine, eastern white pine, white spruce.
						Eastern white pine	---	---	
						Paper birch	---	---	
						Quaking aspen	---	---	
Wakeley	3W	Slight	Severe	Severe	Severe	Quaking aspen	50	43	Northern whitecedar.
						Black spruce	---	---	
						Balsam fir	---	---	
						Northern whitecedar	---	---	
94F:									
Klacking	6R	Severe	Severe	Moderate	Slight	Bigtooth aspen	70	81	Eastern white pine, red pine.
						White oak	57	46	
						Northern red oak	60	51	
						Red maple	---	---	
						Paper birch	---	---	
McGinn	4R	Moderate	Moderate	Slight	Slight	Northern red oak	67	61	Red pine, white spruce.
						Red pine	---	---	
						White oak	65	59	
						Bigtooth aspen	---	---	
97 Colonville	3W	Slight	Severe	Slight	Moderate	Red maple	61	38	White spruce, northern red oak, eastern white pine, northern whitecedar, Norway spruce.
						American basswood	65	59	
						Northern whitecedar	45	67	
						White ash	65	59	
						Balsam fir	61	120	
						Quaking aspen	---	---	
98C Graycalm	6S	Slight	Moderate	Moderate	Slight	Bigtooth aspen	70	81	Red pine, eastern white pine.
						Northern red oak	62	54	
						Jack pine	56	78	
						Red pine	61	104	
						Eastern white pine	---	---	
						Quaking aspen	60	64	
102D Nester	3L	Slight	Moderate	Slight	Slight	Sugar maple	61	38	White spruce, red pine, Norway spruce, eastern white pine.
						Quaking aspen	---	---	
						White ash	---	---	
						American basswood	---	---	
						Northern red oak	---	---	
						White oak	---	---	
						American beech	---	---	
102E Nester	3R	Moderate	Moderate	Slight	Slight	Sugar maple	61	38	White spruce, red pine, Norway spruce, eastern white pine.
						Quaking aspen	---	---	
						White ash	---	---	
						American basswood	---	---	
						Northern red oak	---	---	
						White oak	---	---	
						American beech	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
102F---------- Nester	3R	Severe	Severe	Slight	Slight	Sugar maple---------	61	38	White spruce,
						Quaking aspen-------	---	---	red pine,
						White ash-----------	---	---	Norway spruce,
						American basswood---	---	---	eastern white
						Northern red oak----	---	---	pine.
						White oak-----------	---	---	
						American beech------	---	---	
110D---------- Negwegon	3L	Moderate	Moderate	Slight	Moderate	Sugar maple---------	62	39	White spruce,
						Bigtooth aspen------	---	---	eastern white
						White ash-----------	---	---	pine.
						Northern red oak----	---	---	
						Balsam fir----------	---	---	
						Eastern hemlock-----	---	---	
						American beech------	---	---	
110F---------- Negwegon	3R	Severe	Severe	Slight	Moderate	Sugar maple---------	62	39	White spruce,
						Bigtooth aspen------	---	---	eastern white
						White ash-----------	---	---	pine.
						Northern red oak----	---	---	
						Balsam fir----------	---	---	
						Eastern hemlock-----	---	---	
						American beech------	---	---	
111B---------- Manistee	3A	Slight	Slight	Slight	Slight	Sugar maple---------	67	41	Red pine,
						Eastern white pine--	---	---	eastern white
						Red maple-----------	---	---	pine.
						Red pine------------	---	---	
						American basswood---	---	---	
						Eastern hemlock-----	---	---	
						Northern red oak----	56	44	
						White ash-----------	---	---	
						Bigtooth aspen------	74	86	
209B---------- Grayling	4S	Slight	Moderate	Moderate	Slight	Jack pine-----------	48	63	Jack pine, red
						Northern pin oak----	43	28	pine.
						White oak-----------	---	---	
						Red pine------------	---	---	
						Quaking aspen-------	---	---	
210B, 210C------ Grayling	4S	Slight	Moderate	Moderate	Slight	Jack pine-----------	48	63	Jack pine, red
						Northern pin oak----	43	28	pine.
						White oak-----------	---	---	
						Red pine------------	---	---	
						Quaking aspen-------	---	---	
210D---------- Grayling	4R	Moderate	Moderate	Moderate	Slight	Jack pine-----------	48	63	Jack pine, red
						Northern pin oak----	43	28	pine.
						White oak-----------	---	---	
						Red pine------------	---	---	
						Quaking aspen-------	---	---	
211B, 211C------ Grayling	4S	Slight	Moderate	Moderate	Slight	Jack pine-----------	48	63	Jack pine, red
						Northern pin oak----	43	28	pine.
212B---------- Grayling	4S	Slight	Moderate	Moderate	Slight	Jack pine-----------	48	63	Jack pine, red
						Northern pin oak----	43	28	pine.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
213B, 213C---------- Graycalm	6S	Slight	Moderate	Moderate	Slight	Bigtooth aspen------	70	81	Red pine, eastern white pine.
						Northern red oak----	62	54	
						Jack pine----------	56	78	
						Red pine----------	61	104	
						Eastern white pine--	---	---	
						Quaking aspen-------	60	64	
215C, 220B, 220C---------- Typic Udipsamments	---	Slight	Moderate	Moderate	Slight	---	---	---	---
220D---------- Typic Udipsamments	---	Moderate	Moderate	Moderate	Slight	---	---	---	---
220E---------- Typic Udipsamments	---	Severe	Severe	Moderate	Slight	---	---	---	---
221B, 221C---------- Typic Udipsamments	---	Slight	Moderate	Moderate	Slight	---	---	---	---
221D---------- Typic Udipsamments	---	Moderate	Moderate	Moderate	Slight	---	---	---	---
222B---------- Typic Udipsamments	---	Slight	Moderate	Moderate	Slight	---	---	---	---
223B, 223C:									
Graycalm-------	6S	Slight	Moderate	Moderate	Slight	Bigtooth aspen------	70	81	Red pine, eastern white pine.
						Northern red oak----	62	54	
						Jack pine----------	56	78	
						Red pine----------	61	104	
						Eastern white pine--	---	---	
						Quaking aspen-------	60	64	
Grayling-------	4S	Slight	Moderate	Moderate	Slight	Jack pine----------	48	63	Jack pine, red pine.
						Northern pin oak----	43	28	
						White oak----------	---	---	
						Red pine----------	---	---	
						Quaking aspen-------	---	---	
223D:									
Graycalm-------	6R	Slight	Moderate	Moderate	Slight	Bigtooth aspen------	70	81	Red pine, eastern white pine.
						Northern red oak----	62	54	
						Jack pine----------	56	78	
						Red pine----------	61	104	
						Eastern white pine--	---	---	
						Quaking aspen-------	60	64	
Grayling-------	4R	Moderate	Moderate	Moderate	Slight	Jack pine----------	48	63	Jack pine, red pine.
						Northern pin oak----	43	28	
						White oak----------	---	---	
						Red pine----------	---	---	
						Quaking aspen-------	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
224B---------- Croswell	5S	Slight	Moderate	Moderate	Moderate	Quaking aspen-------	68	78	Red pine, eastern white pine, white spruce.
						Red pine----------	55	88	
						Jack pine----------	53	73	
						Northern red oak----	---	---	
						Black cherry--------	---	---	
						Eastern white pine--	---	---	
						Bigtooth aspen------	69	80	
						Red maple----------	---	---	
						Paper birch---------	54	55	
225B, 225C------ Entic Haplorthods	---	Slight	Moderate	Moderate	Slight	---	---	---	---
230C, 231B, 231C: Entic Haplorthods--	---	Slight	Moderate	Moderate	Slight	---	---	---	---
Alfic Haplorthods--	---	Slight	Slight	Slight	Slight	---	---	---	---
231D: Entic Haplorthods---	---	Moderate	Moderate	Moderate	Slight	---	---	---	---
Alfic Haplorthods---	---	Moderate	Moderate	Slight	Slight	---	---	---	---
232B: Entic Haplorthods---	---	Slight	Moderate	Moderate	Slight	---	---	---	---
Alfic Haplorthods---	---	Slight	Slight	Slight	Slight	---	---	---	---
233B, 233C: Alfic Haplorthods---	---	Slight	Slight	Slight	Slight	---	---	---	---
Entic Haplorthods---	---	Slight	Moderate	Moderate	Slight	---	---	---	---
233D: Alfic Haplorthods---	---	Moderate	Moderate	Slight	Slight	---	---	---	---
Entic Haplorthods---	---	Moderate	Moderate	Moderate	Slight	---	---	---	---

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
235B, 235C:									
Alfic Haplorthods, sandy over loamy	---	Slight	Moderate	Moderate	Slight	---	---	---	---
Alfic Haplorthods, sandy	---	Slight	Slight	Slight	Slight	---	---	---	---
235D:									
Alfic Haplorthods, sandy over loamy	---	Moderate	Moderate	Moderate	Slight	---	---	---	---
Alfic Haplorthods, sandy	---	Moderate	Moderate	Slight	Slight	---	---	---	---
247B, 247C:									
Glennie	5D	Slight	Moderate	Slight	Moderate	Northern red oak	72	69	White spruce, red pine, eastern white pine.
						Red maple	---	---	
						Bigtooth aspen	---	---	
						Paper birch	---	---	
						American beech	---	---	
						Balsam fir	---	---	
						Eastern white pine	---	---	
						White ash	---	---	
Bamfield	3L	Slight	Moderate	Slight	Moderate	Sugar maple	61	38	White spruce, red pine, eastern white pine, Norway spruce.
						Northern red oak	---	---	
						Bigtooth aspen	---	---	
						American basswood	---	---	
						Paper birch	---	---	
						American beech	---	---	
						White ash	---	---	
						Eastern hemlock	---	---	
247D:									
Glennie	5R	Moderate	Moderate	Slight	Moderate	Northern red oak	72	69	White spruce, red pine, eastern white pine.
						Red maple	---	---	
						Bigtooth aspen	---	---	
						Paper birch	---	---	
						American beech	---	---	
						Balsam fir	---	---	
						Eastern white pine	---	---	
						White ash	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
247D:									
Bamfield	3R	Moderate	Moderate	Slight	Slight	Sugar maple	61	38	Red pine, white spruce, eastern white pine, Norway spruce.
						Northern red oak	---	---	
						Bigtooth aspen	---	---	
						American basswood	---	---	
						Paper birch	---	---	
						American beech	---	---	
						White ash	---	---	
						Eastern hemlock	---	---	
252A:									
Borosaprists.									
Au Gres	6W	Slight	Severe	Moderate	Severe	Quaking aspen	70	81	White spruce, red pine, eastern white pine, Norway spruce.
						Bigtooth aspen	---	---	
						Balsam fir	---	---	
						Paper birch	---	---	
						Red maple	65	40	
						Eastern white pine	---	---	
						Northern whitecedar	---	---	
						Jack pine	51	69	
						Red pine	61	104	
253A:									
Au Gres	6W	Slight	Severe	Moderate	Severe	Quaking aspen	70	81	White spruce, red pine, eastern white pine, Norway spruce.
						Bigtooth aspen	---	---	
						Balsam fir	---	---	
						Paper birch	---	---	
						Red maple	65	40	
						Eastern white pine	---	---	
						Northern whitecedar	---	---	
						Jack pine	51	69	
						Red pine	61	104	
Allendale	4W	Slight	Severe	Moderate	Moderate	Quaking aspen	60	64	White spruce, eastern white pine.
						Black ash	---	---	
						Eastern white pine	---	---	
						White spruce	---	---	
						Paper birch	---	---	
						Balsam fir	---	---	
						Red maple	---	---	
Croswell	5S	Slight	Moderate	Moderate	Moderate	Quaking aspen	68	78	Red pine, eastern white pine, white spruce.
						Red pine	55	88	
						Jack pine	53	73	
						Northern red oak	---	---	
						Black cherry	---	---	
						Eastern white pine	---	---	
						Bigtooth aspen	69	6	
						Red maple	---	---	
						Paper birch	54	4	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
262A---------- Au Gres	6W	Slight	Severe	Moderate	Severe	Quaking aspen-------	70	81	White spruce, red pine, eastern white pine, Norway spruce.
						Bigtooth aspen------	---	---	
						Balsam fir----------	---	---	
						Paper birch---------	---	---	
						Red maple-----------	65	40	
						Eastern white pine--	---	---	
						Northern whitecedar-	---	---	
						Jack pine-----------	51	69	
						Red pine------------	61	104	
264A---------- Allendale	4W	Slight	Severe	Slight	Moderate	Quaking aspen-------	60	64	White spruce, eastern white pine.
						Black ash-----------	---	---	
						Eastern white pine--	---	---	
						White spruce--------	---	---	
						Paper birch---------	---	---	
						Balsam fir----------	---	---	
						Red maple-----------	---	---	
273:									
Leafriver------	2W	Slight	Severe	Severe	Severe	Quaking aspen-------	45	32	---
						Northern whitecedar-	---	---	
						Tamarack------------	---	---	
						Black spruce--------	---	---	
Wakeley--------	3W	Slight	Severe	Severe	Severe	Quaking aspen-------	50	43	Northern whitecedar.
						Black spruce--------	---	---	
						Balsam fir----------	---	---	
						Northern whitecedar-	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 9.--Equipment Limitations on Woodland

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
11B---------- Eastport	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
12B:							
Tawas----------	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter---------	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
Au Gres----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight--------	Slight--------	Slight.
16B---------- Graycalm	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Summer, fall, winter.	Slight--------	Slight--------	Slight.
16C, 16D---------- Graycalm	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
16E---------- Graycalm	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
17B---------- Croswell	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
18A---------- Au Gres	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight--------	Slight--------	Slight.
19---------- Leafriver	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight--------	Slight--------	Slight.
26B---------- Croswell	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
27A---------- Au Gres	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight--------	Slight--------	Slight.
28B---------- East Lake	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
28C---East Lake	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
28E---East Lake	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
29A---Battlefield	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, fall, winter.	Slight	Slight	Slight.
30---Wheatley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
31B---Klacking	Slight	Slight	Slight	Year round	Slight	Slight	Slight.
31C, 31D---Klacking	Slight	Moderate: slope.	Slight	Year round	Slight	Moderate: slope.	Slight.
31E---Klacking	Moderate: slope.	Severe: slope.	Moderate: slope.	Year round	Moderate: slope.	Severe: slope.	Moderate: slope.
33B---Mancelona	Slight	Slight	Slight	Year round	Slight	Slight	Slight.
33C, 33D---Mancelona	Slight	Moderate: slope.	Slight	Year round	Slight	Moderate: slope.	Slight.
33E---Mancelona	Moderate: slope.	Severe: slope.	Moderate: slope.	Year round	Moderate: slope.	Severe: slope.	Moderate: slope.
35---Kinross	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
36B---Alcona	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.
36C---Alcona	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
37A---Richter	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight	Slight	Slight.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
38--Tonkey	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight	Slight	Slight.
39B--Glennie	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.
39C--Glennie	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
40A--Sprinkler	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight	Slight	Slight.
41B--McGinn	Slight	Slight	Slight	Year round	Slight	Slight	Slight.
41C, 41D--McGinn	Slight	Moderate: slope.	Slight	Year round	Slight	Moderate: slope.	Slight.
42A--Killmaster	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight	Slight	Slight.
43--Wakeley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
44B--Bamfield	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.
45B--Hoist	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.
45C--Hoist	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
46--Ensley	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight	Slight	Slight.
53B--Negwegon	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
53C---------- Negwegon	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight--------	Moderate: slope.	Slight.
54A---------- Algonquin	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight--------	Slight--------	Slight.
55---------- Springport	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight--------	Slight--------	Slight.
56B---------- Nester	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight--------	Slight--------	Slight.
56C---------- Nester	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight--------	Moderate: slope.	Slight.
57B---------- Kawkawlin	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight--------	Slight--------	Slight.
59B: Algonquin--------	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight--------	Slight--------	Slight.
Springport-------	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight--------	Slight--------	Slight.
60D---------- Glennie	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight--------	Moderate: slope.	Slight.
60E---------- Glennie	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, low strength.	Summer, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
61C, 61D---------- Manistee	Slight---------	Moderate: slope.	Slight--------	Year round-----	Slight--------	Moderate: slope.	Slight.
61F---------- Manistee	Moderate*: slope.	Severe: slope.	Moderate*: slope.	Year round-----	Moderate*: slope.	Severe: slope.	Moderate*: slope.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
62A---------- Allendale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight--------	Slight--------	Slight.
63C---------- Bamfield	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.	Summer, fall, winter.	Slight--------	Moderate: slope.	Slight.
63D---------- Bamfield	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight--------	Moderate: slope.	Slight.
63F---------- Bamfield	Moderate*: slope, low strength.	Severe: slope.	Moderate*: slope, low strength.	Summer, fall, winter.	Moderate*: slope.	Severe: slope.	Moderate*: slope.
66D---------- Alcona	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight--------	Moderate: slope.	Slight.
66E---------- Alcona	Moderate: low strength, slope.	Severe: slope, low strength.	Moderate: slope, low strength.	Summer, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
68---------- Rondeau	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter---------	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
69---------- Loxley	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter---------	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
70---------- Lupton	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter---------	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
71---------- Tawas	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter---------	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
72---------- Dorval	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter---------	Moderate: low strength.	Severe: low strength.	Moderate: low strength.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
73--Markey	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
74C2--Negwegon	Moderate: low strength.	Moderate: low strength, slope, too clayey.	Moderate: low strength, too clayey.	Summer, fall, winter.	Slight	Moderate: slope, too clayey.	Moderate: too clayey.
77--Waucedah	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter	Slight	Slight	Slight.
80F:							
Zimmerman	Severe**: slope.	Severe: slope.	Severe**: slope.	Year round	Severe**: slope.	Severe: slope.	Severe**: slope.
Alcona	Severe**: slope, low strength.	Severe: slope, low strength.	Severe**: slope, low strength.	Summer, fall, winter.	Severe**: slope.	Severe: slope.	Severe**: slope.
81B--Grayling	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
81C--Grayling	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
81E--Grayling	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
84B--Zimmerman	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
84C, 84D--Zimmerman	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
85B:							
Zimmerman	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
Alcona	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
85D:							
Zimmerman	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
Alcona	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
87 Ausable	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
88D Hoist	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
89F:							
Bamfield	Moderate*: low strength, slope.	Severe: slope.	Moderate*: low strength, slope.	Summer, fall, winter.	Moderate*: slope.	Severe: slope.	Moderate*: slope.
Lupton	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
90B Chinwhisker	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
91E:							
Glennie	Moderate: low strength, slope.	Severe: slope.	Moderate: low strength, slope.	Summer, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
Lupton	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Winter	Moderate: low strength.	Severe: low strength.	Moderate: low strength.
92B:							
Klacking	Slight	Slight	Slight	Year round	Slight	Slight	Slight.
McGinn	Slight	Slight	Slight	Year round	Slight	Slight	Slight.
93B:							
Au Gres	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
93B:							
Wakeley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
94F:							
Klacking	Moderate*: slope.	Severe: slope.	Moderate*: slope.	Year round	Moderate*: slope.	Severe: slope.	Moderate*: slope.
McGinn	Moderate*: slope.	Severe: slope.	Moderate*: slope.	Year round	Moderate*: slope.	Severe: slope.	Moderate*: slope.
96D2 Negwegon	Moderate: low strength.	Moderate: slope, low strength, too clayey.	Moderate: low strength, too clayey.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
97 Colonville	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Summer, winter	Slight	Slight	Slight.
98C Graycalm	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
102D Nester	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
102E Nester	Moderate: low strength, slope.	Severe: slope.	Moderate: low strength, slope.	Summer, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
102F Nester	Moderate*: low strength, slope.	Severe: slope.	Moderate*: slope.	Summer, fall, winter.	Moderate*: slope.	Severe: slope.	Moderate*: slope.
110D Negwegon	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
110F Negwegon	Moderate*: slope.	Severe: slope.	Moderate*: slope.	Summer, fall, winter.	Moderate*: slope.	Severe: slope.	Moderate*: slope.
111B Manistee	Slight	Slight	Slight	Year round	Slight	Slight	Slight.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
209B, 210B-------- Grayling	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Summer, fall, winter.	Slight--------	Slight--------	Slight.
210C-------------- Grayling	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
210D-------------- Grayling	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
211B-------------- Grayling	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Summer, fall, winter.	Slight--------	Slight--------	Slight.
211C-------------- Grayling	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
212B-------------- Grayling	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Summer, fall, winter.	Slight--------	Slight--------	Slight.
213B-------------- Graycalm	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Summer, fall, winter.	Slight--------	Slight--------	Slight.
213C-------------- Graycalm	Moderate: too sandy.	Moderate: too sandy,	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
215C-------------- Typic Udipsamments	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
220B-------------- Typic Udipsamments	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
220C-------------- Typic Udipsamments	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
220D-------------- Typic Udipsamments	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
220E--Typic Udipsamments	Severe**: slope.	Severe: slope.	Severe**: slope.	Spring, fall, winter.	Severe**: slope.	Severe: slope.	Severe**: slope.
221B--Typic Udipsamments	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
221C--Typic Udipsamments	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
221D--Typic Udipsamments	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
222B--Typic Udipsamments	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
223B:							
Graycalm	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
Grayling	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
223C:							
Graycalm	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
Grayling	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
223D:							
Graycalm	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
Grayling	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
224B---------- Croswell	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
225B---------- Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
225C---------- Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
230C:							
Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
Alfic Haplorthods	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
231B:							
Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
Alfic Haplorthods	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Slight--------	Slight.
231C:							
Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
Alfic Haplorthods	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight--------	Moderate: slope.	Slight.
231D:							
Entic Haplorthods	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
Alfic Haplorthods	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
232B:							
Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
Alfic Haplorthods	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
233B:							
Alfic Haplorthods	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
233C:							
Alfic Haplorthods	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
Entic Haplorthods	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
233D:							
Alfic Haplorthods	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
Entic Haplorthods	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
235B:							
Alfic Haplorthods, sandy over loamy	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.
Alfic Haplorthods, sandy	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Spring, fall, winter.	Slight	Slight	Slight.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
235C:							
Alfic Haplorthods, sandy over loamy	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
Alfic Haplorthods, sandy	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Spring, fall, winter.	Slight	Moderate: slope.	Slight.
235D:							
Alfic Haplorthods, sandy over loamy	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
Alfic Haplorthods, sandy	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy, slope.	Spring, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
247B:							
Glennie	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.
Bamfield	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Slight	Slight.
247C:							
Glennie	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.
Bamfield	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Summer, fall, winter.	Slight	Moderate: slope.	Slight.

See footnotes at end of table.

Table 9.--Equipment Limitations on Woodland--Continued

Soil name and map symbol	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating season(s)		
	Logging areas and skid roads	Log landings	Haul roads		Logging areas and skid roads	Log landings	Haul roads
247D:							
Glennie	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, low strength.	Summer, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
Bamfield	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, low strength.	Summer, fall, winter.	Moderate: slope.	Severe: slope.	Moderate: slope.
252A:							
Borosaprists.							
Au Gres	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
253A:							
Au Gres	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
Allendale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
Croswell	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Summer, fall, winter.	Slight	Slight	Slight.
262A	Severe:	Severe:	Severe:	Summer, winter	Slight	Slight	Slight.
Au Gres	wetness.	wetness.	wetness.				
264A	Severe:	Severe:	Severe:	Summer, winter	Slight	Slight	Slight.
Allendale	wetness.	wetness.	wetness.				
273:							
Leafriver	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.
Wakeley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Summer, winter	Slight	Slight	Slight.

* Part of the soil may be rated severe.
** Part of the soil may be rated moderate.

