United States Department of Agriculture

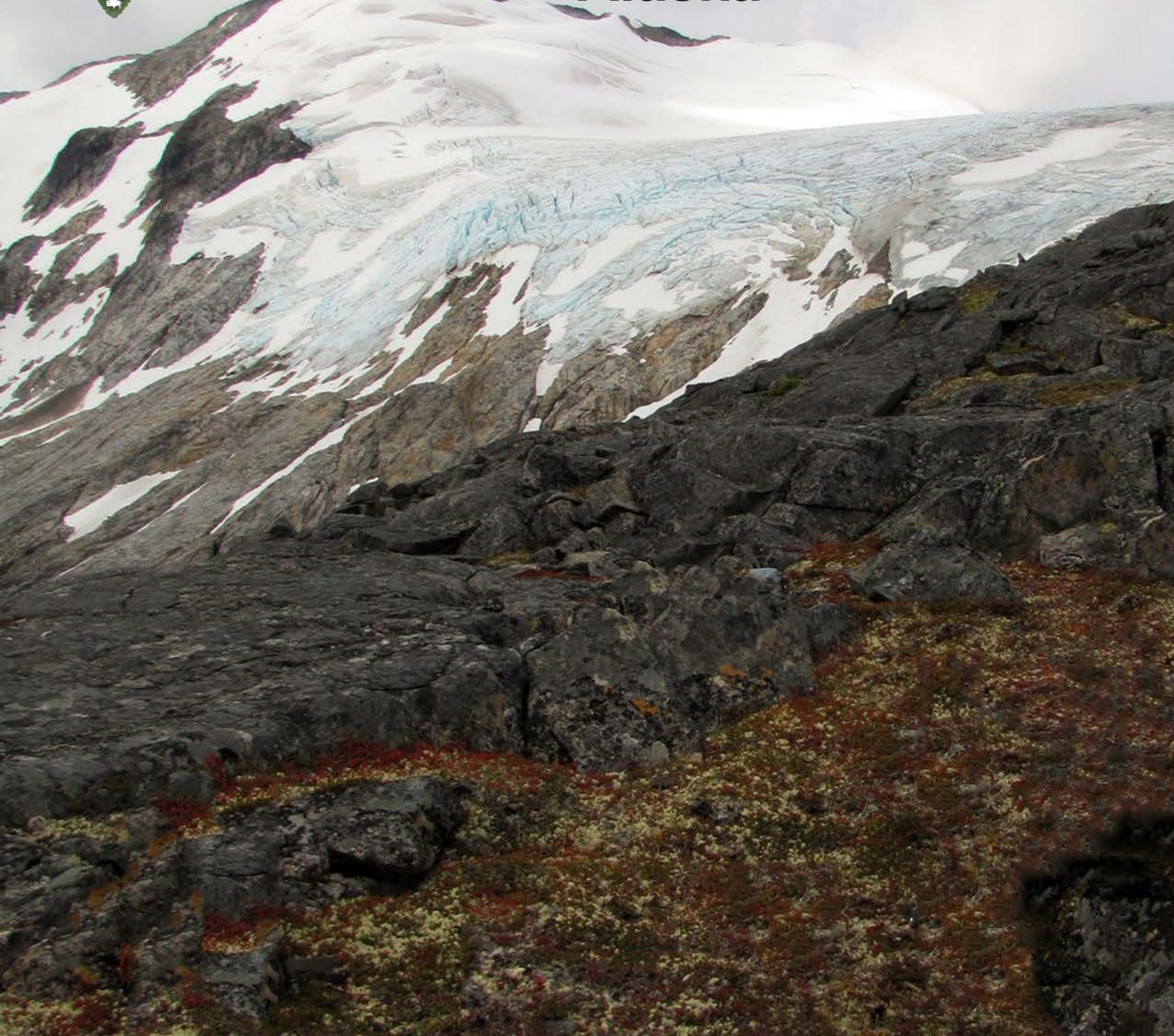
Natural Resources Conservation Service

United States Department of the Interior

National Park Service

In cooperation with the University of Alaska Fairbanks, Agricultural and Forestry Experiment Station

Soil Survey and Ecological Site Inventory of Skagway-Klondike Gold Rush National Historical Park, Alaska



Soil Survey and Ecological Site Inventory of Skagway-Klondike Gold Rush National Historical Park, Alaska

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Maps and spatial data for this survey are available online at http://websoilsurvey.nrcs.usda.gov.

United States Department of Agriculture, Natural Resources Conservation Service, and
United States Department of the Interior, National Park Service,
in cooperation with
University of Alaska Fairbanks, Agricultural and Forestry Experiment Station

Cover: Alpine mountaintops with Rock outcrop and permanent ice and snow.

How To Use This Soil Survey

Detailed Soil Maps

Detailed soil maps are not included in this publication. The maps and spatial data are available online at http://websoilsurvey.nrcs.usda.gov.

The Contents lists the map units by symbol and name and shows the page where each map unit is described. It shows which table has data on a specific land use for each detailed soil map unit. Also see the Contents for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture, Natural Resources Conservation Service, and the United States Department of the Interior, National Park Service. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

The Natural Resources Conservation Service was responsible for the survey design and methodology, data collection and analysis, and completion of this report. Fieldwork was completed in June, July, August, and September of 2011 and 2012. Soil names and descriptions were approved in 2012. Unless indicated otherwise, maps and supporting documentation in this report refer to conditions in the survey area in 2012. This soil survey was made cooperatively by the Natural Resources Conservation Service, the National Park Service, and the University of Alaska Fairbanks, Agricultural and Forestry Experiment Station.

Additional information about the nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov.

Acknowledgements

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Mapping an area more than 200,000 acres in size requires a large amount of energy and resources. The following people are acknowledged for their valued technical or logistical support during the course of this survey.

Michelle Schuman, Dennis Moore, Shawn Nield, Mark Clark, Ted Cox, Pam Taber, Elizabeth Powers, Blaine Spellman, and Timothy Riebe; USDA, NRCS

Pete Biggam and Parker Martyn; USDOI, NPS, Natural Resource Program Center, Inventory and Monitoring Program

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Foreword

This soil survey and ecological site inventory was developed in conjunction with the National Park Service Inventory and Monitoring Program. It serves as the official source document for soils in the survey area of Skagway-Klondike Gold Rush National Historical Park, Alaska. The survey contains predictions of soil behavior for selected land uses. It also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This report is designed for many different users. Government agencies, community officials, Alaska Native tribes, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the report to help them understand, protect, and enhance the environment.

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

Although this information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement the information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS state soil scientist (http://soils.usda.gov).

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

Many soil properties that affect land use are described in this report. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the Alaska State office of the Natural Resources Conservation Service in Palmer, Alaska.

Robert N. Jones, State Conservationist
Natural Resources Conservation Service

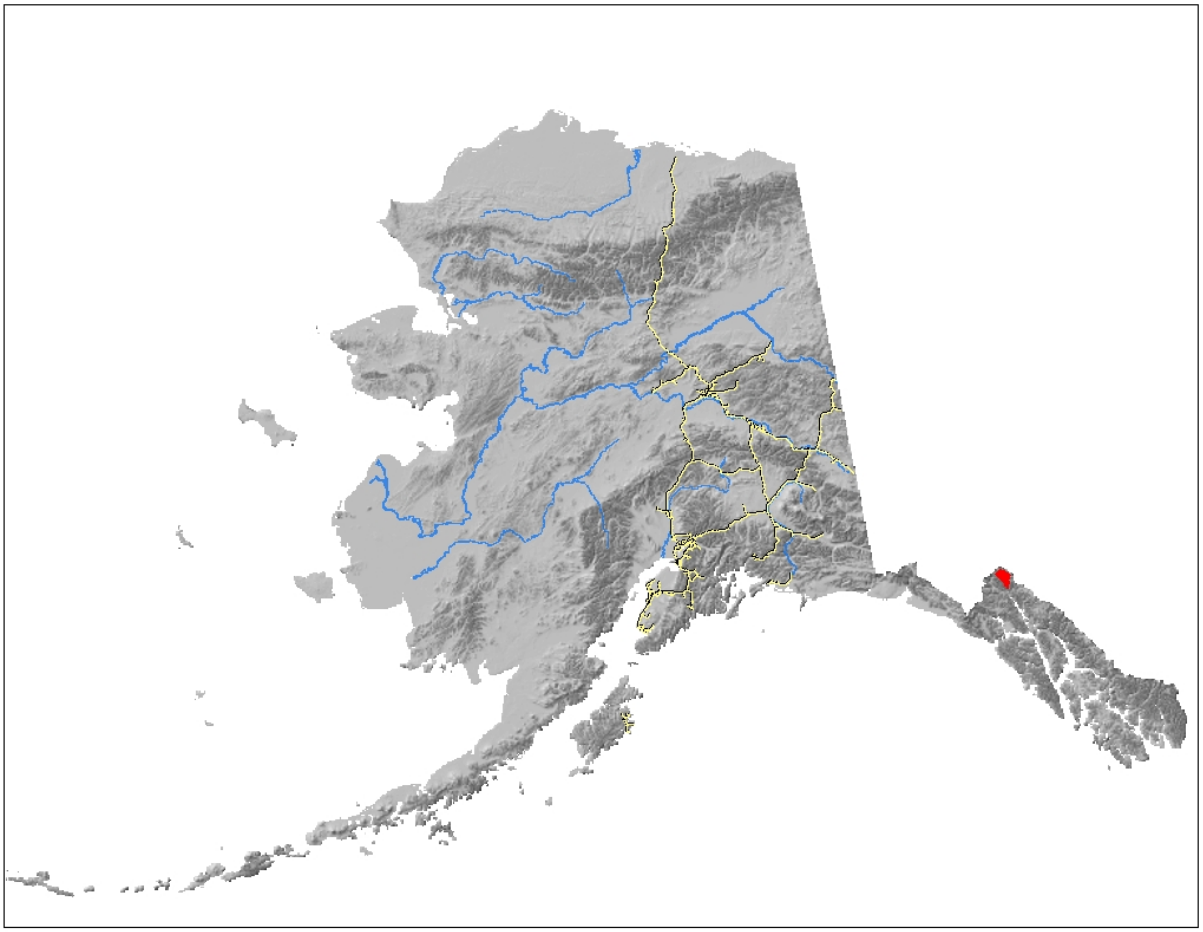


Figure 1.—Location of the survey area of Skagway-Klondike Gold Rush National Historical Park in Alaska (in red). The major road system in the State is represented in yellow, and the major rivers are represented in blue.

Soil Survey and Ecological Site Inventory of

Skagway-Klondike Gold Rush National Historical Park, Alaska

Introduction

The survey area is between the northern end of Lynn Canal and the border with Canada, in the northern part of southeast Alaska. It is bordered on the west by the Haines soil survey area and on the east by the Chatham soil survey area. Skagway is approximately 100 miles northwest of Juneau and 20 miles north of Haines (fig. 1). The entire survey area is in major land resource area 222—Southern Alaska Coastal Mountains (fig. 2). The survey area is about 200,131 acres in size and includes private, State, borough, and municipal property as well as 13,000 acres of public land administered by the United States Department of the Interior, National Park Service. Primary land uses include urban development, tourism, recreation, and fish and wildlife habitat. The Chilkoot and White Pass Units of Klondike Gold Rush National Historical Park are in the survey area. These units along with those in Seattle, Washington, and Canada commemorate the Klondike Gold Rush of the late 1890's.

Survey Purpose and Product Limitations

The primary purpose of the survey was to describe and map the soils and ecological sites of the survey area. Soils were mapped at a scale of 1:24:000 for high use areas such as urban areas and road and trail corridors and at a scale of 1:63,360 for wilderness areas. Descriptions of map units, soil types, and ecological sites were developed through extensive field investigations. The soil data and reference plant communities and major seral communities illustrate the soil and ecological relationships for this part of major land resource area 222. Major land resource areas (MLRAs) are categories used at State and National levels to geographically differentiate landscapes. MLRAs are intended to represent areas of subregional physiographic and geomorphic patterns and processes and general vegetation potentials (Agriculture Handbook 296). Within an MLRA, there are relatively consistent patterns and kinds of landforms, soils, surficial geologic and soil parent material, and geomorphic and soil-forming processes. The detailed soil maps can also be integrated into a multilevel ecological stratification of the area, based on ecological units, to aid in understanding the ecological aspects of the soil information.

Products

This report provides comprehensive documentation of the results of the survey. The content, including maps, tables, and descriptions, are derived dominantly from spatial data and associated attribute data. These include the following:

1. Soil Survey Geographic Database (SSURGO) dataset and standard products of the National Cooperative Soil Survey (NCSS) for the survey area, which include:

- Project area boundary.
- Soil map unit polygons.
- Attribute database (aggregate data exported from the National Soil Information System [NASIS]) linked to map unit polygons with Map Unit Key (MUKEY) (See documentation in metadata and system reports in attribute database.).
- Metadata.

2. Other spatial layers, including special themes and orthophotographs.

3. PEDON_PC and AKVEG databases that provide point data collected during the survey, including:

- Soil and vegetation field data collected at 212 sample points.
- Links to SSURGO data with MUKEY and soil component code (See documentation in database.).

4. Digital photographs, landscape illustrations, and map unit distribution maps.

All products of this manuscript are available at the following locations:

- National Park Service, Klondike Gold Rush National Historical Park Headquarters.
- National Park Service, Regional Office, Anchorage, Alaska.
- Natural Resources Conservation Service, Palmer, Alaska.
- http://websoilsurvey.nrcs.usda.gov.

Survey Methods

This survey provides information about the soils and miscellaneous areas in Klondike Gold Rush National Historical Park and the borough and municipality of Skagway. A scoping meeting was held in September 2010 to identify the soil resource information needs and relate those needs to the survey. Cultural resources were of particular importance to the National Park Service. In response to this, the Natural Resources Conservation Service developed a mapping plan in which study sites were identified and evaluated to avoid possible disturbance of cultural resources. An archeologist from the Klondike Gold Rush National Historical Park accompanied the field crews.

The survey was initiated in October 2010. Fieldwork for the project commenced in June 2011 and continued through September 2012.

The major land resource area map for Alaska and the Ecological Inventory of Klondike Gold Rush National Historical Park and Adjacent National Forest Lands (Paustian and others, 1994) served as primary references for understanding general soil-landform and soil-vegetation relationships within the survey area as well as planning tools for fieldwork. Other information on climate, geology, geomorphology, hydrology, and vegetation was used to aid in the development of map unit, soil component, and ecological site concepts. Initial map units were based on apparent landform and vegetation patterns.

Soils and miscellaneous areas occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform position. By observing the soils and miscellaneous areas in the survey area and relating their position to specific landform segments, a soil scientist develops a concept, or model, of how they were formed. This model is then used to create a preliminary soil map using a geographic information system (GIS) with digital imagery, either orthorectified aerial photographs or satellite images. Digital elevation models (DEMs) are also used in developing the preliminary soil map. They can be used by soil scientists to create many digital layers. Slope, hillshade, and aspect are used to consistently characterize landforms. During this pre-mapping phase, the soil scientists also use other products such as geology and vegetation layers to further stratify the area, if necessary. After identifying recurring patterns, preliminary map unit polygons are delineated.

Representative map units were selected for field evaluation and documentation of soil and vegetation conditions. Teams that included a soil scientist and an ecologist studied several of the tentative map units using the line-intercept transect method. Field documentation for this survey includes 56 individual transects with 212 stops. These points were visited during two 10-day field tours. Observations made included major soil types and associated landforms, site properties, and plant communities. A transect consists of one to several stops within an individual map unit. The number of required stops is dependent on the complexity of the map unit. Corresponding soils and vegetation data were linked to common transect and stop numbers. All transect and stop locations were photographed and recorded using a global positioning system (GPS). These waypoints and photographs were referenced during map preparation and data analysis. During field mapping, the model and pre-mapping concepts were tested and refined to enable the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape. Samples for one of the soils in the area were collected for laboratory analyses and on which to obtain soil climate data (http://www.wcc.nrcs.usda.gov/nwcc/site?sitenum=1176&state=ak). The laboratory data, together with the soil characteristics and properties observed in the field, were used to provide baseline information on soil properties. Following each field season, field data were entered into the PEDON_PC and AKVEG databases for data management and analysis. A complete re-evaluation of draft field mapping using a geographic information system (GIS) as well as spatially-referenced field data was completed. Results of data analysis were entered into the NRCS National Soils Information System (NASIS) database.

General Nature of the Survey Area

Skagway is in southeastern Alaska, about 100 miles northwest of Juneau and 20 miles north of Haines. The borough and municipality of Skagway lie at the northernmost end of Lynn Canal, a fjord that extends into the coastal mountains of southeast Alaska. Skagway itself is situated on the delta and lower floodplain of the Skagway River. Rugged mountains; steep-walled, U-shaped valleys; floodplains; glaciers; and icefields characterize the landscape of the area.

Climate

The climate in the survey area is transitional between the humid, coastal maritime climate and the drier continental climate of interior Alaska. The mean temperature in January is 23 degrees F (-5 degrees C) (table 1). Daily low temperatures rarely are below -20 degrees (-29 degrees C) in winter. The mean temperature in July is 58 degrees
(14 degrees C). Daily high temperatures in summer occasionally exceed 80 degrees (27 degrees C). Daily minimum temperatures in summer generally range from 46 to 49 degrees (8 to 9 degrees C); however, freezing temperatures have been recorded in every month except July. The autumn freeze usually occurs in October and the spring thaw normally is late in April or early in May. The mean annual precipitation is 27 inches (69 centimeters) (table 2). The average annual snowfall is 46 inches (117 centimeters). Maximum rainfall occurs in fall and early in winter.

These climatic conditions are unique in southeast Alaska. Most areas in southeast Alaska are typified by a wet maritime climate with mean annual precipitation of more than 160 inches. The low rainfall in the survey area produces a unique environment for development of plants and soils. The Taiya and Skagway Valleys are dry enough for forest fires, which do not occur in the rest of southeast Alaska.

Physiography and Geology

The survey area lies entirely within MLRA 222—Southern Alaska Coastal Mountains. The terrain consists of steep, rugged, high-relief mountains and massive glaciers and icefields. Elevation in the survey area ranges from sea level to a little more than 8,000 feet. Icefields in the mountains are extensive. The glaciers and icefields cover about 25 percent of the survey area. Level ground is restricted to the lower reaches of the floor of the major valleys. The Skagway and Taiya Rivers flow in braided channels along the floor of these valleys.

Glacial landscapes are dominant in the survey area. Glaciers have advanced and retreated many times in the area, and each advance generally destroyed evidence of the previous one. Evidence of the two most recent periods of glaciation is visible today. About 49,000 years ago, glaciers filled the Skagway River Valley to the level of the craggy peaks. Ice moved through the mountains and carved steep-sided, U-shaped valleys. Between 24,000 and 13,000 years ago, a smaller glacial advance covered the area. The glaciers moved along the previously formed valley floor, creating a smaller U-shaped valley. This resulted in the topographic benches and rounded mountain shoulders on the east side of Skagway. The survey area also includes a number of hanging valleys. These were formed when a large glacier, which cut a very deep valley, crossed the path of a smaller glacier. The smaller glacier caused less erosion of the mountains, so the valley floor remained at a higher elevation in these areas.

Uplift is evident in parts of the survey area. The sheer weight of glaciers thousands of feet thick bowed the earth’s crust. Relieved of that weight due to deglaciation, the crust is springing back in a process called glacial or isostatic rebound. The Skagway and Taiya deltas and estuaries are still rising today. Skagway is built on parts of the delta and the lower floodplain of the Skagway River.

The survey area lies within a linear belt of plutonic intrusive and metamorphic rock. The bedrock in the area is dominantly diorite, but some metamorphic rock and a few igneous dikes are also present.

The area contains only a few types of surficial deposits that are limited in extent. This is mainly because erosion by Pleistocene glaciers often removed previous glacial deposits, but it is also because the resultant slopes were too steep to retain much, if any, unconsolidated material that may have been left behind. Today, most of the steep slopes are nearly devoid of glacial drift. The small amount of drift that may have been deposited either slid or was washed downslope soon after deglaciation. The material that moved downslope under the influence of gravity is referred to as colluvium, and it forms deposits at the base of slopes and avalanche chutes. Locally, only a thin mantle of colluvium is on some of the steep bedrock walls.

The floor of the local valleys is formed of sediment deposited by running water, referred to as alluvium. The modern rivers have formed thick deposits of sandy and gravelly alluvium in the main river valleys. These alluvial deposits extend to tidewater, where they merge with deltaic deposits. Deltaic deposits form at the mouth of rivers, where the flow rate subsides and the sediment load is able to settle. Another type of alluvium is on alluvial fans. It is deposited by small streams in areas where they leave the steep mountain slopes and encounter the gentler slopes of the floodplains. This alluvium generally consists of sandy gravel, cobbles, and some boulders. Many of these coarse fragments are subrounded due to the short distances they have been transported. Manmade fill underlies most of the city of Skagway and covers much of the lower valley floor of the Skagway River. The fill is composed dominantly of gravel and sand derived from the local alluvium.

Hydrology

Melting glaciers provide a substantial amount of the waterflow in the Skagway and Taiya Rivers. Variations in the daily rate of melting in summer can cause large fluctuations in the day-to-day flow of the rivers. Both of the rivers are subject to glacial lake outburst flooding. These floods, also known as jokulhlaups, occur when the dam containing a glacial lake fails. The dam usually consists of glacial ice or a moraine. In 2002, a lateral moraine of the West Creek Glacier failed as a result of melting ice buried in the moraine and caused a large volume of water to flow into West Creek. This generated a large flood that caused extensive damage to private property, bridges, and roads.

Recreation

In summer, the survey area hosts nearly 1,000,000 tourists coming to experience the colorful past of the area. The Klondike Gold Rush National Historical Park is a major tourist attraction. Visitors come to learn about the gold mining history of the area. Local attractions include the Chilkoot Trail and the White Pass Railroad. Visitors can learn about the hardships faced by the early miners trying to get to the goldfields of interior Alaska. Many other outdoor activities, including hiking the many trails, rafting, and kayaking, are available in areas near the park.

General Resource Descriptions

Two general physiographic/ecological maps were used to group the resources in the survey area—the Natural Resources Conservation Service major land resource area map and the Unified Ecoregions Map of Alaska (Nowacki and others, 2001).

Major land resource areas (MLRAs) are geographically associated land resource units (LRUs). Identification of these large areas is important in statewide agricultural planning and in interstate, regional, and National planning. The criteria for these units are based heavily on agricultural use and management. Soil map units are unique to an MLRA. All of the survey area is in MLRA 222—Southern Alaska Coastal Mountains. Complete descriptions of the MLRAs of the United States and a comparison of the various physiographic maps are available in the USDA Agriculture Handbook (USDA, 2006).

The Unified Ecoregions Map of Alaska (Nowacki and others, 2001) combines the Bailey and Omernik approach to ecoregion mapping (Bailey and others, 1994; Cleland and others, 1997). The ecoregions were developed cooperatively by the Forest Service, National Park Service, U.S. Geological Survey, Nature Conservancy, and personnel from many other agencies and private organizations. Ecoregions are large areas that have similar climate and in which ecosystems recur in predictable patterns. The ecoregions hierarchy provides resources and education on the origins of these patterns and their relevance to sustainable design and planning. The Unified Ecoregions Map of Alaska includes the upper levels in the ecological hierarchy down to the section level. The entire survey area is in the Boundary Mountains Ecoregion. The map is available online at http://agdc.usgs.gov/data/usgs/erosafo/ecoreg/index.html.

The detailed soil map units in this report have been correlated to the MLRA map. The MLRA for each map unit is given in the section “Detailed Soil Map Units.”

MLRAs and Associated Map Units

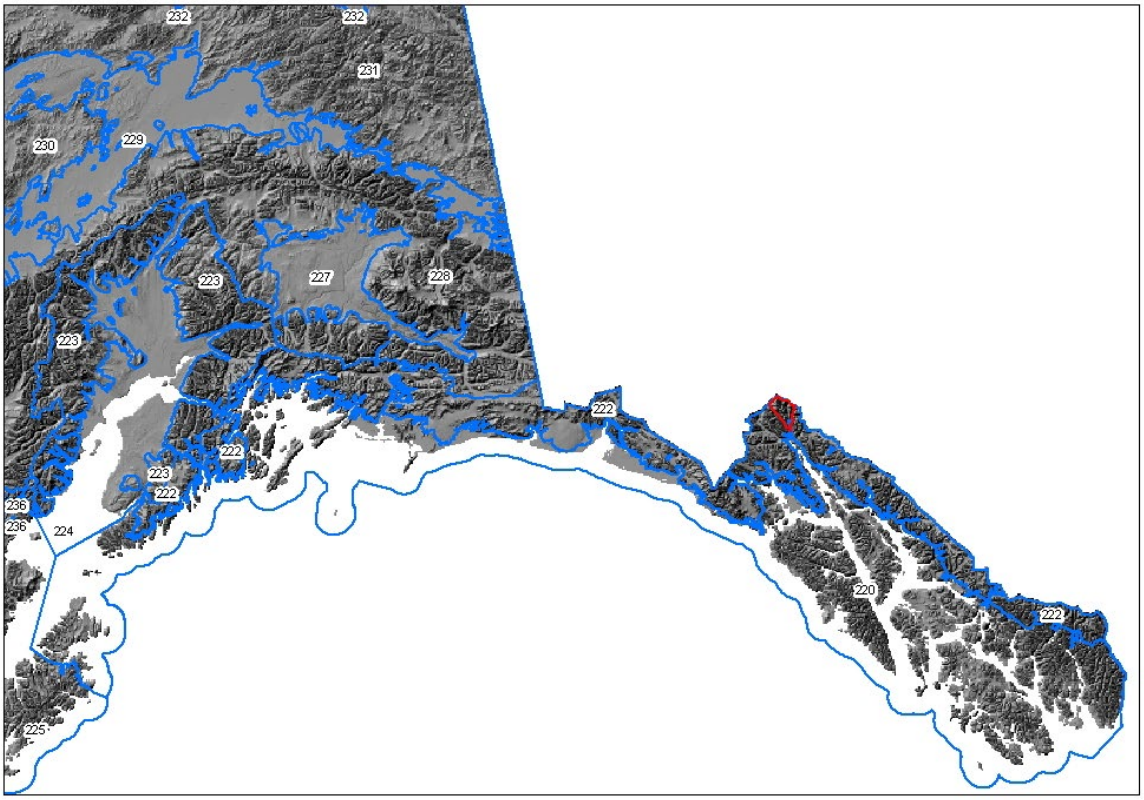


Figure 2.—Skagway-Klondike Gold Rush National Historical Park survey area (outlined in red) with respect to MLRA 222—Southern Alaska Coastal Mountains.

MLRA 222—Southern Alaska Coastal Mountains

Introduction

MLRA 222 is in the southern part of Alaska. It includes the higher elevations of the Coast, St. Elias, Chugach, and Kenai Mountains (fig. 2). This MLRA makes up about 6,815,017 square kilometers. It is almost entirely undeveloped wildland. Small, rural communities along the road system are the only permanent settlements. Federally administered land in the MLRA includes part of the Wrangell-St. Elias National Park and Preserve, Glacier Bay National Park and Preserve, Misty Fjords National Monument, Klondike Gold Rush National Historical Park, Chugach National Forest, and Tongass National Forest.

Physiography

This MLRA is within the Coast Mountains and Pacific Border physiographic provinces of the Pacific Mountain System (Wahrhaftig, 1965). The terrain consists of steep, rugged, high-relief mountains and massive glaciers and icefields. The glaciers and icefields make up about 54 percent of the area. Throughout the icefields are numerous aretes and nunataks. Medial and lateral moraines are common in the glaciers. Unglaciated areas have deeply incised, narrow to broad valleys. Flood plains and stream terraces on the valley floors rapidly give rise to steep alluvial fans and mountain footslopes. Elevation ranges from sea level, at the base of tidewater glaciers and icefields, to 18,008 feet (5,489 meters), at the summit of Mount St. Elias.

The major hydrologic unit areas (identified by 4-digit numbers) of this MLRA are South Central Alaska (1905), which makes up 30 percent, and Southeast Alaska (1906), which makes up 70 percent. This MLRA drains to the Gulf of Alaska and North Pacific Ocean by way of numerous short, high-gradient rivers that originate in the glaciers, icefields, and mountainous uplands. Lakes make up less than 1 percent of the area.

Geology

During the Pleistocene, the survey area was covered with glacial ice. Most glacial deposits have eroded away or been buried by colluvium and slope alluvium, which covers more than 90 percent of the present unglaciated landscape. The remaining glacial and glaciofluvial deposits and recent fluvial deposits generally are restricted to the bottom of the larger valleys. Paleozoic, Mesozoic, and Lower Tertiary stratified sedimentary rock and some Paleozoic intrusive rock underly much of the area and are exposed at the surface on steep mountain slopes and ridges.

Climate

Cloudy conditions and moderate to cold temperatures characterize the climate of this area. Precipitation commonly is abundant throughout the year. Snowfall in winter is abundant, greatly exceeding annual melt in many places as evidenced by the number and extent of glaciers and icefields. The average annual precipitation throughout most of the area is 250 inches (6,350 millimeters) or more. The average annual snowfall ranges from about 200 to 800 inches (508 to 2,032 centimeters). The average annual temperature and length of the frost-free season is not known. At the higher elevations, freezing temperatures are likely to occur during any month of the year.

The climate in the survey area is much drier than the rest of southeast Alaska and is transitional between the humid coastal maritime climate and the drier continental climate of interior Alaska. The mean annual precipitation in this area is only about 27 inches (69 centimeters), and the average annual snowfall is about 46 inches (117 centimeters).

Soils

The approximate extent of the soil orders and nonsoil areas in this MLRA is as follows—Spodosols, 5 percent; Histosols, 2 percent; other soil orders, 3 percent, and miscellaneous (nonsoil) areas, 90 percent. The soils have a cryic or pergelic soil temperature regime, a udic or aquic soil moisture regime, and mixed mineralogy. Humicryods (Nonwalek and Tutka series) and Haplocryods on mountains and hills formed in loamy and gravelly colluvium and glacial till. These soils are shallow to deep and well drained to somewhat poorly drained. Cryosaprists, Cryohemists (Koyuktolik and Nuka series), and Cryofibrists on footslopes, discharge slopes, and valley floors formed in thick organic material. These soils generally are deep and somewhat poorly drained to very poorly drained. Common miscellaneous areas include surface bedrock, rubble fields, talus, and permanent ice and snow.

Biological Resources

Most of this MLRA is within the true alpine zone. Vegetation consists of a variety of dwarf shrubs and herbaceous communities. Low willow is common in drainageways. Lichen, scattered herbs, and dwarf shrubs are dominant in areas of Rock outcrop and very shallow soils. In general, there is little, if any, plant growth above an elevation of about 7,500 feet (2,286 meters). Along the boundary with MLRA 220, there are stringers and inclusions of tall alder shrubs and bluejoint reedgrass grassland, which are characteristic of the subalpine zone.

The survey area is somewhat unique in this MLRA, as it extends through the estuarine, maritime, subalpine, and alpine life zones. The estuarine zone is characterized by salt-tolerant grasses, sedges, and forbs. The maritime life zone is characterized by dense forests of mixed cottonwood and Sitka spruce on the floodplains and western hemlock and Sitka spruce on the mountain flanks. Because of the low rainfall, forest fires are a major ecological disturbance in the area. Slopes that have been burned commonly have lodgepole pine in the forest stand. The subalpine zone in the survey area is characterized dominantly by a mosaic of dwarf shrubs with trees that have been stunted by the harsh climatic conditions. The alpine life zone is characterized dominantly by areas of Rock outcrop, Rubble land, and ice, but some areas support dwarf shrubs and lichen.

Some of the major mammal species in the area include brown bear, Dall sheep, mountain goat, moose, wolf, coyote, fox, snowshoe hare, arctic ground squirrel, and hoary marmot. Ptarmigan, American golden plover, golden eagle, and a wide variety of other birds are also common.

Land Use

Remote wildland recreation is the principal land use. The rugged, high mountains, extensive glaciers and icefields, and wilderness qualities of the area attract visitors from around the world. Most visitors are served by air taxi, guiding, and outfitting companies operating out of major communities in Alaska.

According to the 2010 census, Skagway had a population of 920. In summer, the city hosts nearly 1,000,000 tourists. The Klondike Gold Rush National Historical Park is a large tourist attraction, allowing visitors to learn about the gold mining history of the area. Local attractions include the Chilkoot Trail and White Pass Railroad. Visitors can learn about the hardships faced by the early miners trying to get to the goldfields of interior Alaska. Skagway is one of the few southeast Alaska communities to be connected to the road system.

Soil Map Units (Landtype Associations)

22CF1—Estuarine Floodplains
22CP3—Maritime Coastal Plains
22FF1—Maritime Fans
22HF1—Maritime Floodplains, High Gradient
22LF1—Maritime Floodplains, Gravelly
22LF2—Maritime Floodplains, Loamy
22LM1—Maritime Mountains, Steep
22UF1—Maritime Floodplains, Urban Land
D22AM1—Alpine Diorite Mountains
D22BF1—Maritime Floodplains, High Gradient, Jokulhlaup
D22DW1—Maritime Organic Floodplains
D22HM2—Maritime Mountains, High Elevation
D22LM2—Maritime Mountains, Very Steep, Smooth
D22LM3—Maritime Mountains, Very Steep, Dissected
D22SA1—Subalpine Mountains
D22SA2—Subalpine Mountains, Avalanche Chutes
D22WF1—Maritime Water, Lakes and Ponds
D22WS1—Estuarine Water, Salt

Detailed Soil Map Units

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

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

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

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit.

A *consociation* is a map unit that is made up dominantly of a single soil component or miscellaneous area and similar soils. Generally, at least one-half of the pedons in each delineation consists of the named soil component or miscellaneous area.

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

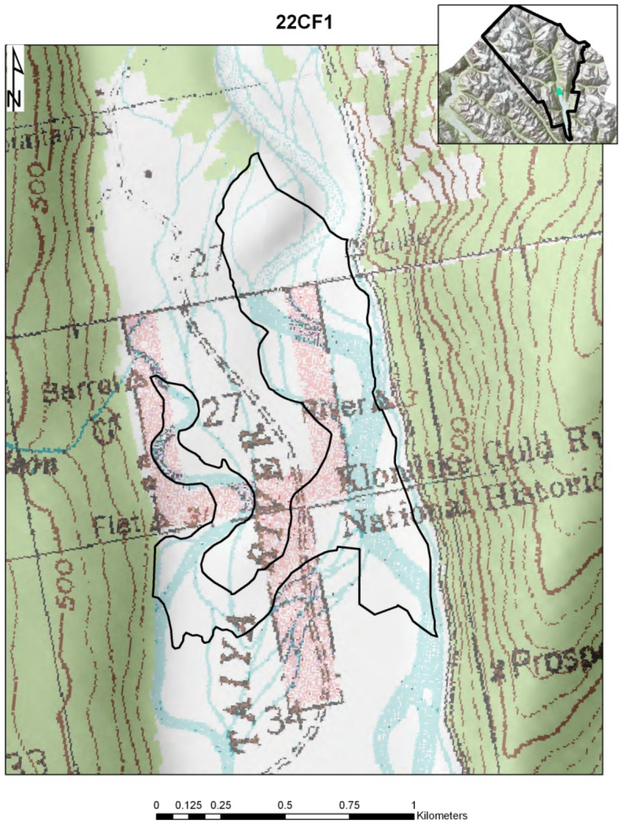
A *complex* consists of two or more soil components or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

An *association* is made up of two or more geographically associated soil components or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar.

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

Table 3 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

22CF1—Estuarine Floodplains



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 10 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

22—Estuarine Graminoid Loamy Floodplains: 65 percent
22—Maritime Water, Flowing: 20 percent
22—Estuarine Graminoid Loamy Floodplains, Depression: 15 percent

22—Estuarine Graminoid Loamy Floodplains

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 0 to 2 percent
Parent material: Loamy alluvium over gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.5)
Salinity maximum (based on representative value): Slightly saline (about 6 millimhos per centimeter)

Sodicity maximum: Sodium adsorption ratio about 1.5
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Somewhat poorly drained
Flooding frequency: Frequent (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: About 10 to 40 centimeters (see Water Features table)
Available water capacity (entire profile): Moderate (about 15.8 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Hydric soil status: Hydric
Hydrologic soil group: B
Soil classification: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Aquic Cryofluvents

Typical profile
A—0 to 2 centimeters; highly organic silt loam
C—2 to 66 centimeters; stratified silt loam
Cg—66 to 90 centimeters; silt loam
2C—90 to 183 centimeters; extremely gravelly coarse sand

22—Maritime Water, Flowing

Setting
Landform: Channels
Aspect (representative): North
Aspect (range): All aspects
Slope range: 0 to 1 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Natural drainage class: Not applicable
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: At the soil surface (see Water Features table)
Available water capacity (entire profile): Not applicable

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified
Soil classification: Not applicable

Typical profile
W—0 to 152 centimeters; water

22—Estuarine Graminoid Loamy Floodplains, Depression

Setting
Landform: Floodplains
Landform position (three-dimensional): Dips
Down-slope shape: Concave
Across-slope shape: Concave
Slope range: 0 to 2 percent
Parent material: Loamy alluvium over gravelly alluvium

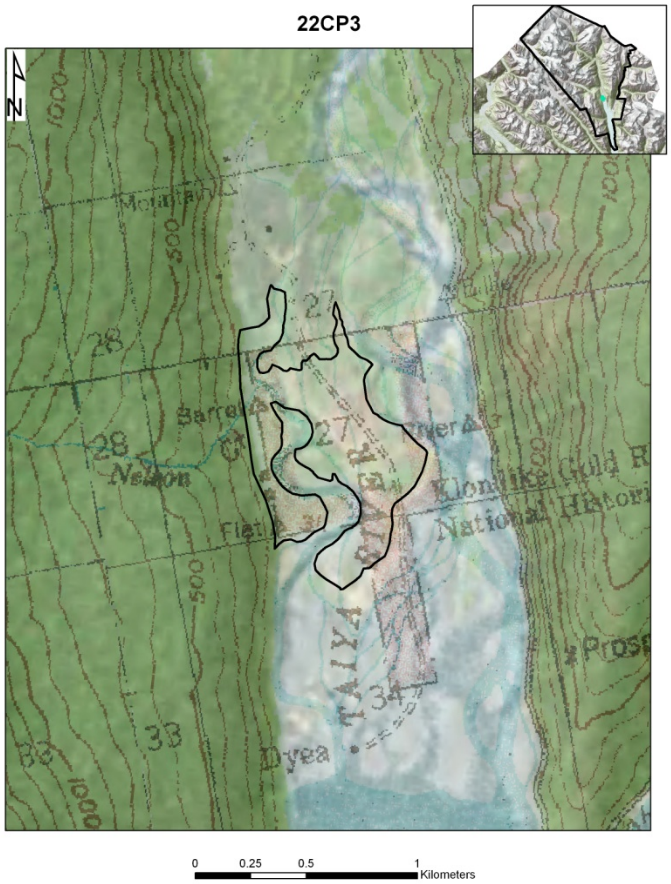
Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.5)
Salinity maximum (based on representative value): Slightly saline (about 6 millimhos per centimeter)
Sodicity maximum: Sodium adsorption ratio about 1.5
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Very poorly drained
Flooding frequency: Frequent (see Water Features table)
Ponding frequency: Frequent (see Water Features table)
Depth to seasonal high water table: At the soil surface (see Water Features table)
Available water capacity (entire profile): Low (about 9.1 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Hydric
Hydrologic soil group: B
Soil classification: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Typic Fluvaquents

Typical profile
C—0 to 23 centimeters; silt loam
Cg—23 to 43 centimeters; silt loam
2C—43 to 183 centimeters; extremely gravelly coarse sand

22CP3—Maritime Coastal Plains



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 20 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 96 to 180 days

Map Unit Composition

22—Estuarine Graminoid Gravelly Coastal Plain: 95 percent
Dissimilar minor components: 5 percent

22—Estuarine Graminoid Gravelly Coastal Plain

Setting
Landform: Coastal plains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 0 to 2 percent
Parent material: Gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.2)
Salinity maximum (based on representative value): Strongly saline (about 35 millimhos per centimeter)
Sodicity maximum: Sodium adsorption ratio about 2
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: Rare (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 5.1 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: A
Soil classification: Sandy-skeletal, mixed, nonacid Typic Cryorthents

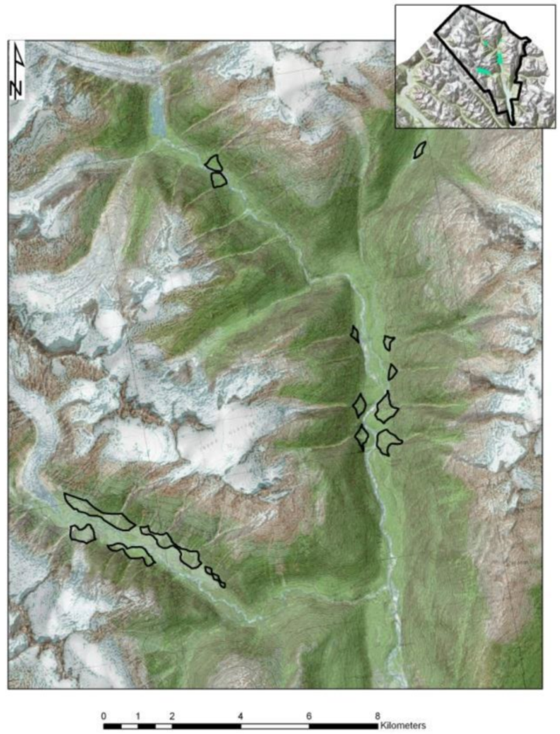
Typical profile
C—0 to 55 centimeters; gravelly sandy loam
2C—55 to 183 centimeters; extremely gravelly sand

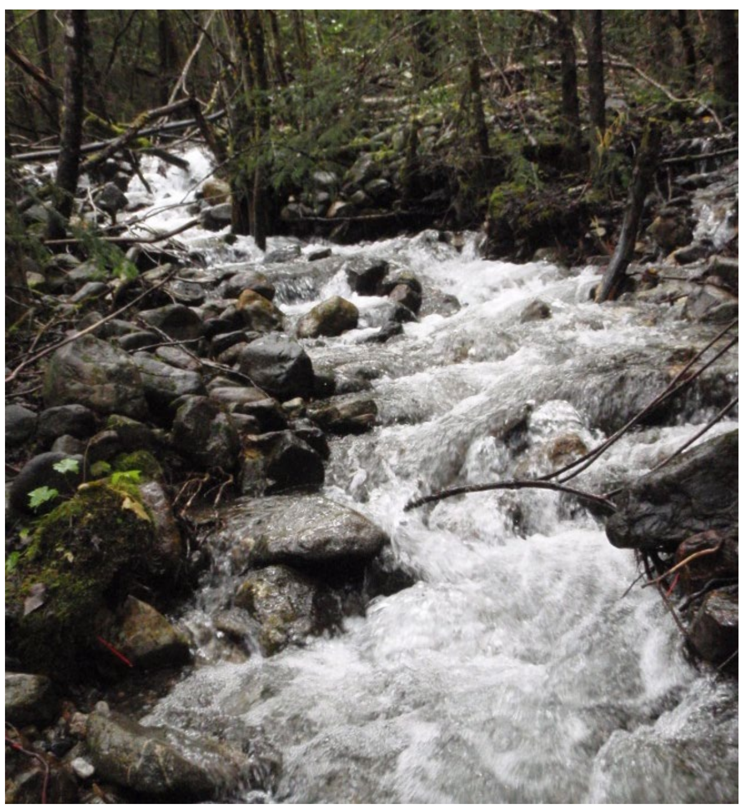
Minor Components

22—Estuarine Graminoid Loamy Floodplains
Percentage of map unit: 3 percent
Slope range: 0 to 1 percent
Landform: Flood plains

22—Estuarine Water, Saline
Percentage of map unit: 2 percent

22FF1—Maritime Fans





Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 40 to 355 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace: 95 percent
Dissimilar minor component: 5 percent

22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace

Setting
Landform: Alluvial fans
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 30 percent
Parent material: Gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.3)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Low (about 10.1 centimeters)

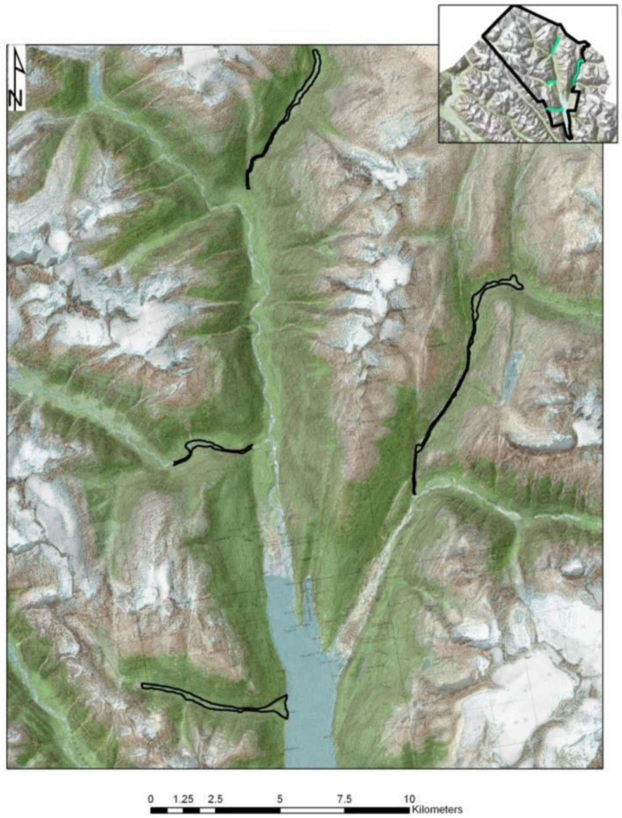
Interpretive groups
Land capability subclass (nonirrigated): 6e
Hydric soil status: Not hydric
Hydrologic soil group: A
Soil classification: Typic Haplocryods

Typical profile
O—0 to 4 centimeters; slightly decomposed plant material
A—4 to 13 centimeters; highly organic sandy loam
C1—13 to 43 centimeters; very gravelly loamy sand
C2—43 to 183 centimeters; very cobbly loamy sand

Minor Component

22—Maritime Water, Flowing
Percentage of map unit: 5 percent
Slope range: 3 to 10 percent
Landform: Alluvial fans

22HF1—Maritime Floodplains, High Gradient



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 2 to 500 meters
Mean annual precipitation: 660 to 1,244 millimeters
Mean annual air temperature: 2 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

22—Maritime Riverwash, Bouldery: 45 percent
22—Maritime Water, Flowing: 30 percent
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded: 25 percent

22—Maritime Riverwash, Bouldery

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear, convex
Across-slope shape: Linear
Aspect (representative): North
Aspect (range): All aspects
Slope range: 1 to 5 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Very high
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: At the soil surface to a depth of 25 centimeters (see Water Features table)
Available water capacity (entire profile): Moderate (about 18.3 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
C—0 to 183 centimeters; stratified very stony coarse sand

22—Maritime Water, Flowing

Setting
Landform: Channels
Aspect (representative): North
Aspect (range): All aspects
Slope range: 1 to 5 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline

Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: At the soil surface (see Water Features table)

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 1 to 5 percent
Parent material: Gravelly alluvium

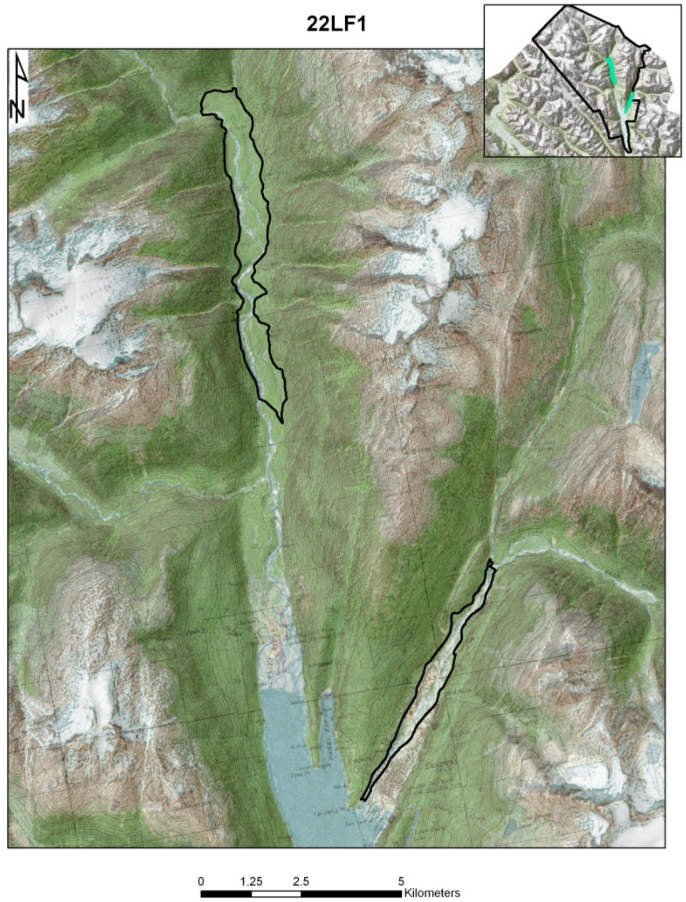
Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.3)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: Occasional (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 3.8 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: A
Soil classification: Typic Cryofluvents

Typical profile
O—0 to 7 centimeters; slightly decomposed plant material
A—7 to 21 centimeters; stratified highly organic gravelly sandy loam
C—21 to 183 centimeters; extremely bouldery coarse sand

22LF1—Maritime Floodplains, Gravelly



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 2 to 1,000 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

22—Maritime Forest Gravelly Floodplains, Rarely Flooded: 60 percent
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded: 20 percent
Dissimilar minor components: 20 percent

22—Maritime Forest Gravelly Floodplains, Rarely Flooded

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 0 to 3 percent
Parent material: Loamy alluvium over gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.4)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Well drained
Flooding frequency: Rare (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 5.1 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: B
Soil classification: Sandy-skeletal, mixed, nonacid Typic Cryorthents

Typical profile
O—0 to 5 centimeters; slightly decomposed plant material
A—5 to 9 centimeters; highly organic silt loam
C—9 to 183 centimeters; very gravelly coarse sand

22—Maritime Forest Gravelly Floodplains, Occasionally Flooded

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 0 to 3 percent
Parent material: Loamy alluvium over gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.3)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Moderately well drained
Flooding frequency: Occasional (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: About 80 to 183 centimeters (see Water Features table)
Available water capacity (entire profile): Very low (about 4.4 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: B
Soil classification: Sandy-skeletal, mixed Typic Cryofluvents

Typical profile
O—0 to 3 centimeters; slightly decomposed plant material
A—3 to 5 centimeters; highly organic sandy loam
C—5 to 183 centimeters; very cobbly loamy sand

Minor Components

22—Maritime Riverwash, Gravelly
Percentage of map unit: 10 percent
Slope range: 1 to 3 percent
Landform: Floodplains

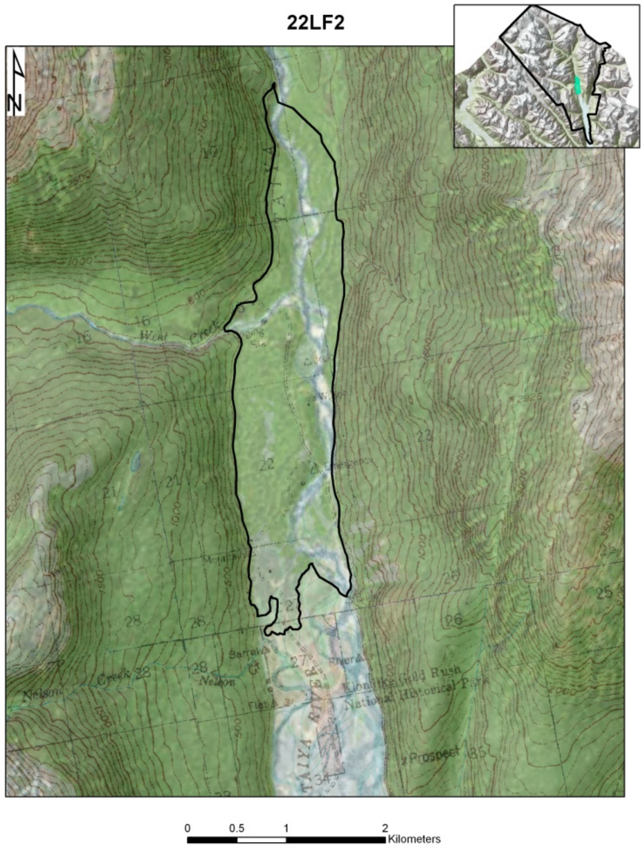
22—Maritime Water, Flowing
Percentage of map unit: 5 percent
Slope range: 1 to 3 percent
Landform: Channels

22—Maritime Scrub Gravelly Floodplains, Frequently Flooded
Percentage of map unit: 2 percent
Slope range: 0 to 3 percent
Landform: Floodplains
Hydric soil status: Not hydric

22—Maritime Scrub Gravelly Floodplains, Depression
Percentage of map unit: 2 percent
Slope range: 0 to 1 percent
Landform: Floodplains
Hydric soil status: Not hydric

22—Maritime Gravel Pit
Percentage of map unit: 1 percent
Slope range: 1 to 7 percent
Landform: Floodplains

22LF2—Maritime Floodplains, Loamy



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 2 to 1,000 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

22—Maritime Forest Loamy Floodplains, Rarely Flooded: 40 percent
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded: 20 percent
22—Maritime Forest Gravelly Floodplains, Rarely Flooded: 20 percent
Dissimilar minor components: 20 percent

22—Maritime Forest Loamy Floodplains, Rarely Flooded

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 0 to 3 percent
Parent material: Loamy alluvium over gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.4)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Well drained
Flooding frequency: Rare (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Low (about 12.3 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: B
Soil classification: Sandy-skeletal, mixed, nonacid Typic Cryorthents

Typical profile
O—0 to 5 centimeters; slightly decomposed plant material
C1—5 to 45 centimeters; highly organic silt loam
C2—45 to 183 centimeters; very gravelly coarse sand

22—Maritime Forest Gravelly Floodplains, Occasionally Flooded

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 0 to 3 percent
Parent material: Loamy alluvium over gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.3)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Moderately well drained
Flooding frequency: Occasional (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: About 80 to 183 centimeters (see Water Features table)
Available water capacity (entire profile): Very low (about 4.4 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: B
Soil classification: Sandy-skeletal, mixed Typic Cryofluvents

Typical profile
O—0 to 3 centimeters; slightly decomposed plant material
A—3 to 5 centimeters; highly organic sandy loam
C—5 to 183 centimeters; very cobbly loamy sand

22—Maritime Forest Gravelly Floodplains, Rarely Flooded

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 0 to 3 percent
Parent material: Loamy alluvium over gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.4)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Well drained
Flooding frequency: Rare (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 5.1 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: B
Soil classification: Sandy-skeletal, mixed, nonacid Typic Cryorthents

Typical profile
O—0 to 5 centimeters; slightly decomposed plant material
A—5 to 9 centimeters; highly organic silt loam
C—9 to 183 centimeters; very gravelly coarse sand

Minor Components

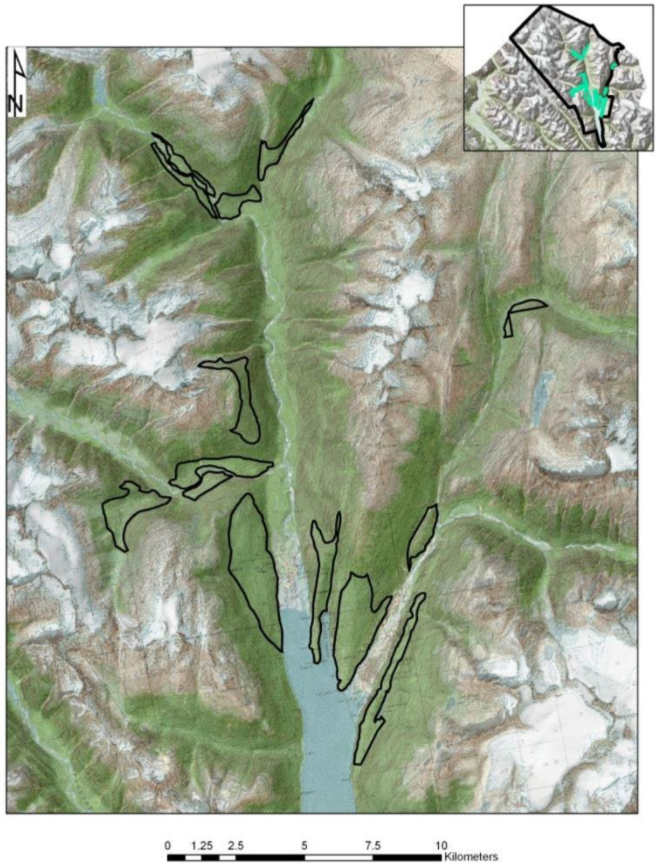
22—Maritime Riverwash, Gravelly
Percentage of map unit: 10 percent
Slope range: 1 to 3 percent
Landform: Floodplains

22—Maritime Water, Flowing
Percentage of map unit: 5 percent
Slope range: 1 to 3 percent
Landform: Channels

22—Maritime Scrub Gravelly Floodplains, Depression
Percentage of map unit: 3 percent
Slope range: 0 to 1 percent
Landform: Floodplains
Hydric soil status: Not hydric

22—Maritime Scrub Gravelly Floodplains, Frequently Flooded
Percentage of map unit: 2 percent
Slope range: 0 to 3 percent
Landform: Floodplains
Hydric soil status: Not hydric

22LM1—Maritime Mountains, Steep



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 1,080 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 96 to 180 days

Map Unit Composition

22—Maritime Forest Gravelly Slopes, Shallow: 60 percent
22—Maritime Forest Organic Slopes, Dry: 20 percent
Dissimilar minor components: 20 percent

22—Maritime Forest Gravelly Slopes, Shallow

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Linear, convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 20 to 50 percent
Parent material: Gravelly colluvium over residuum derived from diorite

Properties and qualities
Depth to restrictive feature: 30 to 50 centimeters to lithic bedrock
Shrink-swell potential: Low (linear extensibility percentage about 0.3)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 3.1 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Hydric soil status: Not hydric
Hydrologic soil group: D
Soil classification: Lithic Haplocryods

Typical profile
O—0 to 8 centimeters; slightly decomposed plant material
A—8 to 12 centimeters; highly organic gravelly sandy loam
E—12 to 17 centimeters; very gravelly sandy loam
Bs—17 to 22 centimeters; very gravelly sandy loam
C—27 to 40 centimeters; very gravelly sandy loam
R—40 to 183 centimeters; bedrock

22—Maritime Forest Organic Slopes, Dry

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes

Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 30 percent
Parent material: Organic material over gravelly colluvium over residuum derived from diorite

Properties and qualities
Depth to restrictive feature: 18 to 36 centimeters to lithic bedrock
Shrink-swell potential: Low (linear extensibility percentage about 0.2)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 3.7 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 8e
Hydric soil status: Not hydric
Hydrologic soil group: D
Soil classification: Lithic Cryofolists

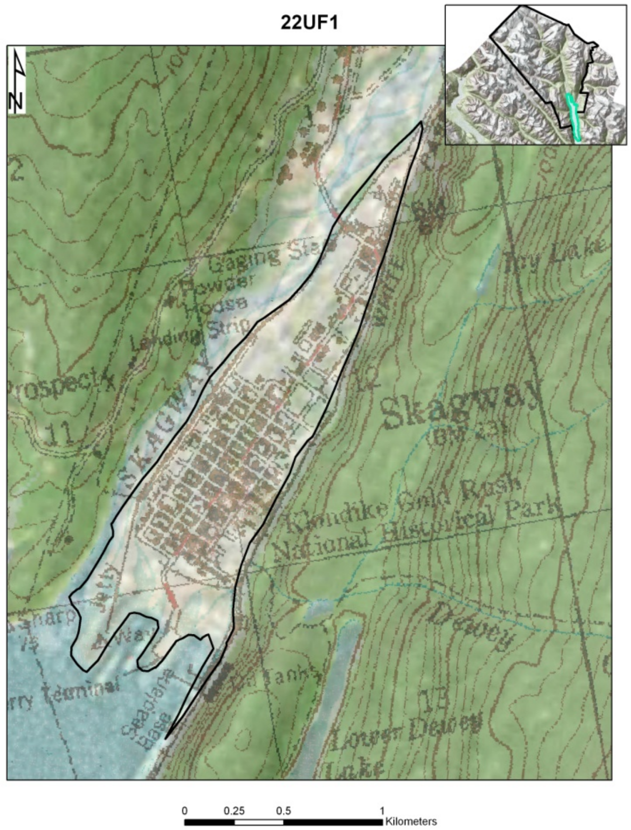
Typical profile
O—0 to 22 centimeters; slightly decomposed plant material
C—22 to 28 centimeters; very stony sandy loam
R—28 to 183 centimeters; bedrock

Minor Components

22—Maritime Rock Outcrop
Percentage of map unit: 15 percent
Slope range: 10 to 120 percent
Landform: Mountains

22—Maritime Forest Organic Slopes, Depression
Percentage of map unit: 5 percent
Slope range: 0 to 2 percent
Landform: Mountains
Hydric soil status: Hydric

22UF1—Maritime Floodplains, Urban Land



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 2 to 100 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

22—Maritime Urban Land: 80 percent
Dissimilar minor components: 20 percent

22—Maritime Urban Land

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): North
Aspect (range): All aspects
Slope range: 0 to 3 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters

Interpretive groups
Land capability subclass (nonirrigated): 8s
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

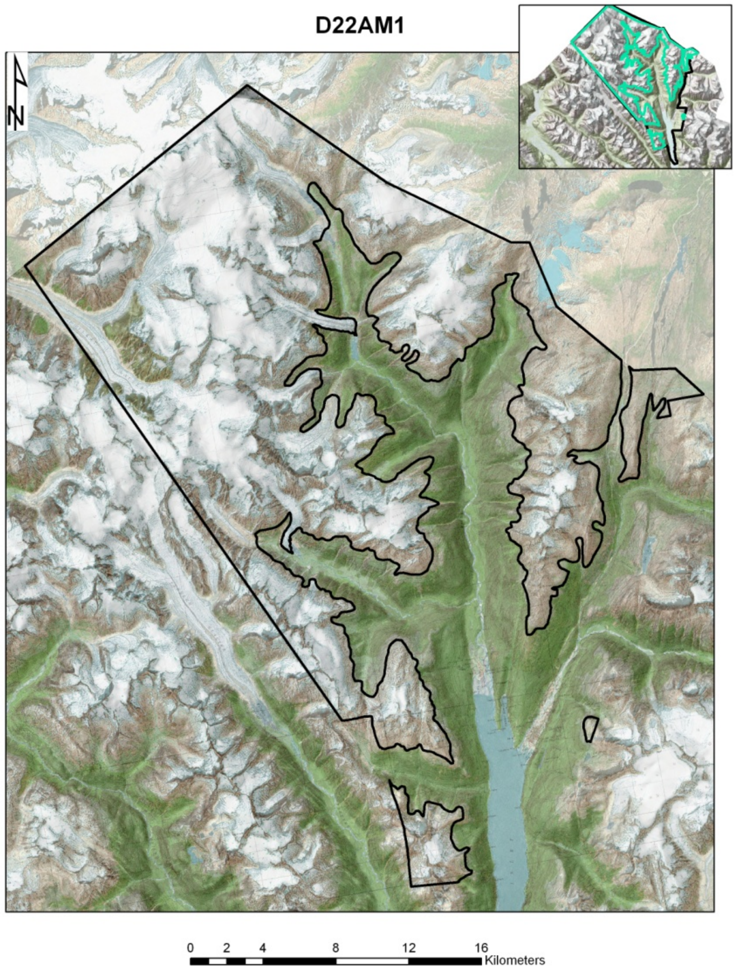
Minor Components

22—Maritime Urban Land, Flooded
Percentage of map unit: 10 percent
Slope range: 0 to 3 percent
Landform: Floodplains

22—Maritime Gravel Pit
Percentage of map unit: 5 percent
Slope range: 1 to 7 percent
Landform: Floodplains

22—Maritime Levees
Percentage of map unit: 5 percent
Slope range: 30 to 50 percent
Landform: Floodplains

D22AM1—Alpine Diorite Mountains



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 300 to 2,477 meters
Mean annual precipitation: 1,000 to 2,880 millimeters
Mean annual air temperature: 1 to 4 degrees C
Frost-free period: 10 to 100 days

Map Unit Composition

D22—Subalpine and Alpine Permanent Ice and Snow: 33 percent
D22—Subalpine and Alpine Rock Outcrop: 33 percent
D22—Subalpine and Alpine Rubble Land: 30 percent
Dissimilar minor component: 4 percent

D22—Subalpine and Alpine Permanent Ice and Snow

Setting
Landform: Mountains
Landform position (two-dimensional): Summits, shoulders
Landform position (three-dimensional): Upper third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 120 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: At the soil surface (see Water Features table)

Interpretive groups
Land capability subclass (nonirrigated): 8c
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

D22—Subalpine and Alpine Rock Outcrop

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes
Landform position (three-dimensional): Upper third of mountainflanks
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 120 percent

Properties and qualities
Depth to restrictive feature: Lithic bedrock at the surface
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters

Interpretive groups
Land capability subclass (nonirrigated): 8s
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
R—0 to 183 centimeters; bedrock

D22—Subalpine and Alpine Rubble Land

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Upper third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 120 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 0 centimeters)

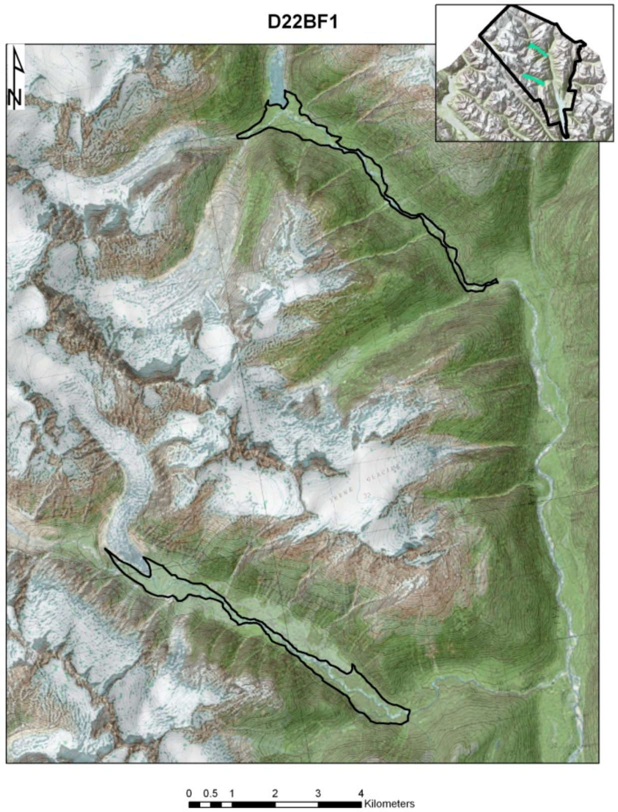
Interpretive groups
Land capability subclass (nonirrigated): 8e
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
C—0 to 183 centimeters; boulders

Minor Component

D22—Alpine Herbaceous Gravelly Diorite Slopes
Percentage of map unit: 4 percent
Slope range: 30 to 60 percent
Landform: Mountains
Hydric soil status: Not hydric

D22BF1—Maritime Floodplains, High Gradient, Jokulhlaup



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 2.0 to 500 meters
Mean annual precipitation: 660 to 1,244 millimeters
Mean annual air temperature: 2 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

D22—Maritime Riverwash, Bouldery: 45 percent
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded: 40 percent
D22—Maritime Water, Flowing: 15 percent

D22—Maritime Riverwash, Bouldery

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear, convex
Across-slope shape: Linear
Aspect (representative): North
Aspect (range): All aspects
Slope range: 1 to 5 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Very high
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: At the soil surface to a depth of 25 centimeters (see Water Features table)
Available water capacity (entire profile): Moderate (about 18.3 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
C—0 to 183 centimeters; stratified very stony coarse sand

D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded

Setting
Landform: Floodplains
Landform position (three-dimensional): Talfs
Down-slope shape: Linear
Across-slope shape: Linear
Slope range: 1 to 5 percent
Parent material: Gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.3)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: Occasional (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 3.8 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Hydric soil status: Not hydric
Hydrologic soil group: A
Soil classification: Typic Cryofluvents

Typical profile
O—0 to 7 centimeters; slightly decomposed plant material
A—7 to 21 centimeters; stratified, highly organic gravelly sandy loam
C—21 to 183 centimeters; extremely bouldery coarse sand

D22—Maritime Water, Flowing

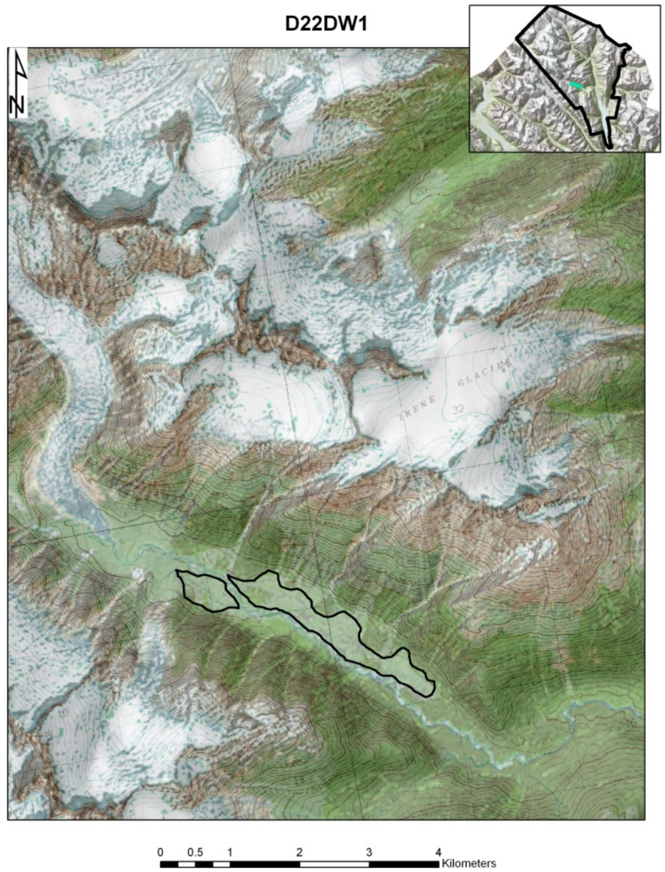
Setting
Landform: Channels
Aspect (representative): North
Aspect (range): All aspects
Slope range: 1 to 5 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Depth to seasonal high water table: At the soil surface (see Water Features table)

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

D22DW1—Maritime Organic Floodplains



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 1,080 meters
Mean annual precipitation: 660 to 1244 millimeters
Mean annual air temperature: 2 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

D22—Maritime Scrub/Herb Mosaic Organic Floodplains: 90 percent
Dissimilar minor component: 10 percent

D22—Maritime Scrub/Herb Mosaic Organic Floodplains

Setting
Landform: Floodplains
Landform position (three-dimensional): Dips
Down-slope shape: Concave
Across-slope shape: Concave
Slope range: 0 to 2 percent
Parent material: Organic material over loamy alluvium over organic material over sandy and gravelly alluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.4)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Very poorly drained
Flooding frequency: Frequent (see Water Features table)
Ponding frequency: Frequent (see Water Features table)
Depth to seasonal high water table: At the soil surface (see Water Features table)
Available water capacity (entire profile): Very high (about 47.4 centimeters)

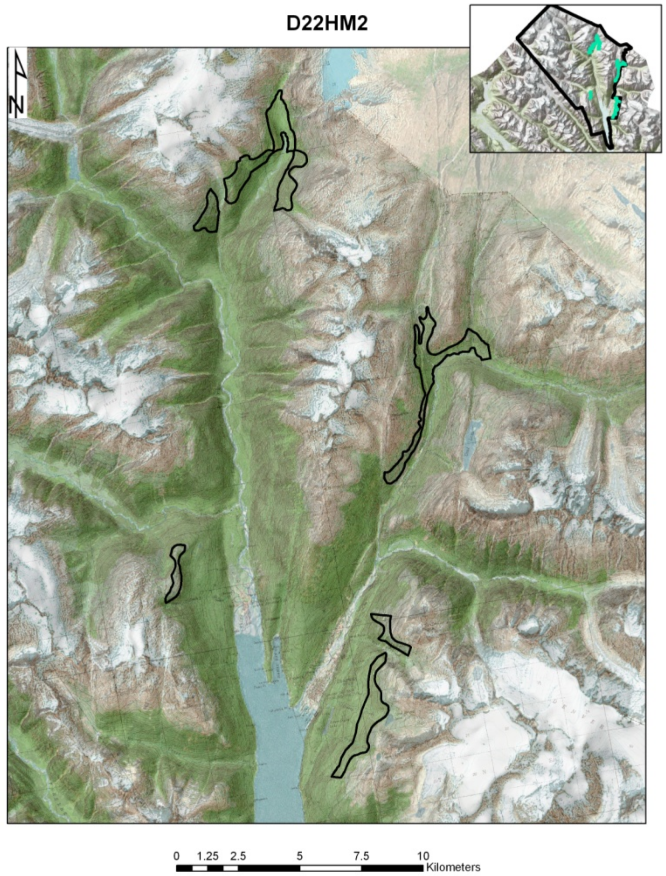
Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Hydric
Hydrologic soil group: B
Soil classification: Fluvaquentic Cryohemists

Typical profile
O—0 to 10 centimeters; peat
C—10 to 32 centimeters; fine sandy loam
O'—32 to 125 centimeters; mucky peat
2C'—125 to 183 centimeters; extremely gravelly sand

Minor Component

D22—Maritime Water, Lakes And Ponds
Percentage of map unit: 10 percent
Slope range: 0 to 1 percent
Landform: Lakes

D22HM2—Maritime Mountains, High Elevation



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 1,505 meters
Mean annual precipitation: 660 to 1,244 millimeters
Mean annual air temperature: 2 to 6 degrees C
Frost-free period: 90 to 171 days

Map Unit Composition

D22—Maritime Forest Organic Slopes, Dry, High Elevation: 50 percent
D20—Maritime Rock Outcrop: 20 percent
D22—Maritime Rubble Land: 20 percent
Dissimilar minor component: 10 percent

D22—Maritime Forest Organic Slopes, Dry, High Elevation

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes
Landform position (three-dimensional): Center third of mountainflanks
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 30 to 90 percent
Parent material: Organic material over gravelly colluvium over residuum

Properties and qualities
Depth to restrictive feature: 17 to 60 centimeters to lithic bedrock
Shrink-swell potential: Low (linear extensibility percentage about 0.2)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 5 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Hydric soil status: Not hydric
Hydrologic soil group: D
Soil classification: Lithic Cryofolists

Typical profile
O—0 to 31 centimeters; slightly decomposed plant material
C—31 to 36 centimeters; very gravelly sandy loam
R—36 to 183 centimeters; bedrock

D20—Maritime Rock Outcrop

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Convex

Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 120 percent

Properties and qualities
Depth to restrictive feature: Lithic bedrock at the surface
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters

Interpretive groups
Land capability subclass (nonirrigated): 8s
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
R—0 to 183 centimeters; bedrock

D22—Maritime Rubble Land

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 30 to 120 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 0 centimeters)

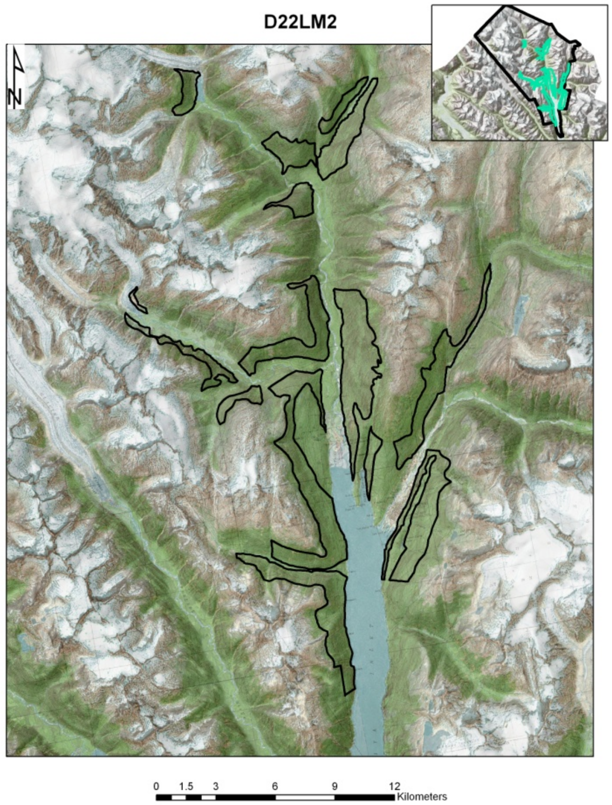
Interpretive groups
Land capability subclass (nonirrigated): 8e
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
C—0 to 183 centimeters; boulders

Minor Component

D22—Maritime Forest Gravelly Slopes, High Elevation
Percentage of map unit: 10 percent
Slope range: 20 to 40 percent
Landform: Mountains
Hydric soil status: Not hydric

D22LM2—Maritime Mountains, Very Steep, Smooth



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 1,505 meters
Mean annual precipitation: 660 to 1,244 millimeters
Mean annual air temperature: 3 to 6 degrees C
Frost-free period: 90 to 180 days

Map Unit Composition

D22—Maritime Forest Gravelly Slopes, Shallow: 35 percent
D22—Maritime Forest Gravelly Slopes, Shallow, Convex: 25 percent
D22—Maritime Rock Outcrop: 20 percent
Dissimilar minor components: 20 percent

D22—Maritime Forest Gravelly Slopes, Shallow

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): North
Aspect (range): All aspects
Slope range: 50 to 90 percent
Parent material: Gravelly colluvium over residuum

Properties and qualities
Depth to restrictive feature: 30 to 65 centimeters to lithic bedrock
Shrink-swell potential: Low (linear extensibility percentage about 0.2)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 2.9 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Hydric soil status: Not hydric
Hydrologic soil group: D
Soil classification: Lithic Dystrocryepts

Typical profile
O—0 to 8 centimeters; slightly decomposed plant material
A—8 to 15 centimeters; highly organic very gravelly sandy loam
Bw—15 to 39 centimeters; very gravelly sandy loam
C—39 to 40 centimeters; very gravelly sandy loam
R—40 to 183 centimeters; bedrock

D22—Maritime Forest Gravelly Slopes, Shallow, Convex

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes

Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 50 to 90 percent
Parent material: Gravelly colluvium over residuum derived from diorite

Properties and qualities
Depth to restrictive feature: 30 to 40 centimeters to lithic bedrock
Shrink-swell potential: Low (linear extensibility percentage about 0.2)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 2.4 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Hydric soil status: Not hydric
Hydrologic soil group: D
Soil classification: Lithic Haplocryods

Typical profile
O—0 to 6 centimeters; slightly decomposed plant material
A—6 to 7 centimeters; highly organic very gravelly sandy loam
E—7 to 12 centimeters; very gravelly sandy loam
Bs—12 to 33 centimeters; extremely gravelly sandy loam
C—33 to 40 centimeters; extremely gravelly sandy loam
R—40 to 183 centimeters; bedrock

D22—Maritime Rock Outcrop

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 120 percent

Properties and qualities
Depth to restrictive feature: Lithic bedrock at the surface
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None

Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters

Interpretive groups
Land capability subclass (nonirrigated): 8s
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
R—0 to 183 centimeters; bedrock

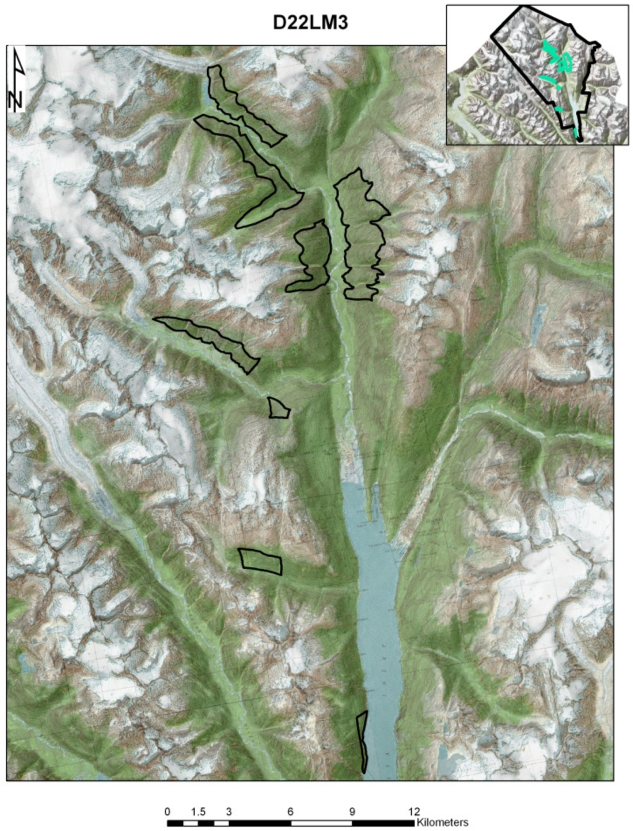
Minor Components

D22—Maritime Forest Organic Slopes, Dry
Percentage of map unit: 10 percent
Slope range: 50 to 100 percent
Landform: Mountains
Hydric soil status: Not hydric

D22—Maritime Forest Gravelly Slopes, High Elevation
Percentage of map unit: 5 percent
Slope range: 50 to 90 percent
Landform: Mountains
Hydric soil status: Not hydric

D22—Maritime Forest Organic Slopes, Depression
Percentage of map unit: 5 percent
Slope range: 2 to 7 percent
Landform: Mountains
Hydric soil status: Hydric

D22LM3—Maritime Mountains, Very Steep, Dissected



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 1,600 meters
Mean annual precipitation: 660 to 1,244 millimeters
Mean annual air temperature: 2 to 6 degrees C
Frost-free period: 65 to 171 days

Map Unit Composition

D22—Maritime Forest Gravelly Slopes, Shallow: 30 percent
D22—Maritime Rubble Land: 20 percent
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional: 20 percent
D20—Maritime Rock outcrop: 15 percent
Dissimilar minor components: 15 percent

D22—Maritime Forest Gravelly Slopes, Shallow

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): North
Aspect (range): All aspects
Slope range: 50 to 90 percent
Parent material: Gravelly colluvium over residuum

Properties and qualities
Depth to restrictive feature: 30 to 65 centimeters to lithic bedrock
Shrink-swell potential: Low (linear extensibility percentage about 0.2)
Salinity maximum (based on representative value): Nonsaline

Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 2.9 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Hydric soil status: Not hydric
Hydrologic soil group: D
Soil classification: Lithic Dystrocryepts

Typical profile
O—0 to 8 centimeters; slightly decomposed plant material
A—8 to 15 centimeters; highly organic very gravelly sandy loam
Bw—15 to 39 centimeters; very gravelly sandy loam
C—39 to 40 centimeters; very gravelly sandy loam
R—40 to 183 centimeters; bedrock

D22—Maritime Rubble Land

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 50 to 120 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 0 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 8e
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
C—0 to 183 centimeters; boulders

D22—Maritime Scrub/Herb Gravelly Slopes, Depositional

Setting
Landform: Mountains
Landform position (two-dimensional): Footslopes
Landform position (three-dimensional): Mountain bases
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 20 to 40 percent
Parent material: Gravelly colluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.1)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Low (about 9.8 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 6e
Hydric soil status: Not hydric
Hydrologic soil group: B
Soil classification: Typic Cryorthents

Typical profile
C—0 to 24 centimeters; extremely gravelly sandy loam
O—24 to 30 centimeters; extremely gravelly, moderately decomposed plant material
C'—30 to 183 centimeters; extremely gravelly sandy loam

D20—Maritime Rock Outcrop

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes
Landform position (three-dimensional): Lower third of mountainflanks
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 50 to 120 percent

Properties and qualities
Depth to restrictive feature: Lithic bedrock at the surface
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters

Interpretive groups
Land capability subclass (nonirrigated): 8s
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

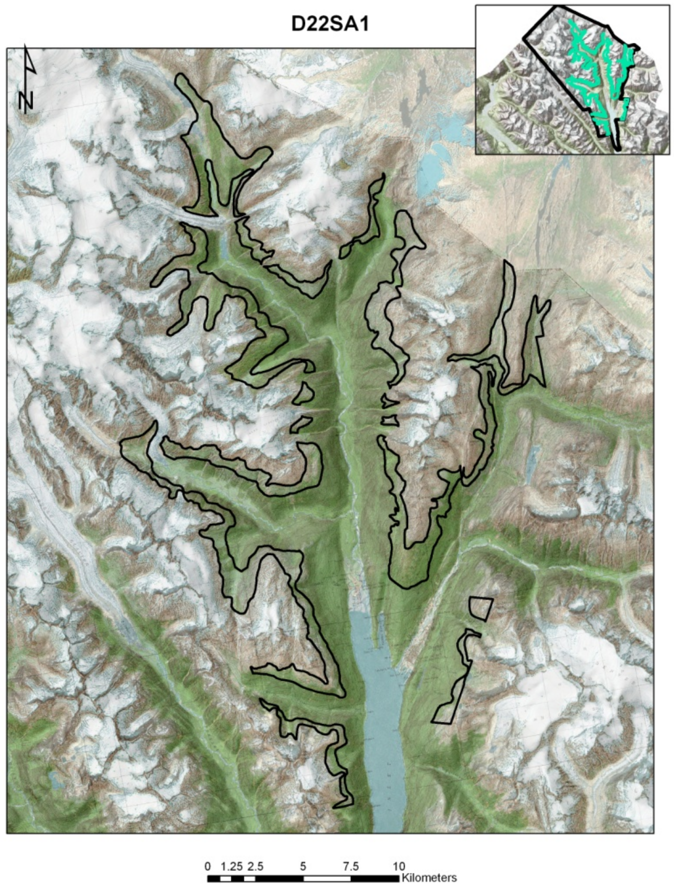
Typical profile
R—0 to 183 centimeters; bedrock

Minor Components

D22—Maritime Forest Organic Slopes, Dry
Percentage of map unit: 10 percent
Slope range: 50 to 100 percent
Landform: Mountains
Hydric soil status: Not hydric

D22—Maritime Forest Gravelly Slopes, High Elevation
Percentage of map unit: 5 percent
Slope range: 50 to 90 percent
Landform: Mountains
Hydric soil status: Not hydric

D22SA1—Subalpine Mountains



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 300 to 2,477 meters
Mean annual precipitation: 980 to 2,880 millimeters
Mean annual air temperature: 1 to 4 degrees C
Frost-free period: 10 to 100 days

Map Unit Composition

D22—Subalpine and Alpine Rubble Land: 25 percent
D22—Subalpine and Alpine Rock Outcrop: 20 percent
D22—Subalpine Scrub Gravelly Slopes, Convex: 15 percent
Dissimilar minor components: 40 percent

D22—Subalpine and Alpine Rubble Land

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Upper third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 120 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 0 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 8e
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
C—0 to 183 centimeters; boulders

D22—Subalpine and Alpine Rock Outcrop

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes
Landform position (three-dimensional): Upper third of mountainflanks
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 10 to 120 percent

Properties and qualities
Depth to restrictive feature: Lithic bedrock at the surface
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters

Interpretive groups
Land capability subclass (nonirrigated): 8s
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
R—0 to 183 centimeters; bedrock

D22—Subalpine Scrub Gravelly Slopes, Convex

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Upper third of mountainflanks
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): North
Aspect (range): All aspects
Slope range: 50 to 90 percent
Parent material: Loamy colluvium over residuum derived from diorite

Properties and qualities
Depth to restrictive feature: 25 to 55 centimeters to lithic bedrock
Shrink-swell potential: Low (linear extensibility percentage about 0.3)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Moderately well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 4.6 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Hydric soil status: Not hydric
Hydrologic soil group: D
Soil classification: Lithic Humicryepts

Typical profile
O—0 to 3 centimeters; moderately decomposed plant material
A—3 to 38 centimeters; cobbly sandy loam
R—38 to 183 centimeters; bedrock

Minor Components

D22—Subalpine Scrub Organic Slopes
Percentage of map unit: 12 percent
Slope range: 50 to 100 percent
Landform: Mountains
Hydric soil status: Not hydric

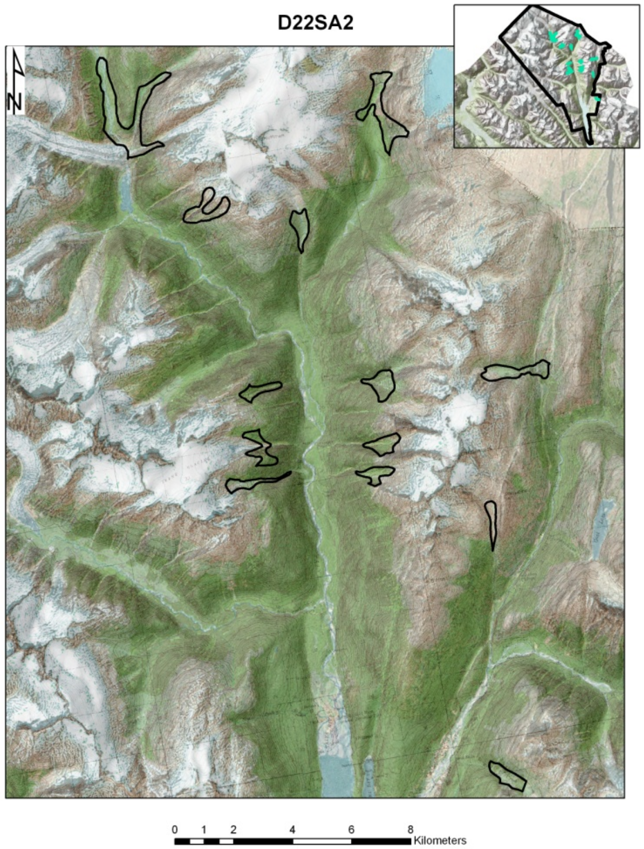
D22—Subalpine Scrub Gravelly Slopes
Percentage of map unit: 10 percent
Slope range: 10 to 30 percent
Landform: Mountains
Hydric soil status: Not hydric

D22—Subalpine Scrub Gravelly Slopes, Depositional
Percentage of map unit: 8 percent
Slope range: 5 to 25 percent
Landform: Mountains
Hydric soil status: Not hydric

D22—Subalpine and Alpine Permanent Ice and Snow
Percentage of map unit: 5 percent
Slope range: 10 to 120 percent

D22—Subalpine Forest Gravelly Slopes
Percentage of map unit: 5 percent
Slope range: 20 to 50 percent
Landform: Mountains
Hydric soil status: Not hydric

D22SA2—Subalpine Mountains, Avalanche Chutes



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 300 to 2,477 meters
Mean annual precipitation: 660 to 2,880 millimeters
Mean annual air temperature: 1 to 6 degrees C
Frost-free period: 25 to 100 days

Map Unit Composition

D22—Subalpine and Alpine Rubble Land: 34 percent
D22—Subalpine and Alpine Rock Outcrop: 33 percent
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional: 30 percent
Dissimilar minor component: 3 percent

D22—Subalpine and Alpine Rubble Land

Setting
Landform: Mountains
Landform position (two-dimensional): Backslopes
Landform position (three-dimensional): Upper third of mountain flanks
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 20 to 120 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 0 centimeters)

Interpretive groups
Land capability subclass (nonirrigated): 8e
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
C—0 to 183 centimeters; boulders

D22—Subalpine and Alpine Rock Outcrop

Setting
Landform: Mountains
Landform position (two-dimensional): Shoulders, backslopes
Landform position (three-dimensional): Upper third of mountainflanks
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 20 to 120 percent

Properties and qualities
Depth to restrictive feature: Lithic bedrock at the surface
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters

Interpretive groups
Land capability subclass (nonirrigated): 8s
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Typical profile
R—0 to 183 centimeters; bedrock

D22—Maritime Scrub/Herb Gravelly Slopes, Depositional

Setting
Landform: Mountains
Landform position (two-dimensional): Footslopes
Landform position (three-dimensional): Mountainbases
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): North
Aspect (range): All aspects
Slope range: 20 to 45 percent
Parent material: Gravelly colluvium

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (linear extensibility percentage about 0.1)
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal high water table: Not present within a depth of 160 centimeters
Available water capacity (entire profile): Low (about 9.8 centimeters)

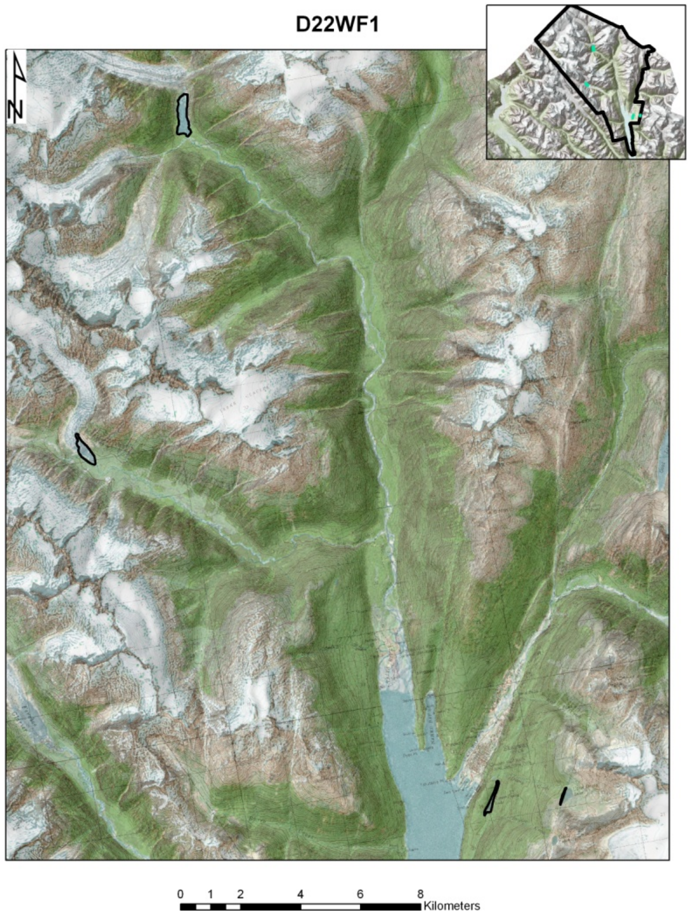
Interpretive groups
Land capability subclass (nonirrigated): 6e
Hydric soil status: Not hydric
Hydrologic soil group: B
Soil classification: Typic Cryorthents

Typical profile
C—0 to 24 centimeters; extremely gravelly sandy loam
O—24 to 30 centimeters; extremely gravelly, moderately decomposed plant material
C'—30 to 183 centimeters; extremely gravelly sandy loam

Minor Component

D22—Subalpine Scrub Gravelly Slopes, Depositional
Percentage of map unit: 3 percent
Slope range: 30 to 70 percent
Landform: Mountains
Hydric soil status: Not hydric

D22WF1—Maritime Water, Lakes and Ponds



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 1,800 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Map Unit Composition

22—Maritime Water, Lakes And Ponds: 100 percent

22—Maritime Water, Lakes and Ponds

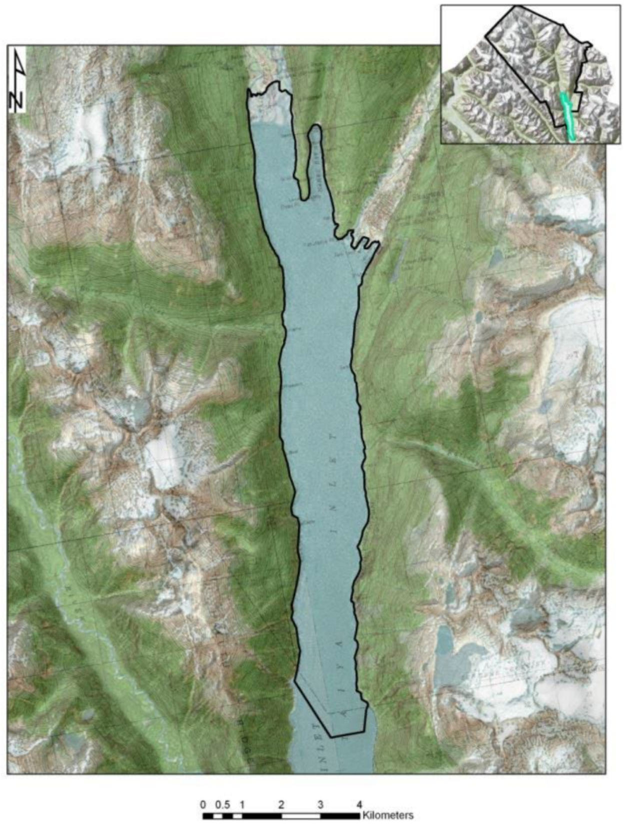
Setting
Landform: Lakes
Aspect (representative): North
Aspect (range): All aspects
Slope range: 0 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: Frequent (see Water Features table)
Depth to seasonal high water table: At the soil surface (see Water Features table)

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

D22WS1—Estuarine Water, Salt



Major land resource area: 222—Southern Alaska Coastal Mountains
Elevation: 0 to 2 meters
Mean annual precipitation: 660 to 703 millimeters
Mean annual air temperature: 4 to 6 degrees C
Frost-free period: 96 to 180 days

Map Unit Composition

D22—Estuarine Water, Saline: 99 percent
Dissimilar minor component: 1 percent

D22—Estuarine Water, Saline

Setting
Aspect (representative): North
Aspect (range): All aspects
Slope range: 0 percent

Properties and qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum (based on representative value): Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent: No carbonates

Hydrologic properties
Slowest capacity to transmit water (Ksat): Unspecified
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: Frequent (see Water Features table)
Depth to seasonal high water table: At the soil surface (see Water Features table)

Interpretive groups
Land capability subclass (nonirrigated): 8w
Hydric soil status: Not applicable
Hydrologic soil group: Unspecified

Minor Component

22—Estuarine Gravelly Tidal Flats
Percentage of map unit: 1 percent
Slope range: 0 to 1 percent
Landform: Tidal flats

Ecological Sites

An ecological site is a conceptual division of the landscape that is defined as a distinctive kind of land, based on recurring soil, landform, geologic, and climatic characteristics. It differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and to respond similarly to management practices and natural disturbances.

Climate, geomorphology, and soils interact to determine how plant species are distributed along environmental gradients and how the resulting associations of plant species (plant communities) respond to disturbances and management. More than a century of observation and experimental research have established the importance of climate, landscape position, soil characteristics, and disturbance regimes in determining how changes in disturbances and management practices can be expected to affect the composition and structure of a plant community. A systematic understanding of how management practices and disturbances interact with abiotic and biotic factors is a critical element in understanding ecological processes and functions. This understanding is also necessary to assess the risk of degradation, implement appropriate management practices, and assess land capability.

An ecological site incorporates abiotic and biotic environmental factors such as climate, soils/landform, hydrology, vegetation, and natural disturbance regimes that define a site. Each ecological site is identified, differentiated, and described based on the relationships between these environmental factors and how they influence plant community composition. While abrupt or distinct breaks between landforms, soils, and vegetation occasionally occur, more commonly the transition is gradual and indistinct. In addition, precipitation, temperature, and other climatic patterns as well as microclimatic variables, such as elevation, change gradually across the landscape. An ecological site classification, therefore, should be viewed as a landscape model. The boundaries between ecological sites are sometimes arbitrary and approximate. On the ground, the characteristics and properties within and between ecological sites are complex and variable and commonly overlap to some degree.

The characteristics differentiating ecological sites and their abiotic and biotic features are documented in ecological site characterization reports. The reports include the following:

- Data used to define the distinctive properties and characteristics of the sites.
- Biotic and abiotic characteristics that differentiate the sites, including climate, physiography, soil characteristics, and plant communities,
- State and transition models that describe the ecological dynamics for the sites and how the plant community responds to disturbance and/or management.

Ecological Site Concept

The identification and classification of ecological sites are based on a fundamental premise that the composition, structure, and function of plant communities are governed by energy, moisture, and nutrient gradients as well as disturbance regimes. In decreasing order of scale, these gradients vary due to differences in macroclimate, geology, geomorphology, topography (elevation, slope, aspect, and landform position), and physical and chemical characteristics of the soils. Collectively, these factors determine soil temperature, moisture, and nutrient regimes that affect patterns and processes associated with particular ecological sites.

At the local scale, soil temperature, moisture, and nutrient regimes are characterized based on key physical and chemical properties of the soils, which are used as differentiating criteria in defining an ecological site. Key soil properties are identified using direct measures of edaphic conditions, including soil morphology, depth, texture, water holding capacity, and pH. Key soil properties are also determined based on knowledge of plant-soil relationships, and vegetation is an indirect indicator of environmental gradients.

The floristic criteria used in combination with environmental factors to define an ecological site are ecologically significant associations of plant species, or indicator plant communities, which serve as indicators of important environmental conditions. Indicator plant communities are composed of species that are strongly associated with a narrow range of environmental conditions. When used in combination with direct measurements of environment, indicator species indicate features that can be readily observed in field applications, such as onsite investigations or ecological site mapping. Knowledge of these associations of indicator species and their relationship to environmental conditions may be from experts following field investigations, through the incorporation of existing vegetative classifications, or objectively developed through analyses of floristic and soil data collected from sites representing the site concept. These relationships define soil moisture and nutrient gradients associated with differences in inherent land capability to support specific kinds of vegetation and provide detectible environmental thresholds that allow for separation of one ecological site from another.

The inherent complexities of vegetation dynamics, or how vegetation originated in an area and how it might change in the future, require an understanding of historical vegetation, disturbance regimes, climatic variability, and existing (current) vegetation. Long-term trends in historic vegetation can be determined using pollen analysis and other dendroecological techniques. The relevance of such data diminishes over time due to increasing differences in climate, disturbance regimes, and species distribution. A 500-year period or shorter immediately preceding European settlement is a reasonable time period for establishing reference conditions within the United States (Winthers and others, 2005).

The ecological site concept is defined based on reference conditions representing natural states. The state changes and transitions are subsequently estimated based on understanding of succession and ecological thresholds. Reference states and their component community phases represent the historical range of variability due to successional dynamics following disturbances. Within this natural, historical, or reference state, the community phase used to define an ecological site is termed the reference community phase.

The reference community phase is identified as the community phase that exhibits the characteristics of the reference state and contains the full complement of plant species that historically occupied the site (Bestelmeyer and others, 2010; Briske and others, 2008). The reference community phase formed as a result of interacting environmental gradients, natural disturbance regimes, and physiological characteristics of species comprising the community. Within landscapes that historically experienced relatively infrequent disturbances, late successional communities that required long-time periods to develop are typically selected as the reference community phase. On landscapes where frequent natural disturbances occurred, however, the geographically dominant community in the reference state may be more relevant and therefore selected as the reference community phase, since the latter stages of succession seldom occurred. For example, the tall grass prairie occurs within a relatively moist macroclimatic zone that would have succeeded to woodland or forest in the absence of disturbance. Frequent fires maintained the prairie over the majority of its natural geographic extent for thousands of years.

State and Transition Model

Ecological dynamics describe the changes to vegetation and soils and the causes of those changes that can occur on an ecological site. Details on the alternative states, ranges of variability within states, and the processes that cause plant community shifts within states as well as transitions among states are described in the text and diagram of a state and transition model (STM).

An STM can include single or multiple states, depending on the nature of the system, and incorporates the concepts of ecological resilience and resistance. Ecological resilience is a measure of the amount of change or disruption that is required to transform a system from being maintained by one set of mutually reinforcing processes and structures to a different set of processes and structures (Peterson and all, 1998). This definition is distinct from that of engineering resilience, which describes the rate at which ecosystems return to their original stable state following disturbance (Holling, 1996). The conditions sufficient to modify the structure and function of a state beyond the limits of ecological resilience result in the formation of an alternative state.

An STM is organized as a collection of community phases and states that communicate data about the ecological dynamics of an ecological site and can provide management alternatives and information about restoration. Alternative states are separated by thresholds that can be induced by natural or human-caused events. Crossing a threshold from one state to another (the transition) indicates persistent changes in vegetation and commonly in dynamic soil properties. The persistence or resilience (Peterson and others, 1998) of alternative states is caused by feedback between environmental conditions and vegetation or long-time lags in vegetation responses to natural events or management practices, such as grazing pressure. In such cases, even if the effects of management or environment, such as grazing pressure or high rainfall, return to a previous state, the vegetation may not return to its earlier state or will so only slowly or in response to unusual events. When transitions are undesirable, costly restoration practices commonly are required to return the community to a previous state within management timeframes or restoration may not even be possible with current technology.

Each state may have one community phase or more representing system dynamics within the limits of the state. The dynamics among community phases may be driven independently or in combination with natural events, such as succession or disturbance, or human activities, such as land management practices (Walker and others, 2004).

STMs provide data on plant succession, ecological thresholds, non-equilibrium dynamics, and functional and structural change in response to disturbances and management practices. They describe relationships among vegetation; soils; animals; hydrology; disturbances such as fire, lack of fire, grazing and browsing, drought, unusually wet periods, insects, and disease; and management practices. This information is used to describe existing soil-vegetation relationships, document historical vegetation and dynamics as well as restoration outcomes, and measurements of ecosystem properties and processes occurring within states, such as cover, soil aggregate stability, erosion rates, and net primary production.

STMs are developed using published literature, expert knowledge, existing agency datasets (for example, National Resources Inventory, Forest Inventory and Analysis data, and legacy datasets), newly collected inventory data, and research data. STMs begin as a working hypothesis based largely on expert knowledge and available inventory data. They are refined as a result of empirical information obtained through research, monitoring, and data collection. STMs ideally are developed using inventory data of soil properties and vegetation; historical reconstructions using long-term monitoring data, historical records, or photography; recent monitoring data, including responses to climate variability and management practices; and process-based research and studies that test for the mechanisms causing or constraining ecosystem responses. The goal in producing STMs is to provide a conceptual understanding of the ecological dynamics that can occur on an ecological site, the drivers and mechanisms of ecosystem change, and the management actions that can be used to influence change.

Ecological Dynamics

Wildfire and flooding are two common recurring disturbance factors in the survey area. Most evidence of fire is in the vicinity of Skagway, the site of the historic town of Dyea, and along the historic travel corridors of the Chilkoot Trail and the White Pass Railroad. While natural fires started by lightning are not unheard of in the area, little evidence of fire is in the more remote areas, leading to the conclusion that most of the fires in the area are anthropogenic.

In mountain slope environments, post-fire vegetation succession on maritime forest sites is accompanied by a gradual increase in the abundance and thickness of the moss-organic layer on the soil or rock surface. Initially, the stand is populated by paper birch and lodgepole pine. As the stand matures, Sitka spruce and western hemlock become established and may in time completely overtake the stand.

Flooding, a common recurring disturbance on floodplains, can interrupt or retard site progression. Depending on the velocity and duration of a flood event, vegetation may be destroyed by the physical abrasion of sediment, prolonged saturation of the site, or burial. Depending on the intensity and duration of the flood, significant site retrogression can occur quickly from a single episode. The degree of alteration is influenced by the distance of the site above active channels as well as its position and orientation to the channel.

Whether or not site retrogression occurs depends on site factors and the intensity and duration of the flood event. Higher lying flood plains are subject to less frequent flood events and the more mature plant communities, such as forest types, are less sensitive to brief periods of flooding. Well established vegetation reduces the velocity of a flood and encourages deposition of sediment. Lower lying flood plains are subject to more frequent flooding and support young, commonly herbaceous and shrub communities that are relatively rapid growing and can quickly colonize a site following significant flooding. The soils commonly are gravelly as a result of the deeper, high-gradient floodwaters and a regime in which sandy and silty sediment is removed from the surface.

Floodplains consist of a number of terraces that have a successively lower frequency of flooding as the elevation above active channels increases. The vegetation on each flood plain level reflects the dominant flood regime. Site and soil properties and vegetation associated with each flood regime are expressed by a single potential natural community (PNC). In addition to identifying the latest successional stage as the PNC, ecological site classification provides a framework for recognizing and describing progression-retrogression dynamics and relationships.

Soil-Ecological Site Correlation

An ecological site consists of one or more soils that have similar vegetative and ecological potentials and processes. A number of different soils might be grouped together in an ecological site, but an individual soil can be included in only one site. To establish soil-site relationships and maintain the one-to-one correlation, vegetative characteristics, ecological patterns and processes, soil characteristics, and other criteria specified in *Soil Taxonomy* (Soil Survey Staff, 1999) and *Keys to Soil Taxonomy* (Soil Survey Staff; 2010) are used to develop the soil classification.

Because of the one-to-one correlation between a soil and an ecological site, the ecological site can be determined by understanding the soil. This is particularly useful in areas where the vegetation is not a definitive indicator of the site. For example, the vegetation has been altered by disturbance or management or the vegetation on two sites is similar in composition and structure. Because of this correlation, an ecological site map can be derived from the soil map. The ecological sites as correlated to the soil components in the survey area are given in table 4.

Ecological Site Characterization Reports

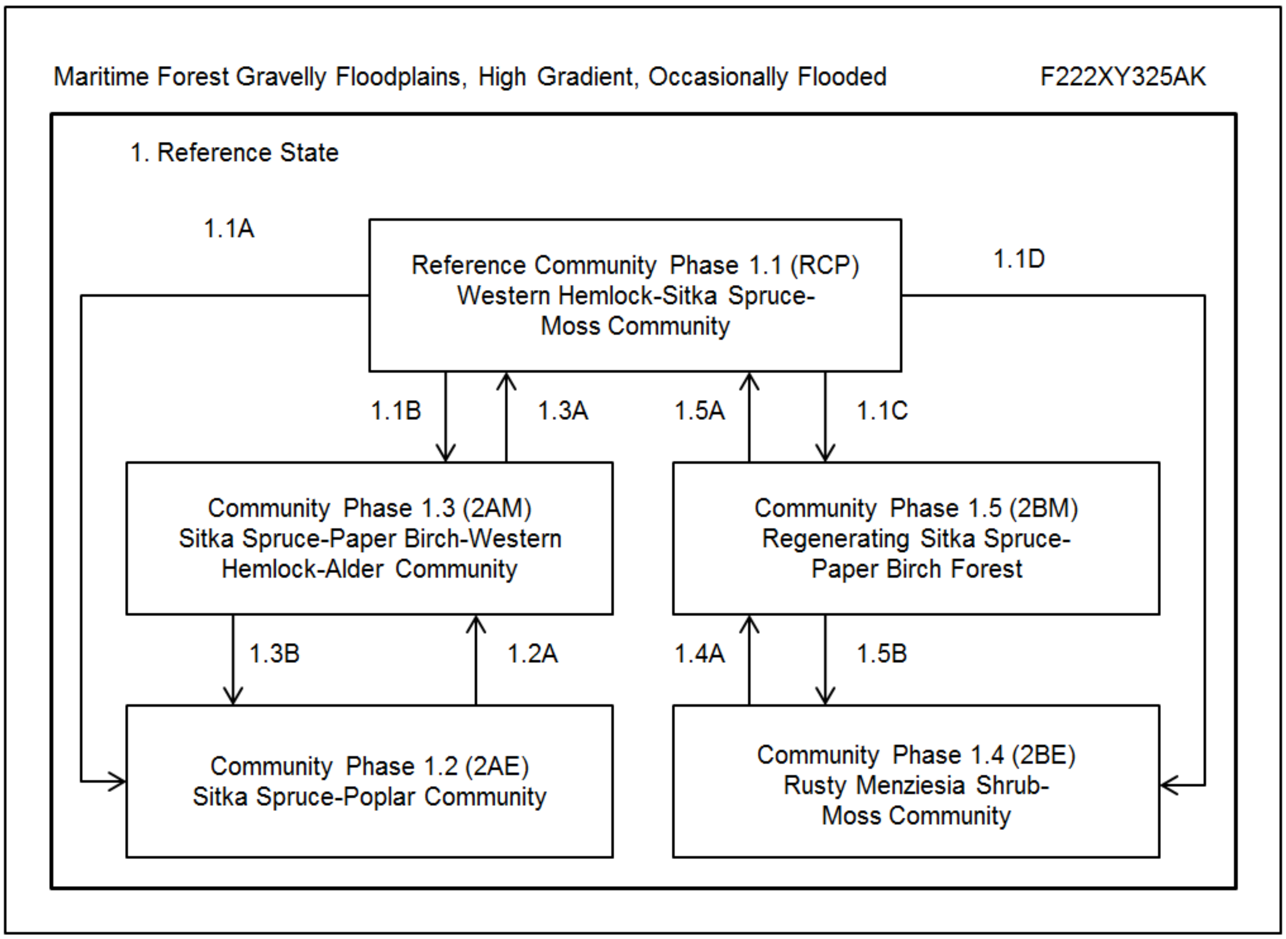
The ecological site characterization reports for the soils in the survey area are provided in this section.