Table 10.--Windbreaks and Environmental Plantings

(The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil or that the soil is entirely forested and planting is not likely)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
12B:				
Tawas	Black spruce, indigo silky dogwood, nannyberry viburnum, common ninebark, redosier dogwood, arrowwood.	Northern whitecedar, green ash.	---	---
Au Gres	American cranberrybush, Amur maple, common ninebark, nannyberry viburnum.	White spruce, jack pine, midwest Manchurian crabapple.	Norway spruce, green ash, eastern white pine.	Imperial Carolina poplar.
16B, 16C, 16D, 16E, Graycalm	Siberian peashrub, lilac, eastern redcedar, Amur maple.	Red pine, jack pine	Eastern white pine	---
17B, Croswell	Amur maple, lilac, eastern redcedar, Siberian peashrub.	Red pine, jack pine	Eastern white pine	---
18A, Au Gres	American cranberrybush, Amur maple, common ninebark, nannyberry viburnum.	White spruce, jack pine, midwest Manchurian crabapple.	Norway spruce, green ash, eastern white pine.	Imperial Carolina poplar.
26B, Croswell	Siberian peashrub, lilac, smooth sumac, eastern redcedar, staghorn sumac.	Eastern white pine, red pine, jack pine, midwest Manchurian crabapple, Austrian pine.	---	---
27A, Au Gres	Indigo silky dogwood, American cranberrybush, lilac, nannyberry viburnum.	Siberian crabapple, white spruce, eastern redcedar.	Eastern white pine, green ash, jack pine, Norway spruce.	Imperial Carolina poplar.
28B, 28C, 28E, East Lake	Siberian peashrub, Amur maple, eastern redcedar, lilac.	Red pine, jack pine	Eastern white pine	---
29A, Battlefield	Northern whitecedar, indigo silky dogwood, American cranberrybush, common ninebark, nannyberry viburnum, Amur maple, lilac.	White spruce, Siberian crabapple.	Norway spruce, eastern white pine, green ash.	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
31B, 31C, 31D, 31E---------- Klacking	Lilac, common ninebark, Roselow sargent crabapple, nannyberry viburnum, Amur maple.	White spruce, Siberian crabapple, eastern redcedar.	Norway spruce, eastern white pine, red pine.	Imperial Carolina poplar.
33B, 33C, 33D, 33E---------- Mancelona	Amur maple, lilac, eastern redcedar, Siberian peashrub, northern whitecedar.	White spruce, jack pine, Manchurian crabapple, Norway spruce.	Red pine, eastern white pine.	Imperial Carolina poplar.
36B, 36C---------- Alcona	Arrowwood, nannyberry viburnum, Siberian peashrub, American cranberrybush, lilac, indigo silky dogwood.	White spruce, Norway spruce, midwest Manchurian crabapple.	Eastern white pine, red pine.	Imperial Carolina poplar.
37A---------- Richter	Northern whitecedar, American cranberrybush, indigo silky dogwood, lilac, nannyberry viburnum, common ninebark, Amur maple.	White spruce----------	Norway spruce, eastern white pine, green ash.	Imperial Carolina poplar.
38---------- Tonkey	Northern whitecedar, indigo silky dogwood, arrowwood, common ninebark, American cranberrybush, redosier dogwood.	White spruce, midwest Manchurian crabapple.	Norway spruce, eastern white pine, green ash, red maple.	---
39B, 39C---------- Glennie	Lilac, nannyberry viburnum, Roselow sargent crabapple, Amur maple, indigo silky dogwood.	Norway spruce, red pine, midwest Manchurian crabapple, white spruce, eastern white pine.	Green ash----------	---
40A---------- Sprinkler	American cranberrybush, lilac, Roselow sargent crabapple, Amur maple, indigo silky dogwood.	Norway spruce, red pine, midwest Manchurian crabapple, white spruce, eastern white pine.	Green ash----------	---
41B, 41C, 41D----- McGinn	Nannyberry viburnum, lilac, arrowwood, Siberian peashrub.	White spruce, Siberian crabapple, Austrian pine, eastern redcedar.	Red pine, eastern white pine, Norway spruce.	Imperial Carolina poplar.
42A---------- Killmaster	American cranberrybush, redosier dogwood, northern whitecedar, lilac, indigo silky dogwood, Roselow sargent crabapple.	White spruce----------	Eastern white pine, white ash, red maple, Norway spruce.	Imperial Carolina poplar.

Table 10.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
44B---------- Bamfield	Roselow sargent crabapple, northern whitecedar, lilac, Siberian peashrub, American cranberrybush.	Austrian pine, white spruce, blue spruce, midwest Manchurian crabapple.	Norway spruce, green ash.	Imperial Carolina poplar.
45B, 45C---------- Hoist	Common ninebark, Amur maple, lilac, Roselow sargent crabapple, arrowwood.	Norway spruce, green ash, white spruce, midwest Manchurian crabapple.	Red pine, eastern white pine.	Imperial Carolina poplar.
46---------- Ensley	American cranberrybush, Roselow sargent crabapple, indigo silky dogwood, arrowwood, nannyberry viburnum, common ninebark.	White spruce, northern whitecedar.	Eastern white pine, green ash, red maple, Norway spruce.	---
53B, 53C---------- Negwegon	Lilac, nannyberry viburnum, Roselow sargent crabapple, Amur maple, indigo silky dogwood, Siberian peashrub.	Midwest Manchurian crabapple, white spruce.	Norway spruce, red pine, green ash, eastern white pine.	---
54A---------- Algonquin	Lilac, Roselow sargent crabapple, indigo silky dogwood, American cranberrybush, Amur maple, Siberian peashrub.	White spruce, blue spruce, midwest Manchurian crabapple.	Norway spruce, eastern white pine, green ash.	---
55---------- Springport	American cranberrybush, lilac, Roselow sargent crabapple, Amur maple, indigo silky dogwood.	Norway spruce, red pine, midwest Manchurian crabapple, white spruce, eastern white pine.	Green ash----------	---
56B, 56C---------- Nester	Arrowwood, lilac, common ninebark, nannyberry viburnum, Siberian peashrub, indigo silky dogwood.	White spruce, blue spruce, midwest Manchurian crabapple.	Red pine, green ash, eastern white pine.	---
57B---------- Kawkawlin	Roselow sargent crabapple, indigo silky dogwood, Amur mample, lilac, American cranberrybush, nannyberry viburnum, northern whitecedar, common ninebark.	White spruce, red pine, Norway sprùce, eastern white pine.	---	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
59B:				
Algonquin	Lilac, Roselow sargent crabapple, indigo silky dogwood, American cranberrybush, Amur maple, Siberian peashrub.	White spruce, blue spruce, midwest Manchurian crabapple.	Norway spruce, eastern white pine, green ash.	---
Springport	American cranberrybush, lilac, Roselow sargent crabapple, Amur maple, indigo silky dogwood.	Norway spruce, red pine, midwest Manchurian crabapple, white spruce, eastern white pine.	Green ash	---
60D, 60E Glennie	Lilac, nannyberry viburnum, Roselow sargent crabapple, Amur maple, indigo silky dogwood.	Norway spruce, red pine, midwest Manchurian crabapple, white spruce, eastern white pine.	Green ash	---
61C, 61D, 61F Manistee	Indigo silky dogwood, Amur maple, nannyberry viburnum, lilac, Amur privet, American cranberrybush.	White spruce, Siberian crabapple, eastern redcedar.	Red pine, Norway spruce, eastern white pine.	---
62A Allendale	Northern whitecedar, American cranberrybush, Roselow sargent crabapple, lilac, nannyberry viburnum.	White spruce, midwest Manchurian crabapple, blue spruce.	Eastern white pine, red maple, Norway spruce.	---
63C, 63D, 63F Bamfield	Roselow sargent crabapple, northern whitecedar, lilac, Siberian peashrub, American cranberrybush.	Austrian pine, white spruce, blue spruce, midwest Manchurian crabapple.	Norway spruce, green ash.	Imperial Carolina poplar.
66D, 66E Alcona	Arrowwood, nannyberry viburnum, Siberian peashrub, American cranberrybush, lilac, indigo silky dogwood.	White spruce, Norway spruce, midwest Manchurian crabapple.	Eastern white pine, red pine.	Imperial Carolina poplar.
74C2 Negwegon	Lilac, nannyberry viburnum, Roselow sargent crabapple, Amur maple, indigo silky dogwood, Siberian peashrub.	Midwest Manchurian crabapple, white spruce.	Norway spruce, red pine, green ash, eastern white pine.	---
81B, 81C, 81E Grayling	Lilac, silver buffaloberry, Siberian peashrub, smooth sumac, eastern redcedar, staghorn sumac.	Jack pine, eastern white pine, red pine.	---	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
84B, 84C, 84D----- Zimmerman	Eastern redcedar, Siberian crabapple, Amur privet, lilac, indigo silky dogwood, Amur maple, Siberian peashrub.	---	Red pine, eastern white pine, jack pine.	---
85B, 85D:				
Zimmerman--------	Eastern redcedar, Siberian crabapple, Amur privet, lilac, indigo silky dogwood, Amur maple, Siberian peashrub.	---	Red pine, eastern white pine, jack pine.	---
Alcona----------	Arrowwood, nannyberry viburnum, Siberian peashrub, American cranberrybush, lilac, indigo silky dogwood.	White spruce, Norway spruce, midwest Manchurian crabapple.	Eastern white pine, red pine.	Imperial Carolina poplar.
88D---------- Hoist	Common ninebark, Amur maple, lilac, Roselow sargent crabapple, arrowwood.	Norway spruce, green ash, white spruce, midwest Manchurian crabapple.	Red pine, eastern white pine.	Imperial Carolina poplar.
91E:				
Glennie----------	Lilac, nannyberry viburnum, Roselow sargent crabapple, Amur maple, indigo silky dogwood.	Norway spruce, red pine, midwest Manchurian crabapple, white spruce, eastern white pine.	Green ash----------	---
Lupton.				
92B:				
Klacking---------	Lilac, common ninebark, Roselow sargent crabapple, nannyberry viburnum, Amur maple.	White spruce, Siberian crabapple, eastern redcedar.	Norway spruce, eastern white pine, red pine.	Imperial Carolina poplar.
McGinn----------	Nannyberry viburnum, lilac, arrowwood, Siberian peashrub.	White spruce, Siberian crabapple, Austrian pine, eastern redcedar.	Red pine, eastern white pine, Norway spruce.	Imperial Carolina poplar.
93B:				
Au Gres----------	Silky dogwood, American cranberrybush, lilac, nannyberry viburnum.	Siberian crabapple, white spruce, eastern redcedar.	Eastern white pine, green ash, jack pine, Norway spruce.	Imperial Carolina poplar.
Wakeley.				
94F:				
Klacking---------	Lilac, common ninebark, Roselow sargent crabapple, nannyberry viburnum, Amur maple.	White spruce, Siberian crabapple, eastern redcedar.	Norway spruce, eastern white pine, red pine.	Imperial Carolina poplar.

Table 10.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
94F:				
McGinn	Nannyberry viburnum, lilac, arrowwood, Siberian peashrub.	White spruce, Siberian crabapple, Austrian pine, eastern redcedar.	Red pine, eastern white pine, Norway spruce.	Imperial Carolina poplar.
96D2	Lilac, nannyberry viburnum, Roselow sargent crabapple, Amur maple, indigo silky dogwood, Siberian peashrub.	Midwest Manchurian crabapple, white spruce.	Norway spruce, red pine, green ash, eastern white pine.	---
97	Nannyberry viburnum, Norway spruce, Siberian peashrub, Washington hawthorn, silver buffaloberry, staghorn sumac.	Lilac, blue spruce	Green ash	Imperial Carolina poplar.
98C	Siberian peashrub, lilac, eastern redcedar, Amur maple.	Red pine, jack pine	Eastern white pine	---
102D, 102E, 102F	Arrowwood, lilac, nannyberry viburnum, common ninebark, Siberian peashrub.	Blue spruce, white spruce, midwest Manchurian crabapple.	Red pine, green ash, eastern white pine.	---
110D, 110F	Lilac, nannyberry viburnum, Roselow sargent crabapple, Amur maple, indigo silky dogwood, Siberian peashrub.	Midwest Manchurian crabapple, white spruce.	Norway spruce, red pine, green ash, eastern white pine.	---
111B	Indigo silky dogwood, Amur maple, eastern redcedar, Siberian peashrub, lilac, Roselow sargent crabapple, American cranberrybush.	White spruce, midwest Manchurian crabapple, Norway spruce.	Red pine, eastern white pine.	---

Table 11.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
11B Eastport	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
12B: Tawas	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
Au Gres	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.
16B Graycalm	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
16C Graycalm	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
16D Graycalm	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
16E Graycalm	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.
17B Croswell	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
18A Au Gres	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.
19 Leafriver	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
26B Croswell	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
27A Au Gres	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.
28B East Lake	Severe: too sandy.	Severe: too sandy.	Moderate: slope, small stones.	Severe: too sandy.
28C East Lake	Severe: too sandy.	Severe: too sandy.	Severe: slope.	Severe: too sandy.
28E East Lake	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope.	Severe: too sandy.
29A Battlefield	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
30--Wheatley	Severe: ponding, excess humus.	Severe: ponding.	Severe: ponding.	Severe: ponding.
31B--Klacking	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
31C--Klacking	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
31D--Klacking	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.
31E--Klacking	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
33B--Mancelona	Slight	Slight	Moderate: slope, small stones.	Slight.
33C--Mancelona	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
33D--Mancelona	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
33E--Mancelona	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
35--Kinross	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
36B--Alcona	Slight	Slight	Moderate: slope.	Slight.
36C--Alcona	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
37A--Richter	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
38--Tonkey	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
39B--Glennie	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight.
39C--Glennie	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
40A--Sprinkler	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
41B--McGinn	Slight	Slight	Moderate: slope, small stones.	Slight.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
41C---------- McGinn	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
41D---------- McGinn	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
42A---------- Killmaster	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
43---------- Wakeley	Severe: ponding, percs slowly.	Severe: ponding, too sandy, percs slowly.	Severe: too sandy, ponding, percs slowly.	Severe: ponding, too sandy.
44B---------- Bamfield	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.
45B---------- Hoist	Slight----------	Slight----------	Moderate: slope, small stones.	Slight.
45C---------- Hoist	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
46---------- Ensley	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
53B---------- Negwegon	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.
53C---------- Negwegon	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.
54A---------- Algonquin	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
55---------- Springport	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.
56B---------- Nester	Slight----------	Slight----------	Moderate: slope, small stones.	Slight.
56C---------- Nester	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
57B---------- Kawkawlin	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
59B:				
Algonquin----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Springport----------	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
60D---------- Glennie	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
60E---------- Glennie	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
61C---------- Manistee	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight.
61D---------- Manistee	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Moderate: slope.
61F---------- Manistee	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope.
62A---------- Allendale	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
63C---------- Bamfield	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
63D---------- Bamfield	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
63F---------- Bamfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
66D---------- Alcona	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
66E---------- Alcona	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
68---------- Rondeau	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
69---------- Loxley	Severe: ponding, excess humus, too acid.	Severe: ponding, excess humus, too acid.	Severe: excess humus, ponding, too acid.	Severe: ponding, excess humus.
70---------- Lupton	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
71---------- Tawas	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
72---------- Dorval	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
73---------- Markey	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
74C2 Negwegon	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.
77 Waucedah	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
78. Pits				
80F: Zimmerman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Alcona	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
81B Grayling	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
81C Grayling	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
81E Grayling	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
82C Udorthents	Variable	Variable	Variable	Variable.
83F. Udipsamments				
84B Zimmerman	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
84C Zimmerman	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
84D Zimmerman	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.
85B: Zimmerman	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
Alcona	Slight	Slight	Moderate: slope.	Slight.
85D: Zimmerman	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
85D:				
Alcona	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
86:				
Histosols.				
Aquents.				
87	Severe:	Severe:	Severe:	Severe:
Ausable	flooding, ponding, excess humus.	ponding, excess humus.	excess humus, ponding, flooding.	ponding, excess humus.
88D	Severe:	Severe:	Severe:	Moderate:
Hoist	slope.	slope.	slope.	slope.
89F:				
Bamfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lupton	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
90B	Severe:	Severe:	Severe:	Severe:
Chinwhisker	too sandy.	too sandy.	too sandy.	too sandy.
91E:				
Glennie	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Lupton	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
92B:				
Klacking	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
McGinn	Slight	Slight	Moderate: slope, small stones.	Slight.
93B:				
Au Gres	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.
Wakeley	Severe: ponding, percs slowly.	Severe: ponding, too sandy, percs slowly.	Severe: too sandy, ponding, percs slowly.	Severe: ponding, too sandy.
94F:				
Klacking	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.
McGinn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
96D2--- Negwegon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
97--- Colonville	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
98C--- Graycalm	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
102D, 102E--- Nester	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
102F--- Nester	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
110D--- Negwegon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
110F--- Negwegon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
111B--- Manistee	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight.
209B, 210B--- Grayling	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
210C--- Grayling	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
210D--- Grayling	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
211B--- Grayling	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
211C--- Grayling	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
212B--- Grayling	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
213B--- Graycalm	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
213C--- Graycalm	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
215C--- Typic Udipsamments	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
220B--- Typic Udipsamments	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
220C Typic Udipsamments	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
220D Typic Udipsamments	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
220E Typic Udipsamments	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.
221B Typic Udipsamments	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
221C Typic Udipsamments	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
221D Typic Udipsamments	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
222B Typic Udipsamments	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
223B:				
Graycalm	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Grayling	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
223C:				
Graycalm	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Grayling	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
223D:				
Graycalm	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Grayling	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
224B Croswell	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
225B Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
225C Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
230C:				
Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Alfic Haplorthods	Moderate: slope, percs slowly.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
231B:				
Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Alfic Haplorthods	Moderate: percs slowly, too sandy.	Moderate: too sandy, percs slowly.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
231C:				
Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Alfic Haplorthods	Moderate: slope, percs slowly.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
231D:				
Entic Haplorthods	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Alfic Haplorthods	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.
232B:				
Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Alfic Haplorthods	Moderate: percs slowly, too sandy.	Moderate: too sandy, percs slowly.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
233B:				
Alfic Haplorthods	Moderate: percs slowly, too sandy.	Moderate: too sandy, percs slowly.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
233C:				
Alfic Haplorthods	Moderate: slope, percs slowly.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
Entic Haplorthods	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
233D:				
Alfic Haplorthods	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.
Entic Haplorthods	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
235B:				
Alfic Haplorthods, sandy over loamy	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Alfic Haplorthods, sandy	Moderate: percs slowly, too sandy.	Moderate: too sandy, percs slowly.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
235C:				
Alfic Haplorthods, sandy over loamy	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Alfic Haplorthods, sandy	Moderate: slope, percs slowly.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
235D:				
Alfic Haplorthods, sandy over loamy	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Alfic Haplorthods, sandy	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.
236B, 236C. Arenic Eutroboralfs				
237B, 237C, 237D. Glossic Eutroboralfs				
247B:				
Glennie	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight.
Bamfield	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.
247C:				
Glennie	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
247C:				
Bamfield	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
247D:				
Glennie	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Bamfield	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
250D:				
Glossic Eutroboralfs.				
Borosaprists.				
252A:				
Borosaprists.				
Au Gres	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.
253A:				
Au Gres	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.
Allendale	Severe: wetness, percs slowly, too sandy.	Severe: wetness, too sandy, percs slowly.	Severe: too sandy, wetness, percs slowly.	Severe: wetness, too sandy.
Croswell	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
262A	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.
Au Gres				
263A.				
Alfic Haplaquods				
264A	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
Allendale				
272:				
Haplaquods.				
Fluvaquents.				
273:				
Leafriver	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
Wakeley	Severe: ponding, percs slowly.	Severe: ponding, too sandy, percs slowly.	Severe: too sandy, ponding, percs slowly.	Severe: ponding, too sandy.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
274. Typic Haplaquods				
280: Aquents.				
Histosols.				
281, 282. Borosaprists				

Table 12.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
11B---------- Eastport	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
12B:										
Tawas----------	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Au Gres----------	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
16B, 16C, 16D------ Graycalm	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
16E---------- Graycalm	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.
17B---------- Croswell	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
18A---------- Au Gres	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
19---------- Leafriver	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
26B---------- Croswell	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
27A---------- Au Gres	Poor	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor.
28B---------- East Lake	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
28C---------- East Lake	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
28E---------- East Lake	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
29A---------- Battlefield	Fair	Fair	Good	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
30---------- Wheatley	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
31B---------- Klacking	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
31C---------- Klacking	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
31D, 31E---------- Klacking	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
33B, 33C---------- Mancelona	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
33D---------- Mancelona	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 12.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
33E---------- Mancelona	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
35---------- Kinross	Very poor.	Poor	Poor	Fair	Fair	Good	Good	Very poor.	Fair	Good.
36B, 36C---------- Alcona	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
37A---------- Richter	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
38---------- Tonkey	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
39B---------- Glennie	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Very poor.
39C---------- Glennie	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
40A---------- Sprinkler	Fair	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair.
41B, 41C---------- McGinn	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
41D---------- McGinn	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
42A---------- Killmaster	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
43---------- Wakeley	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
44B---------- Bamfield	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
45B---------- Hoist	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
45C---------- Hoist	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
46---------- Ensley	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
53B---------- Negwegon	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
53C---------- Negwegon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
54A---------- Algonquin	Fair	Good	Good	Good	Good	Good	Fair	Good	Good	Fair.
55---------- Springport	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.

Table 12.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
56B, 56C---------- Nester	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
57B---------- Kawkawlin	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
59B:										
Algonquin---------	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Springport--------	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
60D---------- Glennie	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
60E---------- Glennie	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
61C---------- Manistee	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
61D---------- Manistee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
61F---------- Manistee	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
62A---------- Allendale	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor.
63C---------- Bamfield	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
63D---------- Bamfield	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
63F---------- Bamfield	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
66D, 66E---------- Alcona	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
68---------- Rondeau	Poor	Poor	Poor	Very poor.	Very poor.	Good	Good	Poor	Very poor.	Good.
69---------- Loxley	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
70---------- Lupton	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
71---------- Tawas	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
72---------- Dorval	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
73---------- Markey	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
74C2---------- Negwegon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 12.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
77--Waucedah	Very poor.	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
78. Pits										
80F:										
Zimmerman	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Alcona	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
81B--Grayling	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
81C, 81E--Grayling	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
82C. Udorthents										
83F. Udipsamments										
84B, 84C, 84D--Zimmerman	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
85B, 85D:										
Zimmerman	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Alcona	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
86: Histosols.										
Aquents.										
87--Ausable	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
88D--Hoist	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
89F:										
Bamfield	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Lupton	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
90B--Chinwhisker	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
91E:										
Glennie	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lupton	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

Table 12.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
92B:										
Klacking	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
McGinn	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
93B:										
Au Gres	Poor	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor.
Wakeley	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
94F:										
Klacking	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
McGinn	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
96D2 Negwegon	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
97 Colonville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
98C Graycalm	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
102D, 102E Nester	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
102F Nester	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
110D Negwegon	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
110F Negwegon	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
111B Manistee	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
209B Grayling	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
210B Grayling	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
210C, 210D, 211B Grayling	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
211C Grayling	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
212B Grayling	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
213B, 213C Graycalm	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

Table 12.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
215C---------- Typic Udipsamments	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
220B---------- Typic Udipsamments	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
220C, 220D, 220E--- Typic Udipsamments	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
221B---------- Typic Udipsamments	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
221C, 221D--------- Typic Udipsamments	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
222B---------- Typic Udipsamments	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
223B:										
Graycalm----------	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Grayling----------	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
223C, 223D:										
Graycalm----------	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Grayling----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
224B---------- Croswell	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
225B---------- Entic Haplorthods	Poor	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
225C---------- Entic Haplorthods	Very poor.	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
230C:										
Entic Haplorthods-	Very poor.	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Alfic Haplorthods-	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
231B:										
Entic Haplorthods-	Poor	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Alfic Haplorthods-	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
231C, 231D:										
Entic Haplorthods-	Very poor.	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Alfic Haplorthods-	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

Table 12.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
232B:										
Entic Haplorthods-	Poor	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Alfic Haplorthods-	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
233B:										
Alfic Haplorthods-	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Entic Haplorthods-	Poor	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
233C, 233D:										
Alfic Haplorthods-	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Entic Haplorthods-	Very poor.	Poor	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
235B:										
Alfic Haplorthods, sandy over loamy-	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Alfic Haplorthods, sandy----------	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
235C, 235D:										
Alfic Haplorthods, sandy over loamy-	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Alfic Haplorthods, sandy----------	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
236B, 236C. Arenic Eutroboralfs										
237B, 237C, 237D. Glossic Eutroboralfs										
247B:										
Glennie----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Very poor.
Bamfield----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
247C:										
Glennie----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bamfield----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 12.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
247D:										
Glennie	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Bamfield	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
250D:										
Glossic Eutroboralfs.										
Borosaprists.										
252A:										
Borosaprists.										
Au Gres	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
253A:										
Au Gres	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
Allendale	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor.
Croswell	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
262A--Au Gres	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
263A. Alfic Haplaquods										
264A--Allendale	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor.
272:										
Haplaquods.										
Fluvaquents.										
273:										
Leafriver	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Wakeley	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
274. Typic Haplaquods										
280:										
Aquents.										
Histosols.										
281, 282. Borosaprists.										