Ecological Site Description ID:	F222XY325AK

Ecological Dynamics of the Site:

This ecological site is a maritime, high-gradient, mountain-confined flood plain. The ecological dynamics of the site are driven by occasional, brief flooding and brush management. The reference vegetation on these moderate to steep slopes is a closed canopy forest of mature Sitka spruce *(Picea sitchensis),* subalpine fir *(Abies lasiocarpa),* and western hemlock *(Tsuga heterophylla).* Early successional flood plain communities are comprised of bare rock and soil with approximately 30 percent cover of species such as dwarf fireweed *(Chamerion latifolium)* and Sitka alder *(Alnus viridis ssp. sinuata).* Soils on this site are cobbly and exhibit little development.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			

Community Phase Number:	1.1	**Community Phase Name:**	Western Hemlock-Sitka Spruce Forest Community

Community Phase Narrative:

The reference community phase for this ecological site is characterized by a closed canopy of Sitka spruce *(Picea sitchensis),* paper birch *(Betula papyrifera var. papyrifera)*, *and* western hemlock *(Tsuga heterophylla)*. Subalpine fir *(Abies lasiocarpa)* may occur at the higher elevations. The subcanopy layer is variable. Some areas have minimal shrub and forb cover and 40 percent moss cover. Other sites have a mixed shrub-forb-moss understory with a high diversity of species. Common shrub species include devilsclub *(Oplopanax horridus),* Sitka alder *(Alnus viridis ssp. sinuata),* squashberry *(Viburnum edule),* rusty menziesia (*Menziesia ferruginea*), and oval-leaf blueberry *(Vaccinium ovalifolium)*. Forb species include western oakfern (*Gymnocarpium dryopteris*), common ladyfern (*Athyrium filix-femina*), spreading woodfern (*Dryopteris expansa*), claspleaf twistedstalk *(Streptopus amplexifolius),* northern groundcone (*Boschniakia rossica*), arctic starflower (*Trientalis europaea*), sidebells wintergreen (*Orthilia secunda*), and single delight (*Moneses uniflora*).

Community Pathways

Pathway Number	**Pathway Name & Description**
1.1A	Occasional, brief flooding
1.1B	Occasional, lower velocity, brief flooding
1.1C	Partial tree removal or brush management
1.1D	Total tree removal

<table>
<tr><td>Phase 1.2</td><td colspan="3">
</td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Sitka Spruce-Poplar Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">Following a flood of brief duration, lichen becomes established on bare rock, resulting in an early successional lichen community. The ground cover is approximately 15 percent bare rock, 75 percent lichen, and 10 percent moss. Common lichen species include snow lichen (Stereocaulon) and greygreen reindeer lichen (Cladina rangiferina). Overstory vegetation includes nearly 35 percent regenerating to medium-sized Sitka spruce (Picea sitchensis), western hemlock (Tsuga heterophylla), and balsam poplar (Populus balsamifera). Shrub cover may be as much as 80 percent, including menziesia (Menziesia) and Sitka alder (Alnus viridis ssp. sinuata).</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.2A</td><td colspan="3">Time since a flood</td></tr>
</table>

Phase 1.3			
Community Phase Number:	1.3	**Community Phase Name:**	Sitka Spruce-Paper Birch-Western Hemlock-Alder Community

Community Phase Narrative:

This is the mid to late sere community phase following a flood. As the plant community progresses from an early sere community into a mid sere community, shrub cover decreases and tree cover and size of trees increases. This shrub community consists dominantly of Sitka alder (*Alnus viridis ssp. sinuata*) and menziesia (*Menziesia)* and smaller proportions of Sitka willow *(Salix sitchensis).* Shrub cover is as much as 80 percent. Tree canopy cover is about 25 percent and is comprised mostly of medium-sized trees (15 to 40 feet tall) and some tall trees (more than 40 feet), including balsam poplar *(Populus balsamifera)*, western hemlock *(Tsuga heterophylla),* and Sitka spruce *(Picea sitchensis).*

Community Pathways

Pathway Number	1.3
1.3A	Time since a flood
1.3B	Occasional, brief flooding

Phase 1.4			
Community Phase Number:	1.4	**Community Phase Name:**	Rusty Menziesia Scrub-Moss Community

Community Phase Narrative:

This is an early sere plant community that is recovering from brush management. This community phase is of limited extent adjacent to roads. The vegetation is dominantly shrubs such as rusty menziesia (*Menziesia ferruginea*) and oplopanax *(Oplopanax)*. Regenerating Sitka spruce *(Picea sitchensis)* and paper birch *(Betula papyrifera var. papyrifera)* may make up as much as 15 percent tree cover. Moss cover may be as much as 25 percent.

Community Pathways

Pathway Number	Pathway Name & Description
1.4A	Time since brush removal

Phase 1.5			
Community Phase Number:	1.5	**Community Phase Name:**	Regenerating Sitka Spruce-Paper Birch Forest

Community Phase Narrative:

This is a mid sere plant community that is recovering from brush management. The community phase is comprised of a few tall western hemlock *(Tsuga heterophylla)* and Sitka spruce *(Picea sitchensis)* trees and as much as 15 percent cover of regenerating Sitka spruce *(Picea sitchensis)* and paper birch *(Betula papyrifera var. papyrifera)*. Shrub cover may be nearly 40 percent with species such as devilsclub *(Oplopanax horridus),* menziesia *(Menziesia),* red currant (*Ribes triste*), squashberry *(Viburnum edule),* American red raspberry (*Rubus idaeus ssp. idaeus*), and bride's feathers (*Aruncus dioicus*). Forb cover may be nearly 40 percent with species such as western oakfern (*Gymnocarpium dryopteris*), spreading woodfern (*Dryopteris expansa*), dogwood *(Cornus),* claspleaf twistedstalk (Streptopus amplexifolius), and fireweed *(Chamerion angustifolium)*.

Community Pathways

Pathway Number	Pathway Name & Description
1.5A	Time since brush management or total tree removal
1.5B	Brush management

Ecological Site Description ID:	F222XY327AK
Ecological Dynamics of the Site:	

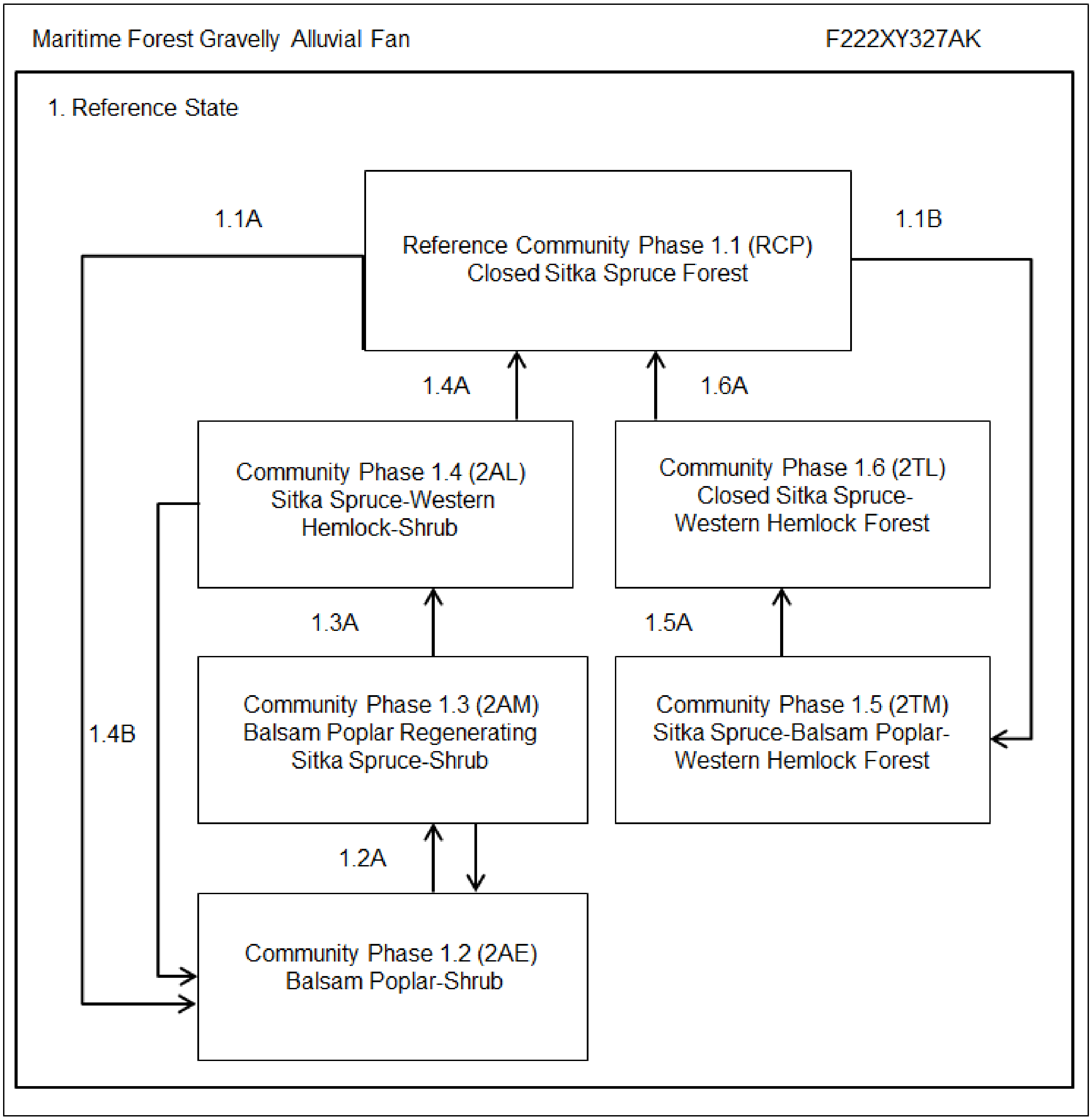
This ecological site is a high-gradient flood plain on alluvial fans. Alluvial fans typically are in areas where steep mountain drainageways emerge onto flatter plains. As the stream gradient decreases, coarse-grained sediment is deposited. This reduces the capacity of the channel to transmit water and forces the stream to change direction, referred to as channel avulsion. As the channel moves back and forth across the fan depositing sediment, a mounded, shallow conical fan is created.

Three different landform segments have been identified on this ecological site, including the active channel, the adjacent flood plain, and the fan terrace. The active channel is the current conduit for the stream to flow down the fan. During periods of high rainfall or snowmelt, some localized flooding may occur, which affects the flood plain. The fan terrace makes up the majority of the spatial extent of the alluvial fan. The climax plant community on the fan terrace is a closed Sitka spruce forest with an understory of moss and forbs. Anthropogenic disturbance from forest management practices may also influence the successional dynamics on this site.

Fan terraces are relatively free of flooding unless channel deposition or flow results in avulsion. A new active channel and adjacent flood plain will develop, depending on the size and velocity of the flood. A balsam poplar forest with little understory cover will become established in the recently abandoned channel. Over time, Sitka spruce and western hemlock will also become established in the abandoned channel.

The soils on the alluvial fans are coarse grained and gravelly and exhibit little development on the flood plains or buried older pedogenic horizons that formed on the terrace. The soils on the terraces are also gravelly but commonly have been stable for a long enough period of time for podzolization to occur, which is a process resulting from the mobilization and precipitation of dissolved organic matter, iron, and aluminum.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1	Photograph not available		
Community Phase Number:	1.1	**Community Phase Name:**	Closed Sitka Spruce Forest

Community Phase Narrative:			
The majority of this alluvial fan ecological site is characterized by a fan terrace. The reference plant community is a closed Sitka spruce *(Picea sitchensis)* forest. The canopy cover is dominantly tall Sitka spruce with a smaller proportion of medium to tall western hemlock *(Tsuga heterophylla)* and tall balsam poplar *(Populus balsamifera)*. The understory is approximately 40 percent moss cover and 40 percent forb cover. Forb species may include sweetcicely (*Osmorhiza berteroi),* common ladyfern (*Athyrium filix-femina*)*,* western oakfern (*Gymnocarpium dryopteris*)*,* and spreading woodfern (*Dryopteris expansa*).			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.1A	Occasional, brief flooding on a high-gradient flood plain. When the water flows over the flood plain channel, a new channel may form on the alluvial fan. This removes the understory vegetation in the climax plant community, and the tree canopy structure shifts from a Sitka spruce forest to mostly bare ground with some balsam poplar *(Populus balsamifera)* and Sitka alder *(Alnus viridis ssp. sinuata).*		
1.1B	Brush management and tree removal		
Phase 1.2			
Community Phase Number:	1.2	**Community Phase Name:**	Balsam Poplar-Shrub Community
Community Phase Narrative:			
This is an early sere flood plant community. Following a flood, a balsam poplar *(Populus balsamifera)* forest establishes with minimal understory vegetation. The forest canopy may have as much as 40 percent tall balsam poplar with regenerating to medium-sized western hemlock *(Tsuga heterophylla)*, subalpine fir *(Abies lasiocarpa),* and Sitka spruce *(Picea sitchensis)*. Sitka alder *(Alnus viridis ssp. sinuata)* is the dominant shrub species.			

Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.2A	Time since a flood		
Phase 1.3			
Community Phase Number:	1.3	**Community Phase Name:**	Balsam Poplar-Regenerating Sitka Spruce-Shrub Community
Community Phase Narrative:			
This mid succession community phase is characterized by 25 to 50 percent forest cover. Tree species include mature balsam poplar *(Populus balsamifera)* and regenerating to medium-sized Sitka spruce *(Picea sitchensis)*. Below the canopy, a shrub-graminoid layer with as much as 70 percent cover is comprised of western oakfern (*Gymnocarpium dryopteris*), devilsclub *(Oplopanax horridus),* bride's feathers (*Aruncus dioicus*), and a small proportion of Sitka alder *(Alnus viridis ssp. sinuata)*.			
Community Pathways			
Pathway Number	1.3		
1.3A	Time since a flood		
1.3B	Occasional, brief flooding. Flowing water may remove regenerating tree and understory cover. If the waterflow or deposition event is significant enough, the flow will breach the channel and create a new channel. See community pathway 1.1A.		

Phase 1.4			
Community Phase Number:	1.4	**Community Phase Name:**	Sitka Spruce-Western Hemlock-Shrub

Community Phase Narrative:

This late succession community phase is characterized by 40 percent forest cover or more. Tree species include tall western hemlock *(Tsuga heterophylla)* and Sitka spruce *(Picea sitchensis)* with a smaller proportion of medium-sized western hemlock *(Tsuga heterophylla)* and Sitka spruce *(Picea sitchensis)*. The shrub cover consists *of* rusty menziesia (*Menziesia ferruginea*), oval-leaf blueberry *(Vaccinium ovalifolium),* squashberry *(Viburnum edule),* devilsclub *(Oplopanax horridus),* and bunchberry dogwood (*Cornus Canadensis*). Moss cover may be as much as 80 percent.

Community Pathways

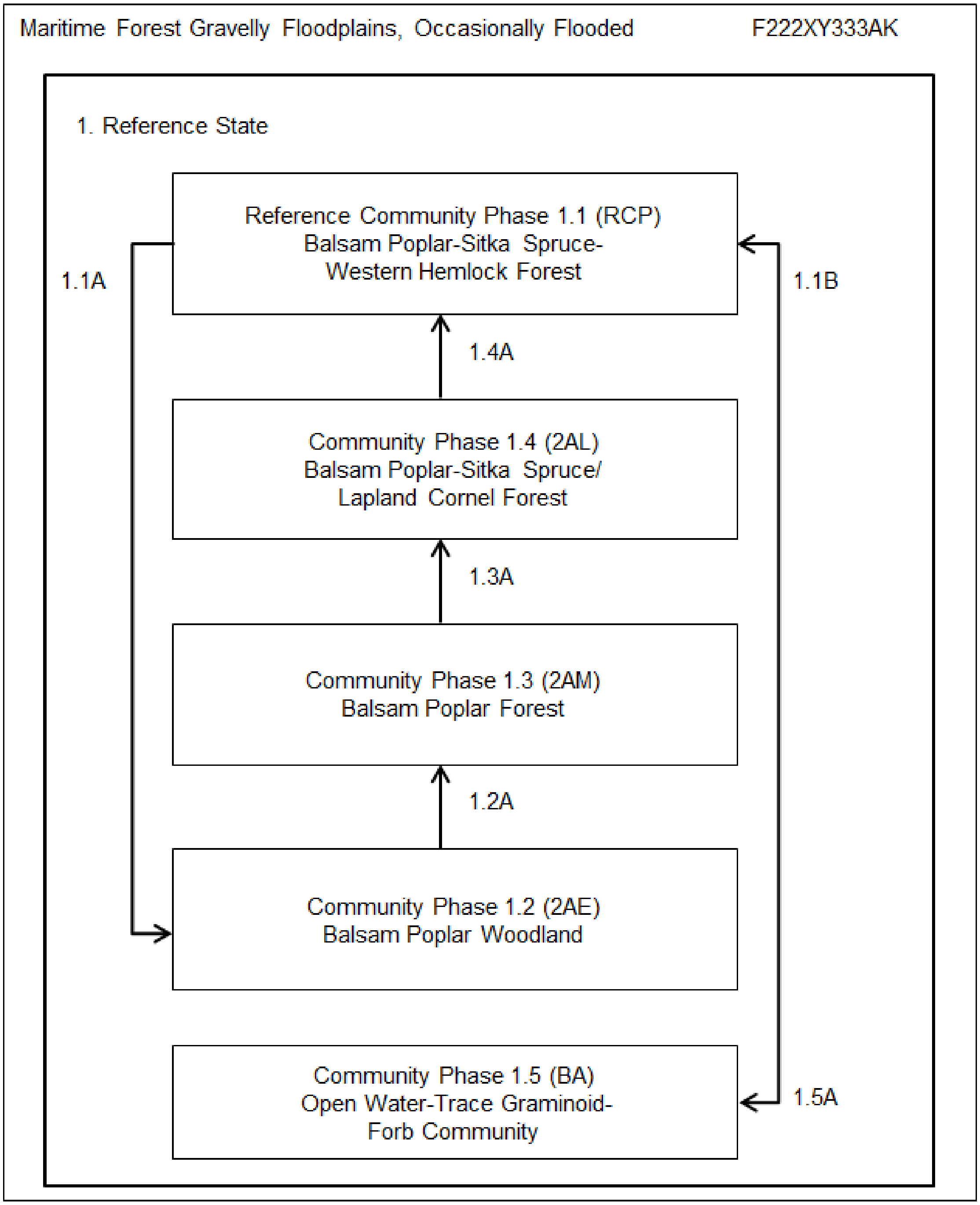
Pathway Number	1.4
1.4A	Time since a flood
1.4B	Occasional, brief flooding on a high-gradient flood plain

<table>
<tr><td>Phase 1.5</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.5</td><td>Community Phase Name:</td><td>Sitka spruce-balsam poplar-western hemlock forest</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This mid succession community phase is recovering from forest management. The plant community is characterized by approximately 50 percent forest cover. Tree cover is dominantly tall Sitka spruce (Picea sitchensis), a few tall balsam poplar (Populus balsamifera), and regenerating to medium-sized Sitka spruce (Picea sitchensis). Below the canopy, a shrub-graminoid layer with as much as 70 percent cover is comprised of shrubs such as devilsclub (Oplopanax horridus) and squashberry (Viburnum edule) and forbs such as western oakfern (Gymnocarpium dryopteris). Moss cover is approximately 30 percent.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">1.5</td></tr>
<tr><td>1.5A</td><td colspan="3">Time since brush management or tree removal</td></tr>
</table>

<table>
<tr><td colspan="2">Phase 1.6</td><td colspan="2"></td></tr>
<tr><td>Community Phase Number:</td><td>1.6</td><td>Community Phase Name:</td><td>Closed Sitka Spruce-Western Hemlock Forest</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This late succession community phase is recovering from timber management and is characterized by a closed canopy of Sitka spruce (Picea sitchensis) and western hemlock (Tsuga heterophylla). Tree species include mature balsam poplar (Populus balsamifera) and regenerating to medium-sized Sitka spruce (Picea sitchensis). The understory is comprised of 60 to 70 percent moss cover with trace lichen and forbs such as licorice fern (Polypodium glycyrrhiza) and sidebells wintergreen (Orthilia secunda).</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">1.6</td></tr>
<tr><td>1.6A</td><td colspan="3">Time since brush management or tree removal</td></tr>
</table>

Ecological Site Description ID:	F222XY333AK
Ecological Dynamics of the Site:	
This ecological site is on low-gradient, maritime flood plains. It is in a mid flood plain position that is subject to occasional flooding. Because the frequency of flooding is occasional, a forest community can establish following flooding. The plant community varies from an early sere balsam poplar woodland to a closed forest climax community with balsam poplar, Sitka spruce, and western hemlock. The community dynamics of this ecological site may be influenced by flooding and beaver ponding. It may also be influenced by urban development. Historical photographs and documentation suggest that fire and logging during the late 1800's to mid-1900's influenced the ecological dynamics of the site. Field documentation describing how fire and timber management affected plant succession is not available. It is likely that flooding transported ash and logging debris away from the site, removing evidence of these past disturbances.	

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	Balsam Poplar-Sitka Spruce-Western Hemlock Forest

Community Phase Narrative:

This is the climax community phase for this ecological site. This closed forest community supports dominantly tall balsam poplar *(Populus balsamifera)* and Sitka spruce *(Picea sitchensis)* and a smaller proportion of regenerating western hemlock *(Tsuga heterophylla)*. It is probable that the tree cover may have a higher proportion of tall Sitka spruce and medium-sized western hemlock than was documented in the field.

As the canopy cover increases, the shrub cover decreases. The shrub cover is less than 15 percent with species such as squashberry *(Viburnum edule)* and devilsclub *(Oplopanax horridus).* Forb cover is approximately 70 percent with species such as western oakfern (*Gymnocarpium dryopteris*), claspleaf twistedstalk (*Streptopus amplexifolius*), and field horsetail (*Equisetum arvense*).

Community Pathways

Pathway Number	**Pathway Name & Description**
1.1A	Occasional flooding erodes the understory vegetation and may remove larger trees, shifting the plant community from a closed balsam poplar and Sitka spruce forest to balsam poplar woodland.

<table>
<tr><td>Phase 1.2</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Balsam Poplar Woodland</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This early sere community phase develops following a flood and is characterized by an open canopy of balsam poplar (Populus balsamifera). Tree cover may be as much as 25 percent, and shrub cover is 30 to 90 percent. Common shrub species include Sitka alder (Alnus viridis ssp. sinuata) and squashberry (Viburnum edule). Forb and graminoid cover commonly is 5 to 35 percent with species such as fireweed (Chamerion angustifolium), deercabbage (Nephrophyllidium crista-galli), meadow barley (Hordeum brachyantherum), and bluejoint grass (Calamagrostis canadensis). This early successional community phase shifts toward a mid sere community as the canopy cover increases and regenerating Sitka spruce (Picea sitchensis) begins to establish.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.2A</td><td colspan="3">Time since a flood and plant growth facilitates the shift from an early flood sere community to a mid sere community. The establishment of Sitka spruce is an indication of a shift in the plant community.</td></tr>
</table>

<table>
<tr><td>Phase 1.3</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.3</td><td>Community Phase Name:</td><td>Balsam Poplar Forest</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This mid sere community phase is characterized by a closed canopy of balsam poplar (Populus balsamifera). Tall balsam poplar cover is 30 to 50 percent with trace regenerating western hemlock (Tsuga heterophylla) and Sitka spruce (Picea sitchensis). Shrub cover commonly is 20 to 50 percent and consists dominantly of Sitka alder (Alnus viridis ssp. sinuata) and a smaller proportion of squashberry (Viburnum edule) and redosier dogwood (Cornus sericea ssp. Sericea). Forb cover commonly is a trace amount to 10 percent with species such as claspleaf twistedstalk (Streptopus amplexifolius), spreading woodfern (Dryopteris expansa), and field horsetail (Equisetum arvense).</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">1.3</td></tr>
<tr><td>1.3A</td><td colspan="3">Time since a flood and plant growth facilitates the shift from a mid flood sere community to a late sere community. The decrease in shrub cover is an indication of a shift in the plant community.</td></tr>
<tr><td>Phase 1.4</td><td colspan="3">Photograph not available</td></tr>
<tr><td>Community Phase Number:</td><td>1.4</td><td>Community Phase Name:</td><td>Balsam Poplar-Sitka Spruce Forest and Shrub Community</td></tr>
</table>

Community Phase Narrative:			
This community phase represents a late sere community on a low-gradient flood plain. The plant community is characterized by a closed canopy consisting of tall balsam poplar *(Populus balsamifera)* and a few tall Sitka spruce *(Picea sitchensis)* and regenerating western hemlock *(Tsuga heterophylla)*. Forb cover may be as much as 70 percent with species such as western oakfern (*Gymnocarpium dryopteris*), claspleaf twistedstalk (*Streptopus amplexifolius*), and field horsetail (*Equisetum arvense*). Shrub cover commonly is less than 10 percent with species such as squashberry *(Viburnum edule)* and devilsclub *(Oplopanax horridus).* As this late sere community begins to transition into the climax community phase, the shrub cover shifts to dense Lapland cornel *(Cornus suecica)* and viburnum (*Viburnum).*			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.4A	Time since a flood and plant growth facilitates the shift from a late flood sere community to the climax plant community. The decrease in shrub cover and increase in forb cover is an indication of a shift in the plant community.		
Phase 1.5			
Community Phase Number:	1.5	**Community Phase Name:**	Open Water-Trace Graminoid-Forb Community

Community Phase Narrative:
This is an early sere community that establishes following beaver ponding. Following the construction of beaver dams, ponded water kills the forest and leaves behind standing dead tree snags and large pieces of downed wood. This early sere community phase is characterized by as much as 97 percent standing water with trace forbs, graminoids, and regenerating balsam poplar *(Populus balsamifera)* and Sitka spruce *(Picea sitchensis)*. Forb cover is minimal, but the diversity of the species is high. Trace species include bride's feathers (*Aruncus dioicus*), marsh marigold *(Caltha leptosepala),* fringed willowherb *(Epilobium ciliatum ssp. ciliatum),* field horsetail (*Equisetum arvense*), and hollyfern *(Polystichum).* Graminoid cover includes bluejoint grass *(Calamagrostis canadensis)* and silvery sedge *(Carex canescens)*. As this site begins to recover, the surface water decreases and graminoid cover increases. As much as 50 percent graminoid cover has been observed in the field. The mid and late succession plant communities were not observed in the field, so these community phases were not included in the state and transition diagram. It is likely that shrub and regenerating tree cover will increase with time. A late successional community would likely be characterized by a closed mixed balsam poplar *(Populus balsamifera)* and Sitka spruce *(Picea sitchensis)* forest with variable shrub and understory cover.

Community Pathways	
Pathway Number	1.5
1.5A	Degradation or removal of beaver dam and time

Ecological Site Description ID:	F222XY334AK
Ecological Dynamics of the Site:	

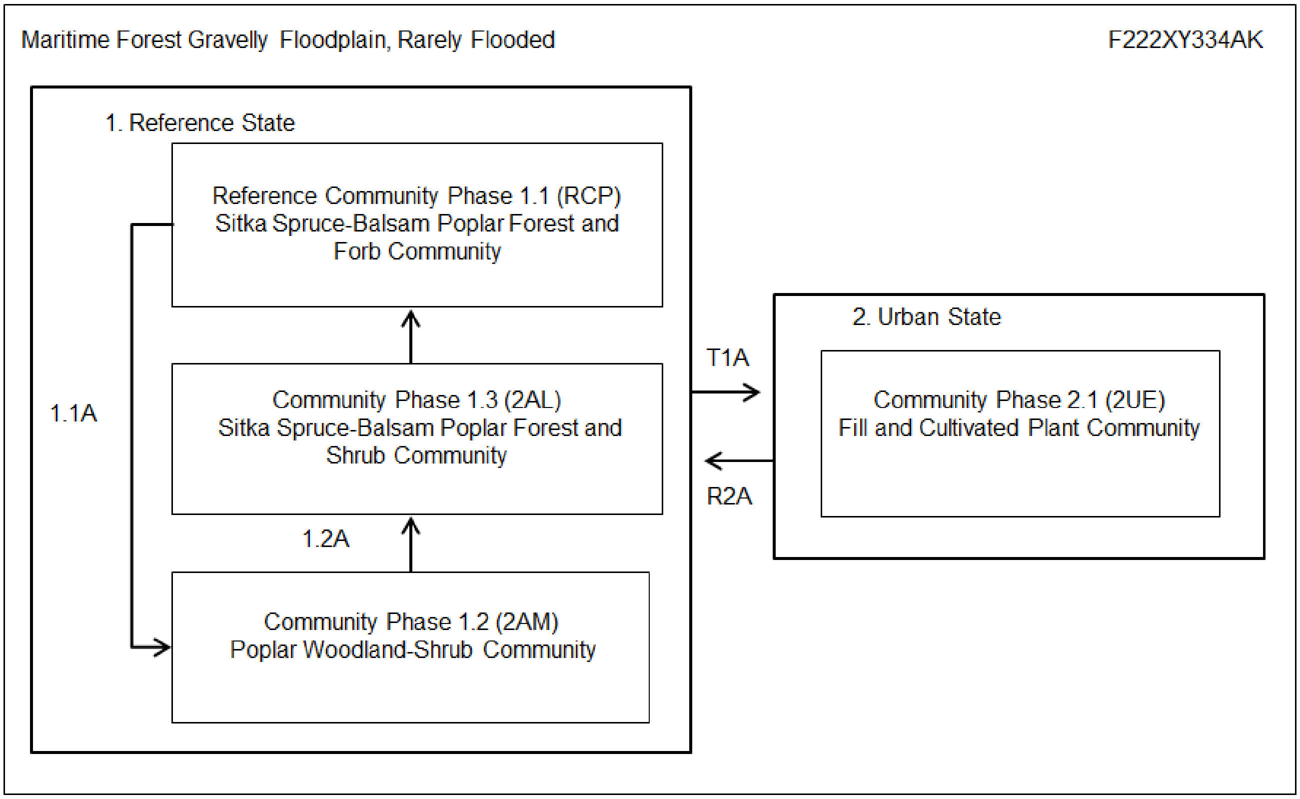
This low-gradient flood plain ecological site is on the outer edges of the flood plains. Because of the distance from or elevation relative to the flood plain channel, the site is subject to rare, brief periods of flooding approximately every 100 years. The flood plain soils of the lower Skagway River and the middle reaches of the Taiya River are characterized by coarse grained, gravelly deposits, which indicate a fairly high-energy streamflow and flooding regime. The soils exhibit minimal development. The lower reaches of the Taiya River have a substantial layer of loamy sediment over sand and gravel. This indicates a lower energy flooding regime. The soils commonly have stratified organic matter throughout the profile, which is indicative of relatively long periods of stability interspersed with deposition events.

This ecological site has two states—a reference state and an urban state. The reference state is influenced by flooding, fire, and logging. The reference state plant community varies from an early flood sere graminoid community phase to a closed canopy Sitka spruce forest with moss cover.

Historical photographs and documentation suggest that fire and logging during the late 1800's to mid-1900's influenced the ecological dynamics of the site. Field documentation describing how fire and timber management affected plant succession is not available. It is likely that flooding events transported ash and logging debris away from the site, removing evidence of these past disturbances.

This ecological site is also influenced by urban development. In the towns of Dyea and Skagway, buildings and land cultivation drastically altered the forest community, creating an alternative state. The community phase in the urban state will not transition back to a forest community unless the towns are abandoned or the areas are actively restored through reforestation efforts.

State and Transition Model:			



State ID Number:	1	State Name:	Reference state

State Narrative:	
	The climax community for the reference state of this ecological site is a closed Sitka spruce-balsam poplar forest with an understory of dominantly forbs. The reference state is affected primarily by flooding and beaver ponding. Flooding may remove the tree and shrub species. The early flood sere community was not documented in the field, but a forb-graminoid community likely will establish following a rare period of flooding. Historical documentation suggests that this ecological site was disturbed by fire, logging, and urban development. During the turn of the century, an influx of people migrated to the towns of Dyea and Skagway in route to the goldfields of the Klondike. As the towns boomed, the surrounding low-elevation forests were heavily impacted by logging and fire. During the Gold Rush, timber was imported from the Pacific Northwest but the demand for timber was supplemented by local sawmills. The sawmills in Dyea produced rough-cut timber for buildings, heating, powering the wood-fired electrical generating plant in Skagway, and railroad and wagon road construction. Historical photographs show that the lower valleys and hillslopes were denuded by logging operations at the turn of the century. The demand for wood slowed quickly as the Gold Rush boom began to diminish; however, logging activity increased again during the 1930's to1960's. The Dyea Wood Company supplied wood for Skagway residents, and the Skagway Lumber Company provided wood, primarily spruce, for wharf pilings,

<table>
<tr><td></td><td colspan="3">bridge timbers, and railroad switch ties. Currently, there is little logging activity within the park.

Historical photographs and articles document multiple fires near the towns of Dyea and Skagway at the turn of the century. The fires occurred within an approximate 20-year period around 1900. By the late 1920’s, the fires and logging had removed nearly all of the trees surrounding Skagway to an elevation of about 1,000 feet. Minimal evidence of logging and fire has been collected in the field. It is likely that charcoal and logging debris were transported downstream or buried with sediment from floods, removing or burring evidence of the disturbance.

The disturbance from urban development surrounding Skagway and Dyea caused the reference state to transition into an urban state. During the turn of the century, the flood plains along the Taiya River transitioned into an urban state with development of the mining town of Dyea. The forest community transitioned into a state characterized by roads, buildings, and bare ground. When Dyea was abandoned, the forest began to come back, marking the transition back to the reference state. Similarly, the flood plains surrounding Skagway transitioned into an urban state and are currently maintained in that state.</td></tr>
<tr><td>Phase 1.1</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.1</td><td>Community Phase Name:</td><td>Sitka Spruce-Balsam Poplar Forest and Forb Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This is the reference community for the outer extent of a low-gradient flood plain. This community is characterized by a closed Sitka spruce-balsam poplar forest. Medium-sized balsam poplar (Populus balsamifera) or paper birch (Betula papyrifera var. papyrifera) may be present in small proportions. The understory for the climax plant community is dominantly forbs, which make up 5 to 50 percent cover. Forb species include spreading woodfern (Dryopteris expansa), liverleaf wintergreen (Pyrola asarifolia ssp. asarifolia), and twistedstalk (Streptopus).</td></tr>
</table>

<table>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.1A</td><td colspan="3">Rare, brief flooding</td></tr>
<tr><td>1.1B</td><td colspan="3">Beaver ponding</td></tr>
<tr><td>Phase 1.2</td><td colspan="3">Photograph not available</td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Poplar Woodland-Shrub Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This is a mid succession plant community phase following a 100-year flood. Forest cover may be 30 to 70 percent paper birch (Betula papyrifera var. papyrifera) and regenerating, medium-sized, and tall Sitka spruce (Picea sitchensis). Shrub cover may be as much as 50 percent and consists dominantly of Sitka alder (Alnus viridis ssp. sinuata) and squashberry (Viburnum edule) and a smaller proportion of redosier dogwood (Cornus sericea), red currant (Ribes triste), and prickly currant (Ribes lacustre).

The early flood sere community was not documented in the field, so an early sere community phase was not included in the state and transition model. It is likely that rare flooding in high flood plain positions will remove the tree, shrub, and herbaceous species and a graminoid community will begin to establish as the ecological site recovers from flooding.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.2A</td><td colspan="3">Time since a flood</td></tr>
<tr><td>Phase 1.3</td><td colspan="3">Photograph not available</td></tr>
<tr><td>Community Phase Number:</td><td>1.3</td><td>Community Phase Name:</td><td>Sitka Spruce-Balsam Poplar Forest and Shrub Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This is a late succession forest community. As the ecosystem continues to recover from disturbance and shift from a mid to late successional phase, the forest community will shift from mixed tall paper birch (Betula papyrifera var. papyrifera) and Sitka spruce (Picea sitchensis) to a forest that supports dominantly Sitka spruce and a smaller proportion of paper birch. The shrub community becomes less prevalent and the moss cover increases as the canopy increases and shades the understory.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.3A</td><td colspan="3">Time since a flood</td></tr>
</table>

State Transition Pathways			
Transition Number	**From**	**To**	**Transition Narrative**
T1A	1	2	Urban development. The rarely flooded maritime flood plain may be influenced by urban development as a result of building and crop cultivation in the Skagway area. Within the city limits, a small proportion of the flood plain has been converted into a garden site that includes cultivated plants, gravel, and buildings.
State Restoration Pathways			
Restoration Pathway Number	**From**	**To**	**Restoration Pathway Narrative**
R2A	2	1	It is likely that the small extent of this ecological site that was disturbed by tillage and cultivation in the Skagway area will remain in this state until the urban areas are abandoned or active restoration takes place. The Dyea area was restored to the reference state when the town of Dyea was abandoned and logging operations were discontinued.
State ID Number:	2	**State Name:**	Urban state
State Narrative:	Urban development in the Skagway and Dyea areas caused the reference state to transition into an urban state. During the turn of the century, the flood plains along the Taiya River transitioned into an urban state with the development of the mining town of Dyea. The forest community transitioned into a state characterized by roads, buildings, and bare ground. When the town of Dyea was abandoned, the forest began to re-establish, marking a transition back to the reference state. Similarly, the flood plains of the Skagway area transitioned into an urban state and are currently maintained in that state. The urban state is characterized by buildings, roads, bare ground, and cultivated plants.		