Table 13.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
11B Eastport	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
12B: Tawas	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
Au Gres	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
16B Graycalm	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
16C Graycalm	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
16D, 16E Graycalm	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
17B Croswell	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
18A Au Gres	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
19 Leafriver	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding, excess humus.
26B Croswell	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
27A Au Gres	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty, too sandy.
28B East Lake	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: large stones, droughty.
28C East Lake	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, droughty, slope.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
28E---------- East Lake	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
29A---------- Battlefield	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
30---------- Wheatley	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
31B---------- Klacking	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
31C---------- Klacking	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
31D, 31E---------- Klacking	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
33B---------- Mancelona	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: large stones, droughty.
33C---------- Mancelona	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, droughty, slope.
33D, 33E---------- Mancelona	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
35---------- Kinross	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
36B---------- Alcona	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Moderate: frost action.	Moderate: large stones, droughty.
36C---------- Alcona	Severe: cutbanks cave.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, droughty, slope.
37A---------- Richter	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
38---------- Tonkey	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
39B---------- Glennie	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Moderate: frost action.	Moderate: large stones, droughty.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
39C Glennie	Severe: cutbanks cave.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, droughty, slope.
40A Sprinkler	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
41B McGinn	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Moderate: large stones.
41C McGinn	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
41D McGinn	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
42A Killmaster	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: large stones, wetness, droughty.
43 Wakeley	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding.	Severe: ponding.
44B Bamfield	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
45B Hoist	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Moderate: large stones.
45C Hoist	Severe: cutbanks cave.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
46 Ensley	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
53B Negwegon	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
53C Negwegon	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: wetness, slope.
54A Algonquin	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
55 Springport	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
56B---------- Nester	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
56C---------- Nester	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
57B---------- Kawkawlin	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
59B:						
Algonquin--------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
Springport-------	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
60D, 60E---------- Glennie	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
61C---------- Manistee	Severe: cutbanks cave.	Moderate: slope.	Severe: shrink-swell.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
61D, 61F---------- Manistee	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: slope.	Severe: slope.
62A---------- Allendale	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness.	Severe: wetness.
63C---------- Bamfield	Moderate: dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
63D, 63F---------- Bamfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
66D, 66E---------- Alcona	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
68---------- Rondeau	Severe: excess humus, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: ponding, excess humus.
69---------- Loxley	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: too acid, ponding, excess humus.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
70--Lupton	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
71--Tawas	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
72--Dorval	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, shrink-swell.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
73--Markey	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
74C2--Negwegon	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: wetness, slope.
77--Waucedah	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding, flooding, excess humus.
78. Pits						
80F:						
Zimmerman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Alcona	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
81B--Grayling	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
81C--Grayling	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
81E--Grayling	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
82C--Udorthents	Variable	Variable	Variable	Variable	Variable	Variable.
83F. Udipsamments						
84B--Zimmerman	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
84C---------- Zimmerman	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
84D---------- Zimmerman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
85B:						
Zimmerman--------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
Alcona----------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Moderate: frost action.	Moderate: large stones, droughty.
85D:						
Zimmerman--------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Alcona----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, droughty, slope.
86:						
Histosols.						
Aquents.					frost action.	
87---------- Ausable	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.
88D---------- Hoist	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
89F:						
Bamfield---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Lupton----------	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
90B---------- Chinwhisker	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
91E:						
Glennie----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lupton----------	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
92B:						
Klacking	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
McGinn	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Moderate: large stones.
93B:						
Au Gres	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty, too sandy.
Wakeley	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding.	Severe: ponding.
94F:						
Klacking	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
McGinn	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
96D2 Negwegon	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
97 Colonville	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: wetness, droughty, flooding.
98C Graycalm	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
102D, 102E, 102F Nester	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
110D, 110F Negwegon	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
111B Manistee	Severe: cutbanks cave.	Slight	Severe: shrink-swell.	Slight	Slight	Moderate: droughty.
209B, 210B Grayling	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
210C Grayling	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
210D Grayling	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
211B Grayling	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
211C---------- Grayling	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
212B---------- Grayling	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
213B---------- Graycalm	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
213C---------- Graycalm	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
215C---------- Typic Udipsamments	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
220B---------- Typic Udipsamments	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
220C---------- Typic Udipsamments	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
220D, 220E-------- Typic Udipsamments	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
221B---------- Typic Udipsamments	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
221C---------- Typic Udipsamments	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
221D---------- Typic Udipsamments	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
222B---------- Typic Udipsamments	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty, too sandy.
223B:						
Graycalm---------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
Grayling---------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
223C:						
Graycalm---------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
Grayling---------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
223D:						
Graycalm	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Grayling	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
224B	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
Croswell						
225B	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
Entic Haplorthods						
225C	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
Entic Haplorthods						
230C:						
Entic Haplorthods	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
Alfic Haplorthods	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
231B:						
Entic Haplorthods	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
Alfic Haplorthods	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
231C:						
Entic Haplorthods	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
Alfic Haplorthods	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
231D:						
Entic Haplorthods	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Alfic Haplorthods	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
232B:						
Entic Haplorthods	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty, too sandy.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
232B:						
Alfic Haplorthods	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
233B:						
Alfic Haplorthods	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
Entic Haplorthods	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
233C:						
Alfic Haplorthods	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Entic Haplorthods	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
233D:						
Alfic Haplorthods	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Entic Haplorthods	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
235B:						
Alfic Haplorthods, sandy over loamy	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
Alfic Haplorthods, sandy	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
235C:						
Alfic Haplorthods, sandy over loamy	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
Alfic Haplorthods, sandy	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
235D:						
Alfic Haplorthods, sandy over loamy	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
235D: Alfic Haplorthods, sandy	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
236B, 236C. Arenic Eutroboralfs						
237B, 237C, 237D. Glossic Eutroboralfs						
247B: Glennie	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Moderate: large stones, droughty.
Bamfield	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
247C: Glennie	Severe: cutbanks cave.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, droughty, slope.
Bamfield	Moderate: dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
247D: Glennie	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bamfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
250D: Glossic Eutroboralfs.						
Borosaprists.						
252A: Borosaprists.						
Au Gres	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
253A: Au Gres	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

Table 13.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
253A:						
Allendale	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Croswell	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
262A---------- Au Gres	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
263A. Alfic Haplaquods						
264A---------- Allendale	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness.	Severe: wetness.
272:						
Haplaquods.						
Fluvaquents.						
273:						
Leafriver	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding, excess humus.
Wakeley	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding.	Severe: ponding.
274. Typic Haplaquods						
280:						
Aquents.						
Histosols.						
281, 282. Borosaprists.						

Table 14.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
11B Eastport	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
12B: Tawas	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Au Gres	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
16B Graycalm	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
16C Graycalm	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
16D, 16E Graycalm	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
17B Croswell	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
18A Au Gres	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
19 Leafriver	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
26B Croswell	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
27A Au Gres	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
28B East Lake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
28C East Lake	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
28E East Lake	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
29A Battlefield	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
30 Wheatley	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, small stones.
31B Klacking	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
31C Klacking	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
31D, 31E Klacking	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
33B Mancelona	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
33C Mancelona	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
33D, 33E Mancelona	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
35 Kinross	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
36B Alcona	Severe: wetness.	Severe: seepage, wetness.	Severe: too sandy.	Moderate: wetness.	Poor: too sandy.
36C Alcona	Severe: wetness.	Severe: seepage, slope, wetness.	Severe: too sandy.	Moderate: wetness, slope.	Poor: too sandy.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
37A Richter	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
38 Tonkey	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
39B Glennie	Severe: wetness, percs slowly.	Severe: seepage.	Moderate: wetness, too sandy.	Slight	Poor: thin layer.
39C Glennie	Severe: wetness, percs slowly.	Severe: seepage, slope.	Moderate: wetness, slope, too sandy.	Moderate: slope.	Poor: thin layer.
40A Sprinkler	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
41B McGinn	Moderate: percs slowly.	Severe: seepage.	Slight	Severe: seepage.	Good.
41C McGinn	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope.	Severe: seepage.	Fair: slope.
41D McGinn	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
42A Killmaster	Severe: wetness, percs slowly.	Severe: seepage.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
43 Wakeley	Severe: ponding, percs slowly, poor filter.	Severe: seepage, ponding.	Severe: ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
44B Bamfield	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
45B Hoist	Severe: wetness, percs slowly.	Severe: seepage.	Moderate: wetness.	Severe: seepage.	Fair: wetness.
45C Hoist	Severe: wetness, percs slowly.	Severe: seepage, slope.	Moderate: wetness, slope.	Severe: seepage.	Fair: slope, wetness.
46 Ensley	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: ponding.
53B Negwegon	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
53C Negwegon	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
54A Algonquin	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
55 Springport	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
56B Nester	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, small stones.
56C Nester	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Fair: too clayey, small stones, slope.
57B Kawkawlin	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
59B: Algonquin	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Springport	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
60D, 60E Glennie	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope, thin layer.
61C Manistee	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: too clayey.	Severe: seepage.	Poor: too clayey, hard to pack.
61D, 61F Manistee	Severe: percs slowly, poor filter, slope.	Severe: seepage, slope.	Severe: slope, too clayey.	Severe: seepage, slope.	Poor: too clayey, hard to pack, slope.
62A Allendale	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: wetness, too clayey.	Severe: seepage, wetness.	Poor: too clayey, hard to pack, wetness.
63C Bamfield	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
63D, 63F---------- Bamfield	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
66D, 66E---------- Alcona	Severe: slope.	Severe: seepage, slope.	Severe: slope, too sandy.	Severe: slope.	Poor: too sandy, slope.
68---------- Rondeau	Severe: subsides, ponding.	Severe: seepage, excess humus.	Severe: ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
69---------- Loxley	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus, too acid.
70---------- Lupton	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
71---------- Tawas	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
72---------- Dorval	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
73---------- Markey	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
74C2---------- Negwegon	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
77---------- Waucedah	Severe: flooding, ponding, percs slowly.	Severe: flooding, excess humus, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
78. Pits					
80F: Zimmerman----------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Alcona----------	Severe: slope.	Severe: seepage, slope.	Severe: slope, too sandy.	Severe: slope.	Poor: too sandy, slope.
81B---------- Grayling	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
81C Grayling	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
81E Grayling	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
82C Udorthents	Variable	Variable	Variable	Variable	Variable.
83F. Udipsamments					
84B Zimmerman	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
84C Zimmerman	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
84D Zimmerman	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
85B: Zimmerman	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alcona	Severe: wetness.	Severe: seepage, wetness.	Severe: too sandy.	Moderate: wetness.	Poor: too sandy.
85D: Zimmerman	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alcona	Severe: wetness.	Severe: seepage, slope, wetness.	Severe: too sandy.	Moderate: wetness, slope.	Poor: too sandy.
86: Histosols. Aquents.					
87 Ausable	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
88D Hoist	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
89F:					
Bamfield	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Lupton	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
90B Chinwhisker	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
91E:					
Glennie	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope, thin layer.
Lupton	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
92B:					
Klacking	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
McGinn	Moderate: percs slowly.	Severe: seepage.	Slight	Severe: seepage.	Good.
93B:					
Au Gres	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Wakeley	Severe: ponding, percs slowly, poor filter.	Severe: seepage, ponding.	Severe: ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
94F:					
Klacking	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
McGinn	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
96D2 Negwegon	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
97--Colonville	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: too sandy, wetness.
98C--Graycalm	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
102D, 102E, 102F--Nester	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
110D, 110F--Negwegon	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
111B--Manistee	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: too clayey.	Severe: seepage.	Poor: too clayey, hard to pack.
209B, 210B--Grayling	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
210C--Grayling	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
210D--Grayling	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
211B--Grayling	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
211C--Grayling	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
212B--Grayling	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
213B--Graycalm	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
213C--Graycalm	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
215C--Typic Udipsamments	Severe: poor filter.	Severe: seepage, slope.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
220B---------- Typic Udipsamments	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
220C---------- Typic Udipsamments	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
220D, 220E---------- Typic Udipsamments	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
221B---------- Typic Udipsamments	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
221C---------- Typic Udipsamments	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
221D---------- Typic Udipsamments	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
222B---------- Typic Udipsamments	Severe: poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
223B:					
Graycalm----------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Grayling----------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
223C:					
Graycalm----------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Grayling----------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
223D:					
Graycalm----------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Grayling----------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
224B---------- Croswell	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
225B---------- Entic Haplorthods	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
225C---------- Entic Haplorthods	Severe: poor filter.	Severe: seepage, slope.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
230C:					
Entic Haplorthods--	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alfic Haplorthods--	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
231B:					
Entic Haplorthods--	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alfic Haplorthods--	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
231C:					
Entic Haplorthods--	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alfic Haplorthods--	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
231D:					
Entic Haplorthods--	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Alfic Haplorthods--	Severe: percs slowly, poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
232B:					
Entic Haplorthods--	Severe: poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alfic Haplorthods--	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
233B:					
Alfic Haplorthods--	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Entic Haplorthods--	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
233C:					
Alfic Haplorthods--	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Entic Haplorthods--	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
233D:					
Alfic Haplorthods--	Severe: percs slowly, poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Entic Haplorthods--	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
235B:					
Alfic Haplorthods, sandy over loamy--	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alfic Haplorthods, sandy----------	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
235C:					
Alfic Haplorthods, sandy over loamy--	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Alfic Haplorthods, sandy----------	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
235D:					
Alfic Haplorthods, sandy over loamy--	Severe: percs slowly, poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Alfic Haplorthods, sandy----------	Severe: percs slowly, poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
236B, 236C. Arenic Eutroboralfs					
237B, 237C, 237D. Glossic Eutroboralfs					
247B:					
Glennie	Severe: wetness, percs slowly.	Severe: seepage.	Moderate: wetness, too sandy.	Slight	Poor: thin layer.
Bamfield	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
247C:					
Glennie	Severe: wetness, percs slowly.	Severe: seepage, slope.	Moderate: wetness, slope, too sandy.	Moderate: slope.	Poor: thin layer.
Bamfield	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
247D:					
Glennie	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope, thin layer.
Bamfield	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
250D:					
Glossic Eutroboralfs.					
Borosaprists.					
252A:					
Borosaprists.					
Au Gres	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
253A:					
Au Gres	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Allendale	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: wetness, too clayey.	Severe: seepage, wetness.	Poor: too clayey, hard to pack, wetness.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
253A: Croswell	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
262A Au Gres	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
263A. Alfic Haplaquods					
264A Allendale	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: wetness, too clayey.	Severe: seepage, wetness.	Poor: too clayey, hard to pack, wetness.
272: Haplaquods.					
Fluvaquents.					
273: Leafriver	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor seepage, too sandy, ponding.
Wakeley	Severe: ponding, percs slowly, poor filter.	Severe: seepage, ponding.	Severe: ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
274. Typic Haplaquods					
280: Aquents.					
Histosols.					
281, 282. Borosaprists					

Table 15.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
11B Eastport	Good	Probable	Improbable: too sandy.	Poor: too sandy.
12B: Tawas	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
Au Gres	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
16B, 16C Graycalm	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
16D Graycalm	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, slope.
16E Graycalm	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, slope.
17B Croswell	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
18A Au Gres	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
19 Leafriver	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
26B Croswell	Fair: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
27A Au Gres	Fair: thin layer, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
28B, 28C East Lake	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
28E East Lake	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
29A Battlefield	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
30 Wheatley	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
31B, 31C Klacking	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
31D Klacking	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, slope.
31E Klacking	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, slope.
33B, 33C Mancelona	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
33D Mancelona	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
33E Mancelona	Poor: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
35 Kinross	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
36B, 36C Alcona	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
37A Richter	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
38 Tonkey	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
39B, 39C Glennie	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
40A Sprinkler	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
41B McGinn	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
41C McGinn	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones, slope.
41D McGinn	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
42A Killmaster	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
43 Wakeley	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
44B Bamfield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, small stones.
45B Hoist	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
45C Hoist	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
46 Ensley	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
53B, 53C Negwegon	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
54A Algonquin	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
55 Springport	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
56B, 56C Nester	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
57B Kawkawlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
59B:				
Algonquin	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Springport	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
60D Glennie	Fair: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
60E Glennie	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
61C Manistee	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
61D Manistee	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, slope.
61F Manistee	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, slope.
62A Allendale	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
63C Bamfield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, slope.
63D Bamfield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
63F Bamfield	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
66D Alcona	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, slope.
66E Alcona	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, slope.
68 Rondeau	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
69--Loxley	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness, too acid.
70--Lupton	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
71--Tawas	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
72--Dorval	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
73--Markey	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
74C2--Negwegon	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
77--Waucedah	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
78. Pits				
80F: Zimmerman	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Alcona	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, slope.
81B, 81C--Grayling	Good	Probable	Improbable: too sandy.	Poor: too sandy.
81E--Grayling	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
82C--Udorthents	Variable	Variable	Variable	Variable.
83F. Udipsamments				
84B, 84C--Zimmerman	Good	Probable	Improbable: too sandy.	Poor: too sandy.
84D--Zimmerman	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
85B, 85D:				
Zimmerman	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Alcona	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
86:				
Histosols.				
Aquents.				
87				
Ausable	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, wetness.
88D				
Hoist	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
89F:				
Bamfield	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lupton	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
90B				
Chinwhisker	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
91E:				
Glennie	Fair: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lupton	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
92B:				
Klacking	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
McGinn	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
93B:				
Au Gres	Fair: thin layer, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Wakeley	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
94F:				
Klacking	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, slope.
McGinn	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
96D2	Poor:	Improbable:	Improbable:	Poor:
Negwegon	shrink-swell, low strength.	excess fines.	excess fines.	too clayey, slope.
97	Fair:	Improbable:	Improbable:	Poor:
Colonville	wetness.	excess fines.	excess fines.	too sandy.
98C	Good	Probable	Improbable:	Poor:
Graycalm			too sandy.	too sandy, small stones.
102D, 102E	Poor:	Improbable:	Improbable:	Poor:
Nester	low strength.	excess fines.	excess fines.	too clayey, small stones, slope.
102F	Poor:	Improbable:	Improbable:	Poor:
Nester	low strength, slope.	excess fines.	excess fines.	too clayey, small stones, slope.
110D	Poor:	Improbable:	Improbable:	Poor:
Negwegon	shrink-swell, low strength.	excess fines.	excess fines.	too clayey, slope.
110F	Poor:	Improbable:	Improbable:	Poor:
Negwegon	shrink-swell, low strength, slope.	excess fines.	excess fines.	too clayey, slope.
111B	Poor:	Improbable:	Improbable:	Poor:
Manistee	shrink-swell, low strength.	excess fines.	excess fines.	too sandy.
209B, 210B, 210C	Good	Probable	Improbable:	Poor:
Grayling			too sandy.	too sandy.
210D	Fair:	Probable	Improbable:	Poor:
Grayling	slope.		too sandy.	too sandy, slope.
211B, 211C, 212B	Good	Probable	Improbable:	Poor:
Grayling			too sandy.	too sandy.
213B, 213C	Good	Probable	Improbable:	Poor:
Graycalm			too sandy.	too sandy, small stones.
215C, 220B, 220C	Good	Probable	Improbable:	Poor:
Typic Udipsamments			too sandy.	too sandy.
220D	Fair:	Probable	Improbable:	Poor:
Typic Udipsamments	slope.		too sandy.	too sandy, slope.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
220E Typic Udipsamments	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
221B, 221C Typic Udipsamments	Good	Probable	Improbable: too sandy.	Poor: too sandy.
221D Typic Udipsamments	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
222B Typic Udipsamments	Good	Probable	Improbable: too sandy.	Poor: too sandy.
223B, 223C: Graycalm	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
Grayling	Good	Probable	Improbable: too sandy.	Poor: too sandy.
223D: Graycalm	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, slope.
Grayling	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
224B Croswell	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
225B, 225C Entic Haplorthods	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
230C, 231B, 231C: Entic Haplorthods	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Alfic Haplorthods	Good	Probable	Improbable: too sandy.	Poor: too sandy.
231D: Entic Haplorthods	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Alfic Haplorthods	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
232B: Entic Haplorthods	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Alfic Haplorthods	Good	Probable	Improbable: too sandy.	Poor: too sandy.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
233B, 233C:				
Alfic Haplorthods	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Entic Haplorthods	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
233D:				
Alfic Haplorthods	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Entic Haplorthods	Fair: slope.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, slope.
235B, 235C:				
Alfic Haplorthods, sandy over loamy	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Alfic Haplorthods, sandy	Good	Probable	Improbable: too sandy.	Poor: too sandy.
235D:				
Alfic Haplorthods, sandy over loamy	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Alfic Haplorthods, sandy	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
236B, 236C.				
Arenic Eutroboralfs				
237B, 237C, 237D.				
Glossic Eutroboralfs				
247B:				
Glennie	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
Bamfield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, small stones.
247C:				
Glennie	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
Bamfield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, slope.

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
247D:				
Glennie	Fair: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Bamfield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
250D:				
Glossic Eutroboralfs.				
Borosaprists.				
252A:				
Borosaprists.				
Au Gres	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
253A:				
Au Gres	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Allendale	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
Croswell	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
262A	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Au Gres				
263A.				
Alfic Haplaquods				
264A	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
Allendale				
272:				
Haplaquods.				
Fluvaquents.				
273:				
Leafriver	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Wakeley	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
274.				
Typic Haplaquods.				

Table 15.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
280: Aquents.				
Histosols.				
281, 282. Borosaprists.				

Table 16.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
11B---------- Eastport	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
12B:						
Tawas----------	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
Au Gres----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, droughty.
16B---------- Graycalm	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
16C, 16D, 16E----- Graycalm	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
17B---------- Croswell	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Slope, cutbanks cave.	Slope, wetness, droughty.	Droughty.
18A---------- Au Gres	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, droughty.
19---------- Leafriver	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
26B---------- Croswell	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Slope, cutbanks cave.	Slope, wetness, droughty.	Droughty, rooting depth.
27A---------- Au Gres	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Cutbanks cave	Wetness, droughty.	Wetness, droughty.
28B---------- East Lake	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
28C, 28E---------- East Lake	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
29A---------- Battlefield	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, droughty.
30---------- Wheatley	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty.	Wetness, droughty.
31B---------- Klacking	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
31C, 31D, 31E----- Klacking	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
33B---------- Mancelona	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
33C, 33D, 33E----- Mancelona	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
35---------- Kinross	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding--------	Wetness.
36B---------- Alcona	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Slope, cutbanks cave.	Slope, wetness, droughty.	Droughty.
36C---------- Alcona	Severe: slope.	Severe: piping.	Severe: no water.	Slope, cutbanks cave.	Slope, wetness, droughty.	Slope, droughty.
37A---------- Richter	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, droughty.	Wetness, droughty.
38---------- Tonkey	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, frost action, cutbanks cave.	Ponding--------	Wetness, rooting depth.
39B---------- Glennie	Moderate: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Erodes easily, droughty.
39C---------- Glennie	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, erodes easily, droughty.
40A---------- Sprinkler	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Frost action---	Wetness, droughty, soil blowing.	Wetness, erodes easily, droughty.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
41B---------- McGinn	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, fast intake, soil blowing.	Rooting depth.
41C, 41D---------- McGinn	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, fast intake, soil blowing.	Slope, rooting depth.
42A---------- Killmaster	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, frost action.	Wetness, droughty, soil blowing.	Wetness, droughty, rooting depth.
43---------- Wakeley	Severe: seepage.	Severe: ponding.	Severe: no water.	Ponding, percs slowly.	Ponding, droughty, fast intake.	Wetness, droughty, percs slowly.
44B---------- Bamfield	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, soil blowing.	Erodes easily, rooting depth, percs slowly.
45B---------- Hoist	Severe: seepage.	Severe: piping.	Severe: no water.	Slope----------	Slope, wetness, soil blowing.	Rooting depth.
45C---------- Hoist	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Slope----------	Slope, wetness, soil blowing.	Slope, rooting depth.
46---------- Ensley	Severe: seepage.	Severe: seepage, piping, ponding.	Moderate: slow refill.	Ponding, frost action.	Ponding--------	Wetness.
53B---------- Negwegon	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Wetness, erodes easily.
53C---------- Negwegon	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Wetness, slope, erodes easily.
54A---------- Algonquin	Slight---------	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, erodes easily, percs slowly.
55---------- Springport	Slight---------	Severe: ponding.	Severe: no water.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Wetness, percs slowly.
56B---------- Nester	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Percs slowly.
56C---------- Nester	Severe: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Slope, percs slowly.
57B---------- Kawkawlin	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness--------	Wetness, erodes easily, percs slowly.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
59B:						
Algonquin	Moderate: slope.	Severe: wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Springport	Slight	Severe: ponding.	Severe: no water.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Wetness, percs slowly.
60D, 60E Glennie	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, erodes easily, droughty.
61C, 61D, 61F Manistee	Severe: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty, rooting depth.
62A Allendale	Severe: seepage.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly	Wetness, droughty.	Wetness, droughty, percs slowly.
63C, 63D, 63F Bamfield	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, percs slowly.	Slope, erodes easily, rooting depth.
66D, 66E Alcona	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
68 Rondeau	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides.	Ponding, soil blowing, percs slowly.	Wetness.
69 Loxley	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, too acid.	Wetness.
70 Lupton	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
71 Tawas	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
72 Dorval	Severe: seepage.	Severe: ponding.	Severe: no water.	Ponding, percs slowly, subsides.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
73 Markey	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
74C2 Negwegon	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Wetness, slope, erodes easily.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
77---------- Waucedah	Moderate: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, frost action.	Ponding, soil blowing, percs slowly.	Wetness, erodes easily.
78. Pits						
80F:						
Zimmerman--------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
Alcona----------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
81B---------- Grayling	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
81C, 81E---------- Grayling	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
82C---------- Udorthents	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
83F. Udipsamments						
84B---------- Zimmerman	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
84C, 84D---------- Zimmerman	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
85B:						
Zimmerman--------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
Alcona----------	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Slope, cutbanks cave.	Slope, wetness, droughty.	Droughty.
85D:						
Zimmerman--------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
Alcona----------	Severe: slope.	Severe: piping.	Severe: no water.	Slope, cutbanks cave.	Slope, wetness, droughty.	Slope, droughty.
86:						
Histosols--------	Slight---------	Severe: excess humus, ponding.	Slight---------	Ponding, frost action.	Ponding, soil blowing.	Wetness.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
86:						
Aquents	Slight	Severe: ponding.	Slight	Ponding, frost action.	Ponding	Wetness.
87 Ausable	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, soil blowing, flooding.	Wetness.
88D Hoist	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, percs slowly.	Slope, rooting depth.
89F:						
Bamfield	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, percs slowly.	Slope, erodes easily, rooting depth.
Lupton	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding	Wetness.
90B Chinwhisker	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Droughty.
91E:						
Glennie	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, erodes easily, droughty.
Lupton	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding	Wetness.
92B:						
Klacking	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
McGinn	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, fast intake, soil blowing.	Rooting depth.
93B:						
Au Gres	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Cutbanks cave	Wetness, droughty.	Wetness, droughty.
Wakeley	Severe: seepage.	Severe: ponding.	Severe: no water.	Ponding, percs slowly.	Ponding, droughty, fast intake.	Wetness, droughty, percs slowly.
94F:						
Klacking	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
94F:						
McGinn	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, fast intake, soil blowing.	Slope, rooting depth.
96D2	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.
97 Colonville	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, frost action, cutbanks cave.	Wetness, droughty, soil blowing.	Wetness, droughty.
98C Graycalm	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
102D, 102E, 102F Nester	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, percs slowly.
110D, 110F Negwegon	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.
111B Manistee	Severe: seepage.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Droughty, percs slowly.
209B, 210B Grayling	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
210C, 210D Grayling	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
211B Grayling	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
211C Grayling	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
212B Grayling	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
213B Graycalm	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
213C Graycalm	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
215C Typic Udipsamments	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
220B---------- Typic Udipsamments	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
220C, 220D, 220E-- Typic Udipsamments	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
221B---------- Typic Udipsamments	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
221C, 221D-------- Typic Udipsamments	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
222B---------- Typic Udipsamments	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
223B:						
Graycalm---------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
Grayling---------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
223C, 223D:						
Graycalm---------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
Grayling---------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
224B---------- Croswell	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Slope, cutbanks cave.	Slope, wetness, droughty.	Droughty.
225B---------- Entic Haplorthods	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
225C---------- Entic Haplorthods	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
230C:						
Entic Haplorthods	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
Alfic Haplorthods	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
231B:						
Entic Haplorthods	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
Alfic Haplorthods	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
231C, 231D:						
Entic Haplorthods	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
Alfic Haplorthods	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
232B:						
Entic Haplorthods	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
Alfic Haplorthods	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
233B:						
Alfic Haplorthods	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
Entic Haplorthods	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
233C, 233D:						
Alfic Haplorthods	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
Entic Haplorthods	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
235B:						
Alfic Haplorthods, sandy over loamy	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.
Alfic Haplorthods, sandy----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Droughty.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
235C, 235D: Alfic Haplorthods, sandy over loamy	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
Alfic Haplorthods, sandy	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, droughty.
236B, 236C. Arenic Eutroboralfs						
237B, 237C, 237D. Glossic Eutroboralfs						
247B: Glennie	Moderate: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Erodes easily, droughty.
Bamfield	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, soil blowing.	Erodes easily, rooting depth, percs slowly.
247C, 247D: Glennie	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, erodes easily, droughty.
Bamfield	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, percs slowly.	Slope, erodes easily, rooting depth.
250D: Glossic Eutroboralfs.						
Borosaprists.						
252A: Borosaprists.						
Au Gres	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, droughty.
253A: Au Gres	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, droughty.
Allendale	Severe: seepage.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly	Wetness, droughty.	Wetness, droughty, percs slowly.

Table 16.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
253A: Croswell	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Droughty.
262A--Au Gres	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, droughty.
263A. Alfic Haplaquods						
264A--Allendale	Severe: seepage.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly---	Wetness, droughty.	Wetness, droughty, percs slowly.
272: Haplaquods.						
Fluvaquents.						
273: Leafriver	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
Wakeley	Severe: seepage.	Severe: ponding.	Severe: no water.	Ponding, percs slowly.	Ponding, droughty, fast intake.	Wetness, droughty, percs slowly.
274. Typic Haplaquods						
280: Aquents.						
Histosols.						
281, 282. Borosaprists.						

Table 17.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
11B---------- Eastport	0-8	Sand----------	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
	8-29	Sand----------	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
	29-80	Sand----------	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
12B:											
Tawas----------	0-5	Muck----------	PT	A-8	0	---	---	---	---	---	---
	5-17	Muck----------	PT	A-8	0	---	---	---	---	---	---
	17-60	Sand----------	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	95-100	90-100	30-70	0-15	---	NP
Au Gres---------	0-10	Sand----------	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
	10-27	Sand, loamy sand	SP-SM, SM, SC-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-75	0-30	---	NP
	27-60	Sand----------	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
16B, 16C, 16D, 16E---------- Graycalm	0-1	Sand----------	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	35-55	0-15	---	NP
	1-46	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2, A-1	0	95-100	85-100	30-75	0-30	---	NP
	46-80	Sand, loamy sand	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	30-75	0-30	---	NP
17B---------- Croswell	0-4	Sand----------	SP-SM, SM	A-3, A-2-4, A-1-b	0	90-100	85-100	40-70	5-15	---	NP
	4-10	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-75	3-30	---	NP
	10-29	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-75	3-30	---	NP
	29-80	Sand----------	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-70	3-15	---	NP
18A---------- Au Gres	0-10	Sand----------	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
	10-27	Sand, loamy sand	SP-SM, SM, SC-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-75	0-30	---	NP
	27-60	Sand----------	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	95-100	90-100	35-70	0-15	---	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
19----------	0-9	Muck----------	PT	A-8	0	---	---	---	---	---	---
Leafriver	9-21	Loamy sand, sand	SM, SP-SM, SP	A-2-4	0	100	75-100	35-75	0-30	---	NP
	21-60	Loamy sand, fine sand, sand.	SM, SP-SM, SP	A-3, A-2, A-2-4, A-1	0	95-100	75-100	35-70	3-15	---	NP
26B----------	0-6	Sand----------	SP-SM, SM, SP	A-3, A-2, A-1	0	90-100	85-100	40-70	0-25	---	NP
Croswell	6-35	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2, A-1	0	90-100	85-100	40-75	0-30	<20	NP-4
	35-50	Sand----------	SP-SM, SM, SP	A-3, A-2, A-1	0	90-100	85-100	40-70	0-25	---	NP
	50-60	Stratified sandy loam to silty clay loam.	CL, SC, SC-SM, CL-ML	A-6, A-4, A-2	0	100	90-100	65-95	25-90	20-40	7-20
27A----------	0-15	Sand----------	SM, SP-SM, SP	A-2-4, A-3	0	95-100	90-100	60-80	0-15	---	NP
Au Gres	15-44	Sand, loamy sand	SM, SP, SP-SM, SC-SM	A-2-4, A-3	0	95-100	90-100	60-80	0-20	---	NP
	44-58	Sand----------	SP, SP-SM	A-3, A-2	0	95-100	90-100	50-80	0-10	---	NP
	58-80	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	75-95	45-60	30-40
28B, 28C, 28E----	0-4	Sand----------	SM, SP-SM, SP	A-1, A-2-4, A-3	0-15	95-100	85-100	40-70	0-15	---	NP
East Lake	4-30	Sand, loamy sand	SM, SP-SM, SP	A-1, A-2-4, A-3	0-5	90-100	75-100	35-75	0-30	---	NP
	30-60	Stratified very gravelly coarse sand to sand.	GP, SP-SM, SP	A-1, A-3, A-2-4	0-5	70-90	50-75	25-55	0-10	---	NP
29A----------	0-9	Sand----------	SP, SP-SM, SM	A-2-4, A-3, A-1	0-5	90-100	90-100	35-70	0-15	---	NP
Battlefield	9-10	Sand, loamy sand	SP, SP-SM, SM, SC-SM	A-2-4, A-3, A-1	0-5	90-100	90-100	35-75	0-30	<25	NP-7
	10-33	Sand, loamy sand	SP, SP-SM, SM, SC-SM	A-2-4, A-3, A-1	0-5	90-100	90-100	35-75	0-30	<25	NP-7
	33-60	Gravelly sand, gravelly coarse sand.	SP, SW, SW-SM, SP-SM	A-1, A-2-4, A-3	0-5	70-90	60-75	30-55	0-10	---	NP
30----------	0-5	Muck----------	PT	A-8	0	---	---	---	---	---	---
Wheatley	5-34	Sand, loamy sand	SM, SP-SM	A-2-4, A-1-b, A-3	0-5	90-95	85-90	40-75	5-30	---	NP
	34-60	Gravelly sand, gravelly loamy sand.	SW, SP	A-1-b, A-1-a, A-2-4, A-3	5-15	70-90	50-75	25-60	0-20	---	NP-2
31B, 31C, 31D, 31E----------	0-3	Loamy sand-------	SM, SP-SM	A-2, A-1	0	90-100	85-100	35-75	10-30	---	NP
Klacking	3-27	Sand, loamy sand	SP-SM, SM, SP	A-2, A-1, A-3	0	90-100	85-100	35-75	0-30	---	NP
	27-60	Sand, loamy sand, sandy loam.	SP-SM, SM, SP, SC-SM	A-2, A-4, A-1, A-3	0	90-100	85-100	35-70	0-40	<25	NP-7

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
33B, 33C, 33D, 33E---------- Mancelona	0-5	Loamy sand-------	SM, SP-SM	A-2, A-1-b	0-15	90-100	85-95	35-80	10-35	---	NP
	5-31	Loamy sand, sand	SM, SP-SM	A-2, A-1-b, A-3	0-15	80-100	85-95	30-75	5-30	---	NP
	31-39	Very gravelly loam, sandy clay loam, sandy loam.	SC-SM, SC, SP-SC	A-2, A-4, A-6, A-1	0-15	85-100	55-95	35-80	10-50	20-35	4-15
	39-60	Stratified very gravelly sand, gravelly sand, sand.	GP, SP, GW, SW	A-1, A-2, A-3	0-15	40-70	30-55	20-60	0-15	---	NP
35---------- Kinross	0-3	Muck----------	PT	A-8	0	---	---	---	---	---	NP
	3-26	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	90-100	50-80	5-30	---	NP
	26-60	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	90-100	50-80	5-30	---	NP
36B, 36C---------- Alcona	0-3	Loamy very fine sand.	SM	A-2-4	0	95-100	90-100	70-95	15-35	<25	NP-4
	3-12	Loamy very fine sand, very fine sandy loam, fine sandy loam.	SM, ML, SC, CL	A-4, A-2-4	0	95-100	90-100	55-95	15-65	<30	NP-10
	12-21	Loamy very fine sand, loam, very fine sandy loam.	SM, ML, SC, CL	A-4	0	95-100	90-100	70-95	35-65	<30	NP-10
	21-41	Sandy loam, very fine sandy loam, loam.	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	95-100	90-100	55-85	25-70	20-30	4-10
	41-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-4, A-2-4	0	95-100	90-100	60-95	25-85	<30	NP-7
37A---------- Richter	0-12	Loamy fine sand	SM, SP-SM	A-2, A-1	0	100	90-100	45-80	10-35	<20	NP-4
	12-37	Loamy sand, fine sandy loam, clay loam.	SM, SC, SC-SM	A-4, A-2, A-6, A-1	0	100	90-100	45-90	15-50	10-30	NP-16
	37-60	Stratified loamy sand to silt loam.	SM, SC, SC-SM	A-4, A-2, A-1	0	100	90-100	45-90	15-75	10-25	NP-10
38---------- Tonkey	0-6	Silt loam--------	CL-ML, CL	A-4, A-6	0	95-100	90-100	85-95	60-90	20-30	4-11
	6-26	Very fine sandy loam, silt loam.	SM, SC-SM, SC, ML	A-2, A-4	0	95-100	90-100	75-95	35-90	<25	NP-9
	26-60	Stratified silt loam, silt, very fine sandy loam.	SM, SC-SM, SC, ML	A-2, A-6, A-4	0-2	100	85-100	75-90	35-95	<30	NP-11

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
39B, 39C--------- Glennie	0-7	Loamy sand-------	SM, SP-SM	A-2, A-1	0-10	90-100	85-100	45-75	10-30	---	NP
	7-20	Loamy sand, sandy loam.	SM, SC-SM, SP-SM	A-2-4, A-1, A-4	0-10	90-100	85-100	45-75	10-40	<25	NP-7
	20-40	Loamy sand, sandy loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-2-6, A-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	40-46	Loamy sand, sandy clay loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-6, A-2-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	46-56	Clay, clay loam, sandy clay loam.	SC, CL, CH	A-7, A-6	0-10	90-100	85-100	65-95	45-90	30-65	10-35
	56-99	Sandy clay loam, clay loam, loam.	SC, CL	A-7, A-6, A-4	0-10	90-100	85-100	65-90	45-75	25-50	7-25
40A-------------- Sprinkler	0-5	Sandy loam-------	SC-SM, SM, SC	A-2-4, A-4	0-5	95-100	90-100	55-70	25-40	<30	NP-10
	5-13	Sandy loam-------	SC-SM, SM, SC	A-2-4, A-4	0-5	95-100	90-100	55-70	25-40	<30	NP-10
	13-28	Sandy loam, loam, clay loam.	SC, CL	A-6, A-7-6	0-5	95-100	90-100	55-90	35-80	25-45	10-20
	28-44	Loam, clay loam	CL	A-6, A-7	0-5	95-100	90-100	75-90	55-80	25-45	10-20
	44-60	Loam, clay loam	CL	A-6, A-7	0-5	95-100	90-100	75-90	55-80	25-45	10-20
41B, 41C, 41D---- McGinn	0-2	Loamy sand-------	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	2-4	Loamy sand-------	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	4-16	Loamy sand-------	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	16-25	Loamy sand, sandy loam, loam.	SP-SM, SM, SC-SM, ML	A-2-4, A-1-b, A-4	0-8	90-100	85-100	35-95	10-60	<25	NP-7
	25-35	Sandy loam, loam	SC-SM, SC, CL, CL-ML	A-2-4, A-4, A-6	0-8	90-100	85-100	45-95	20-60	25-30	7-11
	35-80	Sandy loam-------	SM, SC-SM	A-2-4, A-4, A-1-b	0-8	90-100	85-100	45-80	20-50	<25	NP-7
42A-------------- Killmaster	0-8	Sandy loam-------	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-100	45-85	20-50	<25	NP-7
	8-13	Sandy loam, loamy sand.	SM, SC-SM	A-4, A-2-4	0-8	90-100	85-100	45-85	25-50	<25	NP-6
	13-23	Loamy sand, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-4, A-2-4	0-8	90-100	85-100	35-85	25-70	<25	NP-7
	23-32	Sandy loam, loam	SC-SM, SC, ML, CL-ML	A-4, A-2-4	0-8	90-100	85-100	35-85	25-70	20-30	4-10
	32-80	Sandy loam-------	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-95	85-90	45-80	20-50	<25	NP-7
43--------------- Wakeley	0-6	Mucky sand-------	SP, SP-SM, SM	A-2-4, A-3, A-1-b	0	95-100	75-100	35-70	0-15	---	NP
	6-29	Sand, loamy sand	SP, SP-SM, SM, SC-SM	A-2-4, A-3	0-5	95-100	75-100	35-75	0-30	<25	NP-7
	29-60	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
44B---------- Bamfield	0-6	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	55-85	30-50	<30	NP-11
	6-11	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	11-18	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	18-31	Clay loam--------	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-50	15-25
	31-60	Clay loam--------	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-45	15-25
45B, 45C---------- Hoist	0-9	Sandy loam-------	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-95	45-85	20-50	<25	NP-7
	9-14	Sandy loam-------	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-95	45-85	20-50	<25	NP-7
	14-21	Sandy loam, loamy sand, loam.	SM, SC-SM, ML, CL-ML	A-4, A-2-4, A-1-b	0-8	90-100	85-95	35-85	20-60	<25	NP-7
	21-27	Loam, sandy loam	SC, SC-SM, CL, CL-ML	A-4, A-2-4, A-6	0-8	90-100	85-95	35-85	20-60	25-30	7-11
	27-49	Sandy loam-------	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-95	35-75	20-50	<25	NP-7
	49-80	Sandy loam-------	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-95	85-90	45-80	20-50	<25	NP-7
46---------- Ensley	0-8	Mucky sandy loam	SC, SC-SM	A-4, A-6, A-2	0-10	90-100	85-100	35-75	25-50	20-30	4-11
	8-29	Sandy loam-------	SC, SC-SM	A-6, A-4, A-2, A-1	0-10	90-100	85-100	35-75	20-50	20-35	4-15
	29-60	Sandy loam-------	SC-SM, SM, SC	A-2, A-4, A-1	0-10	85-95	75-90	35-75	15-50	<30	2-9
53B, 53C---------- Negwegon	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	65-90	20-40	5-15
	8-46	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40
	46-60	Stratified silty clay to silt loam.	CL, CH	A-7	0	95-100	90-100	80-100	65-95	40-65	20-40
54A---------- Algonquin	0-7	Silt loam--------	CL	A-4, A-6	0-2	95-100	95-100	80-100	70-90	25-40	7-15
	7-14	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	14-29	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	29-60	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
55---------- Springport	0-8	Clay loam--------	CL	A-6, A-7	0-2	95-100	95-100	85-100	70-80	35-50	15-25
	8-12	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	12-27	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	27-60	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
56B, 56C---------- Nester	0-9	Loam----------	ML, CL, CL-ML	A-4, A-6	0-5	90-100	85-100	65-100	50-90	15-35	2-15
	9-14	Loam, sandy loam, clay loam.	ML, CL, SC, SM	A-4, A-6, A-2-4, A-2-6	0-5	90-100	85-100	45-100	20-90	<35	NP-15
	14-40	Clay loam, silty clay loam, clay.	CL, CH	A-7	0-5	90-100	85-100	75-100	55-95	40-55	20-30
	40-60	Clay loam, silty clay loam.	CL	A-7	0-5	90-100	85-100	70-100	50-95	40-50	15-25
57B---------- Kawkawlin	0-10	Loam----------	ML, CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-95	50-75	20-40	2-15
	10-16	Clay loam, clay	CL, CH	A-7	0-5	95-100	85-100	75-100	55-95	40-55	20-30
	16-60	Clay loam, loam	CL	A-6, A-7	0-5	95-100	85-100	75-100	50-95	35-50	15-25
59B:											
Algonquin-------	0-7	Silt loam--------	CL	A-4, A-6	0-2	95-100	95-100	80-100	70-90	25-40	7-15
	7-14	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	14-29	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	29-60	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
Springport------	0-8	Clay loam--------	CL	A-6, A-7	0-2	95-100	95-100	85-100	70-80	35-50	15-25
	8-12	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	12-27	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
	27-60	Silty clay, silty clay loam.	CL, CH	A-7	0-2	95-100	95-100	85-100	80-95	40-65	20-40
60D, 60E---------- Glennie	0-7	Loamy sand-------	SM, SP-SM	A-2-4, A-1	0-10	90-100	85-100	45-75	10-30	---	NP
	7-20	Loamy sand, sandy loam.	SM, SC-SM, SP-SM	A-2-4, A-1, A-4	0-10	90-100	85-100	45-75	10-40	<25	NP-7
	20-40	Loamy sand, sandy loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-2-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	40-46	Loamy sand, sandy loam, sandy clay loam.	SM, SC, ML, CL	A-2-4, A-4, A-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	46-56	Clay, clay loam, sandy clay loam.	SC, CL, CH	A-7, A-6	0-10	90-100	85-100	65-90	45-90	30-65	10-35
	56-99	Sandy clay loam, clay loam, loam.	SC, CL	A-7, A-6, A-4	0-10	90-100	85-100	65-90	45-75	25-50	7-25
61C, 61D, 61F---- Manistee	0-6	Loamy sand-------	SM, SP-SM	A-2-4, A-1-b	0	95-100	90-100	45-75	10-30	---	NP
	6-24	Sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-3	0-2	95-100	90-100	45-75	5-30	---	NP
	24-50	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40
	50-60	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-100	70-95	40-65	20-40

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
62A---------- Allendale	0-11	Loamy sand-------	SM, SP-SM	A-2-4, A-1-b, A-4	0	95-100	90-100	45-80	10-30	---	NP
	11-25	Sand, loamy sand	SM, SP-SM	A-2-4, A-3, A-1-b	0	95-100	90-100	45-80	5-30	---	NP
	25-60	Silty clay, clay	CH, MH	A-7	0	100	90-100	90-100	75-95	50-70	20-40
63C, 63D, 63F---- Bamfield	0-6	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	55-85	30-50	<30	NP-11
	6-11	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	11-18	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	18-31	Clay loam--------	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-50	15-25
	31-60	Clay loam--------	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-45	15-25
66D, 66E---------- Alcona	0-3	Loamy very fine sand.	SM	A-2-4	0	95-100	90-100	70-95	15-35	<25	NP-4
	3-12	Loamy very fine sand, very fine sandy loam, fine sandy loam.	SM, ML, SC, CL	A-4, A-2-4	0	95-100	90-100	55-95	15-65	<30	NP-10
	12-21	Loamy very fine sand, loam, very fine sandy loam.	SM, ML, SC, CL	A-4	0	95-100	90-100	70-95	35-65	<30	NP-10
	21-41	Fine sandy loam, very fine sandy loam, loam.	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	95-100	90-100	55-85	25-70	20-30	4-10
	41-60	Stratified fine sand to silt loam.	SM, ML, SC, CL	A-2-4, A-4	0	95-100	90-100	60-95	25-85	<30	NP-10
68---------- Rondeau	0-19	Muck----------	PT	A-8	0	---	---	---	---	---	NP
	19-60	Marl----------	OH, MH	A-8, A-5, A-7	0	100	95-100	80-90	60-80	50-90	NP-20
69---------- Loxley	0-18	Peat----------	PT	A-8	0	---	---	---	---	---	---
	18-60	Muck----------	PT	A-8	0	---	---	---	---	---	---
70---------- Lupton	0-5	Muck----------	PT	A-8	0	---	---	---	---	---	---
	5-60	Muck----------	PT	A-8	0	---	---	---	---	---	---
71---------- Tawas	0-5	Muck----------	PT	A-8	0	---	---	---	---	---	---
	5-17	Muck----------	PT	A-8	0	---	---	---	---	---	---
	17-60	Sand----------	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	95-100	90-100	30-70	0-15	---	NP
72---------- Dorval	0-27	Muck----------	PT	A-8	0	---	---	---	---	---	---
	27-60	Silty clay, clay	CH, CL	A-7	0	100	90-100	90-100	80-100	45-70	25-40
73---------- Markey	0-28	Muck----------	PT	A-8	---	---	---	---	---	---	---
	28-60	Sand----------	SP, SM, SP-SM	A-2, A-3, A-1	0	95-100	60-100	30-75	0-15	---	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
74C2----------	0-8	Silty clay loam	CL	A-6, A-7	0	95-100	90-100	80-100	75-95	35-50	15-25
Negwegon	8-40	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-60	Stratified silty clay to silt loam.	CL, CH	A-7	0	95-100	90-100	80-100	65-95	40-65	20-40
77----------	0-9	Muck----------	PT	A-8	0	---	---	---	---	---	---
Waucedah	9-13	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-30	6-11
	13-18	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-30	6-11
	18-55	Loamy sand, sandy loam.	SC, SM, SC-SM	A-2-4, A-4	0	100	100	50-75	15-40	<25	NP-8
	55-60	Silty clay-------	CL, CH	A-7-6	0	100	100	80-100	80-100	45-65	25-40
78.											
Pits											
80F:											
Zimmerman-------	0-4	Loamy fine sand	SM	A-2	0	100	100	95-100	15-30	<20	NP
	4-80	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	95-100	5-20	<20	NP
Alcona----------	0-3	Loamy very fine sand.	SM	A-2-4	0	95-100	90-100	70-95	15-35	<25	NP-4
	3-12	Loamy very fine sand, very fine sandy loam, fine sandy loam.	SM, ML, SC, CL	A-4, A-2-4	0	95-100	90-100	55-95	15-65	<30	NP-10
	12-21	Loamy very fine sand, loam, very fine sandy loam.	SM, ML, SC, CL	A-4	0	95-100	90-100	70-95	35-65	<30	NP-10
	21-41	Fine sandy loam, very fine sandy loam, loam.	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	95-100	90-100	55-85	25-70	20-30	4-10
	41-60	Stratified fine sand to silt loam.	SM, ML, SC, CL	A-2-4, A-4	0	95-100	90-100	60-95	25-85	<30	NP-10
81B, 81C, 81E----	0-2	Sand----------	SM, SP-SM, SP	A-1, A-2, A-3	0	95-100	90-100	45-70	3-15	---	NP
Grayling	2-29	Sand----------	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	45-70	3-15	---	NP
	29-63	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	40-70	0-15	---	NP
	63-80	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	40-70	0-15	---	NP
82C.											
Udorthents											
83F.											
Udipsamments											
84B, 84C, 84D----	0-4	Loamy fine sand	SM	A-2	0	100	100	95-100	15-30	<20	NP
Zimmerman	4-80	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	95-100	5-20	<20	NP
85B, 85D:											
Zimmerman-------	0-4	Loamy fine sand	SM	A-2	0	100	100	95-100	15-30	<20	NP
	4-80	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	95-100	5-20	<20	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
85B, 85D:											
Alcona	0-3	Loamy very fine sand.	SM	A-2-4	0	95-100	90-100	70-95	15-35	<25	NP-4
	3-12	Loamy very fine sand, very fine sandy loam, fine sandy loam.	SM, ML, SC, CL	A-4, A-2-4	0	95-100	90-100	55-95	15-65	<30	NP-10
	12-21	Loamy very fine sand, loam, very fine sandy loam.	SM, ML, SC, CL	A-4	0	95-100	90-100	70-95	35-65	<30	NP-10
	21-41	Fine sandy loam, very fine sandy loam, loam.	SC, SC-SM, CL, CL-ML	A-2-4, A-4	0	95-100	90-100	55-85	25-70	20-30	4-10
	41-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-4, A-2-4	0	95-100	90-100	60-95	25-85	<30	NP-7
86:											
Histosols.											
Aquents.											
87	0-8	Muck	PT	A-8	0	---	---	---	---	---	---
Ausable	8-17	Sand, loamy sand	SP-SM, SM	A-3, A-2-4	0-15	95-100	85-100	50-75	5-30	---	NP
	17-60	Sand, loamy sand	SP, SM, SP-SM	A-3, A-2-4, A-1	0-15	95-100	85-100	50-75	0-30	---	NP
88D	0-9	Sandy loam	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-95	45-85	20-50	<25	NP-7
Hoist	9-14	Sandy loam	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-95	45-85	20-50	<25	NP-7
	14-21	Sandy loam, loamy sand, loam.	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-95	35-85	20-50	<25	NP-7
	21-27	Loam, sandy loam	SC, SC-SM, CL, CL-ML	A-4, A-2-4, A-6	0-8	90-100	85-95	35-85	20-60	25-30	7-11
	27-49	Sandy loam	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-95	35-75	20-50	<25	NP-7
	49-80	Sandy loam	SM, SC-SM	A-4, A-2-4, A-1-b	0-8	90-100	85-90	45-80	20-50	<25	NP-7
89F:											
Bamfield	0-6	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	55-85	30-50	<30	NP-11
	6-11	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	11-18	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	18-31	Clay loam	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-50	15-25
	31-60	Clay loam	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-45	15-25