<table>
<tr><td>Phase 2.1</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>2.1</td><td>Community Phase Name:</td><td>Fill and Cultivated Plant Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This community phase is on developed land in the Skagway area and historically in the Dyea area. The climax plant community in the reference state transitions into this community phase when the land is developed. It is characterized by cultivated garden plants, gravel, and buildings. This community phase was sampled in the urban area of Skagway.</td></tr>
</table>

Ecological Site Description ID:	F222XY337AK
Ecological Dynamics of the Site:	

This maritime ecological site is throughout the low- to mid-elevation mountain slopes. The soils consist of shallow to moderately deep, gravelly mineral material or shallow, dry organic material.

The reference plant community is characterized by a closed canopy forest of western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), lodgepole pine *(Pinus contorta)*, and paper birch (*Betula papyrifera*). The understory is comprised of moss and herbaceous plants. Shrub cover commonly is 15 percent.

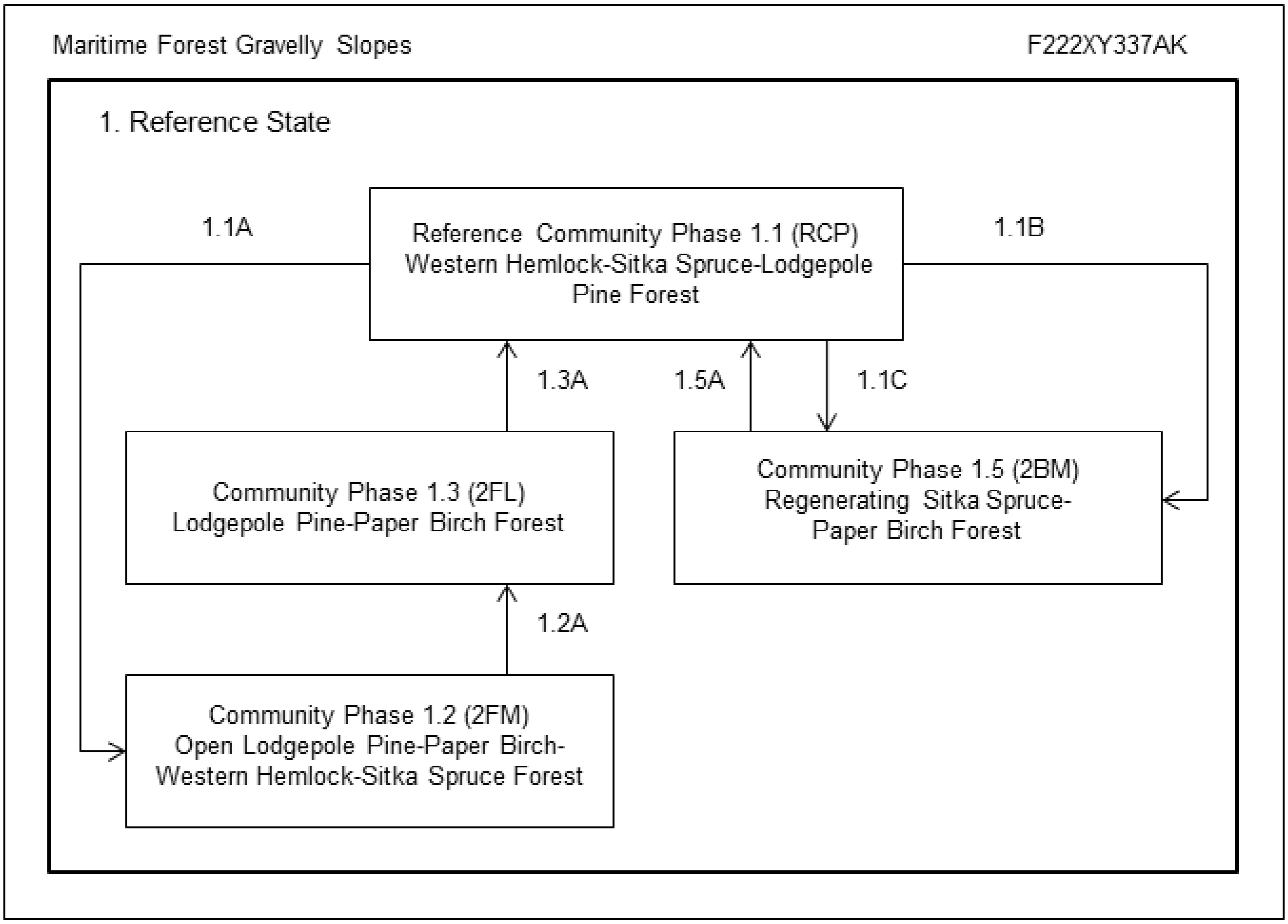
The ecological dynamics of this site are affected by several disturbance regimes. The site is influenced by the natural succession processes from age-related decline in forest productivity. As the forest stand ages, individual trees die and fall over, creating gaps in the forest canopy. This canopy gap allows for more light to reach the ground, which favors growth of understory plants and regenerating trees.

This ecological site may also be influenced by erosion on the steeper mountain slopes. In areas where the slope creeps, the boles of the trees appear bent at the base. The downward movement of the soil causes the trees to lean, and they develop curved boles to continue to grow upward toward the light. The extent and severity of the disturbance from soil creep is minimal as compared to the disturbance from fire and logging during the Gold Rush era.

During the turn of the century, an influx of people migrated into the towns of Dyea and Skagway in search of gold. As the towns boomed, the surrounding low-elevation forests were heavily impacted by logging and fire. During the Gold Rush, timber was imported from the Pacific Northwest but demand for timber was supplemented by local sawmills. The sawmills in Dyea produced rough-cut timber for buildings, heating, powering the wood-fired electrical generating plant in Skagway, and railroad and wagon road construction. Historical photographs show that the lower valleys and hillslopes were denuded by logging operations at the turn of the century. The demand for wood slowed quickly as the Gold Rush boom began to diminish; however, logging activity increased again during the 1930’s to 1960’s. The Dyea Wood Company supplied wood for Skagway residents, and the Skagway Lumber Company provided wood, primarily spruce, for wharf pilings, bridge timbers, and railroad switch ties. Currently, there is little logging activity within the park.

Historical photographs and articles document multiple fires on the mountain slopes surrounding Dyea and Skagway at the turn of the century. The fires occurred during an approximate 20-year period around 1900. By the late 1920’s, the fires and logging had removed nearly all of the trees surrounding Skagway to an elevation of about 1,000 feet. Because of the complexity of the disturbance regimes influencing the ecological dynamics of this site, it is difficult to isolate the effects of fire and logging on the successional trajectory of the forest.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	Western Hemlock-Sitka Spruce-Lodgepole Pine Forest

Community Phase Narrative:

The reference community phase is characterized by a mixed western hemlock *(Tsuga heterophylla),* Sitka spruce *(Picea sitchensis),* lodgepole pine *(Pinus contorta),* and paper birch (*Betula papyrifera*) forest. Because of the complexity of the disturbances from fire, logging, and natural mortality, the structure of the stand is variable. The difference in the overstory/understory composition is influenced by interacting disturbance regimes, variations in fire intensity, natural age-related decline in productivity, slope, and aspect. Isolating these differences is too complex for the scope of this survey. As a result, the reference community phase has variable canopy and understory composition. In general, the tree canopy has more than 60 percent cover and consists dominantly of western hemlock, Sitka spruce, and lodgepole pine. The understory varies from 70 to 80 percent moss to a mixture of forbs, moss, and shrubs. Some drier sites have a higher proportion of lichen cover and minimal herbaceous and shrub cover. Lichen species include star reindeer lichen *(Cladina stellaris),* snow lichen (*Stereocaulon*), greygreen reindeer lichen *(Cladina rangiferina),* and reindeer lichen *(Cladina mitis)*. Forb cover commonly is less than 10 percent. Forb species include licorice fern *(Polypodium glycyrrhiza),* liverleaf wintergreen *(Pyrola asarifolia),* western oakfern (*Gymnocarpium dryopteris*), spreading woodfern (*Dryopteris expansa*), and sidebells wintergreen (*Orthilia secunda*). Shrub cover commonly is less than 15 percent and includes species such as rusty menziesia (*Menziesia ferruginea*), oval-leaf blueberry *(Vaccinium ovalifolium),* redosier dogwood *(Cornus sericea ssp. sericea),* bunchberry dogwood (*Cornus canadensis*), and red baneberry *(Actaea rubra)*.

Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.1A	Fire and logging remove the forest canopy. Fire also removes the understory vegetation.		
1.1B	Brush management removes the forest canopy along roads. The spatial extent of this disturbance is minimal.		
Phase 1.2	Photograph not available		
Community Phase Number:	1.2	**Community Phase Name:**	Open Lodgepole Pine-Paper Birch-Western Hemlock-Sitka Spruce Forest
Community Phase Narrative:			
This mid sere community phase follows disturbance from logging and/or fire. This phase generally has a lower percentage of canopy cover as compared to the reference community phase. The canopy cover consists of tall lodgepole pine *(Pinus contorta)* and paper birch (*Betula papyrifera*) with a smaller proportion of regenerating to medium-sized western hemlock (*Tsuga heterophylla*) and Sitka spruce (*Picea sitchensis*). The drier positions generally recover more slowly, resulting in some of the trees having a stunted appearance. Moss cover is 20 to 50 percent with species such as big red stem moss *(Pleurozium schreberi)* and mountain fern moss (*Hylocomium splendens*). Lichen cover may be as much as 20 percent with species such as snow lichen (*Stereocaulon*)*,* star reindeer lichen *(Cladina stellaris),* greygreen reindeer lichen *(Cladina rangiferina)* and reindeer lichen *(Cladina arbuscula)*. Forb and graminoid cover is sparse.			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.2A	Time since fire and logging		

Phase 1.3			
Community Phase Number:	1.3	**Community Phase Name:**	Lodgepole Pine-Paper Birch Forest

Community Phase Narrative:

This is a late sere community phase affected by fire and logging. The plant community is characterized by a forest cover of 50 to 65 percent that consists of tall western hemlock *(Tsuga heterophylla)*, tall Sitka spruce *(Picea sitchensis)*, and tall lodgepole pine *(Pinus contorta).* Paper birch (*Betula papyrifera var. papyrifera*) may be present in small proportions. The subcanopy layer is comprised of moss species such as mountain fern moss (*Hylocomium splendens*)*,* dicranum moss *(Dicranum fuscescens),* goose neck moss *(Rhytidiadelphus),* and big red stem moss *(Pleurozium schreberi)*. Shrub and forb cover commonly is minimal; however, a higher proportion of shrub and forb cover may be in wetter areas. Shrub cover may be as much as 35 percent with species such as squashberry *(Viburnum edule),* devilsclub *(Oplopanax horridus),* and mountain ash *(Sorbus sitchensis).* Forb cover may be as much as 45 percent with species such as wintergreen (*Pyrola asarifolia)* and western oakfern (*Gymnocarpium dryopteris*).

Community Pathways

Pathway Number	Pathway Name & Description
1.3A	Time since fire and logging

<table>
<tr><td>Phase 1.4</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.4</td><td>Community Phase Name:</td><td>Regenerating Sitka Spruce-Paper Birch Forest</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This community phase results from brush management along roads. The plant community is characterized by a 15 percent cover of regenerating paper birch (Betula papyrifera var. papyrifera). Shrub cover is nearly 100 percent with species such as Labrador tea (Ledum groenlandicum), lingonberry (Vaccinium vitis-idaea), and menziesia (Menziesia). Hylocomium feather moss (Hylocomium) cover is 20 percent, and greygreen reindeer lichen (Cladina rangiferina) cover is 5 percent.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.4A</td><td colspan="3">Time since fire and logging</td></tr>
</table>

Ecological Site Description ID:	F222XY338AK

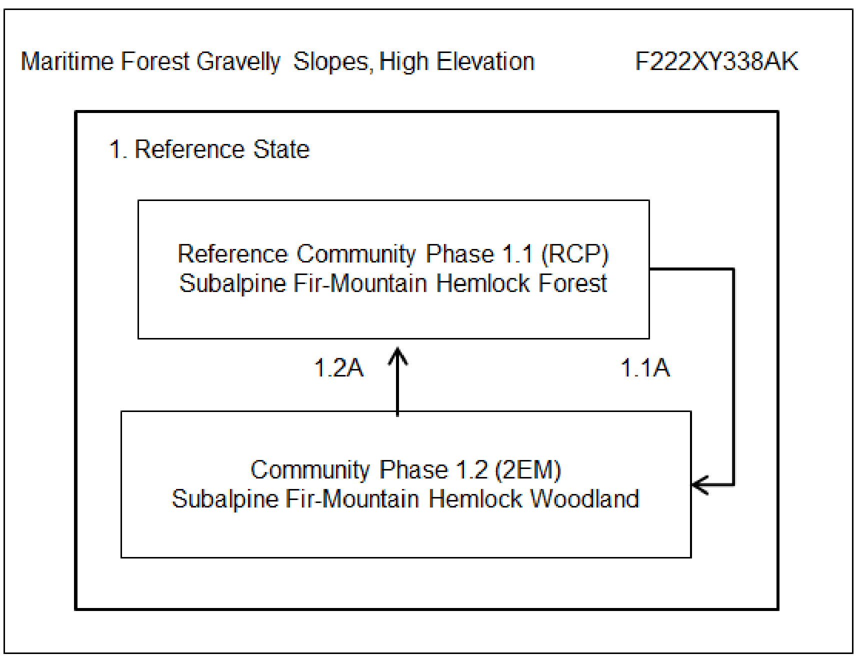
Ecological Dynamics of the Site:

This is a high-elevation, maritime forest ecological site on mountain slopes and shoulders. The soils are generally shallow and gravelly or are organic. The reference community is a forest of subalpine fir and mountain hemlock. Subalpine fir and mountain hemlock commonly are associated with colder, high-elevation mountain slopes. At the higher elevations, the forest transitions into a subalpine forest. In this transition zone, subalpine fir *(Abies lasiocarpa)* is prevalent and mountain hemlock (*Tsuga mertensiana*) and Sitka spruce *(Picea sitchensis)* appear stunted. At lower elevations, subalpine fir is not prevalent and mountain hemlock is replaced by western hemlock.

This ecological site is similar to F222XY337AK, which is at the lower elevations that support western hemlock. Lodgepole pine *(Pinus contorta)* is also present in the early to late fire sere communities on ecological site F222XY337AK. Evidence of fire was not observed in areas of F222XY338AK.

This ecological site is influenced by the natural succession processes from age-related decline in forest productivity. There is minimal documentation of disturbance from slope erosion. The reference and mid sere community phases have been documented in the field. It is likely that an early sere community phase may be associated with this ecological site, but it has not been documented.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	Subalpine Fir-Mountain Hemlock Forest

Community Phase Narrative:

This is the climax community phase for this ecological site. The forest has approximately 30 to 50 percent tree cover that is characterized by medium-sized and tall mountain hemlock (*Tsuga mertensiana*) and tall subalpine fir *(Abies lasiocarpa)*. As much as 10 percent cover of medium-sized Sitka spruce *(Picea sitchensis)* has also been documented, but it does not occur in all subalpine fir-mountain hemlock forest communities. Shrub cover is 30 to 65 percent consisting of medium-sized shrubs such as oval-leaf blueberry *(Vaccinium ovalifolium)* and rusty menziesia (*Menziesia ferruginea*). Dwarf shrub cover consisting of strawberryleaf raspberry *(Rubus pedatus)* may be as much as 30 percent in some areas. Moss cover is 70 to 80 percent in most areas and includes species such as peat moss (*Sphagnum girgensohnii*), big red stem moss *(Pleurozium schreberi),* mountain fern moss (*Hylocomium splendens*), and dicranum moss (*Dicranum scoparium)*. Forb cover commonly is minimal and may include species such as bunchberry dogwood (*Cornus canadensis*), spreading woodfern (*Dryopteris expansa*), western oakfern (*Gymnocarpium dryopteris*), and common ladyfern (*Athyrium filix-femina*).

Community Pathways

Pathway Number	**Pathway Name & Description**
1.1A	The subalpine fir-mountain hemlock woodland community shifts to a subalpine fir-mountain hemlock forest community following age-related decline in forest productivity. There is limited documentation for disturbance from slope erosion.

<table>
<tr><td>Phase 1.2</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Subalpine Fir-Mountain Hemlock Woodland</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">The subalpine fir-mountain hemlock woodland community is a mid sere community that develops following natural succession from age-related decline in the forest or from slope erosion. The community is characterized by an open forest canopy with as much as 20 percent cover of tall subalpine fir (Abies lasiocarpa) and regenerating and medium-sized mountain hemlock (Tsuga mertensiana). Shrub cover is about 60 percent and includes species such as strawberryleaf raspberry (Rubus pedatus), oval-leaf blueberry (Vaccinium ovalifolium), and rusty menziesia (Menziesia ferruginea). Moss cover is about 70 percent.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.2A</td><td colspan="3">Time and slope stabilization</td></tr>
</table>

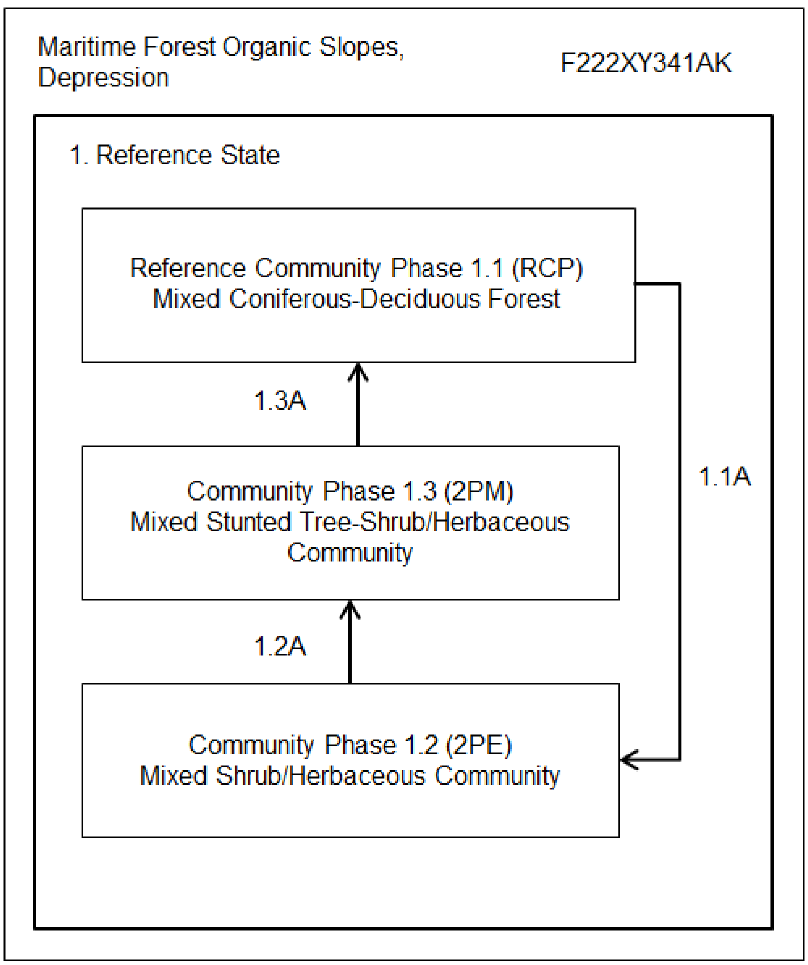
Ecological Site Description ID:	F222XY341AK
Ecological Dynamics of the Site:	

This maritime ecological site is in depressions along lower elevation mountain slopes. The reference plant community is a closed canopy mixed forest with a diversity of tree species, including Sitka spruce *(Picea sitchensis),* western hemlock *(Tsuga heterophylla),* lodgepole pine *(Pinus contorta),* and paper birch *(Betula papyrifera var. papyrifera).*

There is minimal field documentation of the plant community dynamics for this ecological site. An early sere mixed shrub-herbaceous community has been observed in the field. This plant community becomes established after ponding. Late sere plant communities were not observed in the field.

Very poorly drained organic soils are in the depressions.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			

Community Phase Number:	1.1	**Community Phase Name:**	Mixed Coniferous-Deciduous Forest

Community Phase Narrative:

This is the reference community phase for this ecological site. The plant community is characterized by a closed canopy forest with approximately 40 to 55 percent cover. The canopy is comprised of variable cover and tree-sized stratum of paper birch (*Betula papyrifera*), Sitka spruce *(Picea sitchensis)*, and western hemlock *(Tsuga heterophylla).* Lodgepole pine *(Pinus contorta)* may make up as much as 5 percent cover. Shrub cover commonly is 20 to 40 percent with species such as squashberry *(Viburnum edule),* rusty menziesia (*Menziesia ferruginea*), red elderberry (*Sanguisorba canadensis*), Sitka alder *(Alnus viridis ssp. sinuata),* and arctic blackberry (*Rubus arcticus*). Forb cover is 10 to 15 percent with species such as bunchberry dogwood (*Cornus canadensis*), liverleaf wintergreen *(Pyrola asarifolia),* field horsetail (*Equisetum arvense*), and western oakfern (*Gymnocarpium dryopteris*). Moss cover is as much as 75 percent.

Community Pathways

Pathway Number	**Pathway Name & Description**
1.1A	Water ponding in the depressions may kill the tree and understory species.

<table>
<tr><td>Phase 1.2</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Mixed Scrub-Herbaceous Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This early sere community develops following ponding in a forest depression. The closed forest canopy in the reference community is replaced by an open mixed shrub, graminoid, forb, and moss community. Graminoid cover is 60 percent with species such as common spikerush (Eleocharis palustris), mountain hairgrass (Vahlodea atropurpurea), and tall cottongrass (Eriophorum angustifolium). Moss cover is 30 percent. Shrub cover is 20 percent and consists mainly of alpine laurel (Kalmia microphylla). Forb cover is 25 percent with species such as Altai fescue (Fauria crista-galli), subalpine fleabane (Erigeron peregrinus), violet (Viola), avens (Geum), tofieldia (Tofieldia), fireweed (Chamerion angustifolium), scentbottle (Platanthera dilatata), fringed grass of Parnassus (Parnassia fimbriata), field horsetail (Equisetum arvense), and roundleaf sundew (Drosera rotundifolia).</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.2A</td><td colspan="3">The plant community shifts toward a forest community as the soil dries.</td></tr>
</table>

Phase 1.3			
Community Phase Number:	1.3	**Community Phase Name:**	Mixed Scrub-Herbaceous-Stunted Tree Community

Community Phase Narrative:

This mid sere plant community develops as the soils in the depressions dry out. This plant community is characterized by mixed moss, shrubs, and forbs. As compared to the early sere community, this community has more shrub cover. Shrub cover is about 90 percent with species such as marsh Labrador tea *(Ledum palustre ssp. decumbens),* small cranberry (*Vaccinium oxycoccos*), alpine laurel *(Kalmia microphylla),* and bog blueberry (*Vaccinium uliginosum*)*.* Stunted western hemlock *(Tsuga heterophylla),* Sitka spruce *(Picea sitchensis)*, and lodgepole pine *(Pinus contorta)* make up 5 percent cover. Sphagnum moss cover is 65 percent, and forb cover is 50 percent. Forb species include roundleaf sundew (*Drosera rotundifolia*) and Rocky Mountain pond-lily *(Nuphar lutea ssp. Polysepala).*

A late sere community phase was not observed for this ecological site. It is likely that tree canopy cover will increase with time, leading to mixed paper birch (*Betula papyrifera*)*,* Sitka spruce *(Picea sitchensis)*, and western hemlock *(Tsuga heterophylla)* woodland.

Community Pathways

Pathway Number	**Pathway Name & Description**
1.3A	The plant community will shift toward a forest community as the soil continues to dry out.

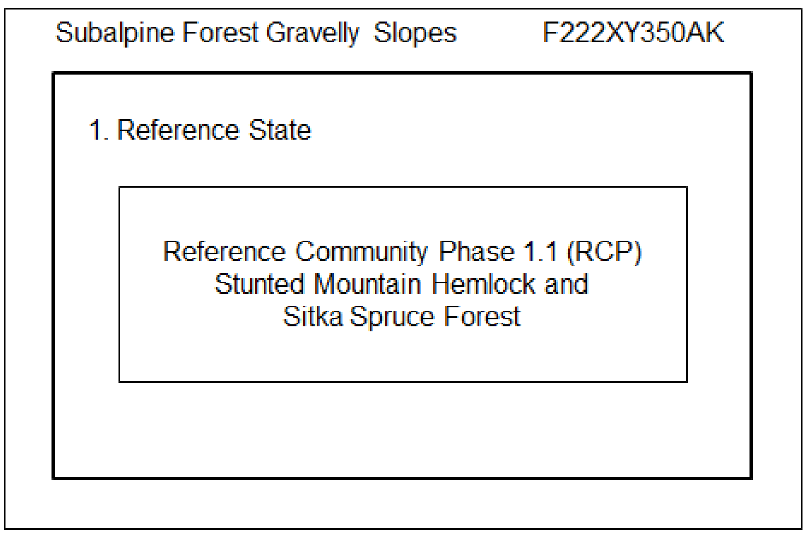
Ecological Site Description ID:	F222XY350AK

Ecological Dynamics of the Site:

This ecological site is in linear to concave positions in the subalpine life zone. These areas generally are more protected from wind as compared with linear to convex positions (ecological sites F222XY352AK and F222XY355AK). The soils are gravelly and shallow to moderately deep.

This plant community is a krummholz forest of mountain hemlock (*Tsuga mertensiana*) and Sitka spruce *(Picea sitchensis)*. Exposure to cold temperatures and wind in the subalpine zone limits tree growth, giving the trees a stunted and deformed appearance. The trees commonly grow in high elevation areas sheltered by rock formations or in concave positions.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	**1.1**	**Community Phase Name:**	Stunted Mountain Hemlock and Sitka spruce Forest

Community Phase Narrative:

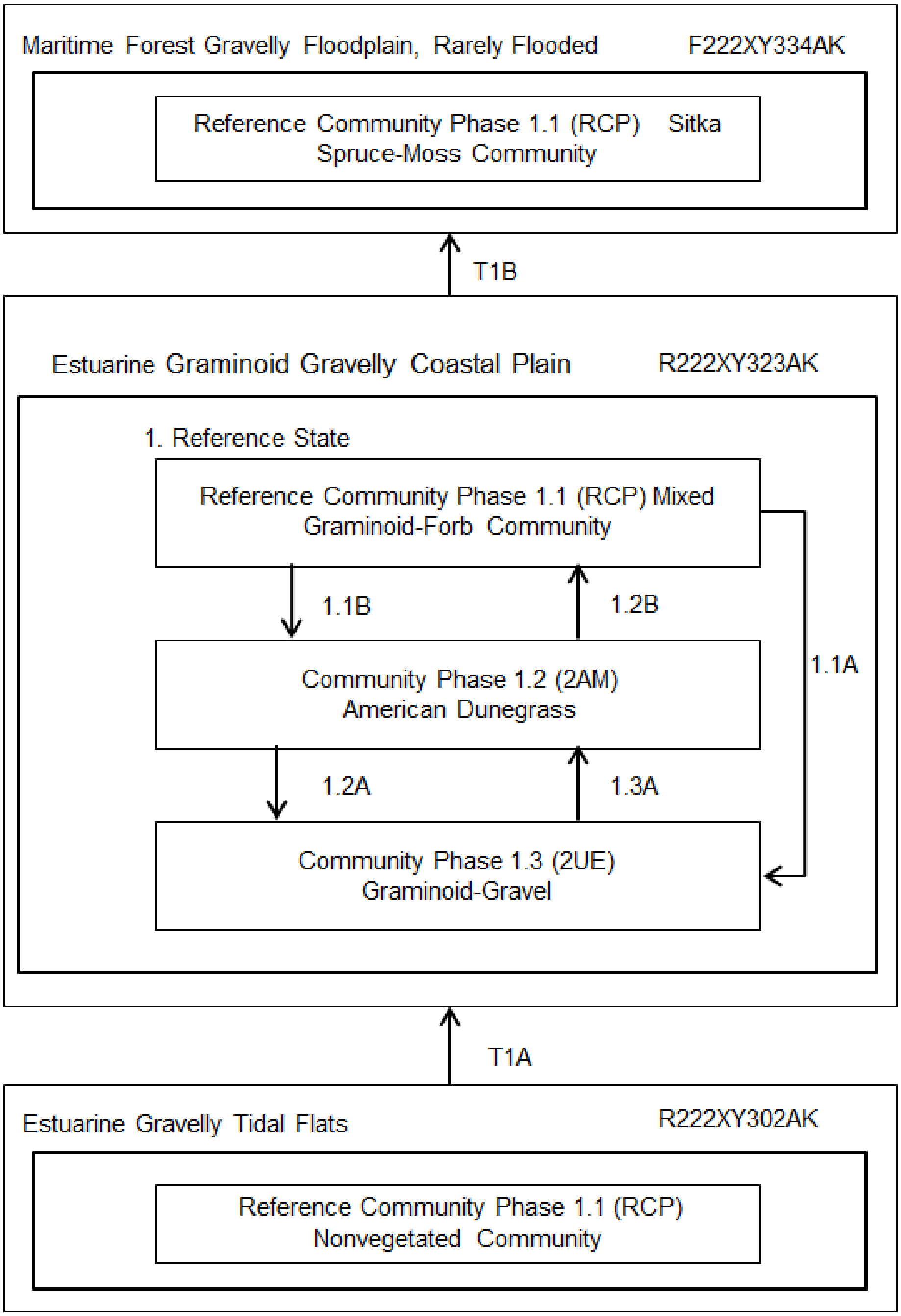
This community phase represents the historical climax community. It is characterized by a krummolz forest with as much as 40 percent stunted tree cover of mountain hemlock (*Tsuga mertensiana*) and Sitka spruce *(Picea sitchensis)*. Subalpine fir *(Abies lasiocarpa)* may be present in small proportions. Various dwarf shrubs, lichen, and moss are between clumps of stunted trees. Dwarf shrub species include black crowberry *(Empetrum nigrum),* bunchberry dogwood (*Cornus canadensis*), strawberryleaf raspberry *(Rubus pedatus),* yellow mountainheath *(Phyllodoce glanduliflora*), clubmoss mountain heather *(Cassiope lycopodioides),* and partridgefoot *(Luetkea pectinata)*. Lichen cover 0 to 50 percent. Commonly observed lichen species include star reindeer lichen *(Cladina stellaris),* greygreen reindeer lichen *(Cladina rangiferina),* arctic kidney lichen (*Nephroma arcticum*), and snow lichen (*Stereocaulon*). Moss cover may be as much as 15 percent, and forb cover is less 5 percent with species such as wood saxifrage *(Saxifraga mertensiana*) and fireweed *(Chamerion angustifolium)*.

Community Pathways

Pathway Number	**Pathway Name & Description**
Not applicable	No community phase pathways have been observed.

Ecological Site Description ID:	R222XY323AK
Ecological Dynamics of the Site:	
This estuarine, graminoid, coastal plain ecological site is comprised of three community phases with varying composition of graminoid species and percent cover. The plant community phases range from a pioneering graminoid community consisting of sparse graminoids to a climax community that is dominantly mixed cover of graminoids, forbs, and regenerating Sitka spruce *(Picea sitchensis)*. The disturbance regimes that affect the dynamics of the plant community include isostatic rebound, alluvial flooding, and motorized vehicle traffic. Alluvial flooding and motorized vehicle traffic affect the plant community dynamics within the ecological site, whereas isostatic rebound following glacial retreat is a larger scale process that may shift the ecological site to an associated ecological site. Following glacial retreat, the ground uplifts at a rate of 0.76 inch per year. As the areas rebound, the influence of daily tides is removed and the salt deposited through tidal activity begins to leach out. Over time, the earth transitions from an estuarine tidal flats system (ecological site R222XY302AK) to an estuarine coastal plain system (ecological site R222XY323AK). Historical documentation suggests that this ecological site was altered by urban development during the Gold Rush era. Historical photographs show that buildings and a pier were constructed in the Dyea Flats area. Pier pilings are on the flats, but there is little evidence of this disturbance in the soil profile and plant community.	

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	Mixed Graminoid-Forb Community

Community Phase Narrative:

This is the climax community phase for this ecological site. The community is comprised of graminoids, moss, and forbs and a smaller proportion of colonizing Sitka spruce *(Picea sitchensis)*. Graminoid cover may be nearly 30 percent with species such as Lyngbye's sedge (*Carex lyngbyei*), American dunegrass *(Leymus mollis ssp. mollis),* arctic rush (*Juncus arcticus*), and Gmelin's sedge *(Carex gmelinii)*. There is a high diversity of forb species, including silverweed cinquefoil *(Argentina anserina),* pea (*Lathyrus*)*,* sea milkwort (*Glaux maritima*)*,* saxifrage *(Saxifraga),* darkthroat shootingstar (*Dodecatheon pulchellum*)*,* Pacific hemlockparsley *(Conioselinum gmelinii),* goose tongue *(Plantago maritime),* common yarrow *(Achillea millefolium),* and common sheep sorrel (*Rumex acetosella*). Juniper polytrichum moss (*Polytrichum juniperinum*) is the dominant moss species, and it may make up as much as 60 percent cover. Regenerating Sitka spruce (*Picea sitchensis*) and shore pine *(Pinus contorta var. contorta)* commonly are in trace amounts, but cover may be as much as 25 percent in areas where this ecological site transitions into a maritime forest gravelly flood plain ecological site.

Community Pathways

Pathway Number	**Pathway Name & Description**
1.1A	Urban disturbance from motorized vehicle traffic
1.1B	Rare, brief, high-velocity flood

Phase 1.2

Community Phase Number:	1.2	Community Phase Name:	American Dunegrass

Community Phase Narrative:

This plant community phase becomes established following alluvial flooding or recovery from motorized vehicle traffic. The community is characterized by a continuous cover of American dunegrass *(Leymus mollis ssp. mollis)*.

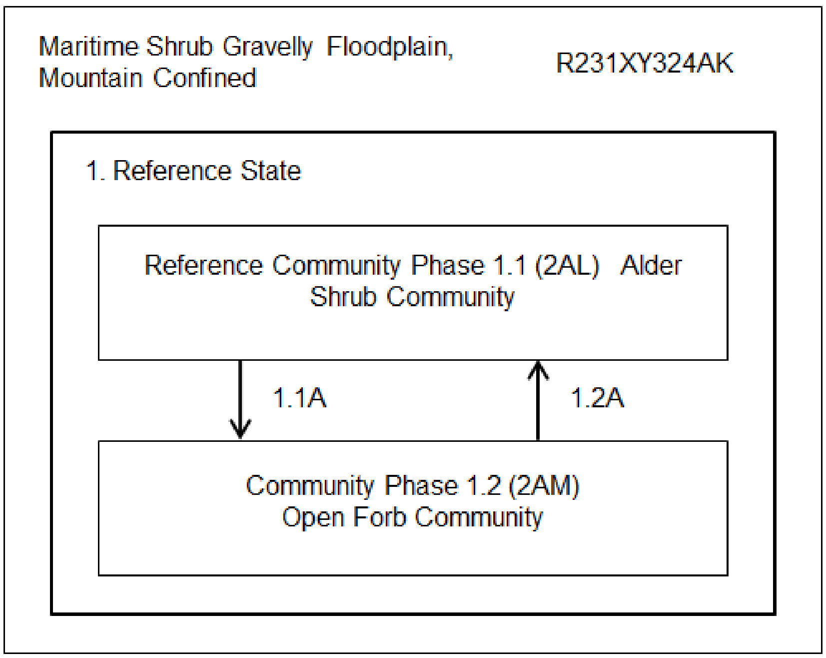
Community Pathways

Pathway Number	Pathway Name & Description
1.2A	Motor vehicle use
1.2B	Time since a flood

<table>
<tr><td colspan="2">Phase 1.3</td><td colspan="2"></td></tr>
<tr><td>Community Phase Number:</td><td>1.3</td><td>Community Phase Name:</td><td>Graminoid-Gravel Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This community phase is a mixture of graminoids and fobs. The cover may be as much as 80 percent with exposed gravel resulting from motorized vehicle traffic. American dunegrass (Leymus mollis ssp. mollis) is the dominant graminoid. Forb cover may be as much as 70 percent with species such as goose tongue (Plantago maritima var. juncoides) and common yarrow (Achillea millefolium var. alpicola).</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">1.3</td></tr>
<tr><td>1.3A</td><td colspan="3">Time since motorized vehicle use</td></tr>
</table>

State Transition Pathways	
Transition Number	**Transition Narrative**
T1A	T1A represents an irreversible transition from the Estuarine Gravelly Tidal Flats ecological site (R222XY302AK) to the Estuarine Graminoid Coastal Plain ecological site (R222XY323AK) as a result of isostatic rebound. During the glacial period, the weight of the ice bowed the earth's crust. When the glacier retreated, the earth began to rebound at a rate of 0.76 inch per year. As the earth continued to lift out of the nonvegetated tidal flats, the salts began to leach from the soil and plants began to become established. Over time, the earth will continue to rebound and the graminoid coastal plain ecological site will transition into flood plain site (see T1B narrative).
T1B	Isostatic rebound is a continuous process that affects the ecological dynamics of an ecosystem. T1A represents the early stages of isostatic rebound, and T1B represents the later stages. As the Estuarine Graminoid Coastal Plain ecological site continues to rebound, tidal influence diminishes and the site transitions out of an estuarine system into a maritime flood plain system. The establishment of Sitka spruce *(Picea sitchensis)* triggers the transition between ecological sites. Once the Sitka spruce cover reaches 25 percent, the Estuarine Graminoid Coastal Plain ecological site becomes the Maritime Forest Gravelly Flood Plain, Rarely Flooded (F222XY334AK) site.