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
89F:											
Lupton----------	0-5	Muck----------	PT	A-8	0	---	---	---	---	---	---
	5-60	Muck----------	PT	A-8	0	---	---	---	---	---	---
90B---------- Chinwhisker	0-3	Sand----------	SM, SP-SM, SP	A-2-4, A-1-b, A-3	0	95-100	75-100	35-70	0-15	---	NP
	3-8	Sand, loamy sand	SM, SP-SM, SP	A-2-4, A-1-b, A-3	0	95-100	75-100	35-70	0-25	---	NP
	8-21	Sand, loamy sand	SM, SP-SM, SP	A-2-4, A-1-b, A-3	0	95-100	75-100	35-70	0-25	---	NP
	21-36	Sand----------	SM, SP-SM, SP	A-2-4, A-1-b, A-3	0	95-100	75-100	35-70	0-15	---	NP
	36-80	Stratified sand to loamy sand.	SM, SP-SM, SP	A-2-4, A-1-b, A-3	0	95-100	75-100	35-75	0-25	---	NP
91E:											
Glennie----------	0-7	Loamy sand-------	SM, SP-SM	A-2-4, A-1	0-10	90-100	85-100	45-75	10-30	---	NP
	7-20	Loamy sand, sandy loam.	SM, SC-SM, SP-SM	A-2-4, A-1, A-4	0-10	90-100	85-100	45-75	10-40	<25	NP-7
	20-40	Loamy sand, sandy loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-2-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	40-46	Loamy sand, sandy clay loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	46-56	Clay, clay loam, sandy clay loam.	SC, CL, CH	A-7, A-6	0-10	90-100	85-100	65-90	45-90	30-65	10-35
	56-99	Sandy clay loam, clay loam, loam.	SC, CL	A-7, A-6, A-4	0-10	90-100	85-100	65-90	45-75	25-50	7-25
Lupton----------	0-5	Muck----------	PT	A-8	0	---	---	---	---	---	---
	5-60	Muck----------	PT	A-8	0	---	---	---	---	---	---
92B:											
Klacking--------	0-3	Loamy sand-------	SM, SP-SM	A-2, A-1	0	90-100	85-100	35-75	10-30	---	NP
	3-27	Sand, loamy sand	SP-SM, SM, SP	A-2, A-1, A-3	0	90-100	85-100	35-75	0-30	---	NP
	27-60	Sand, loamy sand, sandy loam.	SP-SM, SM, SP, SC-SM	A-2, A-4, A-1, A-3	0	90-100	85-100	35-70	0-40	<25	NP-7
McGinn----------	0-2	Loamy sand-------	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	2-4	Loamy sand-------	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	4-16	Loamy sand-------	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	16-25	Loamy sand, sandy loam, loam.	SP-SM, SM, SC-SM, ML	A-2-4, A-1-b, A-4	0-8	90-100	85-100	35-95	10-60	<25	NP-7
	25-35	Sandy loam, loam	SC-SM, SC, CL, CL-ML	A-2-4, A-4, A-6	0-8	90-100	85-100	45-95	20-60	25-30	7-11
	35-80	Sandy loam-------	SM, SC-SM	A-2-4, A-4, A-1-b	0-8	90-100	85-100	45-80	20-50	<25	NP-7

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
93B:											
Au Gres	0-15	Sand	SM, SP-SM, SP	A-2-4, A-3	0	95-100	90-100	60-80	0-15	---	NP
	15-44	Sand, loamy sand	SM, SP, SP-SM, SC-SM	A-2-4, A-3	0	95-100	90-100	60-80	0-20	---	NP
	44-58	Sand	SP, SP-SM	A-3, A-2	0	95-100	90-100	50-80	0-10	---	NP
	58-80	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	75-95	45-60	30-40
Wakeley	0-6	Mucky sand	SP, SP-SM, SM	A-2-4, A-3, A-1-b	0	95-100	75-100	35-70	0-15	---	NP
	6-29	Sand, loamy sand	SP, SP-SM, SM, SC-SM	A-2-4, A-3	0-5	95-100	75-100	35-75	0-30	<25	NP-7
	29-60	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40
94F:											
Klacking	0-3	Loamy sand	SM, SP-SM	A-2, A-1	0	90-100	85-100	35-75	10-30	---	NP
	3-27	Sand, loamy sand	SP-SM, SM, SP	A-2, A-1, A-3	0	90-100	85-100	35-75	0-30	---	NP
	27-60	Sand, loamy sand, sandy loam.	SP-SM, SM, SP, SC-SM	A-2, A-4, A-1, A-3	0	90-100	85-100	35-70	0-40	<25	NP-7
McGinn	0-2	Loamy sand	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	2-4	Loamy sand	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	4-16	Loamy sand	SP-SM, SM	A-2-4, A-1-b	0-8	90-100	85-100	35-75	10-30	---	NP
	16-25	Loamy sand, sandy loam, loam.	SP-SM, SM, SC-SM, ML	A-2-4, A-1-b, A-4	0-8	90-100	85-100	35-95	10-60	<25	NP-7
	25-35	Sandy loam, loam	SC-SM, SC, CL, CL-ML	A-2-4, A-4, A-6	0-8	90-100	85-100	45-95	20-60	25-30	7-11
	35-80	Sandy loam	SM, SC-SM	A-2-4, A-4, A-1-b	0-8	90-100	85-100	45-80	20-50	<25	NP-7
96D2 Negwegon	0-6	Silty clay loam	CL	A-6, A-7	0	95-100	90-100	80-100	75-95	35-50	15-25
	6-40	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-60	Stratified silty clay to silt loam.	CL, CH	A-7	0	95-100	90-100	80-100	65-95	40-65	20-40
97 Colonville	0-11	Very fine sandy loam.	CL, CL-ML	A-4	0	100	100	85-95	50-65	20-25	4-8
	11-60	Fine sandy loam, loamy fine sand, silt loam.	SM, SC, ML, CL	A-4, A-1-b, A-2-4	0	90-100	75-100	35-85	5-55	<30	NP-9
98C Graycalm	0-1	Sand	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	35-55	0-15	---	NP
	1-46	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2, A-1	0	95-100	85-100	30-75	0-30	---	NP
	46-80	Sand, loamy sand, loamy coarse sand.	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	30-75	0-30	---	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
102D, 102E, 102F-Nester	0-9	Loam	ML, CL, CL-ML	A-4, A-6	0-5	90-100	85-100	65-100	50-90	15-35	2-15
	9-14	Loam, sandy loam, clay loam.	ML, SM	A-4, A-2-4, A-1-b	0-5	90-100	85-100	45-100	20-90	<35	NP-7
	14-25	Clay loam, silty clay loam, clay.	CL, CH	A-7	0-5	90-100	85-100	75-100	55-95	40-55	20-30
	25-60	Clay loam, silty clay loam.	CL	A-7	0-5	90-100	85-100	70-100	50-95	40-50	15-25
110D-Negwegon	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	65-90	20-40	6-15
	8-46	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40
	46-60	Stratified silty clay to silt loam.	CL, CH	A-7	0	95-100	90-100	80-100	65-95	40-65	20-40
110F-Negwegon	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	65-90	20-40	6-15
	4-40	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-60	Stratified silty clay to silt loam.	CL, CH	A-7	0	95-100	90-100	80-100	65-95	40-65	20-40
111B-Manistee	0-6	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0-2	95-100	90-100	45-75	10-30	---	NP
	6-24	Sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-3	0-2	95-100	90-100	45-75	5-30	---	NP
	24-50	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	80-95	45-65	25-40
	50-60	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	85-95	45-65	20-40
209B-Grayling	0-2	Sand	SM, SP-SM	A-3, A-1-b, A-2-4	0	90-100	85-100	40-70	5-15	---	NP
	2-29	Sand	SM, SP-SM	A-3, A-1-b, A-2-4	0	90-100	85-100	40-70	5-15	---	NP
	29-70	Sand, coarse sand	SM, SP-SM, SP	A-3, A-1-b, A-2-4	0	90-100	85-100	40-70	0-15	---	NP
	70-180	Sand	SM, SP-SM, SP	A-3, A-1-b, A-2-4	0	90-100	85-100	40-70	0-15	---	NP
210B, 210C, 210D-Grayling	0-2	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	95-100	90-100	45-70	3-15	---	NP
	2-29	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	45-70	3-15	---	NP
	29-63	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	40-70	0-15	---	NP
	63-180	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	40-70	0-15	---	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
211B, 211C--- Grayling	0-3	Sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	3-35	Sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	35-60	Sand, coarse sand	SM, SP-SM, SP	A-3, A-1, A-2	0	90-100	85-100	40-70	0-15	---	NP
	60-180	Stratified sand to loamy fine sand.	SM, SC-SM, SC, SP-SM	A-3, A-1, A-2, A-4	0	90-100	85-100	40-90	5-50	<30	NP-10
212B--- Grayling	0-3	Sand	SM, SP-SM	A-1, A-2, A-3	0	90-100	85-100	45-70	5-15	---	NP
	3-30	Sand	SP-SM, SM	A-1, A-2, A-3	0	90-100	85-100	45-70	5-15	---	NP
	30-180	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	90-100	85-100	40-70	0-15	---	NP
213B, 213C--- Graycalm	0-1	Sand	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	35-55	0-15	---	NP
	1-46	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2, A-1	0	95-100	85-100	30-75	0-30	---	NP
	46-70	Sand, loamy sand	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	30-75	0-30	---	NP
	70-180	Sand, coarse sand	SP, SP-SM, SM	A-2, A-1, A-3	0	95-100	85-100	35-55	0-15	---	NP
215C--- Typic Udipsamments	0-2	Sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	2-25	Sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	25-75	Sand, coarse sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	75-95	Sandy loam, sandy clay loam.	SC, CL, CL-ML, SC-SM	A-2, A-4, A-6	0	90-100	85-100	50-90	25-50	20-40	4-18
220B, 220C, 220D, 220E--- Typic Udipsamments	0-2	Sand	SM, SP-SM	A-3, A-1-b, A-2-4	0	90-100	85-100	40-70	5-15	---	NP
	2-40	Sand, loamy sand	SM, SP-SM	A-3, A-1-b, A-2-4	0	90-100	85-100	40-70	5-30	---	NP
	40-180	Sand, coarse sand	SP, SP-SM	A-3, A-1-b, A-2-4	0	90-100	85-100	40-70	0-5	---	NP
221B, 221C, 221D--- Typic Udipsamments	0-3	Sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	3-30	Sand, loamy sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-30	---	NP
	30-45	Sand, coarse sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	45-180	Stratified sand to sandy loam.	SM, SC-SM, SC, SP-SM	A-3, A-1, A-2, A-4	0	90-100	85-100	40-70	5-40	<30	NP-10

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
222B---------- Typic Udipsamments	0-2	Sand----------	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-15	---	NP
	2-30	Sand, loamy sand	SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	5-30	---	NP
	30-100	Sand, coarse sand	SP, SM, SP-SM	A-3, A-1, A-2	0	90-100	85-100	40-70	0-15	---	NP
223B, 223C, 223D:											
Graycalm--------	0-1	Sand----------	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	35-55	0-15	---	NP
	1-46	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2, A-1	0	95-100	85-100	30-75	0-30	---	NP
	46-70	Sand, loamy sand	SM, SP-SM, SP	A-2, A-1, A-3	0	95-100	85-100	30-75	0-30	---	NP
	70-180	Sand, coarse sand	SP, SP-SM, SM	A-2, A-1, A-3	0	95-100	85-100	35-55	0-15	---	NP
Grayling--------	0-2	Sand----------	SM, SP-SM, SP	A-1, A-2, A-3	0	95-100	90-100	45-70	3-15	---	NP
	2-29	Sand----------	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	45-70	3-15	---	NP
	29-63	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	40-70	0-15	---	NP
	63-180	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	40-70	0-15	---	NP
224B---------- Croswell	0-4	Sand----------	SP-SM, SM	A-3, A-2-4, A-1-b	0	90-100	85-100	40-70	5-15	---	NP
	4-10	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-75	3-30	---	NP
	10-29	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-75	3-30	---	NP
	29-80	Sand----------	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-70	3-15	---	NP
225B, 225C------- Entic Haplorthods	0-2	Sand----------	SP-SM, SM	A-2, A-1, A-3	0	95-100	90-100	45-70	5-15	---	NP
	2-30	Sand, fine sand, loamy sand.	SP, SP-SM, SM	A-2, A-1, A-3	0	95-100	90-100	45-90	3-35	---	NP
	30-55	Sand, coarse sand	SP, SP-SM, SM	A-2, A-1, A-3	0	95-100	90-100	45-70	0-15	---	NP
	55-80	Sandy clay loam, clay loam.	SC, CL	A-6, A-7, A-2-7	0	95-100	85-100	65-95	30-80	30-50	10-25
230C: Entic Haplorthods----	0-2	Sand----------	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-70	3-15	---	NP
	2-35	Sand, fine sand, loamy sand.	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-90	3-35	---	NP
	35-180	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	35-70	0-15	---	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
230C:											
Alfic Haplorthods----	0-4	Loamy sand-------	SM, SP-SM	A-2-4, A-1-b	0	90-100	75-100	35-75	10-30	---	NP
	4-37	Sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
	37-42	Sandy loam, silt loam, sandy clay loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand.	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
231B, 231C, 231D:											
Entic Haplorthods----	0-2	Sand----------	SP, SP-SM, SM	A-2, A-3, A-1	0	95-100	85-100	45-70	1-15	---	NP
	2-30	Sand, loamy sand	SP, SP-SM, SM	A-2, A-3, A-1	0	95-100	85-100	45-70	1-30	---	NP
	30-60	Sand----------	SP, SP-SM, SM	A-2, A-3, A-1	0	95-100	85-100	45-70	1-15	---	NP
	60-180	Stratified sand to sandy loam.	SP, SM, SC-SM, SC	A-3, A-1, A-2, A-4	0	95-100	85-100	40-70	1-40	0-30	NP-10
Alfic Haplorthods----	0-4	Loamy sand-------	SM, SP-SM	A-2-4, A-1-b	0	90-100	75-100	35-75	10-30	---	NP
	4-37	Sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
	37-42	Sandy loam, silt loam, sandy clay loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand.	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
232B:											
Entic Haplorthods----	0-2	Sand----------	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-70	3-15	---	NP
	2-30	Sand, loamy sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-70	3-30	---	NP
	30-100	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-70	0-15	---	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
232B:											
Alfic Haplorthods----	0-4	Loamy sand-------	SM, SP-SM	A-2-4, A-1-b	0	95-100	75-100	35-75	10-30	---	NP
	4-37	Sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	95-100	75-100	35-75	0-30	---	NP
	37-42	Sandy loam, silt loam, sandy clay loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	95-100	75-100	45-95	20-80	20-40	4-18
	42-100	Sand, loamy sand, coarse sand.	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	95-100	75-100	35-75	0-30	---	NP
233B, 233C, 233D:											
Alfic Haplorthods----	0-4	Loamy sand-------	SM, SP-SM	A-2-4, A-1-b	0	90-100	75-100	35-75	10-30	---	NP
	4-37	Sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
	37-42	Sandy loam, silt loam, sandy clay loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand.	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
Entic Haplorthods---	0-2	Sand----------	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-70	3-15	---	NP
	2-30	Sand, loamy sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-70	3-30	---	NP
	30-55	Sand, coarse sand	SP, SP-SM, SM	A-1, A-2, A-3	0	95-100	85-100	40-70	0-15	---	NP
	55-180	Stratified sand to sandy clay loam.	SM, SC, CL, ML	A-3, A-2, A-4, A-6	0	95-100	85-100	40-90	5-55	0-40	NP-20
235B, 235C, 235D:											
Alfic Haplorthods, sandy over loamy----------	0-4	Sand----------	SP-SM, SM	A-2-4, A-3, A-1-b	0	90-100	85-100	40-70	5-15	---	NP
	4-6	Sand, loamy sand	SP-SM, SM	A-2-4, A-3, A-1-b	0	90-100	85-100	40-75	5-30	---	NP
	6-27	Sand, loamy sand	SP-SM, SM	A-2-4, A-3, A-1-b	0	90-100	85-100	40-75	5-30	---	NP
	27-44	Sandy clay loam, silt loam, silty clay loam.	SC, CL	A-6, A-7, A-2-6	0	85-100	75-100	60-95	30-90	30-50	11-25
	44-120	Sand, loamy sand	SP-SM, SM	A-2-4, A-3, A-1-b	0	85-100	75-100	40-75	0-30	<25	NP-7

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
235B, 235C, 235D: Alfic Haplorthods, sandy	0-4	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0	90-100	75-100	35-75	10-30	---	NP
	4-37	Sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
	37-42	Sandy loam, silt loam, sandy clay loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	90-100	75-100	45-95	20-85	20-40	4-18
	42-180	Sand, loamy sand, coarse sand.	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	90-100	75-100	35-75	0-30	---	NP
236B, 236C. Arenic Eutroboralfs											
237B, 237C, 237D. Glossic Eutroboralfs											
247B, 247C:											
Glennie	0-7	Loamy sand	SM, SP-SM	A-2, A-1	0-10	90-100	85-100	45-75	10-30	---	NP
	7-20	Loamy sand, sandy loam.	SM, SC-SM, SP-SM	A-2-4, A-1, A-4	0-10	90-100	85-100	45-75	10-40	<25	NP-7
	20-40	Loamy sand, sandy loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-2-6, A-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	40-46	Loamy sand, sandy clay loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-6, A-2-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	46-56	Clay, clay loam, sandy clay loam.	SC, CL, CH	A-7, A-6	0-10	90-100	85-100	65-95	45-90	30-65	10-35
	56-99	Sandy clay loam, clay loam, loam.	SC, CL	A-7, A-6, A-4	0-10	90-100	85-100	65-90	45-75	25-50	7-25
Bamfield	0-6	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	55-85	30-50	<30	NP-11
	6-11	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	11-18	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	18-31	Clay loam	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-50	15-25
	31-60	Clay loam	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-45	15-25

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
247D:											
Glennie	0-7	Loamy sand	SM, SP-SM	A-2-4, A-1	0-10	90-100	85-100	45-75	10-30	---	NP
	7-20	Loamy sand, sandy loam.	SM, SC-SM, SP-SM	A-2-4, A-1, A-4	0-10	90-100	85-100	45-75	10-40	<25	NP-7
	20-40	Loamy sand, sandy loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-2-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	40-46	Loamy sand, sandy clay loam, loam.	SM, SC, ML, CL	A-2-4, A-4, A-6	0-10	90-100	85-100	45-85	10-75	10-35	NP-15
	46-56	Clay, clay loam, sandy clay loam.	SC, CL, CH	A-7, A-6	0-10	90-100	85-100	65-90	45-90	30-65	10-35
	56-99	Sandy clay loam, clay loam, loam.	SC, CL	A-7, A-6, A-4	0-10	90-100	85-100	65-90	45-75	25-50	7-25
Bamfield	0-6	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	55-85	30-50	<30	NP-11
	6-11	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	11-18	Fine sandy loam, sandy loam.	SM, SC-SM, SC	A-2-4, A-4, A-2-6, A-6	0-5	95-100	85-100	50-85	25-50	<30	NP-11
	18-31	Clay loam	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-50	15-25
	31-60	Clay loam	CL	A-6, A-7	0-5	95-100	85-100	70-90	50-80	35-45	15-25
250D:											
Glossic Eutroboralfs.											
Borosaprists.											
252A:											
Borosaprists.											
Au Gres	0-10	Sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
	10-27	Sand, loamy sand	SP-SM, SM, SC-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-75	0-30	<25	NP-7
	27-60	Sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
253A:											
Au Gres	0-10	Sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-70	0-15	---	NP
	10-27	Sand, loamy sand	SP-SM, SM, SC-SM, SP	A-2-4, A-3, A-1-b	0	95-100	90-100	35-75	0-30	<25	NP-7
	27-60	Sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	95-100	90-100	35-70	0-15	---	NP

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
253A:											
Allendale	0-11	Sand	SM, SW-SM, SP-SM	A-2-4, A-3, A-1-b	0	95-100	90-100	45-80	5-15	---	NP
	11-25	Sand, loamy sand	SM, SP-SM	A-2-4, A-3, A-1-b	0	95-100	90-100	45-80	5-30	---	NP
	25-60	Silty clay, clay	CH, MH	A-7	0	100	90-100	90-100	75-95	50-70	20-40
Croswell	0-4	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	90-100	85-100	40-70	5-15	---	NP
	4-10	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-75	3-30	---	NP
	10-29	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-75	3-30	---	NP
	29-80	Sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	90-100	85-100	40-70	3-15	---	NP
262A Au Gres	0-10	Sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	95-100	95-100	35-70	0-15	---	NP
	10-27	Sand, loamy sand	SP-SM, SM, SC-SM, SP	A-2-4, A-3, A-1-b	0	95-100	95-100	35-75	0-30	---	NP
	27-60	Sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	95-100	95-100	35-70	0-15	---	NP
263A. Alfic Haplaquods											
264A Allendale	0-11	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0	95-100	90-100	45-80	10-30	---	NP
	11-25	Sand, loamy sand	SM, SP-SM	A-2-4, A-3, A-4, A-1-b	0	95-100	90-100	45-80	5-30	---	NP
	25-60	Silty clay, clay	CH, MH	A-7	0	100	90-100	90-100	75-95	50-70	20-40
272:											
Haplaquods.											
Fluvaquents.											
273:											
Leafriver	0-9	Muck	PT	A-8	0	---	---	---	---	---	---
	9-21	Loamy sand	SM, SP-SM	A-2-4	0	100	75-100	35-75	15-30	---	NP
	21-60	Sand	SM, SP-SM, SP	A-3, A-2-4, A-1	0	95-100	70-100	35-70	3-15	---	NP
Wakeley	0-6	Mucky sand	SP, SP-SM, SM	A-2-4, A-3, A-1-b	0	95-100	75-100	35-70	0-15	---	NP
	6-29	Sand, loamy sand	SP, SP-SM, SM, SC-SM	A-2-4, A-3	0-5	95-100	75-100	35-75	0-30	---	NP
	29-60	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	90-100	85-100	75-95	40-65	20-40

Table 17.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
274. Typic Haplaquods											
280: Aquents.											
Histosols.											
281, 282. Borosaprists											

Table 18.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
11B	0-8	0-10	1.40-1.60	6.0-20	0.07-0.09	5.1-7.3	Low	0.15	5	1	1-2
Eastport	8-29	0-10	1.40-1.60	6.0-20	0.06-0.08	5.1-7.8	Low	0.15			
	29-80	0-4	1.40-1.55	6.0-20	0.03-0.06	6.6-8.4	Low	0.15			
12B:											
Tawas	0-5	---	0.30-0.55	0.2-6.0	0.35-0.45	4.5-7.8			4	2	40-60
	5-17	---	0.30-0.55	0.2-6.0	0.24-0.45	4.5-7.8					
	17-60	0-10	1.40-1.65	6.0-20	0.05-0.07	5.6-8.4	Low	0.15			
Au Gres	0-10	0-8	1.30-1.55	6.0-20	0.07-0.10	3.6-7.3	Low	0.10	5	1	2-4
	10-27	1-10	1.50-1.70	6.0-20	0.06-0.09	4.5-7.3	Low	0.10			
	27-60	0-8	1.50-1.70	6.0-20	0.05-0.07	5.1-7.3	Low	0.10			
16B, 16C, 16D, 16E	0-1	0-10	1.30-1.55	6.0-20	0.04-0.10	4.5-6.5	Low	0.10	5	1	.5-2
Graycalm	1-46	0-15	1.25-1.60	6.0-20	0.05-0.10	4.5-7.3	Low	0.10			
	46-80	0-10	1.50-1.65	6.0-20	0.04-0.09	4.5-7.3	Low	0.10			
17B	0-4	0-10	1.30-1.55	6.0-20	0.06-0.09	3.6-6.5	Low	0.10	5	1	.5-2
Croswell	4-10	0-10	1.40-1.60	6.0-20	0.06-0.10	4.5-7.3	Low	0.10			
	10-29	0-10	1.40-1.60	6.0-20	0.06-0.09	4.5-7.3	Low	0.10			
	29-80	0-10	1.50-1.65	6.0-20	0.05-0.07	5.1-8.4	Low	0.10			
18A	0-10	0-8	1.30-1.55	6.0-20	0.07-0.10	3.6-7.3	Low	0.10	5	1	2-4
Au Gres	10-27	1-10	1.50-1.70	6.0-20	0.06-0.09	4.5-7.3	Low	0.10			
	27-60	0-8	1.50-1.70	6.0-20	0.05-0.07	5.1-7.3	Low	0.10			
19	0-9	---	0.10-0.25	0.6-6.0	0.35-0.50	5.6-7.3			2	2	50-90
Leafriver	9-21	3-15	1.40-1.65	6.0-20	0.08-0.14	5.6-7.3	Low	0.17			
	21-60	0-10	1.50-1.65	6.0-20	0.03-0.08	5.6-7.3	Low	0.17			
26B	0-6	0-5	1.35-1.75	6.0-20	0.06-0.09	4.5-6.0	Low	0.15	5	1	.5-2
Croswell	6-35	0-10	1.35-1.75	6.0-20	0.06-0.10	5.1-6.5	Low	0.15			
	35-50	0-5	1.45-1.70	6.0-20	0.04-0.06	5.1-6.5	Low	0.15			
	50-60	10-35	1.30-1.90	0.2-0.6	0.10-0.21	5.1-7.8	Low	0.24			
27A	0-15	1-6	1.35-1.65	6.0-20	0.06-0.09	4.5-6.5	Low	0.15	5	1	1-2
Au Gres	15-44	1-10	1.30-1.65	6.0-20	0.05-0.12	4.5-6.5	Low	0.15			
	44-58	1-3	1.35-1.65	6.0-20	0.05-0.08	4.5-6.5	Low	0.15			
	58-80	40-60	1.60-1.70	<0.06	0.08-0.12	6.6-7.8	High	0.32			
28B, 28C, 28E	0-4	0-8	1.30-1.60	6.0-20	0.05-0.09	5.6-7.3	Low	0.15	4	1	.5-2
East Lake	4-30	0-10	1.30-1.60	6.0-20	0.07-0.10	5.6-7.3	Low	0.15			
	30-60	0-10	1.50-1.65	>20	0.02-0.06	7.4-8.4	Low	0.10			
29A	0-9	0-10	1.25-1.45	6.0-20	0.07-0.09	4.5-6.0	Low	0.10	4	1	1-3
Battlefield	9-10	0-15	1.40-1.60	6.0-20	0.06-0.12	4.5-6.0	Low	0.10			
	10-33	0-15	1.40-1.60	6.0-20	0.06-0.11	4.5-7.8	Low	0.10			
	33-60	0-5	1.50-1.65	>20	0.02-0.04	7.4-8.4	Low	0.10			
30	0-5	---	0.30-0.40	0.2-6.0	0.35-0.45	6.1-7.8	Low		3	2	40-70
Wheatley	5-34	2-10	1.45-1.70	6.0-20	0.06-0.08	6.1-7.8	Low	0.15			
	34-60	0-10	1.55-1.70	>20	0.02-0.04	7.4-8.4	Low	0.10			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
31B, 31C, 31D, 31E---------- Klacking	0-3	2-12	1.35-1.65	6.0-20	0.08-0.11	4.5-6.0	Low----------	0.15	5	2	1-2
	3-27	0-10	1.35-1.65	6.0-20	0.05-0.08	4.5-7.3	Low----------	0.10			
	27-60	2-15	1.55-1.70	2.0-6.0	0.05-0.11	4.5-7.3	Low----------	0.15			
33B, 33C, 33D, 33E---------- Mancelona	0-5	0-10	1.35-1.65	2.0-6.0	0.08-0.12	5.1-7.3	Low----------	0.17	4	2	.5-3
	5-31	2-15	1.30-1.65	6.0-20	0.06-0.12	5.6-7.8	Low----------	0.17			
	31-39	10-25	1.30-1.65	2.0-6.0	0.06-0.16	6.1-7.8	Low----------	0.17			
	39-60	0-10	1.45-1.65	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
35---------- Kinross	0-3	---	0.10-0.35	2.0-20	0.35-0.45	3.6-5.0	----------	----	5	2	20-70
	3-26	0-10	1.40-1.70	6.0-20	0.04-0.09	3.6-6.0	Low----------	0.15			
	26-60	0-10	1.40-1.70	6.0-20	0.04-0.06	4.5-6.5	Low----------	0.15			
36B, 36C---------- Alcona	0-3	2-15	1.10-1.60	0.6-6.0	0.10-0.14	4.5-7.3	Low----------	0.17	5	2	1-3
	3-12	5-15	1.25-1.70	0.6-6.0	0.10-0.17	4.5-7.3	Low----------	0.17			
	12-21	5-15	1.35-1.70	0.6-6.0	0.08-0.17	5.1-7.8	Low----------	0.17			
	21-41	10-20	1.35-1.70	0.6-2.0	0.13-0.20	5.1-7.8	Low----------	0.24			
	41-60	5-18	1.50-1.70	0.6-2.0	0.08-0.20	5.1-7.8	Low----------	0.24			
37A---------- Richter	0-12	0-10	1.20-1.50	2.0-6.0	0.10-0.12	5.6-7.3	Low----------	0.17	5	2	2-4
	12-37	10-22	1.35-1.60	0.6-2.0	0.10-0.18	5.6-7.3	Low----------	0.20			
	37-60	2-15	1.60-1.70	0.6-2.0	0.08-0.13	7.4-8.4	Low----------	0.20			
38---------- Tonkey	0-6	10-20	1.10-1.50	2.0-6.0	0.20-0.24	5.6-7.8	Low----------	0.32	4	5	4-7
	6-26	8-18	1.30-1.80	2.0-6.0	0.10-0.15	5.6-7.8	Low----------	0.24			
	26-60	0-20	1.60-1.80	2.0-6.0	0.05-0.19	7.4-8.4	Low----------	0.24			
39B, 39C---------- Glennie	0-7	2-10	1.35-1.60	2.0-6.0	0.09-0.12	5.1-7.3	Low----------	0.17	3	2	1-3
	7-20	5-15	1.35-1.70	2.0-6.0	0.10-0.14	5.1-7.3	Low----------	0.24			
	20-40	5-27	1.35-1.70	<0.06	0.09-0.18	5.6-7.3	Low----------	0.37			
	40-46	5-27	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	Low----------	0.37			
	46-56	20-55	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	High---------	0.37			
	56-99	15-40	1.80-2.10	<0.06	0.03-0.04	7.4-8.4	Moderate-----	0.37			
40A---------- Sprinkler	0-5	5-18	1.20-1.50	0.6-2.0	0.13-0.15	5.1-6.0	Low----------	0.28	3	3	2-4
	5-13	5-18	1.35-1.60	0.6-2.0	0.12-0.14	5.1-6.0	Low----------	0.28			
	13-28	15-35	1.65-1.80	0.2-0.6	0.03-0.05	5.1-6.0	Moderate-----	0.37			
	28-44	18-35	1.65-1.80	0.2-0.6	0.03-0.05	5.1-6.0	Moderate-----	0.37			
	44-60	18-35	1.50-1.70	0.6-2.0	0.03-0.05	7.9-8.4	Moderate-----	0.37			
41B, 41C, 41D---- McGinn	0-2	0-5	1.25-1.40	2.0-6.0	0.11-0.14	5.1-5.5	Low----------	0.17	5	2	1-3
	2-4	0-5	1.30-1.65	2.0-6.0	0.10-0.12	4.5-5.5	Low----------	0.17			
	4-16	0-5	1.30-1.65	2.0-6.0	0.09-0.11	5.1-5.5	Low----------	0.17			
	16-25	5-15	1.30-1.65	2.0-6.0	0.10-0.13	5.1-6.0	Low----------	0.17			
	25-35	15-20	1.50-1.75	0.6-2.0	0.12-0.14	5.6-6.5	Low----------	0.28			
	35-80	5-15	1.65-1.80	0.6-2.0	0.11-0.13	7.4-8.4	Low----------	0.28			
42A---------- Killmaster	0-8	5-15	1.30-1.65	2.0-6.0	0.12-0.15	5.1-6.5	Low----------	0.24	4	3	2-4
	8-13	3-12	1.40-1.70	2.0-6.0	0.10-0.14	5.6-6.5	Low----------	0.24			
	13-23	5-15	1.40-1.70	2.0-6.0	0.09-0.14	6.1-6.5	Low----------	0.24			
	23-32	10-18	1.50-1.75	0.6-2.0	0.11-0.15	6.6-7.8	Low----------	0.24			
	32-80	5-15	1.80-2.00	<0.06	0.03-0.04	7.4-8.4	Low----------	0.24			
43---------- Wakeley	0-6	0-10	1.00-1.20	6.0-20	0.15-0.20	5.6-7.8	Low----------	0.10	4	1	10-15
	6-29	0-15	1.45-1.60	6.0-20	0.05-0.10	5.6-7.8	Low----------	0.10			
	29-60	35-60	1.50-1.70	<0.06	0.08-0.12	7.4-8.4	High---------	0.32			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
44B	0-6	5-20	1.30-1.60	2.0-6.0	0.14-0.18	4.5-5.0	Low	0.24	4	3	1-3
Bamfield	6-11	5-20	1.35-1.70	2.0-6.0	0.11-0.17	5.1-5.5	Low	0.24			
	11-18	5-20	1.60-1.80	0.6-2.0	0.11-0.17	5.1-5.5	Low	0.24			
	18-31	27-40	1.35-1.65	0.2-0.6	0.13-0.19	5.6-8.4	Moderate	0.37			
	31-60	27-35	1.70-2.00	<0.06	0.03-0.04	7.9-8.4	Moderate	0.37			
45B, 45C	0-9	5-15	1.30-1.65	2.0-6.0	0.12-0.15	5.6-7.3	Low	0.24	4	3	1-3
Hoist	9-14	5-15	1.40-1.70	2.0-6.0	0.10-0.14	5.6-7.3	Low	0.24			
	14-21	5-15	1.40-1.70	2.0-6.0	0.09-0.14	6.1-7.3	Low	0.24			
	21-27	15-18	1.50-1.75	0.2-0.6	0.11-0.18	6.6-7.8	Low	0.32			
	27-49	5-15	1.60-1.80	0.2-0.6	0.11-0.15	7.4-8.4	Low	0.24			
	49-80	5-15	1.80-2.00	<0.06	0.03-0.04	7.4-8.4	Low	0.28			
46	0-8	10-20	1.10-1.30	2.0-6.0	0.17-0.22	6.1-7.8	Low	0.24	5	5	10-15
Ensley	8-29	10-25	1.30-1.70	0.6-2.0	0.11-0.18	6.6-8.4	Low	0.24			
	29-60	8-18	1.45-1.70	0.6-2.0	0.10-0.14	7.4-8.4	Low	0.20			
53B, 53C	0-8	12-27	1.40-1.60	0.6-2.0	0.22-0.24	6.1-7.8	Low	0.37	3	5	1-3
Negwegon	8-46	35-60	1.40-1.70	<0.06	0.11-0.20	6.1-7.8	High	0.32			
	46-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.9-8.4	High	0.32			
54A	0-7	15-27	1.20-1.55	0.6-2.0	0.22-0.24	6.6-7.3	Low	0.37	3	6	2-3
Algonquin	7-14	35-60	1.40-1.60	0.06-0.2	0.11-0.20	7.4-8.4	High	0.32			
	14-29	35-60	1.40-1.60	<0.06	0.11-0.20	7.9-8.4	High	0.32			
	29-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.9-8.4	High	0.32			
55	0-8	27-40	1.25-1.50	0.2-0.6	0.17-0.19	6.6-7.3	Moderate	0.32	3	6	2-5
Springport	8-12	35-60	1.40-1.65	0.06-0.2	0.11-0.20	7.4-8.4	High	0.32			
	12-27	35-60	1.40-1.70	<0.06	0.11-0.20	7.4-8.4	High	0.32			
	27-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.4-8.4	High	0.32			
56B, 56C	0-9	7-27	1.25-1.60	0.6-2.0	0.20-0.24	5.1-7.3	Low	0.32	3	5	1-3
Nester	9-14	5-25	1.25-1.60	0.6-2.0	0.15-0.22	5.1-7.3	Low	0.32			
	14-40	35-45	1.40-1.60	0.06-0.2	0.08-0.17	5.1-7.3	Moderate	0.32			
	40-60	30-40	1.40-1.65	0.06-0.2	0.10-0.17	7.9-8.4	Moderate	0.32			
57B	0-10	8-27	1.45-1.60	0.6-2.0	0.20-0.22	5.1-7.3	Low	0.37	3	5	2-4
Kawkawlin	10-16	35-45	1.45-1.60	0.06-0.2	0.10-0.20	5.1-7.8	Moderate	0.32			
	16-60	30-40	1.50-1.60	0.06-0.2	0.13-0.20	7.9-8.4	Moderate	0.32			
59B:											
Algonquin	0-7	15-27	1.20-1.55	0.6-2.0	0.22-0.24	6.6-7.3	Low	0.37	3	6	2-3
	7-14	35-60	1.40-1.60	0.06-0.2	0.11-0.20	7.4-8.4	High	0.32			
	14-29	35-60	1.40-1.60	<0.06	0.11-0.20	7.9-8.4	High	0.32			
	29-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.9-8.4	High	0.32			
Springport	0-8	27-40	1.25-1.50	0.2-0.6	0.17-0.19	6.6-7.3	Moderate	0.32	3	6	2-5
	8-12	35-60	1.40-1.65	0.06-0.2	0.11-0.20	7.4-8.4	High	0.32			
	12-27	35-60	1.40-1.70	<0.06	0.11-0.20	7.4-8.4	High	0.32			
	27-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.4-8.4	High	0.32			
60D, 60E	0-7	2-5	1.35-1.60	2.0-6.0	0.09-0.12	5.1-7.3	Low	0.17	3	2	1-3
Glennie	7-20	5-15	1.35-1.70	2.0-6.0	0.10-0.14	5.1-7.3	Low	0.24			
	20-40	5-27	1.35-1.70	<0.06	0.09-0.18	5.6-7.3	Low	0.37			
	40-46	5-27	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	Low	0.37			
	46-56	20-55	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	High	0.37			
	56-99	15-40	1.80-2.10	<0.06	0.03-0.04	7.4-8.4	Moderate	0.37			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
61C, 61D, 61F----	0-6	3-12	1.35-1.60	6.0-20	0.10-0.12	4.5-7.3	Low----------	0.17	4	2	2-4
Manistee	6-24	2-12	1.35-1.60	6.0-20	0.06-0.10	5.1-7.3	Low----------	0.17			
	24-50	35-60	1.50-1.70	<0.06	0.08-0.12	5.1-7.3	High---------	0.32			
	50-60	35-60	1.60-1.75	0.06-0.2	0.08-0.16	6.6-8.4	High---------	0.32			
62A----------	0-11	0-12	1.25-1.40	6.0-20	0.09-0.12	4.5-7.3	Low----------	0.17	4	2	2-4
Allendale	11-25	0-15	1.35-1.45	6.0-20	0.06-0.10	4.5-7.3	Low----------	0.17			
	25-60	40-60	1.45-1.70	<0.06	0.08-0.12	6.1-8.4	High---------	0.32			
63C, 63D, 63F----	0-6	5-20	1.30-1.60	2.0-6.0	0.14-0.18	4.5-5.0	Low----------	0.24	4	3	1-3
Bamfield	6-11	5-20	1.35-1.70	2.0-6.0	0.11-0.17	5.1-5.5	Low----------	0.24			
	11-18	5-20	1.60-1.80	0.6-2.0	0.11-0.17	5.1-5.5	Low----------	0.24			
	18-31	27-40	1.35-1.65	0.2-0.6	0.13-0.19	5.6-8.4	Moderate-----	0.37			
	31-60	27-35	1.70-2.00	<0.06	0.03-0.04	7.9-8.4	Moderate-----	0.37			
66D, 66E----------	0-3	2-15	1.30-1.60	0.6-6.0	0.10-0.14	4.5-7.3	Low----------	0.17	5	2	1-3
Alcona	3-12	5-20	1.35-1.70	0.6-6.0	0.10-0.17	4.5-7.3	Low----------	0.20			
	12-21	5-18	1.35-1.70	0.6-6.0	0.08-0.17	5.1-7.8	Low----------	0.15			
	21-41	10-20	1.35-1.70	0.6-2.0	0.13-0.20	5.1-7.8	Low----------	0.24			
	41-60	5-18	1.50-1.70	0.6-2.0	0.08-0.20	5.1-7.8	Low----------	0.24			
68----------	0-19	---	0.10-0.25	0.2-6.0	0.35-0.48	5.1-7.8	----------	----	5	2	>25
Rondeau	19-60	5-15	0.05-0.20	<0.2	0.20-0.22	7.4-8.4	----------	----			
69----------	0-18	---	0.30-0.40	>6.0	0.35-0.65	<4.5	----------	----	5	7	70-90
Loxley	18-60	---	0.10-0.35	0.2-6.0	0.35-0.45	<4.5	----------	----			
70----------	0-5	---	0.10-0.35	0.2-6.0	0.35-0.45	5.6-7.8	----------	----	5	2	70-90
Lupton	5-60	---	0.10-0.35	0.2-6.0	0.35-0.45	5.6-7.8	----------	----			
71----------	0-5	---	0.30-0.55	0.2-6.0	0.35-0.45	4.5-7.8	----------	----	4	2	40-60
Tawas	5-17	---	0.30-0.55	0.2-6.0	0.24-0.45	4.5-7.8	----------	----			
	17-60	0-10	1.40-1.65	6.0-20	0.03-0.10	5.6-8.4	Low----------	0.15			
72----------	0-27	---	0.13-0.42	0.6-6.0	0.20-0.25	5.1-7.8	----------	----	2	2	50-95
Dorval	27-60	35-60	1.40-1.65	<0.06	0.10-0.20	6.1-8.4	High---------	0.28			
73----------	0-28	---	0.15-0.45	0.2-6.0	0.35-0.45	5.6-7.8	----------	----	4	2	55-85
Markey	28-60	0-10	1.40-1.65	6.0-20	0.03-0.08	5.6-8.4	Low----------	0.10			
74C2----------	0-8	27-40	1.40-1.60	0.2-0.6	0.21-0.23	6.1-7.8	Moderate-----	0.37	3	7	.5-2
Negwegon	8-40	35-60	1.40-1.70	<0.06	0.11-0.20	6.1-7.8	High---------	0.32			
	40-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.9-8.4	High---------	0.32			
77----------	0-9	---	0.30-0.40	0.2-6.0	0.35-0.45	6.1-7.3	----------	----	5	2	40-70
Waucedah	9-13	12-20	1.40-1.60	0.6-2.0	0.20-0.22	6.1-8.4	Low----------	0.37			
	13-18	12-20	1.40-1.60	0.6-2.0	0.20-0.22	6.1-8.4	Low----------	0.37			
	18-55	5-15	1.40-1.65	0.6-2.0	0.09-0.12	6.1-8.4	Low----------	0.28			
	55-60	40-60	1.40-1.60	<0.06	0.10-0.12	6.1-8.4	Low----------	0.28			
78.											
Pits											
80F:											
Zimmerman--------	0-4	2-12	1.27-1.56	6.0-20	0.10-0.12	4.5-6.5	Low----------	0.17	5	2	1-2
	4-80	0-12	1.60-1.70	6.0-20	0.06-0.10	6.1-7.3	Low----------	0.17			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
80F:											
Alcona	0-3	2-15	1.30-1.60	0.6-6.0	0.10-0.14	4.5-7.3	Low	0.17	5	2	1-3
	3-12	5-20	1.35-1.70	0.6-6.0	0.10-0.17	4.5-7.3	Low	0.20			
	12-21	5-18	1.35-1.70	0.6-6.0	0.08-0.17	5.1-7.8	Low	0.15			
	21-41	10-20	1.35-1.70	0.6-2.0	0.13-0.20	5.1-7.8	Low	0.24			
	41-60	5-18	1.50-1.70	0.6-2.0	0.08-0.20	5.1-7.8	Low	0.24			
81B, 81C, 81E	0-2	0-10	1.30-1.65	6.0-20	0.07-0.09	3.6-5.5	Low	0.15	5	1	1-6
Grayling	2-29	0-10	1.30-1.65	6.0-20	0.06-0.08	3.6-5.5	Low	0.15			
	29-63	0-10	1.45-1.65	6.0-20	0.04-0.06	4.5-6.5	Low	0.15			
	63-80	0-10	1.45-1.65	6.0-20	0.04-0.06	5.6-8.4	Low	0.15			
82C.											
Udorthents											
83F.											
Udipsamments											
84B, 84C, 84D	0-4	2-12	1.27-1.56	6.0-20	0.10-0.12	4.5-6.5	Low	0.17	5	2	1-2
Zimmerman	4-80	0-12	1.60-1.70	6.0-20	0.06-0.10	6.1-7.3	Low	0.17			
85B, 85D:											
Zimmerman	0-4	2-12	1.27-1.56	6.0-20	0.10-0.12	4.5-6.5	Low	0.17	5	2	1-2
	4-80	0-12	1.60-1.70	6.0-20	0.06-0.10	6.1-7.3	Low	0.17			
Alcona	0-3	2-15	1.10-1.60	0.6-6.0	0.10-0.14	4.5-7.3	Low	0.17	5	2	1-3
	3-12	5-15	1.25-1.70	0.6-6.0	0.10-0.17	4.5-7.3	Low	0.17			
	12-21	5-15	1.35-1.70	0.6-6.0	0.08-0.17	5.1-7.8	Low	0.17			
	21-41	10-20	1.35-1.70	0.6-2.0	0.13-0.20	5.1-7.8	Low	0.24			
	41-60	5-18	1.50-1.70	0.6-2.0	0.08-0.20	5.1-7.8	Low	0.24			
86:											
Histosols.											
Aquents.											
87	0-8	---	0.20-0.30	0.6-6.0	0.35-0.45	6.1-7.3	---	----	5	2	70-90
Ausable	8-17	0-10	1.40-1.65	6.0-20	0.06-0.10	6.1-7.8	Low	0.10			
	17-60	0-10	1.30-1.60	6.0-20	0.04-0.08	6.1-7.8	Low	0.15			
88D	0-9	5-15	1.30-1.65	2.0-6.0	0.12-0.15	5.6-7.3	Low	0.24	4	3	1-3
Hoist	9-14	5-15	1.40-1.70	2.0-6.0	0.10-0.14	5.6-7.3	Low	0.24			
	14-21	5-15	1.40-1.70	2.0-6.0	0.09-0.14	6.1-7.3	Low	0.24			
	21-27	15-18	1.50-1.75	0.6-2.0	0.11-0.18	6.6-7.8	Moderate	0.32			
	27-49	5-15	1.60-1.80	0.6-2.0	0.11-0.15	7.4-8.4	Low	0.24			
	49-80	5-15	1.80-2.00	<0.06	0.03-0.04	7.4-8.4	Low	0.28			
89F:											
Bamfield	0-6	5-20	1.30-1.60	2.0-6.0	0.14-0.18	4.5-5.0	Low	0.24	4	3	1-3
	6-11	5-20	1.35-1.70	2.0-6.0	0.11-0.17	5.1-5.5	Low	0.24			
	11-18	5-20	1.60-1.80	0.6-2.0	0.11-0.17	5.1-5.5	Low	0.24			
	18-31	27-40	1.35-1.65	0.2-0.6	0.13-0.19	5.6-8.4	Moderate	0.37			
	31-60	27-35	1.70-2.00	<0.06	0.03-0.04	7.9-8.4	Moderate	0.37			
Lupton	0-5	---	0.10-0.35	0.2-6.0	0.35-0.45	5.6-7.8	---	----	5	8	70-90
	5-60	---	0.10-0.35	0.2-6.0	0.35-0.45	5.6-7.8	---	----			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
90B	0-3	0-5	1.30-1.55	6.0-20	0.07-0.09	4.5-6.5	Low	0.10	5	1	.5-2
Chinwhisker	3-8	0-10	1.30-1.55	6.0-20	0.06-0.08	4.5-6.0	Low	0.10			
	8-21	0-10	1.30-1.55	6.0-20	0.06-0.08	4.5-6.5	Low	0.10			
	21-36	0-5	1.30-1.55	6.0-20	0.05-0.07	4.5-7.3	Low	0.10			
	36-80	3-10	1.50-1.65	6.0-20	0.05-0.10	5.6-8.4	Low	0.10			
91E:											
Glennie	0-7	2-5	1.35-1.60	2.0-6.0	0.09-0.12	5.1-7.3	Low	0.17	3	2	1-3
	7-20	5-15	1.35-1.70	2.0-6.0	0.10-0.14	5.1-7.3	Low	0.24			
	20-40	5-27	1.35-1.70	<0.06	0.09-0.18	5.6-7.3	Low	0.37			
	40-46	5-27	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	Low	0.37			
	46-56	20-55	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	High	0.37			
	56-99	15-40	1.80-2.10	<0.06	0.03-0.04	7.4-8.4	Moderate	0.37			
Lupton	0-5	---	0.10-0.35	0.2-6.0	0.35-0.45	5.6-7.8			5	8	70-90
	5-60	---	0.10-0.35	0.2-6.0	0.35-0.45	5.6-7.8					
92B:											
Klacking	0-3	2-12	1.35-1.65	6.0-20	0.08-0.11	4.5-6.0	Low	0.15	5	2	1-2
	3-27	0-10	1.35-1.65	6.0-20	0.05-0.08	4.5-7.3	Low	0.10			
	27-60	2-15	1.55-1.70	2.0-6.0	0.05-0.11	4.5-7.3	Low	0.15			
McGinn	0-2	0-5	1.25-1.40	2.0-6.0	0.11-0.14	5.1-5.5	Low	0.17	5	2	1-3
	2-4	0-5	1.30-1.65	2.0-6.0	0.10-0.12	4.5-5.5	Low	0.17			
	4-16	0-5	1.30-1.65	2.0-6.0	0.09-0.11	5.1-5.5	Low	0.17			
	16-25	5-15	1.30-1.65	2.0-6.0	0.10-0.13	5.1-6.0	Low	0.17			
	25-35	15-20	1.50-1.75	0.6-2.0	0.12-0.14	5.6-6.5	Low	0.28			
	35-80	5-15	1.65-1.80	0.6-2.0	0.11-0.13	7.4-8.4	Low	0.28			
93B:											
Au Gres	0-15	1-6	1.35-1.65	6.0-20	0.06-0.09	4.5-6.5	Low	0.15	5	1	1-2
	15-44	1-15	1.30-1.65	6.0-20	0.05-0.12	4.5-6.5	Low	0.15			
	44-58	1-3	1.35-1.65	6.0-20	0.05-0.08	4.5-6.5	Low	0.15			
	58-80	40-60	1.60-1.70	<0.06	0.08-0.12	6.6-7.8	High	0.32			
Wakeley	0-6	0-10	1.00-1.20	6.0-20	0.15-0.20	5.6-7.8	Low	0.10	4	1	10-15
	6-29	0-15	1.45-1.60	6.0-20	0.05-0.10	5.6-7.8	Low	0.10			
	29-60	35-60	1.50-1.70	<0.06	0.08-0.12	7.4-8.4	High	0.32			
94F:											
Klacking	0-3	2-12	1.35-1.65	6.0-20	0.08-0.11	4.5-6.0	Low	0.15	5	2	1-2
	3-27	0-10	1.35-1.65	6.0-20	0.05-0.08	4.5-7.3	Low	0.10			
	27-60	2-15	1.55-1.70	2.0-6.0	0.05-0.11	4.5-7.3	Low	0.15			
McGinn	0-2	0-5	1.25-1.40	2.0-6.0	0.11-0.14	5.1-5.5	Low	0.17	5	2	1-3
	2-4	0-5	1.30-1.65	2.0-6.0	0.10-0.12	4.5-5.5	Low	0.17			
	4-16	0-5	1.30-1.65	2.0-6.0	0.09-0.11	5.1-5.5	Low	0.17			
	16-25	5-15	1.30-1.65	2.0-6.0	0.10-0.13	5.1-6.0	Low	0.17			
	25-35	15-20	1.50-1.75	0.6-2.0	0.12-0.14	5.6-6.5	Low	0.28			
	35-80	5-15	1.65-1.80	0.6-2.0	0.11-0.13	7.4-8.4	Low	0.28			
96D2	0-6	27-40	1.40-1.60	0.2-0.6	0.21-0.23	6.1-7.8	Moderate	0.37	3	7	.5-2
Negwegon	6-40	35-60	1.40-1.70	<0.06	0.11-0.20	6.1-7.8	High	0.32			
	40-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.9-8.4	High	0.32			
97	0-11	10-15	1.35-1.45	2.0-6.0	0.20-0.22	6.6-8.4	Low	0.28	3	3	2-4
Colonville	11-60	0-18	1.40-1.65	2.0-6.0	0.02-0.12	7.9-8.4	Low	0.15			
98C	0-1	0-10	1.30-1.55	6.0-20	0.04-0.10	4.5-6.5	Low	0.10	5	1	.5-2
Graycalm	1-46	0-15	1.25-1.60	6.0-20	0.05-0.10	4.5-7.3	Low	0.10			
	46-80	0-10	1.50-1.65	6.0-20	0.04-0.09	4.5-7.3	Low	0.10			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
102D, 102E, 102F-Nester	0-9	7-27	1.25-1.60	0.6-2.0	0.20-0.24	5.1-7.3	Low	0.32	3	5	1-3
	9-14	5-25	1.40-1.60	0.6-2.0	0.15-0.22	5.1-7.3	Low	0.32			
	14-25	35-45	1.40-1.65	0.06-0.2	0.08-0.17	5.1-7.3	Moderate	0.32			
	25-60	30-40	1.55-1.70	0.06-0.2	0.10-0.17	7.9-8.4	Moderate	0.32			
110D-Negwegon	0-8	12-27	1.40-1.60	0.6-2.0	0.22-0.24	6.1-7.8	Low	0.37	3	5	1-3
	8-46	35-60	1.40-1.70	<0.06	0.11-0.20	6.1-7.8	High	0.32			
	46-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.9-8.4	High	0.32			
110F-Negwegon	0-4	12-27	1.40-1.60	0.6-2.0	0.22-0.24	6.1-7.8	Low	0.37	3	5	1-3
	4-40	35-60	1.40-1.70	<0.06	0.11-0.20	6.1-7.8	High	0.32			
	40-60	35-60	1.40-1.70	<0.06	0.11-0.20	7.9-8.4	High	0.32			
111B-Manistee	0-6	3-12	1.35-1.60	6.0-20	0.10-0.12	4.5-7.3	Low	0.17	4	2	2-4
	6-24	2-12	1.35-1.60	6.0-20	0.06-0.10	5.1-7.3	Low	0.17			
	24-50	35-60	1.50-1.70	<0.06	0.08-0.12	5.1-7.3	High	0.32			
	50-60	35-60	1.60-1.70	0.06-0.2	0.08-0.16	6.6-8.4	High	0.32			
209B-Grayling	0-2	0-4	1.30-1.55	6.0-20	0.06-0.08	4.5-6.5	Low	0.15	5	1	1-5
	2-29	0-4	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low	0.15			
	29-70	0-4	1.50-1.65	6.0-20	0.04-0.06	5.1-6.5	Low	0.15			
	70-180	0-4	1.50-1.65	6.0-20	0.04-0.12	7.4-8.4	Low	0.15			
210B, 210C, 210D-Grayling	0-2	0-10	1.30-1.65	6.0-20	0.07-0.09	3.6-5.5	Low	0.15	5	1	1-6
	2-29	0-10	1.30-1.65	6.0-20	0.06-0.08	3.6-5.5	Low	0.15			
	29-63	0-10	1.45-1.65	6.0-20	0.04-0.06	4.5-6.5	Low	0.15			
	63-180	0-10	1.45-1.65	6.0-20	0.04-0.06	5.6-8.4	Low	0.15			
211B, 211C-Grayling	0-3	0-4	1.30-1.55	6.0-20	0.06-0.08	4.5-6.5	Low	0.15	5	1	1-5
	3-35	0-4	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low	0.15			
	35-60	0-4	1.50-1.65	6.0-20	0.04-0.06	4.5-6.5	Low	0.15			
	60-180	0-20	1.55-1.70	0.6-20	0.04-0.12	4.5-6.5	Low	0.20			
212B-Grayling	0-3	0-4	1.30-1.55	6.0-20	0.07-0.09	3.6-5.5	Low	0.15	5	1	1-5
	3-30	0-4	1.40-1.60	6.0-20	0.06-0.08	4.5-6.5	Low	0.15			
	30-180	0-4	1.50-1.65	6.0-20	0.04-0.06	4.5-6.5	Low	0.15			
213B, 213C-Graycalm	0-1	0-10	1.30-1.55	6.0-20	0.04-0.10	4.5-6.5	Low	0.10	5	1	.5-2
	1-46	0-15	1.25-1.60	6.0-20	0.05-0.10	4.5-7.3	Low	0.10			
	46-70	0-10	1.50-1.65	6.0-20	0.04-0.09	4.5-7.3	Low	0.10			
	70-180	0-10	1.50-1.65	6.0-20	0.04-0.06	5.6-8.4	Low	0.10			
215C-Typic Udipsamments	0-2	0-4	1.30-1.55	6.0-20	0.06-0.08	4.5-6.5	Low	0.15	5	1	1-5
	2-25	0-4	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low	0.15			
	25-75	0-4	1.50-1.65	6.0-20	0.04-0.06	4.5-6.5	Low	0.15			
	75-95	10-30	1.65-1.80	0.2-2.0	0.11-0.17	5.1-6.5	Low	0.28			
220B, 220C, 220D, 220E-Typic Udipsamments	0-2	0-4	1.30-1.55	6.0-20	0.06-0.08	4.5-6.5	Low	0.15	5	1	1-5
	2-40	0-4	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low	0.15			
	40-180	0-4	1.50-1.65	6.0-20	0.04-0.06	4.5-6.5	Low	0.15			
221B, 221C, 221D-Typic Udipsamments	0-3	0-4	1.30-1.55	6.0-20	0.06-0.08	4.5-6.5	Low	0.15	5	1	1-5
	3-30	0-4	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low	0.15			
	30-45	0-4	1.50-1.65	6.0-20	0.04-0.06	4.5-6.5	Low	0.15			
	45-180	0-20	1.55-1.70	0.6-20	0.04-0.12	4.5-6.5	Low	0.20			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
222B----------	0-2	0-4	1.30-1.55	6.0-20	0.06-0.08	4.5-6.5	Low----------	0.15	5	1	1-5
Typic	2-30	0-4	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.15			
Udipsamments	30-										
	180	0-4	1.50-1.65	6.0-20	0.04-0.06	4.5-6.5	Low----------	0.15			
223B, 223C, 223D:											
Graycalm--------	0-1	0-10	1.30-1.55	6.0-20	0.04-0.10	4.5-6.5	Low----------	0.10	5	1	.5-2
	1-46	0-15	1.25-1.60	6.0-20	0.05-0.10	4.5-7.3	Low----------	0.10			
	46-70	0-10	1.50-1.65	6.0-20	0.04-0.09	4.5-7.3	Low----------	0.10			
	70-										
	180	0-10	1.50-1.65	6.0-20	0.04-0.06	5.6-8.4	Low----------	0.10			
Grayling--------	0-2	0-10	1.30-1.65	6.0-20	0.07-0.09	3.6-5.5	Low----------	0.15	5	1	1-6
	2-29	0-10	1.30-1.65	6.0-20	0.06-0.08	3.6-5.5	Low----------	0.15			
	29-63	0-10	1.45-1.65	6.0-20	0.04-0.06	4.5-6.5	Low----------	0.15			
	63-										
	180	0-10	1.45-1.65	6.0-20	0.04-0.06	5.6-8.4	Low----------	0.15			
224B----------	0-4	0-10	1.30-1.55	6.0-20	0.06-0.09	3.6-6.5	Low----------	0.10	5	1	.5-2
Croswell	4-10	0-10	1.40-1.60	6.0-20	0.06-0.10	4.5-7.3	Low----------	0.10			
	10-29	0-10	1.40-1.60	6.0-20	0.06-0.09	4.5-7.3	Low----------	0.10			
	29-80	0-10	1.50-1.65	6.0-20	0.05-0.07	5.1-8.4	Low----------	0.10			
225B, 225C-------	0-2	0-5	1.30-1.55	6.0-20	0.07-0.09	4.5-6.5	Low----------	0.15	5	1	1-5
Entic	2-30	0-5	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.15			
Haplorthods	30-55	0-5	1.50-1.65	6.0-20	0.04-0.06	5.6-7.3	Low----------	0.15			
	55-80	20-40	1.30-1.65	0.2-0.6	0.14-0.16	5.6-8.4	Moderate-----	0.37			
230C:											
Entic											
Haplorthods----	0-2	0-5	1.30-1.55	6.0-20	0.07-0.09	4.5-6.0	Low----------	0.15	5	1	1-5
	2-35	0-5	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.15			
	35-										
	180	0-5	1.50-1.65	6.0-20	0.04-0.06	5.6-7.3	Low----------	0.15			
Alfic											
Haplorthods----	0-4	2-10	1.35-1.65	6.0-20	0.10-0.12	5.1-6.5	Low----------	0.15	5	2	1-5
	4-37	0-10	1.35-1.65	6.0-20	0.06-0.10	5.1-6.5	Low----------	0.10			
	37-42	10-22	1.50-1.70	0.2-2.0	0.11-0.18	5.1-6.5	Low----------	0.24			
	42-										
	180	0-10	1.55-1.70	6.0-20	0.04-0.10	6.1-7.3	Low----------	0.10			
231B, 231C, 231D:											
Entic											
Haplorthods----	0-2	0-5	1.30-1.55	6.0-20	0.07-0.09	4.5-6.5	Low----------	0.15	5	1	1-5
	2-30	0-5	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.15			
	30-60	0-5	1.50-1.65	6.0-20	0.04-0.06	5.6-7.3	Low----------	0.15			
	60-										
	180	0-20	1.55-1.70	0.6-20	0.07-0.10	5.6-7.3	Low----------	0.17			
Alfic											
Haplorthods----	0-4	2-10	1.35-1.65	6.0-20	0.10-0.12	5.1-6.5	Low----------	0.15	5	2	1-5
	4-37	0-10	1.35-1.65	6.0-20	0.06-0.10	5.1-6.5	Low----------	0.10			
	37-42	10-22	1.50-1.70	0.2-2.0	0.11-0.18	5.1-6.5	Low----------	0.24			
	42-										
	180	0-10	1.55-1.70	6.0-20	0.04-0.10	6.1-7.3	Low----------	0.10			
232B:											
Entic											
Haplorthods----	0-2	0-5	1.30-1.55	6.0-20	0.07-0.09	4.5-6.0	Low----------	0.15	5	1	1-5
	2-30	0-5	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.15			
	30-										
	100	0-5	1.50-1.65	6.0-20	0.04-0.06	5.6-7.3	Low----------	0.15			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
232B:											
Alfic Haplorthods----	0-4	2-10	1.35-1.65	6.0-20	0.10-0.12	5.1-6.5	Low----------	0.15	5	2	1-5
	4-37	0-10	1.35-1.65	6.0-20	0.06-0.10	5.1-6.5	Low----------	0.15			
	37-42	10-22	1.50-1.70	0.2-2.0	0.11-0.18	5.1-6.5	Low----------	0.24			
	42-100	0-10	1.55-1.70	6.0-20	0.04-0.10	6.1-7.3	Low----------	0.10			
233B, 233C, 233D:											
Alfic Haplorthods----	0-4	2-10	1.35-1.65	6.0-20	0.10-0.12	5.1-6.5	Low----------	0.15	5	2	1-5
	4-37	0-10	1.35-1.65	6.0-20	0.06-0.10	5.1-6.5	Low----------	0.10			
	37-42	10-22	1.50-1.70	0.2-2.0	0.11-0.18	5.1-6.5	Low----------	0.24			
	42-180	0-10	1.55-1.70	6.0-20	0.04-0.10	6.1-7.3	Low----------	0.10			
Entic Haplorthods----	0-2	0-5	1.30-1.55	6.0-20	0.07-0.09	4.5-6.5	Low----------	0.15	5	1	1-5
	2-30	0-5	1.40-1.60	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.15			
	30-55	0-5	1.50-1.65	6.0-20	0.04-0.06	5.6-7.3	Low----------	0.15			
	55-180	0-35	1.50-1.70	0.2-20	0.04-0.17	5.6-7.3	Moderate-----	0.28			
235B, 235C, 235D:											
Alfic Haplorthods, sandy over loamy----------	0-4	0-10	1.30-1.55	6.0-20	0.06-0.09	5.1-6.5	Low----------	0.15	5	1	1-3
	4-6	0-10	1.30-1.65	6.0-20	0.05-0.11	5.1-6.5	Low----------	0.15			
	6-27	0-10	1.30-1.65	6.0-20	0.05-0.11	5.1-6.5	Low----------	0.15			
	27-44	20-40	1.45-1.60	0.2-0.6	0.15-0.18	5.6-7.3	Moderate-----	0.32			
	44-120	0-15	1.55-1.70	2.0-20	0.04-0.13	6.1-7.8	Low----------	0.17			
Alfic Haplorthods, sandy----------	0-4	2-10	1.35-1.65	6.0-20	0.10-0.12	5.1-6.5	Low----------	0.15	5	2	1-5
	4-37	0-10	1.35-1.65	6.0-20	0.06-0.10	5.1-6.5	Low----------	0.10			
	37-42	10-22	1.50-1.70	0.2-2.0	0.11-0.18	5.1-6.5	Low----------	0.24			
	42-180	0-10	1.55-1.70	6.0-20	0.04-0.10	6.1-7.3	Low----------	0.10			
236B, 236C. Arenic Eutroboralfs											
237B, 237C, 237D. Glossic Eutroboralfs											
247B, 247C:											
Glennie---------	0-7	2-10	1.35-1.60	2.0-6.0	0.09-0.12	5.1-7.3	Low----------	0.17	3	2	1-3
	7-20	5-15	1.35-1.70	2.0-6.0	0.10-0.14	5.1-7.3	Low----------	0.24			
	20-40	5-27	1.35-1.70	<0.06	0.09-0.18	5.6-7.3	Low----------	0.37			
	40-46	5-27	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	Low----------	0.37			
	46-56	20-55	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	High----------	0.37			
	56-99	15-40	1.80-2.10	<0.06	0.03-0.04	7.4-8.4	Moderate-----	0.37			
Bamfield--------	0-6	5-20	1.30-1.60	2.0-6.0	0.14-0.18	4.5-5.0	Low----------	0.24	4	3	1-3
	6-11	5-20	1.35-1.70	2.0-6.0	0.11-0.17	5.1-5.5	Low----------	0.24			
	11-18	5-20	1.60-1.80	0.6-2.0	0.11-0.17	5.1-5.5	Low----------	0.24			
	18-31	27-40	1.35-1.65	0.2-0.6	0.13-0.19	5.6-8.4	Moderate-----	0.37			
	31-60	27-35	1.70-2.00	<0.06	0.03-0.04	7.9-8.4	Moderate-----	0.37			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
247D:											
Glennie	0-7	2-5	1.35-1.60	2.0-6.0	0.09-0.12	5.1-7.3	Low	0.17	3	2	1-3
	7-20	5-15	1.35-1.70	2.0-6.0	0.10-0.14	5.1-7.3	Low	0.24			
	20-40	5-27	1.35-1.70	<0.06	0.09-0.18	5.6-7.3	Low	0.37			
	40-46	5-27	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	Low	0.37			
	46-56	20-55	1.80-2.10	<0.06	0.03-0.04	5.6-7.3	High	0.37			
	56-99	15-40	1.80-2.10	<0.06	0.03-0.04	7.4-8.4	Moderate	0.37			
Bamfield	0-6	5-20	1.30-1.60	2.0-6.0	0.14-0.18	4.5-5.0	Low	0.24	4	3	1-3
	6-11	5-20	1.35-1.70	2.0-6.0	0.11-0.17	5.1-5.5	Low	0.24			
	11-18	5-20	1.60-1.80	0.6-2.0	0.11-0.17	5.1-5.5	Low	0.24			
	18-31	27-40	1.35-1.65	0.2-0.6	0.13-0.19	5.6-8.4	Moderate	0.37			
	31-60	27-35	1.70-2.00	<0.06	0.03-0.04	7.9-8.4	Moderate	0.37			
250D:											
Glossic Eutroboralfs.											
Borosaprists.											
252A:											
Borosaprists.											
Au Gres	0-10	0-8	1.30-1.55	6.0-20	0.07-0.10	3.6-7.3	Low	0.10	5	1	2-4
	10-27	1-15	1.50-1.70	6.0-20	0.06-0.09	4.5-7.3	Low	0.10			
	27-60	0-8	1.50-1.70	6.0-20	0.05-0.07	5.1-7.3	Low	0.10			
253A:											
Au Gres	0-10	0-8	1.30-1.55	6.0-20	0.07-0.10	3.6-7.3	Low	0.10	5	1	2-4
	10-27	1-10	1.50-1.70	6.0-20	0.06-0.09	4.5-7.3	Low	0.10			
	27-60	0-8	1.50-1.70	6.0-20	0.05-0.07	5.1-7.3	Low	0.10			
Allendale	0-11	0-10	1.25-1.40	6.0-20	0.07-0.09	4.5-7.3	Low	0.15	4	1	2-4
	11-25	0-15	1.35-1.45	6.0-20	0.06-0.10	4.5-7.3	Low	0.17			
	25-60	40-60	1.45-1.70	<0.06	0.08-0.12	6.1-8.4	High	0.32			
Croswell	0-4	0-10	1.30-1.55	6.0-20	0.06-0.09	3.6-6.5	Low	0.10	5	1	.5-2
	4-10	0-10	1.40-1.60	6.0-20	0.06-0.10	4.5-7.3	Low	0.10			
	10-29	0-10	1.40-1.60	6.0-20	0.06-0.09	4.5-7.3	Low	0.10			
	29-80	0-10	1.50-1.65	6.0-20	0.05-0.07	5.1-8.4	Low	0.10			
262A	0-10	0-8	1.30-1.55	6.0-20	0.07-0.10	3.6-7.3	Low	0.10	5	1	2-4
Au Gres	10-27	1-10	1.50-1.70	6.0-20	0.06-0.09	4.5-7.3	Low	0.10			
	27-60	0-8	1.50-1.70	6.0-20	0.05-0.07	5.1-7.3	Low	0.10			
263A.											
Alfic Haplaquods											
264A	0-11	0-12	1.25-1.40	6.0-20	0.09-0.12	4.5-7.3	Low	0.17	4	2	2-4
Allendale	11-25	0-15	1.35-1.45	6.0-20	0.06-0.10	4.5-7.3	Low	0.17			
	25-60	40-60	1.45-1.70	<0.06	0.08-0.12	6.1-8.4	High	0.32			
272:											
Haplaquods.											
Fluvaquents.											
273:											
Leafriver	0-9	---	0.10-0.25	0.6-6.0	0.35-0.50	5.6-7.3			2	2	50-90
	9-21	3-18	1.40-1.65	2.0-20	0.08-0.14	5.6-7.3	Low	0.17			
	21-60	0-10	1.50-1.65	6.0-20	0.03-0.08	5.6-7.3	Low	0.17			