Ecological Site Description ID:	R222XY324AK
Ecological Dynamics of the Site:	
This is a high-gradient, mountain-confined flood plain surrounding a moderate to very steep, deeply entrenched, debris transport stream. The ecological dynamics of this site are driven by high energy floods and high sediment supply due to the steep channel slopes. The late sere vegetation on these steep slopes is a Sitka alder *(Alnus viridis ssp. sinuata)* shrub community. The mid successional flood plain community is comprised of bare soil with gravel, cobbles, and boulders and approximately 30 percent vegetation cover of species such as dwarf fireweed *(Chamerion latifolium).* Over time without flooding, it is expected that few balsam poplar *(Populus balsamifera)* trees may begin to establish; however, this was not observed in the field.	
State and Transition Model:	



State ID Number:	1	**State Name:**	Reference state

Phase 1.1

Community Phase Number:	1.1	**Community Phase Name:**	Alder Shrub Community

Community Phase Narrative:
This is the late sere community following flooding. The shrub community is dominantly Sitka alder (*Alnus viridis ssp. sinuata*), which makes up as much as 80 percent cover.

Community Pathways

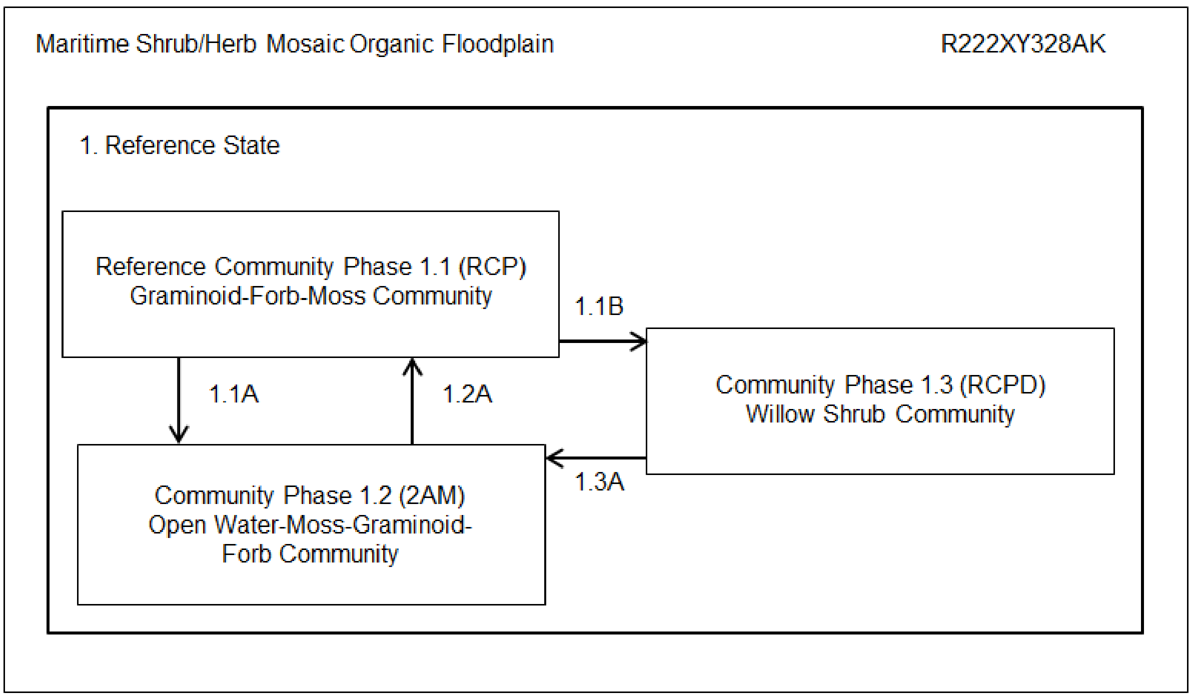
Pathway Number	**Pathway Name & Description**
1.1A	High-velocity flood

<table>
<tr><td colspan="2">Phase 1.2</td><td colspan="2"></td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Open Forb Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">Following a high-intensity flood, dwarf fireweed (Chamerion latifolium) and Sitka alder (Alnus viridis ssp. sinuate) may begin to emerge to produce a sparse early successional community. Vegetation cover may be as much as 30 percent with exposed bare soil and surface rock. Lichen and moss commonly cover the surface rock.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.2A</td><td colspan="3">Time since a flood</td></tr>
</table>

Ecological Site Description ID:	R222XY328AK
Ecological Dynamics of the Site:	

This is a maritime shrub and herb ecological site that is shaped by the movement of water in discharge wetlands. The movement of water creates a unique banding of vegetation through the formation of string bogs. The bands of vegetation in the early development of a string bog consist of pools of open water with water-loving vegetation and moss. Surrounding the pools, organic matter develops and graminoid and forb cover increases. Over a longer period of time, the organic matter continues to develop and the ecological site transitions from an open water-moss herbaceous state to a shrub state. Once the shrub community develops, it will not transition back to an open water-moss herbaceous state unless the area is drained enough to erode the shrub community and organic mat. A rare ice jam flood may also erode the shrub vegetation and organic layer and deposit a mineral soil over the organic layer. The soils formed in thick organic matter with strata of mineral material of varying thickness.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	Graminoid-Forb-Moss Community

Community Phase Narrative:

This is the reference plant community for string bog succession. Waterflow in a discharge wetland produces strings, or bands, of water and vegetation. The vegetative community begins to grow as a layer of organic matter develops. The community is a mixture of moss, graminoids, and forbs. This ecological site has approximately 15 percent standing water. Graminoid cover may be as much as 80 to 90 percent with species such as alpine bulrush *(Trichophorum alpinum),* water sedge *(Carex aquatilis),* and livid sedge (*Carex livida).* Buckbean (*Menyanthes trifoliate*) is the dominant forb species.

Community Pathways

Pathway Number	**Pathway Name & Description**
1.1A	If drainage is sufficient to erode the organic mat, the graminoid-forb-moss community may transition back to an open water-moss-graminoid-forb community.
1.1B	Over a longer period of time, the string bog mosaic of open water and banded vegetation will transition to a more continuous organic mat with vegetation and a smaller proportion of open water. Following the establishment of a graminoid-forb community in the reference community phase, shrub species may begin to encroach. The ecological site will then transition from a graminoid-forb state to a drier shrub state.

<table>
<tr><td colspan="2">Phase 1.2</td><td colspan="2"></td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Open Water-Moss-Graminoid-Forb Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This community phase is characterized by more than 30 percent open water. Moss may form a mat that makes up as much as 30 percent cover. A continuous cover of forbs such as buckbean (Menyanthes trifoliate), water horsetail (Equisetum fluviatile), and purple marshlocks (Comarum palustre) and graminoids such as water sedge (Carex aquatilis) and creeping sedge (Carex chordorrhiza) may be in small patches and along the edges of the bodies of water.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.2A</td><td colspan="3">In the discharge wetland areas, a layer of organic matter begins to develop. The exact mechanism for the development is unknown, but downslope drainage and accumulation of mud, peat, and debris may contribute to the formation of banded organic material that supports the growth of water-loving graminoid and forb species.</td></tr>
</table>

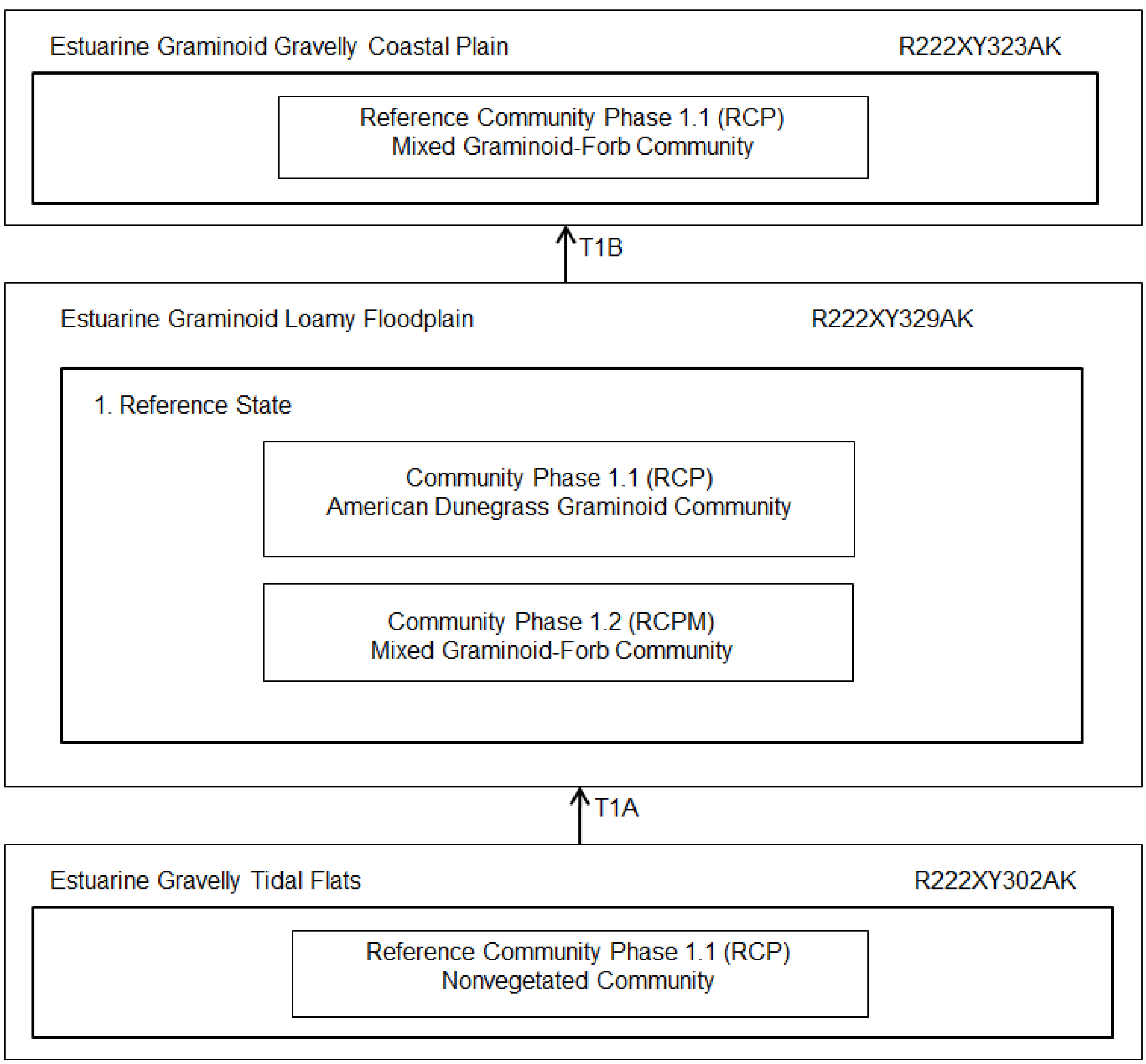
<table>
<tr><td>Phase 1.3</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.3</td><td>Community Phase Name:</td><td>Willow Shrub Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">The willow shrub community is characterized by a mixed graminoid-shrub community with as much as 15 percent open water. Forb and graminoid cover may be 50 to 90 percent. Common graminoids include water sedge (Carex aquatilis) and bluejoint grass (Calamagrostis canadensis). Forb species include purple marshlocks (Comarum palustre) and field horsetail (Equisetum arvense). Shrub cover may be as much as 50 percent. Barclay’s willow (Salix barclayi) is the dominant shrub species. Sitka alder (Alnus viridis ssp. sinuata) and squashberry (Viburnum edule) may become established in small proportions along the edges of the discharge wetlands.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3"></td></tr>
<tr><td>1.3A</td><td colspan="3">If water drainage is sufficient enough to erode the shrub community and organic mat, the plant community may transition back to an open water-moss-graminoid-forb community. A rare ice jam flood may also erode the shrub vegetation and organic layer and deposit a mineral soil over the organic layer.</td></tr>
</table>

Ecological Site Description ID:	R222XY329AK

Ecological Dynamics of the Site:

This estuarine ecological site is on loamy flood plains. River flooding and isostatic rebound shape the plant community phases. Plant communities range from a community characterized by a continuous cover of American dunegrass (*Leymus mollis)* to a mixed American dunegrass graminoid and forb community. Minimal documentation is available on how river flooding and isostatic rebound shape the dynamics of this site. Additional field data would help to determine how flooding, decreased tidal influence from isostatic rebound, soil drainage, and proximity to the tidal zone influence the plant community structure.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	American Dunegrass Graminoid Community
Community Phase Narrative:			
This reference plant community is comprised of a nearly continuous cover of American Dunegrass (*Leymus mollis),* which is a salt-tolerant species that can become established in brackish water.			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
Not applicable	No community phase pathways have been observed.		

<table>
<tr><td>Phase 1.2</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Mixed Graminoid-Forb Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This is a mixed graminoid-forb community in the Estuarine Flood Plain ecological site. This plant community is comprised of 30 percent graminoid cover of American dunegrass (Leymus mollis ssp. mollis) and Lyngbye’s sedge (Carex lyngbyei). Forb cover is approximately 40 percent with species such as silverweed cinquefoil (Argentina anserina), sea milkwort (Glaux maritima), trace goose tongue (Plantago maritima var. juncoides), and stickystem pearlwort (Sagina maxima). Compared to the American dunegrass graminoid community, this community phase has a higher proportion of forb species. It is not clear whether this difference is the result of riverine flooding or if it is related to the spatial proximity to the ocean. This community phase is along flood plains near the transition to the tidal zone and may be subject to more frequent tidal influences than the American dunegrass graminoid community.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>Not applicable</td><td colspan="3">No community phase pathways have been observed.</td></tr>
</table>

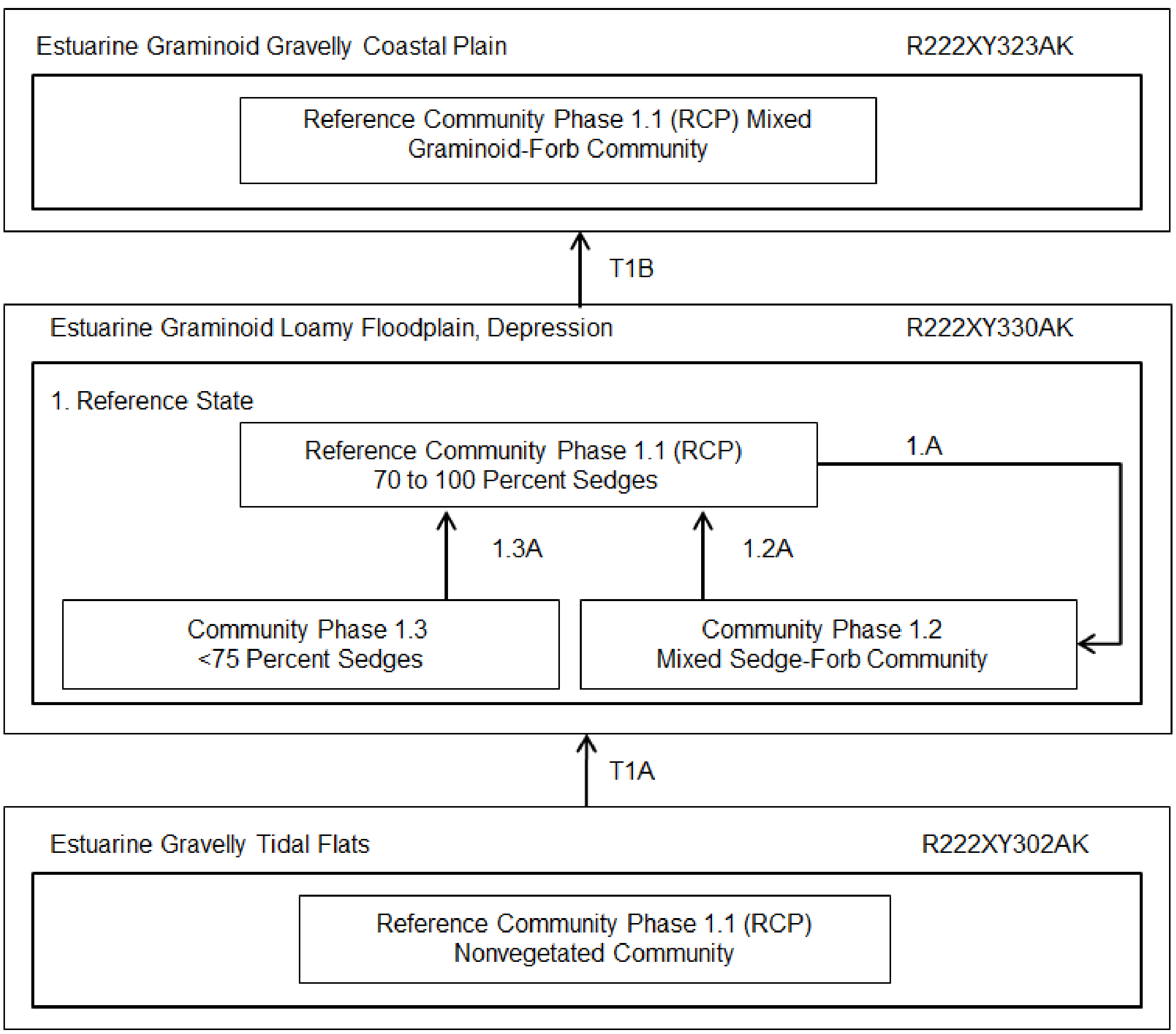
State Transition Pathways			
Transition Number	**From**	**To**	**Transition Narrative**
T1A	1	2	T1A represents an irreversible transition from the Estuarine Barren Gravelly Tidal Flats ecological site (R222XY302AK) to the Estuarine Graminoid Sandy Floodplain site (R222XY329AK) as a result of isostatic rebound. During the glacial period, the weight of the ice bowed the earth's crust. When the glacier retreated, the earth began to rebound at a rate of 0.76 inch per year. As the earth lifted out of the nonvegetated tidal flats, plants began to establish, marking the transition from the tidal flat ecological site to the graminoid- and forb-dominant floodplain site. Over time, the earth will continue to rebound and the Estuarine Graminoid Sandy Floodplain ecological site will transition to a graminoid coastal plain ecological site (see T1B narrative).
T1B	2	3	Isostatic rebound is a continuous process that shapes the dynamics of an ecosystem. T1A represents the early stages of isostatic rebound, and T1B represents the later stages of isostatic rebound. As the Estuarine Graminoid Sandy Floodplain site continues to rebound, riverine flooding and tidal influences diminish and the ecological site transitions from a flood plain system to a coastal plain system. The removal of low frequency, short duration, high-velocity flooding triggers the transition. The Estuarine Graminoid Sandy Floodplain site becomes the Estuarine Graminoid Sandy Coastal Plain site (R222XY323AK) when the composition of the community transitions from graminoids to mixed graminoids and forbs.

Ecological Site Description ID:	R222XY330AK

Ecological Dynamics of the Site:

This ecological site is in depressions of estuarine loamy flood plains. The climax plant community is a nearly continuous cover of sedges. The mineral soil is subject to daily tidal influences. The ecological dynamics of this site are driven by post-glacial isostatic rebound and rare, high-velocity flooding. Following post-glacial rebound, the barren tidal flats transition into a flood plain ecological site with sparse sedges. As the flood plain continues to rebound, the community gradually shifts toward the climax community of a nearly continuous cover of sedges. Isostatic rebound will continue to elevate the flood plain until it no longer floods. This marks the transition from a flood plain ecological site to a coastal flood plain site.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	70 to 100 percent sedges
Community Phase Narrative:			
This is the reference community phase for depressions of estuarine graminoid floodplains. This community is characterized by a 70 to 100 percent cover of Lyngbye's sedge (*Carex lyngbyei*) as the site recovers after post-glacial rebound or river flooding. Lyngbye's sedge is salt-tolerant and grows in areas that are subject to daily tidal events.			

Community Pathways

Pathway Number	**Pathway Name & Description**
1.1A	Low frequency, short duration, high-velocity flooding along river channels shape the community structure. Although it has not been documented, it is likely that rare, extreme tidal events may also wash away the established plants.

Phase 1.2			
Community Phase Number:	1.2	**Community Phase Name:**	Mixed Sedge-Forb Community
Community Phase Narrative:			
Low frequency, short duration, high-velocity flooding may erode the climax sedge community. Following flooding, a community phase characterized by a mixture of sedges and forbs with as much as 80 percent cover will become established. Lyngbye's sedge (*Carex lyngbyei*) is the dominant sedge. Smaller proportions of rushes such as arctic rush (*Juncus arcticus*) and forbs such as darkthroat shootingstar (*Dodecatheon pulchellum*) are mixed in this sedge-dominant community.			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.2A	Time since a flood		
Phase 1.3	Photograph not available		
Community Phase Number:	1.3	**Community Phase Name:**	Less than 75 percent sedges
Community Phase Narrative:			
This community phase was not documented in the field. Following post-glacial rebound, salt-tolerant sedges such as Lyngbye's sedge (*Carex lyngbyei*) may begin to emerge, producing a sparsely vegetated early successional community.			

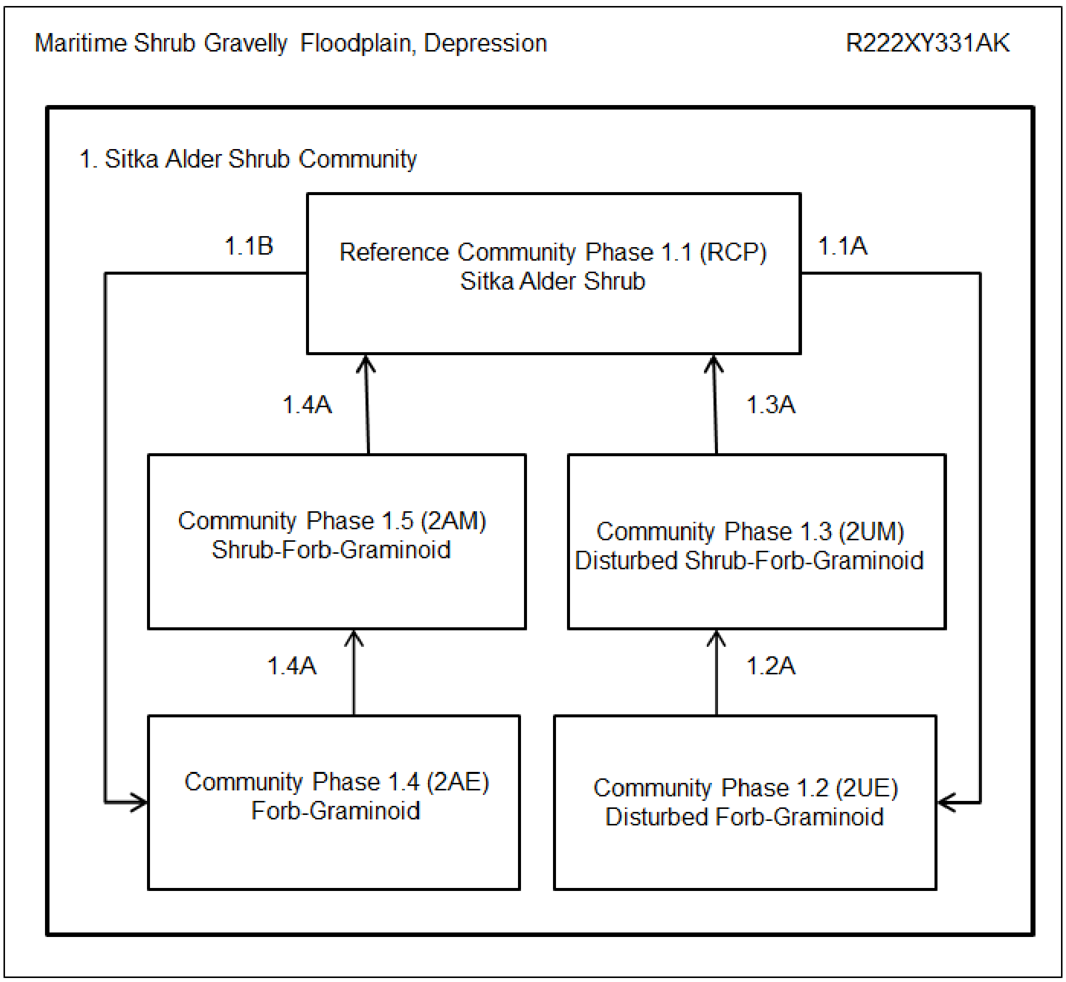
Community Pathways	
Pathway Number	1.3
1.3A	Post-glacial rebound
State Transition Pathways	
Transition Number	**Transition Narrative**
T1A	T1A represents an irreversible transition from the Estuarine Barren Gravelly Tidal Flats ecological site (R222XY302AK) to the Estuarine Graminoid Sandy Floodplains, Depression, site (R222XY330AK) as a result of isostatic rebound. During the glacial period, the weight of the ice bowed the earth's crust. When the glacier retreated, the earth began to rebound at a rate of 0.76 inch per year. As the earth continued to lift out of the nonvegetated tidal flats, plants began to establish, marking the transition from the tidal flat ecological site to the graminoid-dominant coastal plain site. Over time, the earth will continue to rebound and the Estuarine Graminoid Sandy Floodplains, Depression, ecological site will transition to a graminoid coastal plain site (see T1B narrative).
T1B	Isostatic rebound is a continuous process that shapes the ecological dynamics of an ecosystem. T1A represents the early stages of isostatic rebound, and T1B represents the later stage of isostatic rebound. As the Estuarine Graminoid Sandy Floodplains, Depression, site continues to rebound, riverine flooding and tidal influence diminish and the ecological site transitions from a flood plain system to a coastal plain system. Absence of low frequency, short duration, high-velocity flooding triggers the transition between ecological sites. The Estuarine Graminoid Sandy Floodplains, Depression, site transitions to the Estuarine Graminoid Sandy Coastal Plain site (R222XY323AK) as the composition of the plant community changes from sedges to mixed graminoids and forbs.

Ecological Site Description ID:	R222XY331AK

Ecological Dynamics of the Site:

This is a maritime shrub ecological site in low-gradient flood plain depressions. The ecological dynamics of this site are driven by alluvial flooding and urban disturbance from foot traffic. The reference plant community is a Sitka alder shrub community with a variety of other shrub and herbaceous species. Early succession plant community phases are characterized by bare soil with graminoids and forbs. The early sere disturbed community is similar to the early sere flood community, but there is bare ground in areas of high foot traffic.

State and Transition Model:



<table>
<tr><td>State ID Number:</td><td>1</td><td>State Name:</td><td>Reference state</td></tr>
<tr><td>Phase 1.1</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.1</td><td>Community Phase Name:</td><td>Sitka Alder Shrub Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">The climax community phase for depressions low-gradient floodplains is characterized by a shrub cover of 20 percent or more with species such as Barclay’s willow (Salix barclayi), Sitka alder (Alnus viridis ssp. sinuata), redosier dogwood (Cornus sericea ssp. Sericea), and arctic blackberry (Rubus arcticus). A field horsetail (Equisetum arvense) forb cover makes up approximately 25 percent, and a bluejoint grass (Calamagrostis canadensis) graminoid cover makes up approximately 10 percent.</td></tr>
<tr><td colspan="4">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="3">Pathway Name & Description</td></tr>
<tr><td>1.1A</td><td colspan="3">Urban disturbance from foot traffic</td></tr>
<tr><td>Phase 1.2</td><td colspan="3">Photograph not available</td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Disturbed Forb-Graminoid</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This is a disturbed community phase that is subject to flooding and foot traffic. This phase has a field horsetail (Equisetum arvense) forb cover of 50 to 70 percent. A bluejoint grass (Calamagrostis canadensis) graminoid cover may be as much as 10 percent. This site may have a trace cover of moss and shrub species such as Sitka alder (Alnus viridis ssp. sinuata) and Barclay’s willow (Salix barclayi).</td></tr>
</table>

Community Pathways	
Pathway Number	**Pathway Name & Description**
1.2A	Removal of foot traffic and time since a flood
Phase 1.3	

Community Phase Number:	1.3	**Community Phase Name:**	Disturbed Shrub-Forb-Graminoid Community

Community Phase Narrative:

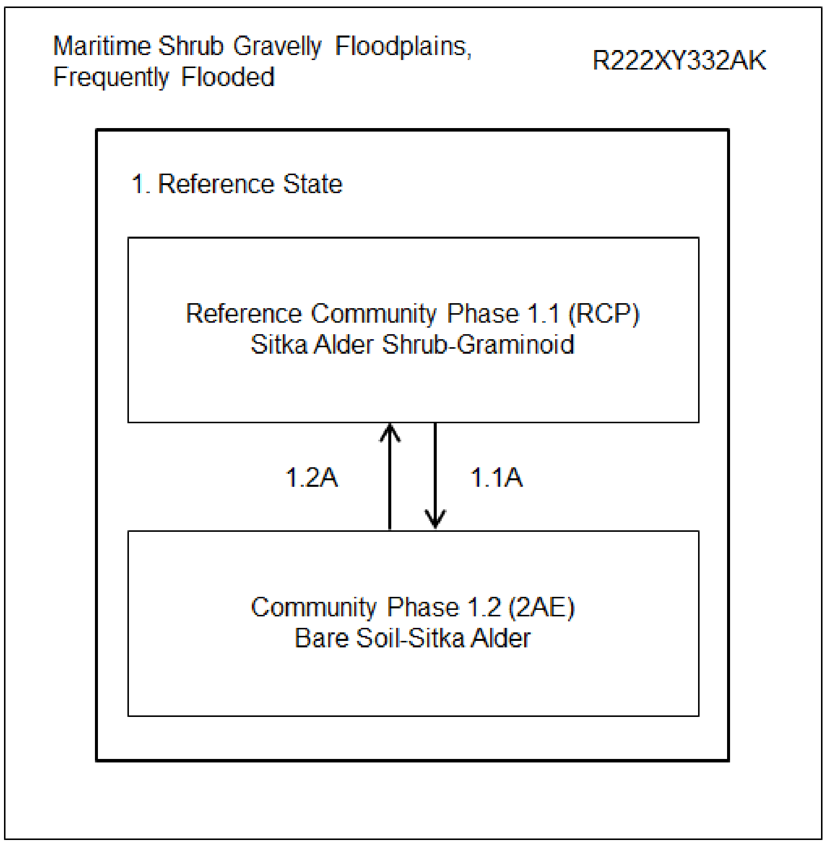
This mid succession plant community phase establishes following flooding and/or urban disturbance. The composition of the plant community is a mixture of forbs, graminoids, and shrubs. Shrub cover is approximately 10 percent with species such as Sitka alder *(Alnus viridis ssp. sinuata)* and Sitka willow *(Salix sitchensis).* Fifty to sixty percent of the ground is covered with forb and graminoid species such as field horsetail (*Equisetum arvense*), Spike bentgrass (*Agrostis exarata*), and western buttercup *(Ranunculus occidentalis).*

This community phase is similar to phase 1.2; however, this community has not been disturbed by foot traffic. This community was not documented in the field, but it is expected that it will support a graminoid and forb cover of as much as 40 percent with species such as field horsetail (*Equisetum arvense*) and bluejoint grass (*Calamagrostis canadensis*).

Community Pathways	
Pathway Number	1.3
1.3A	Time since a flood and removal of foot traffic

Phase 1.4	Photograph not available		
Community Phase Number:	1.4	**Community Phase Name:**	Forb-Graminoid
Community Phase Narrative:			
This community phase represents an early sere community following flooding. This phase was not documented in the field; however, it is believed that the plant community would be similar to that of community phase 1.2 except without the bare ground from foot traffic.			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.4A	Time since a flood		
Phase 1.5	Photograph not available		
Community Phase Number:	1.5	**Community Phase Name:**	Shrub-Forb-Graminoid
Community Phase Narrative:			
This is a mid sere plant community that establishes following a flood. The community is characterized by mixed herbaceous plants and shrubs. Forb and graminoid cover is approximately 50 to 60 percent with species such as field horsetail (*Equisetum arvense*), Spike bentgrass (*Agrostis exarata*), and western buttercup *(Ranunculus occidentalis)*. Shrub cover is approximately 10 percent with species such as Sitka alder *(Alnus viridis ssp. sinuata)* and Sitka willow *(Salix sitchensis)*.			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.5A	Time since a flood		

Ecological Site Description ID:	R222XY332AK
Ecological Dynamics of the Site:	
This ecological site is adjacent to stream channels on low-gradient maritime flood plains. The ecological dynamics of this site are driven by frequent flooding. The plant community varies from a sparse Sitka alder shrub phase to a continuous cover of Sitka alder and willow with a dense layer of forbs and graminoids. Because of the high frequency of flooding, tree cover is less than 10 percent and consists of regenerating or medium-sized trees.	
State and Transition Model:	



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	Sitka Alder Shrub-Graminoid
Community Phase Narrative:			
This is the climax community phase for a maritime gravelly flood plain adjacent to the stream channel. The vegetation community consists of 60 to 100 percent shrub cover of Sitka alder *(Alnus viridis ssp. sinuata)* and Sitka willow *(Salix sitchensis).* There is a nearly continuous layer of graminoid and forb species, dominantly field horsetail (*Equisetum arvense*), bride's feathers (*Aruncus dioicus*), and claspleaf twistedstalk *(Streptopus amplexifolius var. amplexifolius).* As much as 5 percent cover of regenerating and medium-sized balsam poplar *(Populus balsamifera)* has been observed in some areas.			
Community Pathways			

Pathway Number	**Pathway Name & Description**
1.1A	Frequent flooding

Phase 1.2			
Community Phase Number:	1.2	**Community Phase Name:**	Bare Soil-Sitka Alder
Community Phase Narrative:			
This community phase develops following a flood and is characterized by 60 to 100 percent bare soil and surface rock. This early successional phase consists of 0 to 25 percent cover of Sitka alder *(Alnus viridis ssp. sinuata)* and willow *(Salix)*. The shrubs are distributed in small clumps. As much as 10 percent moss cover may be in some areas.			
Community Pathways			
Pathway Number	**Pathway Name & Description**		
1.2A	Time since a flood		

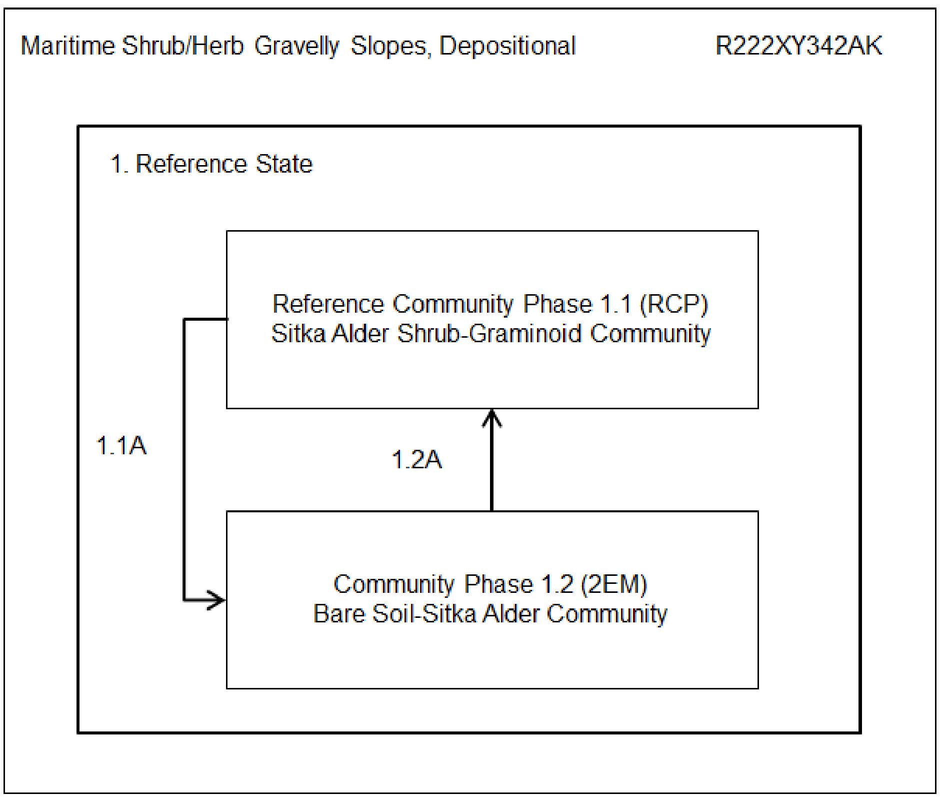
Ecological Site Description ID:	R222XY342AK

Ecological Dynamics of the Site:

This ecological site is in maritime mountain avalanche chutes. Specifically, it is on mountain chutes and side slopes from sea level to tree line in areas where frequent avalanches or slides occur. This ecological site also includes less steep avalanche slopes in the runout zones at the bottom of the avalanche path. The ecological dynamics of this site are maintained by frequent snow or debris slides that erode the soils and prevent trees from becoming established. The vegetation is dominantly shrubs and graminoids. Tree seedlings may become established in areas that are subject to less frequent avalanches, but growth rarely extends beyond the regenerating phase.

The reference plant community for this ecological site is characterized by mixed shrubs, forbs, and graminoids with minimal exposed bare soil, rock, and rubble. Earlier sere plant communities have more exposed soil and rock and less plant cover. The early sere plant community was not documented in the field, but it is likely to be characterized by extensive bare soil and rock with minimal plant cover.