Table 18.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
273:											
Wakeley---------	0-6	0-10	1.00-1.20	6.0-20	0.15-0.20	5.6-7.8	Low----------	0.10	4	1	10-15
	6-29	0-15	1.45-1.60	6.0-20	0.05-0.10	5.6-7.8	Low----------	0.10			
	29-60	35-60	1.50-1.70	<0.2	0.08-0.12	7.4-8.4	High---------	0.32			
274. Typic Haplaquods											
280: Aquents.											
Histosols.											
281, 282. Borosaprists											

Table 19.--Soil and Water Features

("Flooding" and "water table" and terms such as "frequent," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
11B---------- Eastport	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
12B:										
Tawas----------	A/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	Moderate.
Au Gres----------	B	None	---	---	0.5-1.5	Apparent	Oct-May	Moderate	Low	Moderate.
16B, 16C, 16D, 16E---------- Graycalm	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
17B---------- Croswell	A	None	---	---	2.0-3.5	Apparent	Oct-May	Low	Low	Moderate.
18A---------- Au Gres	B	None	---	---	0.5-1.5	Apparent	Oct-May	Moderate	Low	Moderate.
19---------- Leafriver	A/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	High.
26B---------- Croswell	A	None	---	---	2.0-3.5	Perched	Oct-May	Low	Low	Moderate.
27A---------- Au Gres	C	None	---	---	0.5-1.5	Perched	Oct-May	Moderate	Low	Moderate.
28B, 28C, 28E----- East Lake	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
29A---------- Battlefield	A/D	None	---	---	0.5-1.5	Apparent	Oct-May	Moderate	High	High.
30---------- Wheatley	A/D	None	---	---	+1-1.0	Apparent	Oct-May	Moderate	High	Low.
31B, 31C, 31D, 31E---------- Klacking	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
33B, 33C, 33D, 33E---------- Mancelona	A	None	---	---	>6.0	---	---	Low	Low	Low.
35---------- Kinross	A/D	None	---	---	+1-1.0	Apparent	Oct-May	Moderate	High	Moderate.
36B, 36C---------- Alcona	B	None	---	---	2.5-6.0	Perched	Nov-May	Moderate	Moderate	Low.
37A---------- Richter	B	None	---	---	0.5-1.5	Apparent	Oct-May	High	High	Moderate.
38---------- Tonkey	B/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	Low.

Table 19.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
39B, 39C---------- Glennie	C	None---------	---	---	3.5-4.5	Perched	Nov-May	Moderate	Moderate	Low.
40A---------- Sprinkler	C	None---------	---	---	0.5-1.5	Apparent	Oct-May	High-----	High-----	Moderate.
41B, 41C, 41D----- McGinn	B	None---------	---	---	>6.0	---	---	Moderate	Low------	Moderate.
42A---------- Killmaster	C	None---------	---	---	1.0-3.0	Perched	Oct-May	High-----	Low------	Low.
43---------- Wakeley	D	None---------	---	---	+1-1.0	Perched	Oct-May	Moderate	High-----	Moderate.
44B---------- Bamfield	B	None---------	---	---	1.5-3.0	Perched	Nov-May	Moderate	Moderate	Moderate.
45B, 45C---------- Hoist	B	None---------	---	---	2.5-3.5	Perched	Nov-May	Moderate	Low------	Low.
46---------- Ensley	B/D	None---------	---	---	+1-1.0	Apparent	Oct-May	High-----	High-----	Low.
53B, 53C---------- Negwegon	C	None---------	---	---	1.0-3.0	Perched	Nov-May	Moderate	High-----	Low.
54A---------- Algonquin	D	None---------	---	---	0.5-1.5	Perched	Oct-May	High-----	High-----	Low.
55---------- Springport	D	None---------	---	---	+1-1.0	Perched	Oct-Jun	High-----	High-----	Low.
56B, 56C---------- Nester	C	None---------	---	---	2.5-5.0	Perched	Nov-May	Moderate	High-----	Low.
57B---------- Kawkawlin	C	None---------	---	---	1.0-2.0	Apparent	Oct-May	High-----	High-----	Low.
59B: Algonquin-------- Springport-------	D D	None--------- None---------	--- ---	--- ---	0.5-1.5 +1-1.0	Perched Perched	Oct-May Oct-Jun	High----- High-----	High----- High-----	Low. Low.
60D, 60E---------- Glennie	C	None---------	---	---	>6.0	---	---	Moderate	Moderate	Low.
61C, 61D, 61F----- Manistee	A	None---------	---	---	>6.0	---	---	Low------	High-----	Moderate.
62A---------- Allendale	C	None---------	---	---	0.5-1.5	Perched	Oct-May	Moderate	High-----	Moderate.
63C, 63D, 63F----- Bamfield	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
66D, 66E---------- Alcona	B	None---------	---	---	>6.0	---	---	Moderate	Low------	Low.
68---------- Rondeau	A/D	None---------	---	---	+1-1.0	Apparent	Oct-May	High-----	High-----	Low.

Table 19.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
69--Loxley	A/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	High.
70--Lupton	A/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	Low.
71--Tawas	A/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	Moderate.
72--Dorval	A/D	None	---	---	+1-1.0	Perched	Oct-May	High	High	Moderate.
73--Markey	A/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	Low.
74C2--Negwegon	C	None	---	---	1.0-3.0	Perched	Nov-May	Moderate	High	Low.
77--Waucedah	D	Frequent	Brief to very long.	Mar-May	+2-1.0	Apparent	Oct-May	High	Moderate	Low.
78. Pits										
80F:										
Zimmerman	A	None	---	---	>6.0	---	---	Low	Low	High.
Alcona	B	None	---	---	>6.0	---	---	Moderate	Low	Low.
81B, 81C, 81E--Grayling	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
82C--Udorthents	---	None	---	---	>6.0	---	---	---	---	---
83F--Udipsamments	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
84B, 84C, 84D--Zimmerman	A	None	---	---	>6.0	---	---	Low	Low	High.
85B, 85D:										
Zimmerman	A	None	---	---	>6.0	---	---	Low	Low	High.
Alcona	B	None	---	---	2.5-6.0	Perched	Nov-May	Moderate	Moderate	Low.
86:										
Histosols	D	None	---	---	+1-0	Apparent	Jan-Dec	High	---	---
Aquents	D	None	---	---	+1-0	Apparent	Jan-Dec	High	---	---
87--Ausable	D	Frequent	Brief or long.	Nov-May	+1.-1.0	Apparent	Oct-May	Moderate	High	Low.
88D--Hoist	B	None	---	---	>6.0	---	---	Moderate	Low	Moderate.
89F:										
Bamfield	B	None	---	---	>6.0	---	---	Moderate	Moderate	Moderate.

Table 19.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
89F:										
Lupton	D	None	---	---	+2-0	Apparent	Jan-Dec	High	High	Low.
90B	A	None	---	---	2.0-4.0	Apparent	Nov-May	Low	Low	Moderate.
Chinwhisker										
91E:										
Glennie	C	None	---	---	>6.0	---	---	Moderate	Moderate	Low.
Lupton	D	None	---	---	+2-0	Apparent	Jan-Dec	High	High	Low.
92B:										
Klacking	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
McGinn	B	None	---	---	>6.0	---	---	Moderate	Low	Moderate.
93B:										
Au Gres	C	None	---	---	1.0-3.0	Perched	Oct-May	Moderate	Low	Moderate.
Wakeley	D	None	---	---	+1-1.0	Perched	Oct-May	Moderate	High	Moderate.
94F:										
Klacking	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
McGinn	B	None	---	---	>6.0	---	---	Moderate	Low	Moderate.
96D2	C	None	---	---	>6.0	---	---	Moderate	High	Low.
Negwegon										
97	C	Occasional	Brief	Dec-May	1.0-2.0	Apparent	Oct-May	High	Low	Low.
Colonville										
98C	A	None	---	---	>6.0	---	---	Low	Low	Moderate.
Graycalm										
102D, 102E, 102F	C	None	---	---	>6.0	---	---	Moderate	High	Low.
Nester										
110D, 110F	C	None	---	---	>6.0	---	---	Moderate	High	Low.
Negwegon										
111B	A	None	---	---	2.5-4.0	Perched	Nov-May	Low	High	Moderate.
Manistee										
209B	A	None	---	---	>15	---	---	Low	Low	High.
Grayling										
210B, 210C, 210D	A	None	---	---	>15	---	---	Low	Low	Moderate.
Grayling										
211B, 211C	A	None	---	---	>15	---	---	Low	Low	High.
Grayling										
212B	A	None	---	---	6.0-15	---	---	Low	Low	Moderate.
Grayling										
213B, 213C	A	None	---	---	>15	---	---	Low	Low	Moderate.
Graycalm										

Table 19.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
215C, 220B, 220C, 220D, 220E, 221B, 221C, 221D--Typic Udipsamments	A	None	---	---	>15	---	---	Low	Low	High.
222B--Typic Udipsamments	A	None	---	---	5.0-10	Apparent	Jan-Dec	Low	Low	High.
223B, 223C, 223D:										
Graycalm	A	None	---	---	>15	---	---	Low	Low	Moderate.
Grayling	A	None	---	---	>15	---	---	Low	Low	Moderate.
224B--Croswell	A	None	---	---	2.0-3.5	Apparent	Oct-May	Low	Low	Moderate.
225B, 225C--Entic Haplorthods	A	None	---	---	>15	---	---	Low	Low	High.
230C, 231B, 231C, 231D:										
Entic Haplorthods	A	None	---	---	>15	---	---	Low	Low	High.
Alfic Haplorthods	A	None	---	---	>15	---	---	Low	Low	High.
232B:										
Entic Haplorthods	A	None	---	---	6.0-15	Apparent	Jan-Dec	Low	Low	High.
Alfic Haplorthods	A	None	---	---	6.0-15	Apparent	Jan-Dec	Low	Low	High.
233B, 233C, 233D:										
Alfic Haplorthods	A	None	---	---	>15	---	---	Low	Low	High.
Entic Haplorthods	A	None	---	---	>15	---	---	Low	Low	High.
235B, 235C, 235D:										
Alfic Haplorthods, sandy over loamy	A	None	---	---	>15	---	---	Low	Low	Moderate.
Alfic Haplorthods, sandy	A	None	---	---	>15	---	---	Low	Low	High.
236B, 236C--Arenic Eutroboralfs	---	None	---	---	---	---	---	---	---	---
237B, 237C, 237D--Glossic Eutroboralfs	---	None	---	---	---	---	---	---	---	---

Table 19.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
247B:										
Glennie	C	None	---	---	3.5-4.5	Perched	Nov-May	Moderate	Moderate	Low.
Bamfield	B	None	---	---	1.5-3.0	Perched	Nov-May	Moderate	Moderate	Moderate.
247C:										
Glennie	C	None	---	---	3.5-4.5	Perched	Nov-Apr	Moderate	Moderate	Low.
Bamfield	B	None	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
247D:										
Glennie	C	None	---	---	>6.0	---	---	Moderate	Moderate	Low.
Bamfield	B	None	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
250D:										
Glossic Eutroboralfs	---	None	---	---	>6.0	---	---	---	---	---
Borosaprists	D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	Moderate.
252A:										
Borosaprists	D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	Moderate.
Au Gres	B	None	---	---	0.5-1.5	Apparent	Oct-May	Moderate	Low	Moderate.
253A:										
Au Gres	B	None	---	---	0.5-1.5	Apparent	Oct-May	Moderate	Low	Moderate.
Allendale	C	None	---	---	0.5-1.5	Perched	Oct-May	Moderate	High	Moderate.
Croswell	A	None	---	---	2.0-3.5	Apparent	Oct-May	Low	Low	Moderate.
262A--Au Gres	B	None	---	---	0.5-1.5	Apparent	Oct-May	Moderate	Low	Moderate.
263A--Alfic Haplaquods	A	None	---	---	0.5-1.5	Apparent	Oct-May	Moderate	---	---
264A--Allendale	C	None	---	---	0.5-1.5	Perched	Oct-May	Moderate	High	Moderate.
272:										
Haplaquods	---	None	---	---	+1-1.0	Apparent	Oct-May	---	---	---
Fluvaquents	---	Frequent	Brief	Nov-Apr	+1-1.0	Apparent	Oct-May	---	---	---
273:										
Leafriver	A/D	None	---	---	+1-1.0	Apparent	Oct-May	High	High	High.
Wakeley	D	None	---	---	+1-1.0	Perched	Oct-May	Moderate	High	Moderate.
274--Typic Haplaquods	D	None	---	---	+1-1.0	Apparent	Oct-May	High	---	---
280:										
Aquents	D	None	---	---	+1-0	Apparent	Jan-Dec	High	---	---
Histosols	D	None	---	---	+1-0	Apparent	Jan-Dec	High	---	---

Table 19.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
281---------- Borosaprists	D	None--------	---	---	+1-1.0	Apparent	Oct-May	High-----	High-----	High.
282---------- Borosaprists	D	None--------	---	---	+1-1.0	Apparent	Oct-May	High-----	High-----	Moderate.

Table 20.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Alcona	Coarse-loamy, mixed, frigid Alfic Haplorthods
Alfic Haplaquods	Alfic Haplaquods
Alfic Haplorthods, sandy	Sandy, mixed, frigid Alfic Haplorthods
Alfic Haplorthods, sandy over loamy	Sandy over loamy, mixed, frigid Alfic Haplorthods
Algonquin	Fine, mixed Aquic Eutroboralfs
Allendale	Sandy over clayey, mixed, frigid Alfic Haplaquods
Aquents	Aquents
Arenic Eutroboralfs	Mixed, frigid Arenic Eutroboralfs
Au Gres	Sandy, mixed, frigid Typic Haplaquods
Ausable	Sandy, mixed, frigid Histic Humaquepts
Bamfield	Fine-loamy, mixed Typic Glossoboralfs
Battlefield	Sandy, mixed, frigid Entic Haplaquods
Borosaprists	Euic Borosaprists
Borosaprists	Dysic Borosaprists
Chinwhisker	Sandy, mixed, frigid Entic Haplorthods
*Colonville	Coarse-loamy, mixed (calcareous), frigid Fluvaquentic Haplaquolls
Croswell	Sandy, mixed, frigid Entic Haplorthods
Dorval	Clayey, mixed, euic Terric Borosaprists
East Lake	Sandy, mixed, frigid Entic Haplorthods
Eastport	Mixed, frigid Spodic Udipsamments
Ensley	Coarse-loamy, mixed, nonacid, frigid Aeric Haplaquepts
Entic Haplorthods	Sandy, mixed, frigid Entic Haplorthods
Fluvaquents	Fluvaquents
Glennie	Coarse-loamy, mixed Typic Fragiboralfs
Glossic Eutroboralfs	Glossic Eutroboralfs
Graycalm	Mixed, frigid Alfic Udipsamments
Grayling	Mixed, frigid Typic Udipsamments
Haplaquods	Haplaquods
Histosols	Histosols
Hoist	Coarse-loamy, mixed Glossic Eutroboralfs
Kawkawlin	Fine, mixed Glossaquic Eutroboralfs
Killmaster	Coarse-loamy, mixed Glossaquic Eutroboralfs
Kinross	Sandy, mixed, frigid Typic Haplaquods
Klacking	Coarse-loamy, mixed Psammentic Eutroboralfs
Leafriver	Sandy, mixed, frigid Histic Humaquepts
Loxley	Dysic Typic Borosaprists
Lupton	Euic Typic Borosaprists
Mancelona	Sandy, mixed, frigid Alfic Haplorthods
Manistee	Sandy over clayey, mixed, frigid Alfic Haplorthods
Markey	Sandy or sandy-skeletal, mixed, euic Terric Borosaprists
McGinn	Coarse-loamy, mixed Typic Glossoboralfs
Negwegon	Fine, mixed Glossic Eutroboralfs
Nester	Fine, mixed Glossic Eutroboralfs
Richter	Coarse-loamy, mixed, frigid Alfic Haplaquods
Rondeau	Marly, euic Limnic Borosaprists
Springport	Fine, mixed, nonacid, frigid Typic Haplaquolls
Sprinkler	Fine-loamy, mixed Aquic Glossoboralfs
Tawas	Sandy or sandy-skeletal, mixed, euic Terric Borosaprists
*Tonkey	Coarse-loamy, mixed, nonacid, frigid Mollic Haplaquepts
Typic Haplaquods	Mixed, frigid Typic Haplaquods
Typic Udipsamments	Mixed, frigid Typic Udipsamments
Udipsamments	Udipsamments
Udorthents	Udorthents
Wakeley	Sandy over clayey, mixed, nonacid, frigid Aeric Haplaquents
Waucedah	Coarse-loamy, mixed, nonacid, frigid Histic Humaquepts
*Wheatley	Mixed, frigid Mollic Psammaquents
Zimmerman	Mixed, frigid Alfic Udipsamments

Interpretive Groups

Interpretive Groups

(Dashes indicate that the interpretive group is not assigned)

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
11B Eastport	VIs	No	5S	5.3a	---
12B Tawas	VIw	No	5W	M/4c	---
Au Gres			6W	5b	
16B Graycalm	IVs	No	6S	5a	---
16C, 16D Graycalm	VIs	No	6S	5a	---
16E Graycalm	VIIs	No	6R	5a	---
17B Croswell	IVs	No	5S	5a	---
18A Au Gres	IVw	No	6W	5b	---
19 Leafriver	VIw	No	2W	5c	---
26B Croswell	IVs	No	7S	5a	---
27A Au Gres	IVw	No	7W	5b	---
28B East Lake	IVs	No	2S	5a	---
28C East Lake	VIs	No	2S	5a	---
28E East Lake	VIIs	No	2R	5a	---
29A Battlefield	IVw	No	5W	5b	---
30 Wheatley	Vw	No	2W	5c	---
31B Klacking	IIIs	No	6S	4a	---
31C Klacking	IIIe	No	6S	4a	---
31D Klacking	IVe	No	6S	4a	---
31E Klacking	VIIe	No	6R	4a	---

See footnote at end of table.

Interpretive Groups--Continued

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
33B Mancelona	IIIs	No	3A	4a	---
33C Mancelona	IIIe	No	3A	4a	---
33D Mancelona	IVe	No	3A	4a	---
33E Mancelona	VIIe	No	3R	4a	---
35 Kinross	VIw	No	2W	5c-a	---
36B Alcona	IIe	Yes	3L	3a-s	---
36C Alcona	IIIe	No	3L	3a-s	---
37A Richter	IIw	Yes	3W	3b-s	---
38 Tonkey	Vw	Yes	5W	3c-s	---
39B Glennie	IIIs	No	5D	4/2a-f	---
39C Glennie	IIIe	No	5D	4/2a-f	---
40A Sprinkler	IIw	Yes	3W	2.5b	---
41B McGinn	IIIs	Yes	4S	4a	---
41C McGinn	IIIe	No	4S	4a	---
41D McGinn	IVe	No	4S	4a	---
42A Killmaster	IIw	Yes	4W	3b	---
43 Wakeley	Vw	No	3W	4/1c	---
44B Bamfield	IIe	Yes	3L	3/2a	---
45B Hoist	IIe	Yes	3L	3a	---
45C Hoist	IIIe	No	3L	3a	---
46 Ensley	Vw	Yes	3W	3c	---

See footnote at end of table.

Interpretive Groups--Continued

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
53B Negwegon	IIIe	Yes	3L	1a	---
53C Negwegon	IIIe	No	3L	1a	---
54A Algonquin	IIIw	Yes	6W	1b	---
55 Springport	IIIw	Yes	6W	1c	---
56B Nester	IIe	Yes	3L	1.5a	---
56C Nester	IIIe	No	3L	1.5a	---
57B Kawkawlin	IIe	Yes	3W	1.5b	---
59B Algonquin	IIIe	Yes	6W	1b	---
Springport			6W	1c	
60D Glennie	IVe	No	5D	4/2a-f	---
60E Glennie	VIIe	No	5R	4/2a-f	---
61C Manistee	IIIe	No	3A	4/1a	---
61D Manistee	IVe	No	3A	4/1a	---
61F Manistee	VIIe	No	3R	4/1a	---
62A Allendale	IIIw	No	4W	4/1b	---
63C Bamfield	IIIe	No	3L	1.5a	---
63D Bamfield	IVe	No	3L	1.5a	---
63F Bamfield	VIIe	No	3R	1.5a	---
66D Alcona	IVe	No	3L	3a-s	---
66E Alcona	VIIe	No	3R	3a-s	---
68 Rondeau	VIw	No	---	M/mc	---

See footnote at end of table.

Interpretive Groups--Continued

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
69---------- Loxley	VIIw	No	2W	Mc-a	---
70---------- Lupton	VIw	No	2W	Mc	---
71---------- Tawas	VIw	No	5W	M/4c	---
72---------- Dorval	Vw	No	2W	M/1c	---
73---------- Markey	Vw	No	---	M/4c	---
74C2---------- Negwegon	IIIe	No	---	1a	---
77---------- Waucedah	Vw	No	3W	L-2c	---
78. Pits					
80F----------	VIIe	No			---
Zimmerman----------			8R	4a	
Alcona----------			3R	3a-s	
81B, 81C---------- Grayling	VIs	No	4S	5.7a	---
81E---------- Grayling	VIIs	No	4R	5.7a	---
82C. Udorthents					
83F. Udipsamments					
84B---------- Zimmerman	IVs	No	8S	4a	---
84C, 84D---------- Zimmerman	VIs	No	8S	4a	---
85B----------	IVs	No			---
Zimmerman----------			8S	4a	
Alcona----------			3L	3a-s	
85D----------	VIs	No			---
Zimmerman----------			8S	4a	
Alcona----------			3L	3a-s	
86. Histosols and Aquents					
87---------- Ausable	VIIw	No	2W	L-4c	---

See footnote at end of table.

Interpretive Groups--Continued

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
88D---------- Hoist	IVe	No	3L	3a	---
89F---------- Bamfield----------	VIIe	No	3R	1.5a	---
Lupton----------			---	Mc	
90B---------- Chinwhisker	IVs	No	6S	5a	---
91E---------- Glennie----------	VIe	No	5R	4/2a-f	---
Lupton----------			---	Mc	
92B---------- Klacking----------	IIIs	No	6S	4a	---
McGinn----------			4S	4a	
93B---------- Au Gres----------	IVw	No	7W	5b	---
Wakeley----------			3W	4/1c	
94F---------- Klacking----------	VIIe	No	6R	4a	---
McGinn----------			4R	4a	
96D2---------- Negwegon	IVe	No	---	1a	---
97---------- Colonville	Vw	Yes	3W	L-2c	---
98C---------- Graycalm	VIs	No	6S	5a	---
102D---------- Nester	IVe	No	3L	1.5a	---
102E---------- Nester	VIe	No	3R	1.5a	---
102F---------- Nester	VIIe	No	3R	1.5a	---
110D---------- Negwegon	IVe	No	3L	1a	---
110F---------- Negwegon	VIIe	No	3R	1a	---
111B---------- Manistee	IIIs	No	3A	4/1a	---
209B, 210B---------- Grayling	VIs	No	4S	5.7a	1, 2

See footnote at end of table.

Interpretive Groups--Continued

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
210C---------- Grayling	VIIs	No	4S	5.7a	1, 2
210D---------- Grayling	VIIs	No	4R	5.7a	1, 2
211B---------- Grayling	VIs	No	4S	5.7a	1, 2
211C---------- Grayling	VIIs	No	4S	5.7a	1, 2
212B---------- Grayling	VIs	No	4S	5.7a	1, 2
213B---------- Graycalm	IVs	No	6S	5a	1, 2
213C---------- Graycalm	VIs	No	6S	5a	1, 2
215C---------- Typic Udipsamments	VIIs	No	---	---	1, 2
220B---------- Typic Udipsamments	VIs	No	---	---	2, 1
220C, 220D, 220E--------- Typic Udipsamments	VIIs	No	---	---	2, 1
221B---------- Typic Udipsamments	VIs	No	---	---	2, 1
221C, 221D---------- Typic Udipsamments	VIIs	No	---	---	2, 1
222B---------- Typic Udipsamments	VIs	No	---	---	2, 1
223B----------	IVs	No			2, 1
Graycalm----------			6S	5a	
Grayling----------			4S	5.7a	
223C----------	VIs	No			2, 1
Graycalm----------			6S	5a	
Grayling----------			4S	5.7a	
223D----------	VIIs	No			2, 1
Graycalm----------			6R	5a	
Grayling----------			4R	5.7a	
224B---------- Croswell	IVs	No	5S	5a	2, 1
225B---------- Entic Haplorthods	VIs	No	---	---	2, 3
225C---------- Entic Haplorthods	VIIs	No	---	---	2, 3

See footnote at end of table.

Interpretive Groups--Continued

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
230C---------- Entic Haplorthods- Alfic Haplorthods	VIIs	No	---	---	3, 2
231B---------- Entic Haplorthods- Alfic Haplorthods	VIs	No	---	---	3, 2
231C, 231D---------- Entic Haplorthods- Alfic Haplorthods	VIIs	No	---	---	3, 2
232B---------- Entic Haplorthods- Alfic Haplorthods	VIs	No	---	---	3, 2
233B---------- Alfic Haplorthods- Entic Haplorthods	IIIs	No	---	---	3, 2
233C---------- Alfic Haplorthods- Entic Haplorthods	IVe	No	---	---	3, 2
233D---------- Alfic Haplorthods- Entic Haplorthods	VIIe	No	---	---	3, 2
235B---------- Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy	IIIs	No	---	---	3, 4
235C---------- Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy	IVe	No	---	---	3, 4
235D---------- Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy	VIIe	No	---	---	3, 4
236B, 236C---------- Arenic Eutroboralfs	---	No	---	---	3, 4
237B, 237C, 237D--------- Glossic Eutroboralfs	---	No	---	---	4, 3
247B---------- Glennie----------	IIIs	No	5D	4/2a-f	6, 4
Bamfield----------			3L	3/2a	
247C---------- Glennie----------	IVe	No	5D	4/2a-f	6, 4
Bamfield----------			3L	3/2a	

See footnote at end of table.

Interpretive Groups--Continued

Soil name and map symbol	Land capability	Prime farmland	Woodland ordination symbol	Michigan soil management group	Primary and secondary plant associations*
247D----------	VIe	No			6, 4
Glennie----------			5R	4/2a-f	
Bamfield----------			3R	3/2a	
250D.					
Glossic Eutroboralfs-Borosaprists					
252A----------	---	No			7, 8
Borosaprists----------			---	---	
Au Gres----------			6W	5b	
253A----------	IVw	No			---
Au Gres----------			6W	5b	
Allendale----------			4W	4/1b	
Croswell----------			5S	5a	
262A----------	IVw	No	6W	5b	7, 8
Au Gres					
263A----------	---	No	---	---	8, 7
Alfic Haplaquods					
264A----------	IIIw	No	4W	4/1b	9, 8
Allendale					
272----------	---	No	---	---	7, 8
Haplaquods-Fluvaquents					
273----------	VIw	No			8, 7
Leafriver----------			2W	5c	
Wakeley----------			3W	4/1c	
274----------	---	No	---	---	9, 11
Typic Haplaquods					
280.					
Aquents and Histosols					
281----------	---	No	---	---	10
Borosaprists					
282----------	---	No	---	---	11, 9
Borosaprists					

* See text for descriptions of these plant associations.

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