State and Transition Model:



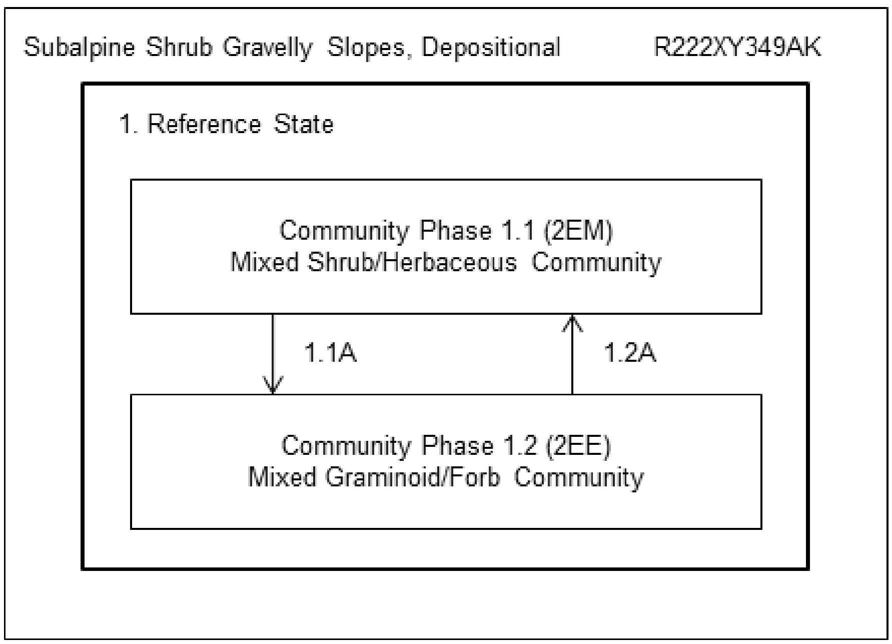
<table>
<tr><td>State ID Number:</td><td>1</td><td>State Name:</td><td>Reference state</td></tr>
<tr><td>Phase 1.1</td><td colspan="3"></td></tr>
<tr><td>Community Phase Number:</td><td>1.1</td><td>Community Phase Name:</td><td>Sitka Alder Shrub-Graminoid Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This is the reference plant community for an avalanche chute. Compared to the early successional community phase, bare soil and rock cover is minimal. Medium-sized shrub cover may be as much as 70 percent. Shrub species include Sitka alder (Alnus viridis ssp. sinuata), Barclay’s willow (Salix barclayi), stink currant (Ribes bracteosum), and Sitka willow (Salix sitchensis). Graminoid cover consisting of fowl bluegrass (Poa palustris) is approximately 20 percent. Forb cover is approximately 15 percent with species such as arctic starflower (Trientalis europaea) and spreading woodfern (Dryopteris expansa). Tree seedlings may become established on this site, but growth likely will not extend beyond the regenerating phase because of the frequency and intensity of the disturbance.</td></tr>
</table>

Community Pathways	
Pathway Number	**Pathway Name & Description**
1.1A	High-frequency avalanches on steep mountainous slopes carry snow and debris from higher elevations to lower elevations. The slides erode the soil and deposit large boulders and rocks at the lower elevations. The movement of snow and rock removes the plants. The high frequency and intensity of the disturbance in the avalanche chutes prevents a forest community from becoming established.

<table>
<tr><td>Phase 1.2</td><td colspan="3">
</td></tr>
<tr><td>Community Phase Number:</td><td>1.2</td><td>Community Phase Name:</td><td>Bare Soil-Sitka Alder Community</td></tr>
<tr><td colspan="4">Community Phase Narrative:</td></tr>
<tr><td colspan="4">This community phase represents the mid successional sere plant community following an avalanche. The plant community is characterized by shrubs and graminoids with as much as 50 percent bare ground and surface rock. Shrub species may include Sitka alder (Alnus viridis ssp. sinuata), Sitka willow (Salix sitchensis), salmonberry (Rubus spectabilis), and bride's feathers (Aruncus dioicus). Shrub cover may be 10 to 40 percent, and graminoid cover may be 10 to 50 percent. Common graminoid species include sedges (Carex), bluejoint grass (Calamagrostis canadensis), and arctic bluegrass (Poa arctica). Boreal sagebrush (Artemisia arctica) was the only observed forb species; however, it is likely that other species may become established over time.</td></tr>
</table>

Community Pathways	
Pathway Number	**Pathway Name & Description**
1.2A	Time since an avalanche and soil stabilization

Ecological Site Description ID:	R222XY349AK
Ecological Dynamics of the Site:	
This ecological site is at the outflow of avalanche chutes in the subalpine life zone. Snow and debris are transported from higher elevations and deposited in these areas. The soils are shallow to moderately deep and gravelly, and they exhibit little development. The vegetation is characterized by a mixed shrub/herbaceous community (2EM) that transitions to an early sere (2EE) herbaceous community following deposition from the downward movement of snow and debris. It is possible that the mixed shrub/herbaceous community will shift to a community that is dominantly dwarf shrubs and stunted mountain hemlock (*Tsuga mertensiana)* over time without deposition. The dwarf shrub and stunted tree community was not included in the state and transition model because it was not observed in the field.	
State and Transition Model:	



State ID Number:	1	**State Name:**	Reference state
Phase 1.1			
Community Phase Number:	1.1	**Community Phase Name:**	Mixed Shrub/Herbaceous Community

Community Phase Narrative:

This community phase represents a mid sere plant community following disturbance from the downward movement of snow and debris. The plant community is characterized by a mixture of forb and graminoid species and dwarf to medium-sized shrubs. Medium-sized shrub species include Sitka alder *(Alnus viridis ssp. sinuata),* marsh Labrador tea *(Ledum palustre ssp. decumbens),* Barclay's willow *(Salix barclayi)*, stink currant (*Ribes bracteosum)*, yellow mountainheath *(Phyllodoce glanduliflora)*, red elderberry (*Sambucus racemosa)*, and devilsclub (*Oplopanax horridus)*. Dwarf shrub species include black crowberry *(Empetrum nigrum),* oval-leaf willow *(Salix ovalifolia),* mountain heather *(Cassiope),* and alpine azalea (*Loiseleuria procumbens*)*.* Bluejoint grass (*Calamagrostis canadensis*) and longawn sedge *(Carex macrochaeta)* are the dominant graminoids. This community supports a diversity of forb species such as western oakfern (*Gymnocarpium dryopteris*)*,* common ladyfern (*Athyrium filix-femina*)*,* violet *(Viola),* curled starwort (*Stellaria crispa*)*,* claspleaf twistedstalk *(Streptopus amplexifolius),* spreading woodfern (*Dryopteris expansa*)*,* dwarf fireweed *(Chamerion latifolium),* and western moss heather *(Cassiope mertensiana).*

Community Pathways

Pathway Number	Pathway Name & Description
1.1A	The downward movement of snow and debris erodes the hillslope. The resulting deposition either covers or obliterates the existing vegetation.

Phase 1.2			
Community Phase Number:	1.2	**Community Phase Name:**	Mixed Graminoid/Forb Community

Community Phase Narrative:

This community phase represents an early sere plant community following slope erosion. The community is characterized by a mixture of graminoid species such as longawn sedge *(Carex macrochaeta)* and bluejoint grass (*Calamagrostis canadensis*) and forb species such as white false hellebore (*Veratrum album*), Sitka valerian (*Valeriana sitchensis*), arctic lupine (*Lupinus arcticus*), fireweed *(Chamerion angustifolium),* and common cowparsnip (*Heracleum maximum*). Snow creep in some areas may maintain this community phase for extended periods.

Community Pathways

Pathway Number	**Pathway Name & Description**
1.2A	Time since slope deposition

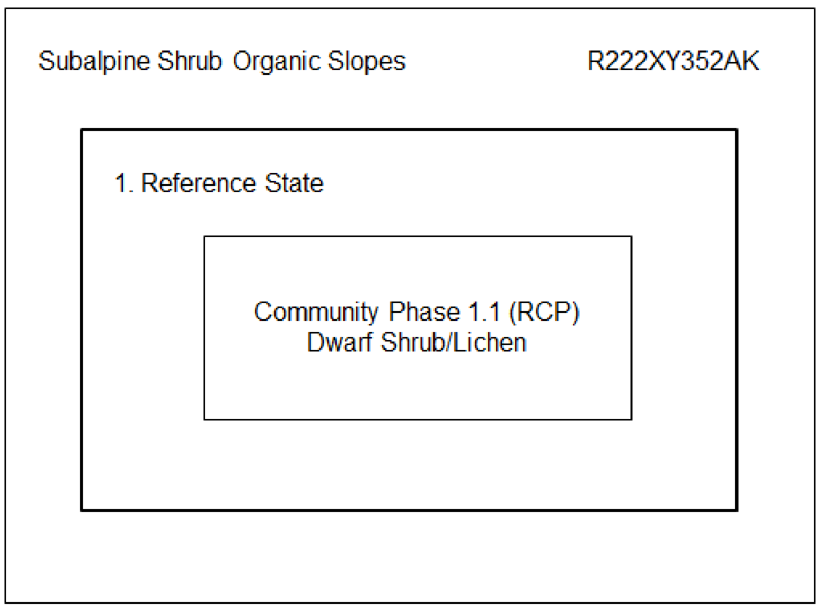
Ecological Site Description ID:	R222XY352AK

Ecological Dynamics of the Site:

This ecological site is in linear to convex positions in the subalpine life zone. These areas generally are drier and less protected from wind as compared to ecological site F222XY350AK, which is in protected concave positions.

This site is characterized by shallow organic soils over bedrock. The soils support a mixed shrub-lichen community. The ecological dynamics of the site are driven by exposure to cold temperatures, wind, and a short growing season. The climate and shallow, dry soils generally limit tree growth. The historical climax plant community was the only community phase observed.

State and Transition Model:



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<tr><td>State ID Number:</td><td>1</td><td>State Name:</td><td colspan="2">Reference state</td></tr>
<tr><td>Phase 1.1</td><td colspan="4">
</td></tr>
<tr><td>Community Phase Number:</td><td>1.1</td><td>Community Phase Name:</td><td colspan="2">Mixed Dwarf Shrub-Lichen Community</td></tr>
<tr><td colspan="5">Community Phase Narrative:</td></tr>
<tr><td colspan="5">This is the historical climax community phase. The community is characterized by mixed dwarf shrub and lichen. Average dwarf shrub cover is 50 percent. Common dwarf shrub species include black crowberry (Empetrum nigrum) and bog blueberry (Vaccinium uliginosum) with a smaller proportion of beauverd spirea (Spiraea stevenii), yellow mountainheath (Phyllodoce glanduliflora), western moss heather (Cassiope mertensiana), strawberryleaf raspberry (Rubus pedatus), Alaska bellheather (Harrimanella stelleriana), mountain heather (Cassiope), lingonberry (Vaccinium vitis-idaea), and least willow (Salix rotundifolia). Average lichen cover is 45 to 50 percent. Star reindeer lichen (Cladina stellaris) and greygreen reindeer lichen (Cladina rangiferina) are the dominant lichen species with a smaller proportion of reindeer lichen (Cladina portentosa), fruticose lichens (Usnea), foliose lichens (Peltigera), and cup lichen (Cladonia macilenta). Stunted Sitka spruce (Picea sitchensis) makes up less than 5 percent cover. Trace graminoid and forb cover has been observed.</td></tr>
<tr><td colspan="5">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="4">Pathway Name & Description</td></tr>
<tr><td>Not applicable</td><td colspan="4">No community phase pathways have been observed.</td></tr>
</table>

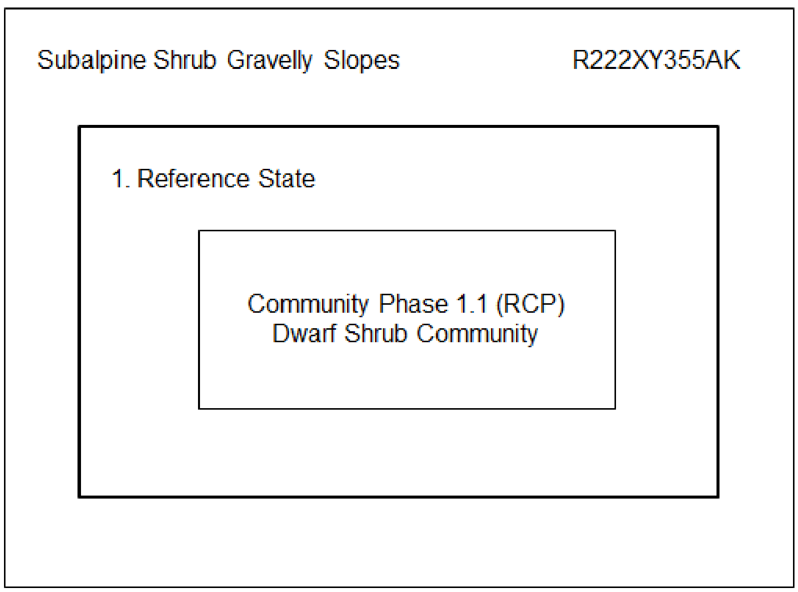
Ecological Site Description ID:	R222XY355AK

Ecological Dynamics of the Site:

This ecological site is in linear to convex positions in the subalpine life zone. These positions generally are drier and less protected from wind as compared to ecological site F222XY350AK, which is in protected concave positions. This ecological site is in similar landscape positions as ecological site F222XY352AK, but it has different soils. This may be the reason for the differences in the plant community structure. The soils on this ecological site are shallow to moderately deep, gravelly Spodosols or Inceptisols.

The historical climax plant community is a dwarf shrub community. This was the only plant community phase observed in the field. There were no observed disturbance regimes that alter the plant community dynamics. It is likely that continuous exposure to cold temperatures, wind, and a short growing season maintains this plant community in a steady state phase.

State and Transition Model:



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<tr><td>State ID Number:</td><td>1</td><td>State Name:</td><td colspan="2">Reference state</td></tr>
<tr><td>Phase 1.1</td><td colspan="4"></td></tr>
<tr><td>Community Phase Number:</td><td>1.1</td><td>Community Phase Name:</td><td colspan="2">Dwarf Shrub Community</td></tr>
<tr><td colspan="5">Community Phase Narrative:</td></tr>
<tr><td colspan="5">This is the reference plant community phase. The community is characterized by mixed dwarf shrub and herbaceous plants. Average dwarf shrub cover is 80 percent. The dominant dwarf shrub species include black crowberry (Empetrum nigrum), yellow mountainheath (Phyllodoce glanduliflora), and western moss heather (Cassiope mertensiana) with smaller proportions of bog blueberry (Vaccinium uliginosum), glacier avens (Geum calthifolium), Alaska bellheather (Harrimanella stelleriana), bunchberry dogwood (Cornus canadensis), strawberryleaf raspberry (Rubus pedatus), and twinflower (Linnaea borealis). Stunted mountain hemlock (Tsuga mertensiana) and Sitka spruce (Picea sitchensis) cover is as much as 10 percent. Graminoid cover generally is less than 5 percent, but it can be as much as 18 percent. Observed graminoid species include black alpine sedge (Carex nigricans), longawn sedge (Carex macrochaeta), alpine sweetgrass (Hierochloe alpina), Piper's woodrush (Luzula piperi), and Drummond's rush (Juncus drummondii). Forb cover is less than 2 percent with species such as redstem saxifrage (Saxifraga lyallii) and spreading woodfern (Dryopteris expansa).</td></tr>
<tr><td colspan="5">Community Pathways</td></tr>
<tr><td>Pathway Number</td><td colspan="4">Pathway Name & Description</td></tr>
<tr><td>Not applicable</td><td colspan="4">No community phase pathways have been observed.</td></tr>
</table>

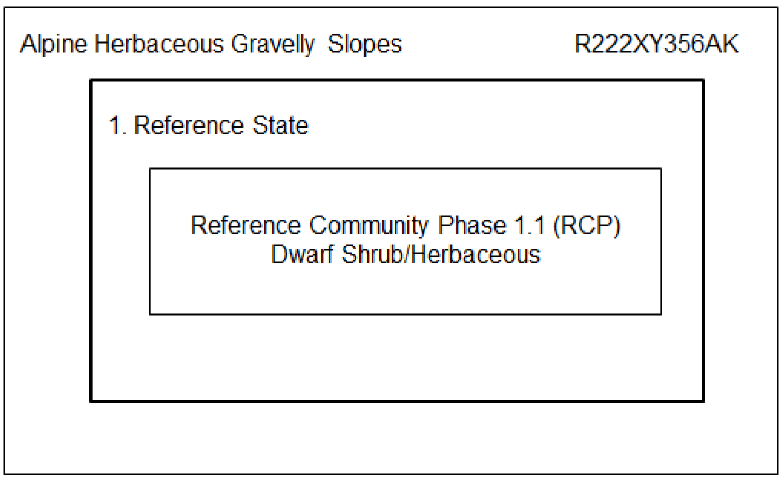
Ecological Site Description ID:	R222XY356AK

Ecological Dynamics of the Site:

This ecological site is on mountainous slopes in the alpine life zone. The soils consist of shallow, gravelly, well drained colluvium over residuum.

The ecological dynamics of this high-elevation ecological site are driven by long-term exposure to cold temperatures, wind, and a short growing season. The harsh climatic conditions and shallow, gravelly soils limit tree growth. The plant community is characterized by a steady state herbaceous and dwarf shrub community. One plant community phase of this site was observed.

State and Transition Model:



State ID Number:	1	**State Name:**	Reference state
State Narrative:	The reference state has one plant community phase. No observed at-risk community phases or alternative states were observed.		

Phase 1.1

Community Phase Number:	1.1	**Community Phase Name:**	Dwarf Shrub/Herbaceous

Community Phase Narrative:

This is the reference plant community. This ecological site is characterized by an herbaceous-dwarf shrub community interspersed with exposed bedrock and surface rock fragments. Bedrock cover is 10 to 70 percent, and surface rock fragment cover is as much as 50 percent. The plant community is dominantly dwarf shrub species such as bog blueberry (*Vaccinium uliginosum*), black crowberry *(Empetrum nigrum),* yellow mountainheath *(Phyllodoce glanduliflora),* western moss heather *(Cassiope mertensiana),* alpine azalea (*Loiseleuria procumbens*), lingonberry *(Vaccinium vitis-idaea), and* arctic willow (*Salix arctica*). Dwarf shrub cover generally is 35 to 45 percent. Lichen cover is 5 to 60 percent. Common lichens include star reindeer lichen *(Cladina stellaris),* greygreen reindeer lichen *(Cladina rangiferina),* snow lichen (*Stereocaulon*), reindeer lichen *(Cladina arbuscula),* cup lichen *(Cladonia squamosa, Cladonia gracilis),* and foliose lichens *(Peltigera)*. Forb cover generally is less than 10 percent with species such as redstem saxifrage *(Saxifraga lyallii),* dwarf fireweed *(Chamerion latifolium),* russethair saxifrage *(Saxifraga ferruginea),* partridgefoot *(Luetkea pectinata),* Eschscholtz's buttercup *(Ranunculus eschscholtzii),* ground cedar (*Lycopodium complanatum*), stiff clubmoss *(Lycopodium annotinum),* western oakfern (*Gymnocarpium dryopteris*), arctic starflower (*Trientalis europaea*), and arctic sweet coltsfoot (*Petasites frigidus*). Moss cover is minimal, but it may be as much as 30 percent in areas where lichen cover is minimal. Moss species include sphagnum (*Sphagnum capillifolium),* mountain fern moss (*Hylocomium splendens*), big red stem moss *(Pleurozium schreberi),* feather moss *(Rhytidiadelphus),* dicranum moss *(Dicranum scoparium),* and polytrichum moss *(Polytrichum commune)*.

Community Pathways

Pathway Number	**Pathway Name & Description**
Not applicable	No community pathways were observed.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, erosion properties, physical and chemical properties, total soil carbon, and pertinent soil and water features.

Engineering Properties

Table 5 gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number.

Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 250 millimeters in diameter and 75 to 250 millimeters in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Erosion Properties

Table 6 shows estimates of some erosion factors that affect the potential of a soil for various uses. These estimates are given for the layers of each soil for the K factor and as a single rating for the entire soil for the T factor, wind erodibility group, and wind erodibility index. Values are reported for each soil in the soil survey area. Estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Factor K quantifies soil detachment by runoff and rainfall. It is used to predict the long-term average soil loss from sheet and rill erosion by water in areas where cropping systems and conservation practices are used. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. The procedure for determining the Kf factor is given in “Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation” (USDA, 1997).

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments. If the total content of rock fragment in the layer is 15 percent or more, by volume, the Kw factor is less than the Kf factor.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size. Layers that do not have rock fragments are assigned the same value for the Kw factor and the Kf factor.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the “National Soil Survey Handbook,” which is available in local offices of the Natural Resources Conservation Service or on the Internet.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Physical Properties

Table 7 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^{1}/_{3}$- or $^{1}/_{10}$-bar (33-kPa or 10-kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ability of a soil to transmit water or air. The estimates in the table indicate the rate of water movement, in micrometers per second, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in centimeters of water per centimeter of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Chemical Properties

Table 8 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced saturated hydraulic conductivity (Ksat) and aeration, and a general degradation of soil structure.

Total Soil Carbon

Table 9 gives estimates of soil organic carbon (SOC) and soil inorganic carbon (SIC). Both are reported in kilograms per square meter to a depth of 2 meters or to a representative depth of either hard bedrock or a cemented horizon. Values are on a whole soil basis, corrected for rock fragments.

SOC is carbon (C) in soil that originated from a biological source, such as plants, animals, or micro-organisms. SIC is derived from a non-biological source. Calcium carbonate ($CaCO_3$) is the most common form of inorganic carbon in soils. SOC is in both organic and mineral soil layers. The term “soil organic carbon” refers only to the carbon in soil organic matter. Soil organic carbon makes up about one-half the weight of soil organic matter. The rest of soil organic matter is mostly oxygen, nitrogen, and hydrogen.

SOC can be an indicator of overall soil fertility and soil quality that affects ecosystem function. Soil organic matter is the main reservoir for most plant nutrients, such as phosphorus and nitrogen. Managing for SOC by managing for soil organic matter increases the content of these elements and improves soil resiliency.

Soil organic matter, the source of SOC, binds soil particles together and thus increases soil porosity and water infiltration and allows better root penetration and waterflow into the soil. Greater inflow of water reduces the hazard of erosion and the rate of surface water runoff.

Higher SOC levels improve not only the quality of soil but also the quality of air and water. Soil acts as a filter and improves water quality. Fertile soils that support plant life remove CO_2 from the atmosphere and increase oxygen levels through photosynthesis. Maintaining the level of SOC reduces the release of carbon into the atmosphere and thus can minimize the effects of global warming.

Soil Features

Table 10 gives estimates of various soil features. The estimates are used in land use planning.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Table 11 gives estimates of various water features. The estimates are used in land use planning.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which a water table, ponding, or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years.

Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and “very frequent” that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Data on the extent and level of flooding and the relationship of each soil to historic floods are also considered. Data on the extent of flooding based on soil data are less specific than data provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Use and Management of the Soils

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of about 152 to 213 centimeters. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Land Management

In tables 12 through 17, interpretive ratings are given for various aspects of land management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified aspect of land management. *Well suited* indicates that the soil has features that are favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified management aspect. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified management aspect or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified land management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

Rating class terms for soil rutting hazard, hazard of erosion, and hazard of erosion on roads and trails are expressed as slight, moderate, severe, and very severe. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for erosion is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils.

Planting

In table 12, the ratings for *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

The ratings for *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of planting equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Hazard of Erosion and Suitability for Roads

In table 13, the ratings for *hazard of erosion* are based on slope and on soil erosion factor K. The soil loss is caused by sheet or rill erosion in areas where 50 to 75 percent of the surface has been exposed by various kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

The ratings for *hazard of erosion on roads and trails* are based on the soil erosion factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

The ratings for *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Site Preparation

In table 14, the ratings for *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 meter is considered in the ratings.

The ratings for *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 30 centimeters is considered in the ratings.

Site Restoration

In table 15, the ratings for *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

The ratings for *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Source of Reclamation Material, Roadfill, and Topsoil

Table 16 gives information about the soils as potential sources of reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good, fair,* or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. Numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, and roadfill. The ratings are shown as decimal fractions ranging from 0.00 to 0.99. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 1.8 meters high and less exacting in design than higher embankments. The ratings are for the whole soil, from the surface to a depth of about 152 centimeters. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 102 centimeters of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Source of Gravel and Sand

Table 17 gives information about the soils as potential sources of gravel and sand. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. Only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of gravel or sand are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains gravel or sand, the soil is considered a likely source regardless of thickness. The assumption is that the gravel or sand layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 183 centimeters.

The soils are rated *good, fair,* or *poor* as potential sources of gravel and sand. A rating of good or fair means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of gravel or sand. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

Recreation

The soils in the survey area are rated in the tables according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

Camp and Picnic Areas

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings in table 18 are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Trail Management

Foot traffic and equestrian trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings in table 19 are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Mountain bike and off-road vehicle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, depth to a water table, ponding, slope, flooding, and texture of the surface layer.

Hydric Soils

Table 20 lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2010) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (USDA, 2010).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
    - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
    - B. are poorly drained or very poorly drained and have either:
        - 1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
        - 2) a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
        - 3) a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for periods of long or very long duration during the growing season.
4. Soils that are frequently flooded for periods of long or very long duration during the growing season.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field, or inferred from those observations, or from laboratory measurements. The categories are defined in the following paragraphs.

ORDER. 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 Inceptisol.

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 Cryept (*Cry*, meaning cold, plus *ept*, from Inceptisol).

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 Eutrocryepts (*Eutro*, meaning high base saturation, plus *cryept*, the suborder of the Inceptisols that have a cryic temperature regime).

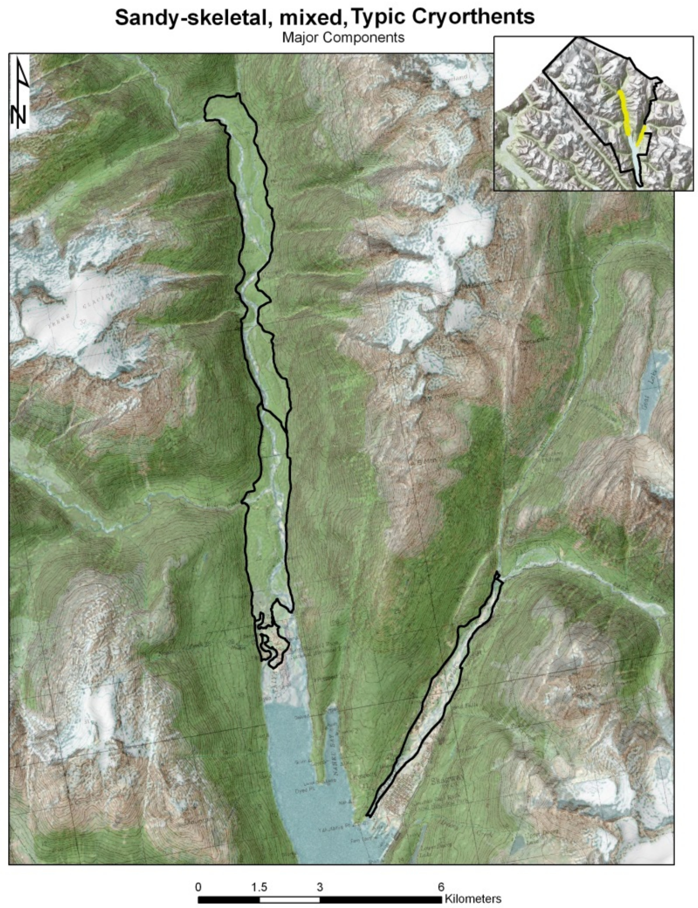
SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that 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. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Eutrocryepts.

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, thickness of the root zone, consistence, moisture equivalent, slope, cation-exchange activity classes, 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, superactive Typic Eutrocryepts.

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. Series are not used in this survey.

Table 21 gives the classification of the soils in the survey area.

22—Estuarine Graminoid Gravelly Coastal Plain



Depth class: Very deep
Drainage class: Well drained
Landform: Coastal plains
Parent material: Alluvium
Elevation: 2 to 20 meters
Slope: 0 to 3 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Sandy-skeletal, mixed Typic Cryorthents

Typical Pedon

22—Estuarine Graminoid Gravelly Coastal Plain on a 1-percent slope with beach ryegrass vegetation. (Colors are for moist soil.)

C1—0 to 48 centimeters; light olive brown (2.5Y 5/4) gravelly coarse sandy loam; 60 percent sand, 36 percent silt, and 4 percent clay; single grain; loose, nonsticky and nonplastic; common medium, fine, and very fine roots throughout; 25 percent gravel; neutral (pH 6.9); clear wavy boundary.

2C2—48 to 183 centimeters; variegated very gravelly coarse sand; 90 percent sand, 8 percent silt, and 2 percent clay; single grain; loose, nonsticky and nonplastic; 45 percent gravel; neutral (pH 7.0).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°29’49” north and longitude 135°21’21” west.

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Control section: Fine sand to coarse sand with 40 to 80 percent rock fragments

C horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6
Texture—gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand, very gravelly loamy sand
Content of clay—3 to 8 percent
Content of rock fragments—20 to 50 percent gravel
Reaction—neutral or slightly alkaline

2*C horizon:*
Color—variegated
Texture—very gravelly sand, extremely gravelly sand

Content of clay—1 to 3 percent
Content of rock fragments—45 to 80 percent gravel, 0 to 2 percent cobbles
Reaction—neutral or slightly alkaline

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Well drained; saturated hydraulic conductivity high in loamy layers and very high in sandy and gravelly layers; may be subject to rare flooding

Use

Recreation, wildlife habitat, source of gravel

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

Established

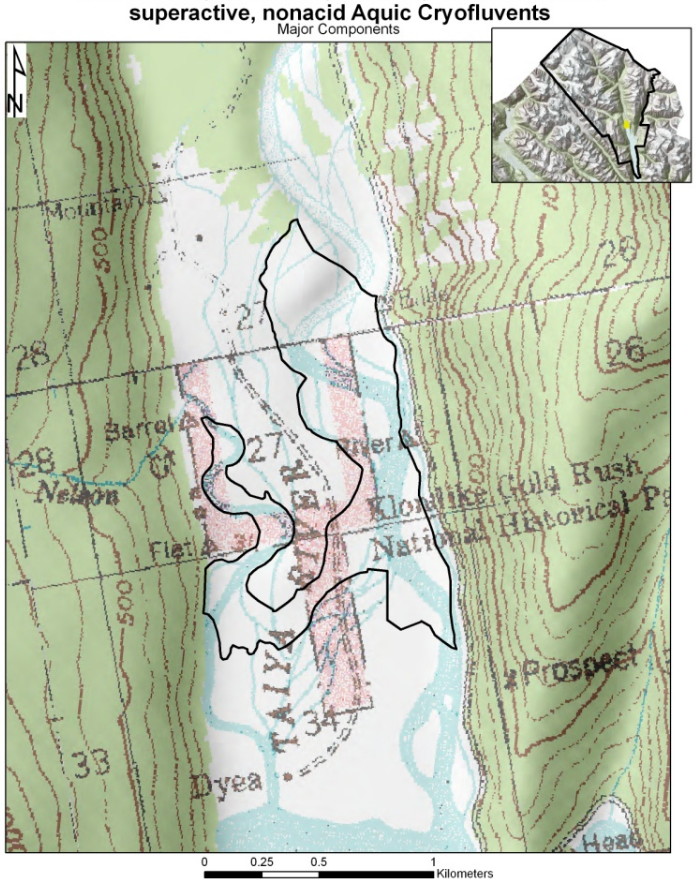
Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Weighted average particle size: Sandy-skeletal from 25 to 100 centimeters

22—Estuarine Graminoid Loamy Floodplains

Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Aquic Cryofluvents



Depth class: Very deep
Drainage class: Poorly drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 0 to 10 meters
Slope: 0 to 2 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Aquic Cryofluvents

Typical Pedon

22—Estuarine Graminoid Loamy Floodplains on a 1-percent slope with grass vegetation. (Colors are for moist soil, and textures are apparent field textures.)

A—0 to 2 centimeters; very dark brown (10YR 2/2) silt loam; 25 percent sand, 70 percent silt, and 5 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common coarse and medium and many fine roots throughout; neutral (pH 7.1); abrupt smooth boundary.

C1—2 to 25 centimeters; light olive brown (2.5Y 5/3) silt loam; 45 percent sand, 50 percent silt, and 5 percent clay; moderate medium angular blocky structure; friable, nonsticky and nonplastic; common fine, medium, and coarse roots throughout; 5 percent medium prominent strong brown (7.5YR 4/6) redoximorphic concentrations; neutral (pH 6.7); gradual smooth boundary.

C2—25 to 66 centimeters; olive brown (2.5Y 4/3), stratified silt loam; 36 percent sand, 58 percent silt, and 6 percent clay; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common medium and fine roots throughout; 5 percent medium faint irregular light olive brown (2.5Y 5/6) redoximorphic concentrations; slightly acid (pH 6.3); clear smooth boundary.

Cg—66 to 90 centimeters; dark gray (2.5Y 4/1) very fine sandy loam; 38 percent sand, 56 percent silt, and 6 percent clay; massive; friable, nonsticky and nonplastic; common fine roots throughout; slightly acid (pH 6.4); clear smooth boundary.

2C3—90 to 183 centimeters; variegated extremely gravelly coarse sand; 90 percent sand, 7 percent silt, and 3 percent clay; single grain; loose, nonsticky and nonplastic; 70 percent gravel and 5 percent cobbles; slightly alkaline (pH 7.4).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°29’47” north and longitude 135°21’12” west.

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Content of organic carbon: Decreases irregularly with depth
Depth to sand and gravel: 60 to 100 centimeters
Upper part of control section: More than 15 percent fine sand or coarser and less than 18 percent clay (weighted average)
*Lower part of control section: S*and that is less than 50 percent very fine sand

A horizon:
Color—hue of 10YR or 2.5Y, value of 2 to 3, chroma of 1 to 3
Texture—silt loam, very fine sandy loam
Content of clay—3 to 8 percent
Reaction—neutral or slightly alkaline

C horizon:
Color—hue of 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture—silt loam, very fine sandy loam
Content of clay—3 to 10 percent
Reaction—neutral or slightly alkaline

Cg horizon, where present:
Color—hue of 2.5Y, value of 4 or 5, chroma of 1 or 2
Texture—silt loam, very fine sandy loam
Content of clay—3 to 8 percent
Reaction—neutral or slightly alkaline

2*C horizon:*
Color—variegated
Texture—coarse sand
Content of clay—0 to 1 percent
Content of rock fragments—65 to 80 percent gravel and 5 to 20 percent cobbles
Reaction—slightly alkaline or moderately alkaline

Geographically Associated Soils

22—Estuarine Graminoid Loamy Floodplains, Depression

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Somewhat poorly drained; saturated hydraulic conductivity moderately high or high in the loamy layers and very high in the sandy and gravelly layers; may be subject to frequent flooding and occasional tidal inundation

Use

Wildlife habitat

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Content of organic carbon: Assumed irregular decrease with depth based on stratification and colors

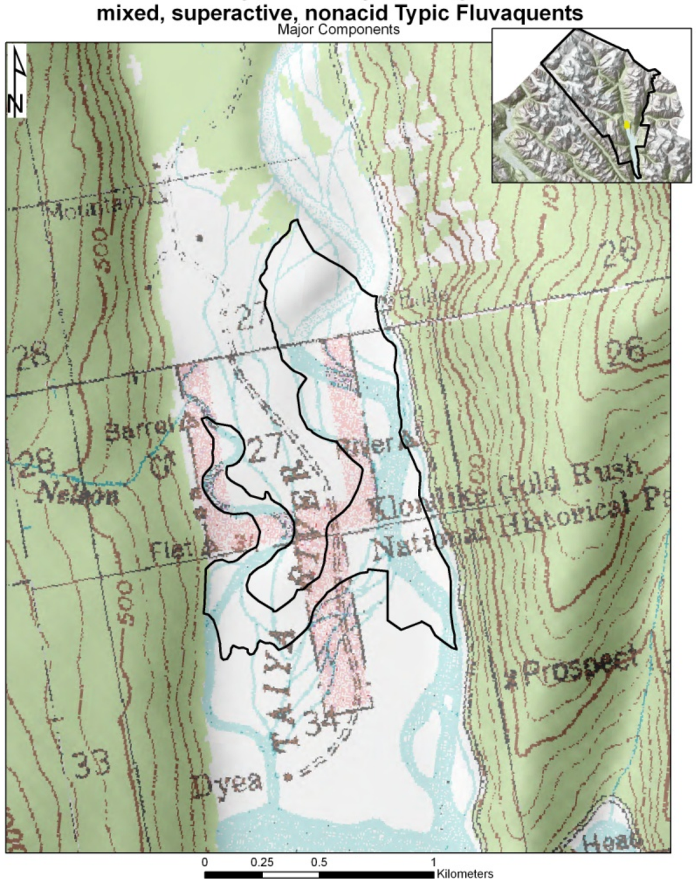
Reduced matrix: 66 to 90 centimeters

Depth to redoximorphic concentrations: 2 to 66 centimeters

Particle-size control section: Coarse-loamy from 25 to 90 centimeters and sandy-skeletal from 90 to 100 centimeters (weighted average)

22—Estuarine Graminoid Loamy Floodplains, Depression

Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Typic Fluvaquents



Depth class: Very deep
Drainage class: Very poorly drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 0 to 4 meters
Slope: 0 to 2 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Typic Fluvaquents

Typical Pedon

22—Estuarine Graminoid Loamy Floodplains, Depression, on a 1-percent slope with grass sedge vegetation. (Colors are for moist soil, and textures are apparent field textures.)

C—0 to 23 centimeters; light olive brown (2.5Y 5/4) silt loam; 40 percent sand, 53 percent silt, and 7 percent clay; massive; friable, nonsticky and nonplastic; many medium and common fine roots; common fine prominent yellowish brown (10YR 5/6) redoximorphic concentrations with sharp boundaries along root channels and common fine faint irregular dark gray (2.5Y 4/1) redoximorphic depletions; 5 percent gravel; electrical conductivity 104 millimhos per centimeter; slightly alkaline (pH 7.4); clear smooth boundary.

Cg—23 to 43 centimeters; dark gray (2.5Y 4/1) silt loam; 42 percent sand, 52 percent silt, and 6 percent clay; massive; friable, nonsticky and nonplastic; common medium and fine roots; common medium strong brown (7.5YR 4/6) redoximorphic concentrations; 10 percent gravel; electrical conductivity 96 millimhos per centimeter; slightly alkaline (pH 7.5); clear smooth boundary.

2C—43 to 183 centimeters; brown (7.5YR 4/4) extremely gravelly coarse sand; 90 percent sand, 7 percent silt, and 3 percent clay; single grain; loose, nonsticky and nonplastic; 80 percent gravel and 5 percent cobbles; electrical conductivity 227 millimhos per centimeter; slightly alkaline (pH 7.8).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°29’47” north and longitude 135°21’10” west.

Range in Characteristics

Soil moisture class: Aquic
Annual soil temperature: 1 to 3 degrees C
Content of organic carbon: Decreases irregularly with depth
Depth to sand and gravel: 30 to 50 centimeters

Upper part of control section: More than 15 percent fine sand or coarser and less than 18 percent clay (weighted average)
Lower part of control section: Sand that is less than 50 percent very fine sand

C horizon:
Color—hue of 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture—silt loam, very fine sandy loam
Content of clay—3 to 10 percent
Content of rock fragments—0 to 7 percent gravel
Reaction—neutral or slightly alkaline

Cg horizon (where present):
Color—hue of 2.5Y, value of 4 or 5, chroma of 1 or 2
Texture—silt loam
Content of clay—3 to 8 percent
Content of rock fragments—0 to 10 percent gravel
Reaction—extremely acid to neutral

2*C horizon:*
Color—hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture—coarse sand
Content of clay—0 to 1 percent
Content of rock fragments—65 to 80 percent gravel, 5 to 20 percent cobbles
Reaction—pH 5.6 to 7.7

Geographically Associated Soils

22—Estuarine Graminoid Loamy Floodplains

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Very poorly drained; saturated hydraulic conductivity moderately high or high in the loamy layers and very high in the sandy and gravelly layers; may be subject to frequent flooding, ponding, and tidal inundation

Use

Wildlife habitat

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

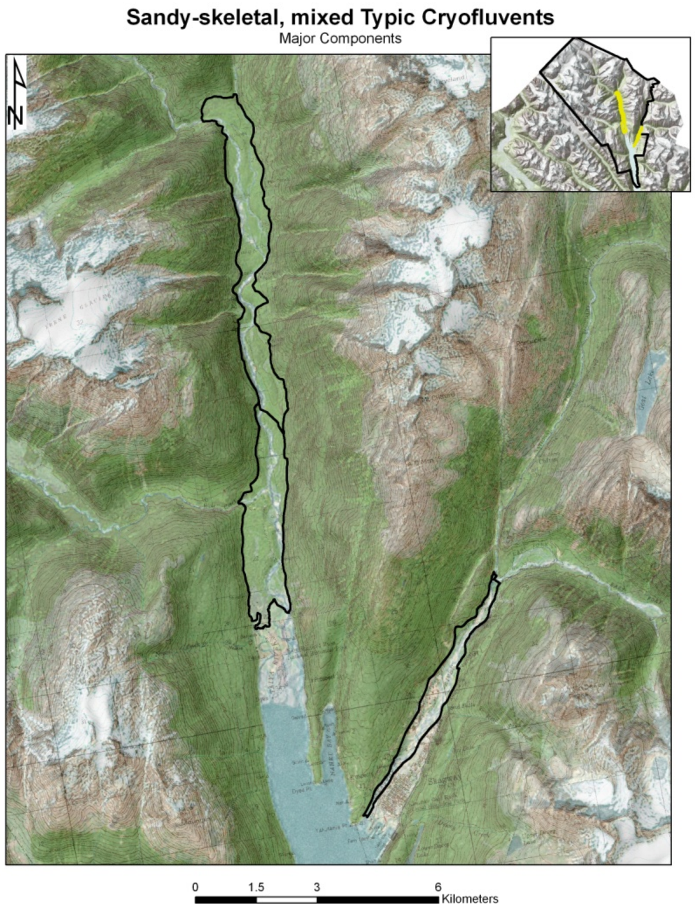
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Content of organic carbon: Assumed irregular decrease with depth based on stratification and color
Aquic conditions: 0 to 43 centimeters
Reduced matrix: 23 to 43 centimeters
Redoximorphic concentrations: 0 to 43 centimeters
Particle-size control section: Coarse-loamy from 25 to 43 centimeters and sandy-skeletal from 43 to 100 centimeters (weighted average)

22—Maritime Forest Gravelly Floodplains, Occasionally Flooded



Depth class: Very deep
Drainage class: Well drained or moderately well drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 2 to 130 meters
Slope: 0 to 3 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Sandy-skeletal, mixed Typic Cryofluvents

Typical Pedon

22—Maritime Forest Gravelly Floodplains, Occasionally Flooded, on a 1-percent slope with cottonwood forest and alder and pyrola understory. (Colors are for moist soil.)

O—0 to 3 centimeters; dark brown (7.5YR 3/4) slightly decomposed plant material; common very fine and fine roots; moderately acid (pH 5.9); abrupt smooth boundary.
A—3 to 10 centimeters; dark grayish brown (10YR 4/2), stratified sandy loam; 54 percent sand, 40 percent silt, and 6 percent clay; weak fine subangular blocky structure;

friable, nonsticky and nonplastic; common fine, medium, and coarse roots; 5 percent gravel; neutral (pH 6.9); clear smooth boundary.

C1—10 to 22 centimeters; light yellowish brown (2.5Y 6/3), stratified fine sandy loam; 60 percent sand, 34 percent silt, and 6 percent clay; weak medium angular blocky structure; friable, nonsticky and nonplastic; common fine, medium, and coarse roots; 5 percent gravel; neutral (pH 6.9); abrupt smooth boundary.

2C2—22 to 183 centimeters; light yellowish brown (2.5Y 6/3) gravelly loamy sand; weak medium angular blocky structure; very friable, nonsticky and nonplastic; common medium and coarse roots; 35 percent (many) medium distinct irregular light olive brown (2.5Y 5/6) masses of oxidized iron that are clear in matrix and 30 percent (many) medium prominent irregular gray (2.5Y 5/1) masses of reduced iron that are clear in matrix; 30 percent gravel, 5 percent cobbles, and 1 percent stones; neutral (pH 6.7).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°32’35” north and longitude 135°20’8” west.

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 3 to 9 centimeters
Content of organic carbon: Decreases irregularly with depth

Depth to skeletal material: 3 to 45 centimeters
Control section: Sandy-skeletal from 25 to 100 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Content of organic matter—50 to 100 percent
Reaction—extremely acid to moderately acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 5, chroma of 1 or 3
Texture—sandy loam, highly organic sandy loam, highly organic silt loam, silt loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 7 percent gravel and 0 to 7 percent cobbles
Reaction—extremely acid to slightly acid

C horizon (*where present):*
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; or variegated
Texture—sandy loam, silt loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 7 percent gravel and 0 to 7 percent cobbles
Reaction—extremely acid to slightly acid

2*C horizon:*
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; or variegated
Texture—very cobbly loamy sand, extremely cobbly sand, cobbly sand, very gravelly sand, very gravelly sand, gravelly loamy sand
Content of clay—0 to 3 percent
Content of rock fragments—10 to 50 percent gravel, 5 to 50 percent cobbles, and 0 to 2 percent stones
Reaction—extremely acid to slightly acid

Geographically Associated Soils

22—Maritime Forest Gravelly Floodplains, Rarely Flooded; 22—Maritime Riverwash, Gravelly; 22—Maritime Water, Flowing; 22—Maritime Scrub Gravelly Floodplains; 22—Maritime Scrub Gravelly Floodplains, Depression

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Well drained or moderately well drained; saturated hydraulic conductivity moderately high or very high in the organic layer, high in the loamy layer, and very high in the sandy and gravelly layers; may be subject to occasional flooding

Use and Vegetation

Forestry, recreation, wildlife habitat, and source of gravel; cottonwood forest with alder and pyrola

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

Established

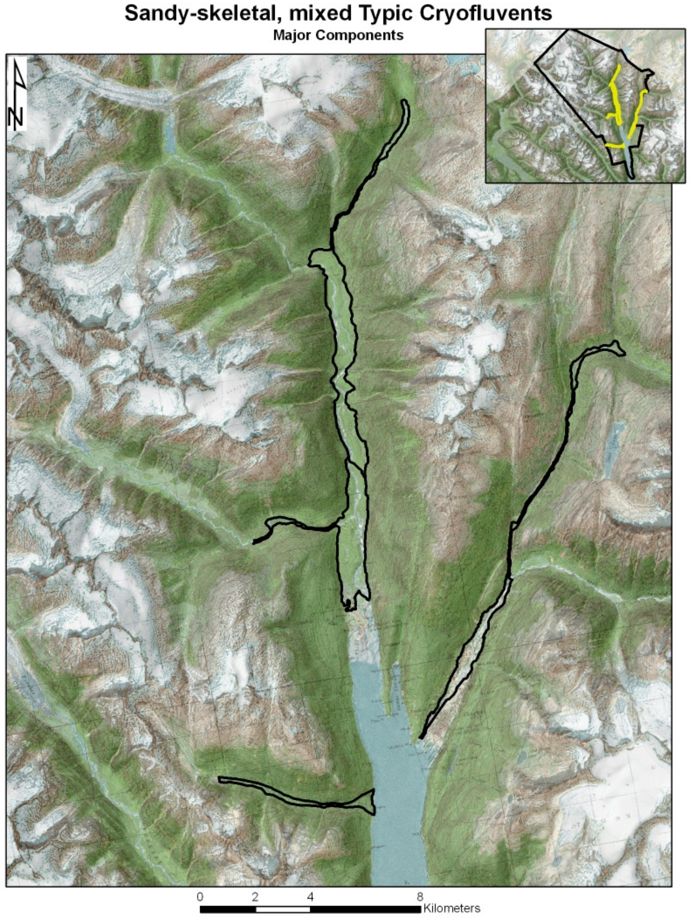
Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Ochric epipedon: 3 to 10 centimeters
Content of organic carbon: Assumed irregular decrease with depth based on stratification and color
Weighted average particle size: Sandy-skeletal from 25 to 100 centimeters

22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded

Sandy-skeletal, mixed Typic Cryofluvents
Major Components



Depth class: Very deep
Drainage class: Well drained or moderately well drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 5 to 500 meters
Slope: 1 to 5 percent
Annual precipitation: 711 to 1,244 millimeters
Annual temperature: 2 to 5 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Sandy-skeletal, mixed Typic Cryofluvents

Typical Pedon

22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded, on a 1-percent slope with cottonwood forest and alder and pyrola understory. (All colors are for moist soil.)

Oe—0 to 8 centimeters; black (7.5YR 2.5/1) moderately decomposed plant material; common coarse, medium, and fine and many very fine roots throughout; very strongly acid (pH 5).

AC—8 to 26 centimeters; very dark grayish brown (10YR 3/2) gravelly fine sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; moderate medium subangular blocky structure; friable, nonsticky and nonplastic; common coarse, medium, and fine roots throughout; 20 percent gravel; moderately acid (pH 5.8).

C—23 to 183 centimeters; brown (10YR 5/3) extremely bouldery sand; 92 percent sand, 7 percent silt, and 1 percent clay; massive; very friable, nonsticky and nonplastic; common medium and fine roots throughout; 10 percent gravel, 20 percent cobbles, 5 percent stones, and 50 percent boulders; slightly acid (pH 6.1).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°39’14” north and longitude 135°25’7” west.

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 3 to 9 centimeters
Content of organic carbon: Decreases irregularly with depth
Depth to skeletal material: 3 to 45 centimeters
*Control section: S*andy-skeletal from 25 to 100 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Content of organic matter—50 to 100 percent
Reaction—extremely acid to moderately acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 5, chroma of 1 or 3
Texture—highly organic gravelly sandy loam, highly organic very gravelly sandy loam, very gravelly sandy loam, gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—16 to 40 percent gravel
Reaction—extremely acid to slightly acid

C horizon
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—extremely bouldery coarse sand, very bouldery coarse sand, extremely stony coarse sand, very stony coarse sand
Content of clay—0 to 3 percent
Content of rock fragments—10 to 20 percent gravel, 20 to 40 percent cobbles, 0 to 5 percent stones, 9 to 50 percent boulders
Reaction—extremely acid to slightly acid

Geographically Associated Soils

D22—Maritime Riverwash, Bouldery; D22—Maritime Water, Flowing

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Well drained or moderately well drained; saturated hydraulic conductivity moderately high to very high in the organic layer, high in the loamy layer, and very high in the sandy and gravelly layers; may be subject to occasional flooding

Use and Vegetation

Forestry, recreation, wildlife habitat, source of gravel; cottonwood forest with alder and pyrola understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

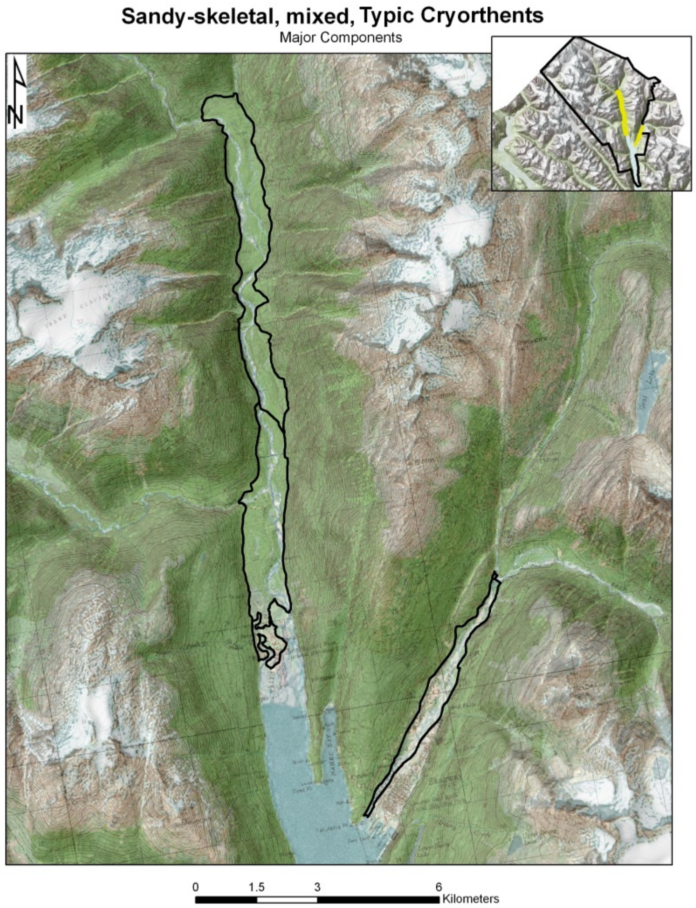
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Ochric epipedon: 8 to 26 centimeters
Content of organic carbon: Assumed irregular decrease with depth based on stratification and color
Weighted average particle size: Sandy-skeletal from 25 to 100 centimeters

22—Maritime Forest Gravelly Floodplains, Rarely Flooded



Depth class: Very deep
Drainage class: Well drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 2 to 130 meters
Slope: 0 to 3 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Sandy-skeletal, mixed Typic Cryorthents

Typical Pedon

22—Maritime Forest Gravelly Floodplains, Rarely Flooded, on a 1-percent slope with Sitka spruce and cottonwood forest and viburnum and fern understory. (Colors are for moist soil.)

Oi—0 to 5 centimeters; dark brown (10YR 3/3) slightly decomposed plant material; common medium, fine, and very fine roots throughout; slightly acid (pH 6.3); abrupt smooth boundary.

A—5 to 12 centimeters; black (10YR 2/1) fine sandy loam; 65 percent sand, 29 percent silt, and 6 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common medium, fine, and coarse roots throughout; 5 percent gravel; slightly alkaline (pH 7.0); abrupt smooth boundary.

C1—12 to 29 centimeters; olive brown (2.5Y 4/4), stratified fine sandy loam; 69 percent sand, 27 percent silt, and 4 percent clay; weak fine subangular blocky structure; friable, nonsticky and nonplastic; common fine, many medium, and common coarse roots throughout; 10 percent gravel; neutral (pH 6.6); abrupt smooth boundary.

2C2—29 to 183 centimeters; variegated, stratified very gravelly coarse sand; 92 percent sand, 6 percent silt, and 2 percent clay; single grain; loose, nonsticky and nonplastic; common coarse roots throughout; 40 percent gravel, 5 percent cobbles, and 1 percent stones; neutral (pH 6.8).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°32’15” north and longitude 135°20’43” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 0 to 8 centimeters
Depth to sand and gravel: 0 to 25 centimeters
Control section: Fine sand to coarse sand with 36 to 60 percent rock fragments

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Content of organic matter—50 to 100 percent
Reaction—moderately acid or slightly acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1 or 2
Texture—highly organic silt loam, highly organic very fine sandy loam, silt loam, very fine sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—3 to 10 percent gravel
Reaction—moderately acid to neutral

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6
Texture—silt loam, very fine sandy loam, fine sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 14 percent gravel
Reaction—moderately acid to neutral

2*C horizon:*
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—very gravelly coarse sand, very gravelly loamy coarse sand
Content of clay—2 to 5 percent
Content of rock fragments—30 to 40 percent gravel, 5 to 10 percent cobbles, 1 to 5 percent stones
Reaction—moderately acid to neutral

Geographically Associated Soils

22—Maritime Scrub Gravelly Floodplains, Frequently Flooded; 22—Maritime Forest Gravelly Floodplains, Occasionally Flooded

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Well drained; saturated hydraulic conductivity high in the loamy layers and very high in the sandy and gravelly layers; may be subject to rare periods of flooding

Use

Urban development, forestry, recreation, wildlife habitat, source of gravel

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

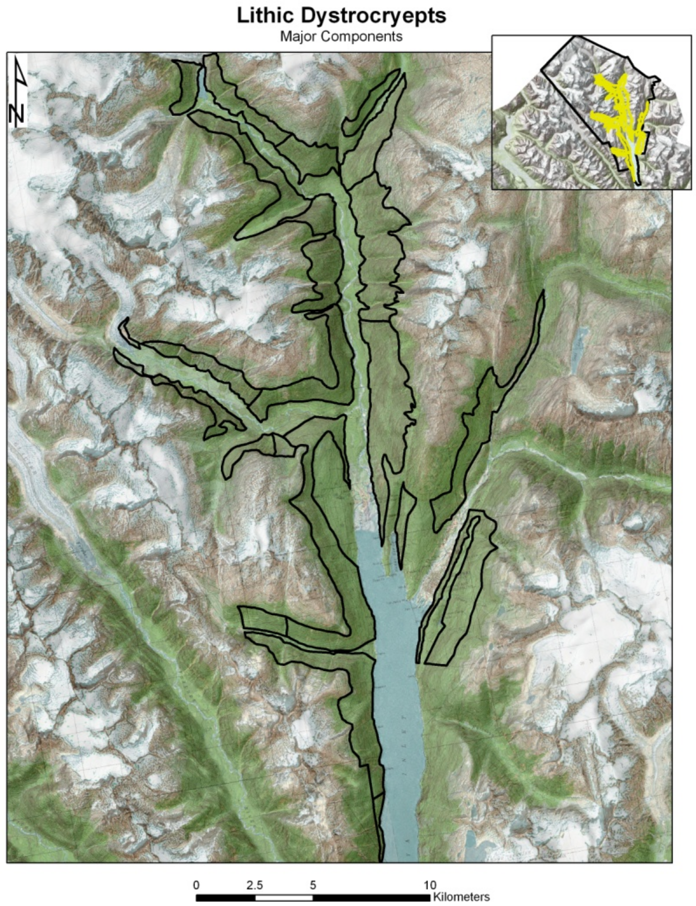
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Ochric epipedon: 5 to 12 centimeters
Weighted average particle size: Sandy-skeletal from 25 to 100 centimeters

22—Maritime Forest Gravelly Slopes, Shallow



Depth class: Shallow or moderately deep
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Gravelly colluvium over bedrock
Elevation: 0 to 1,080 meters
Slope: 50 to 90 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Taxonomic Family

- Loamy-skeletal, mixed, superactive Lithic Dystrocryepts

Typical Pedon

D22—Maritime Forest Gravelly Slopes, Shallow, on a 53-percent slope with lodgepole pine and western hemlock forest and moss and lichen understory (Colors are for moist soil.)

Oi—0 to 7 centimeters; very dark brown (7.5YR 2.5/2) slightly decomposed plant material; many medium and fine roots; extremely acid (pH 4.1); abrupt smooth boundary.

A—7 to 10 centimeters; dark brown (10YR 3/3) very gravelly sandy loam; 60 percent sand, 35 percent silt, and 5 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common coarse and many medium and fine roots; 30 percent gravel and 10 percent cobbles; very strongly acid (pH 4.5); abrupt irregular boundary.

Bw—10 to 35 centimeters; 70 percent brownish yellow (10YR 6/6) and 30 percent strong brown (7.5YR 4/6) very gravelly sandy loam; 60 percent sand, 35 percent silt, and 5 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common coarse, medium, and fine roots; 30 percent gravel, 20 percent cobbles, and 1 percent stones; extremely acid (pH 4.4); abrupt broken boundary.

R—35 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°27’6.34” north and longitude 135°18’28.62” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 3 to 12 centimeters
Thickness of solum: 29 to 50 centimeters
Control section: Loamy-skeletal from 25 to 65 centimeters
Depth to bedrock: 30 to 65 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid or very strongly acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—highly organic gravelly sandy loam, highly organic very gravelly sandy loam, highly organic cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 40 percent gravel, 5 to 15 percent cobbles, 0 to 2 percent stones
Reaction—ultra acid or extremely acid

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, chroma of 3 to 6
Texture—gravelly sandy loam, very gravelly sandy loam, cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—30 to 50 percent gravel, 5 to 20 percent cobbles, 1 to 3 percent stones
Reaction—extremely acid or very strongly acid

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—gravelly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—15 to 55 percent gravel, 5 to 14 percent cobbles, 1 to 14 percent stones
Reaction—very strongly acid to moderately acid

Geographically Associated Soils

22—Maritime Forest Organic Slopes, Dry; 22—Maritime Forest Organic Slopes, Depression

Drainage Class and Saturated Hydraulic Conductivity

Well drained or moderately well drained; saturated hydraulic conductivity moderately high to very high in organic layer and high or very high in subsurface layers

Use and Vegetation

Forestry, urban development, recreation, wildlife habitat; lodgepole pine and western hemlock forest with moss and lichen understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

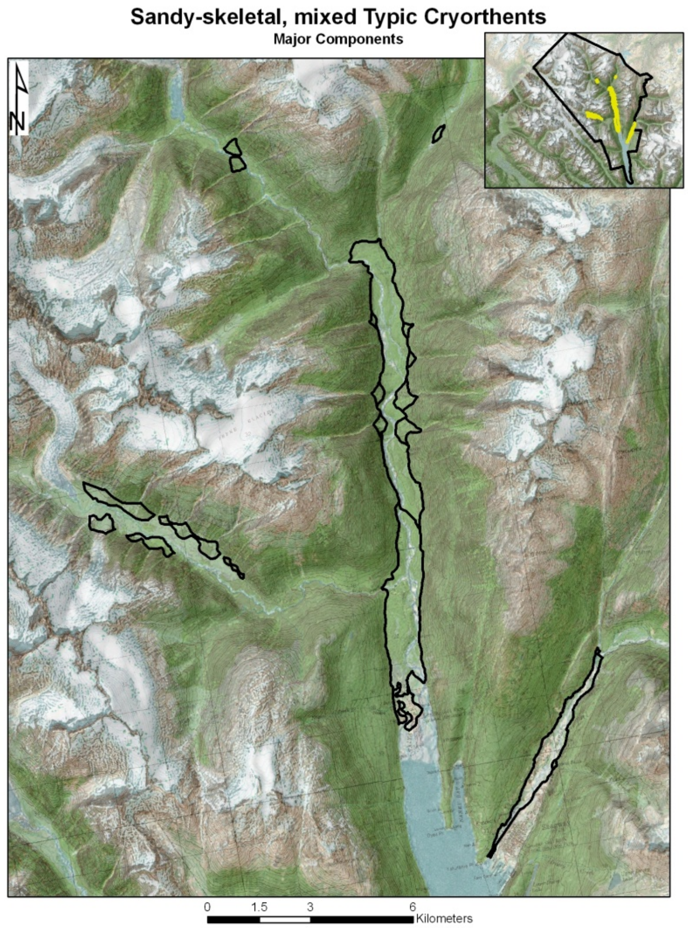
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Ochric epipedon: 7 to 10 centimeters
Cambic horizon: 10 to 35 centimeters
Depth to bedrock: 35 centimeters
Control section: Loamy-skeletal from 25 to 35 centimeters

22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace



Depth class: Very deep
Drainage class: Well drained or moderately well drained
Landform: Alluvial fan terraces
Parent material: Alluvium
Elevation: 40 to 355 meters
Slope: 10 to 30 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Taxonomic Family

- Sandy-skeletal, mixed Typic Cryorthents

Typical Pedon

22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace, on a 15-percent slope with Sitka spruce, western hemlock, rusty menziesia, and feather moss. (Colors are for moist soil.)

Oi—0 to 3 centimeters; dark brown (7.5YR 3/4) slightly decomposed plant material; common very fine, fine, and medium roots; 3 percent gravel and 3 percent cobbles; extremely acid (pH 4.0); abrupt smooth boundary.
A—3 to 11 centimeters; very dark gray (10YR 3/1) gravelly fine sandy loam; 60 percent sand, 35 percent silt, and 5 percent clay; weak fine subangular blocky structure;

friable, nonsticky and nonplastic; common very fine, many fine and medium, and common coarse and very coarse roots; 16 percent gravel; very strongly acid (pH 4.5); abrupt smooth boundary.

C1—11 to 36 centimeters; olive brown (2.5Y 4/4) very cobbly sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common very fine and fine, many medium, and common coarse and very coarse roots; 20 percent gravel, 25 percent cobbles, and 5 percent stones; strongly acid (pH 5.1); clear smooth boundary.

C2—36 to 183 centimeters; olive brown (2.5Y 4/3) very cobbly loamy sand; 70 percent sand, 25 percent silt, and 5 percent clay; single grain; loose, nonsticky and nonplastic; common fine, coarse, and medium roots; 20 percent gravel, 25 percent cobbles, and 5 percent stones; moderately acid, pH 5.6.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°34’23” north and longitude 135°19’59” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 2 to 19 centimeters
Thickness of solum: 50 to 65 centimeters

Depth to skeletal material: 2 to 20 centimeters
Control section: Loamy-skeletal sandy loam with 40 to 60 percent rock fragments

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid to slightly acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—sandy loam, gravelly sandy loam, highly organic sandy loam, highly gravelly organic sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—16 to 40 percent gravel
Reaction—extremely acid to slightly acid

C horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—extremely cobbly sand, very cobbly sand
Content of clay—1 to 5 percent
Content of rock fragments—10 to 20 percent gravel, 25 to 40 percent cobbles, 1 to 5 percent stones
Reaction—strongly acid to neutral

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity high or very high

Use

Recreation, wildlife habitat

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

Established

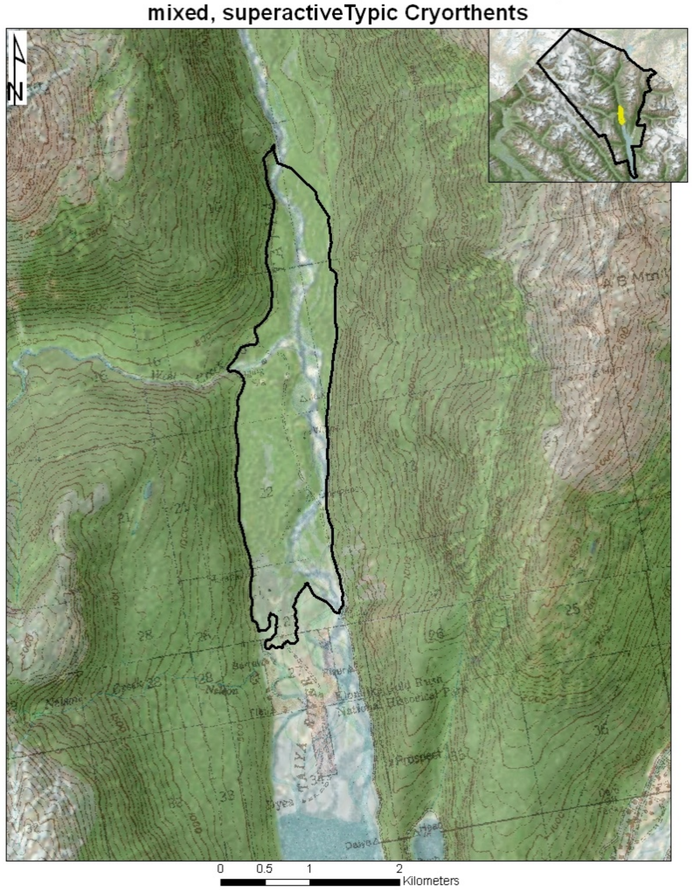
Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Weighted average particle size: Loamy-skeletal from 25 to 100 centimeters

22—Maritime Forest Loamy Floodplains, Rarely Flooded

Coarse-loamy over sandy or sandy-skeletal, mixed, superactiveTypic Cryorthents



Depth class: Very deep
Drainage class: Well drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 2 to 130 meters
Slope: 0 to 3 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Coarse-loamy over sandy or sandy-skeletal, mixed, superactive Typic Cryorthents

Typical Pedon

22—Maritime Forest Loamy Floodplains, Rarely Flooded, on a 1-percent slope with Sitka spruce and cottonwood forest and viburnum and fern understory. (Colors are for moist soil.)

Oi—0 to 5 centimeters; very dark brown (7.5YR 2.5/2) slightly decomposed plant material; many fine and common medium and coarse roots; moderately acid (pH 6.0); abrupt smooth boundary.

C1—5 to 24 centimeters; dark grayish brown (2.5Y 4/2) silt loam; 17 percent sand, 80 percent silt, and 3 percent clay; massive; very friable, nonsticky and nonplastic; common fine roots; 3 percent gravel; slightly acid (pH 6.5); abrupt smooth boundary.

C2—24 to 46 centimeters; brown (10YR 4/3) sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; weak medium subangular blocky structure; very friable, nonsticky and nonplastic; 5 percent (common) fine distinct irregular noncemented gray (7.5YR 5/1) iron depletions that are clear in matrix; 5 percent gravel; neutral (pH 6.7); clear smooth boundary.

2C3—46 to 183 centimeters; variegated very gravelly loamy sand; 80 percent sand, 18 percent silt, and 2 percent clay; single grain; loose, nonsticky and nonplastic; 40 percent gravel and 10 percent cobbles; 1 percent stones; slightly acid (pH 6.3).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°32’15” north and longitude 135°20’43” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 0 to 8 centimeters
Depth to sand and gravel: 0 to 25 centimeters
Control section: Fine sand to coarse sand with 36 to 60 percent rock fragments

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Content of organic matter—50 to 100 percent
Reaction—moderately acid or slightly acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1 or 2
Texture—highly organic silt loam, highly organic very fine sandy loam, silt loam, very fine sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—3 to 10 percent gravel
Reaction—moderately acid to neutral

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6
Texture—silt loam, very fine sandy loam, fine sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—3 to 10 percent gravel
Reaction—moderately acid to neutral

2*C horizon:*
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—very gravelly coarse sand, very gravelly loamy coarse sand
Content of clay—2 to 5 percent
Content of rock fragments—30 to 40 percent gravel, 5 to 10 percent cobbles, 1 to 5 percent stones
Reaction—moderately acid to neutral

Geographically Associated Soils

22—Maritime Scrub Gravelly Floodplains, Frequently Flooded; 22—Maritime Forest Gravelly Floodplains, Occasionally Flooded; 22—Maritime Forest Gravelly Floodplains, Rarely Flooded

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Well drained; saturated hydraulic conductivity moderate to high in the loamy layers and very high in the sandy and gravelly layers; may be subject to rare flooding

Use

Urban development, forestry, recreation, wildlife habitat, source of gravel

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

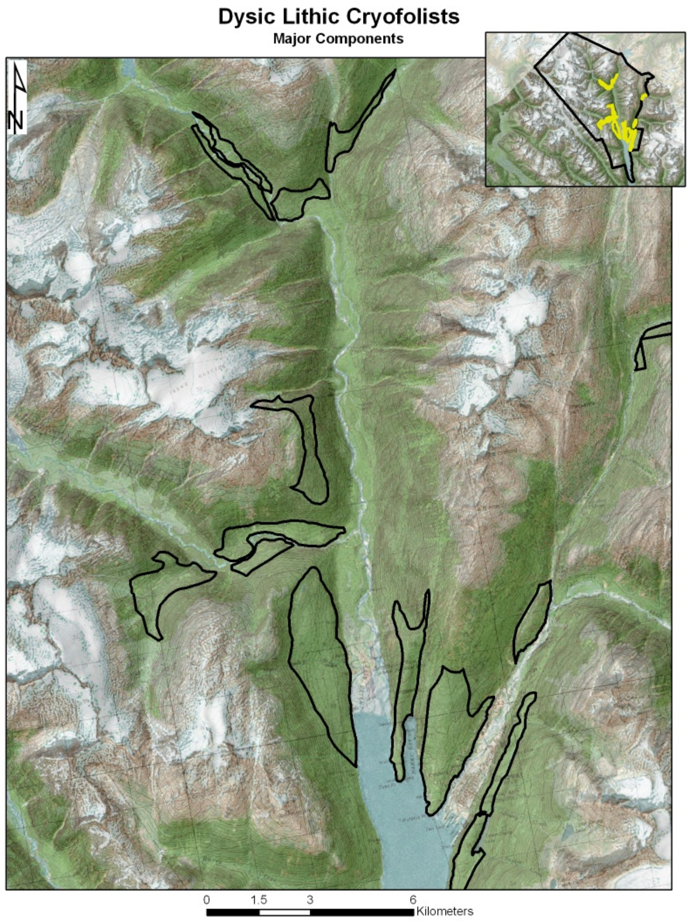
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Ochric epipedon: 5 to 12 centimeters
Weighted average particle size: Coarse-loamy from 25 to 46 centimeters, sandy-skeletal from 46 to 100 centimeters

22—Maritime Forest Organic Slopes, Dry



Depth class: Very shallow or shallow
Drainage class: Well drained
Landform: Mountains
Parent material: Organic material
Elevation: 0 to 1,080 meters
Slope: 50 to 100 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Subgroup

- Dysic Lithic Cryofolists

Typical Pedon

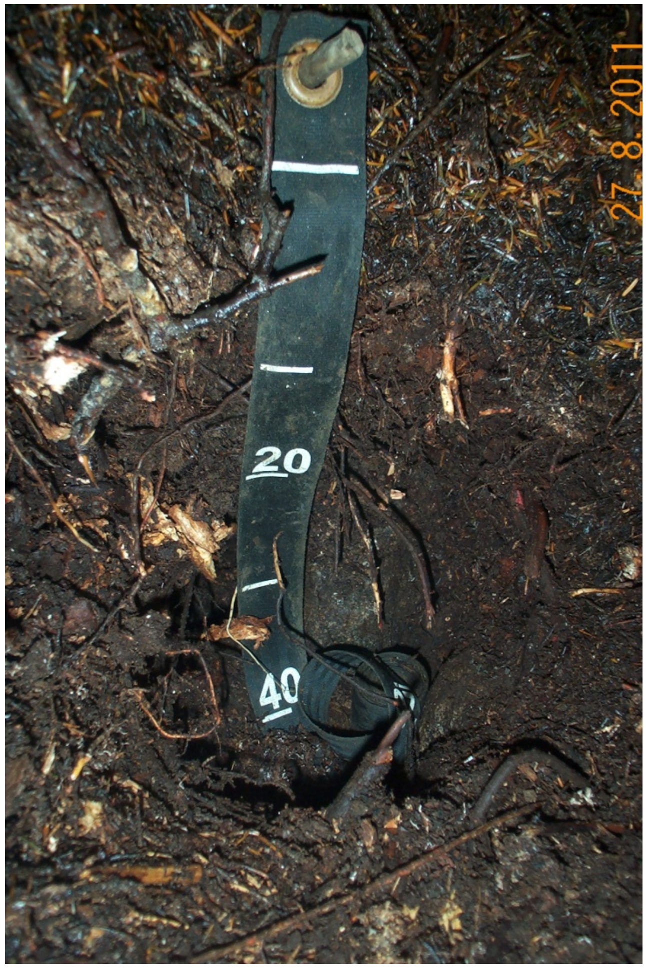
22—Maritime Forest Organic Slopes, Dry, on a 50-percent slope with western hemlock and Sitka spruce forest and feather moss understory. (Colors are for moist soil.)

Oi—0 to 7 centimeters; very dark brown (7.5YR 2.5/2) slightly decomposed plant material; common medium and fine roots throughout; extremely acid (pH 4.1); abrupt wavy boundary.

Oe—7 to 22 centimeters; black (7.5YR 2.5/1) moderately decomposed plant material; many fine and medium and common very fine and coarse roots throughout; extremely acid (pH 4.1); gradual wavy boundary.

OC—22 to 36 centimeters; black (7.5YR 2.5/1) extremely stony moderately decomposed plant material; common medium and fine roots; 5 percent gravel, 10 percent cobbles, and 50 percent stones; extremely acid (pH 4.1).

R—36 to 183 centimeters; diorite.



Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°39’14” north and longitude 135°24’35” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic layer: 14 to 36 centimeters

O horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 or 2
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid or very strongly acid

C horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 to 5, chroma of 1 or 3
Texture—very stony sandy loam, extremely stony sandy loam
Content of clay—3 to 8 percent

Content of rock fragments—5 to 15 percent gravel, 1 to 10 percent cobbles, 10 to 50 percent stones
Reaction—extremely acid or very strongly acid

Geographically Associated Soils

22—Maritime Forest Gravelly Slopes, Shallow

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity moderately high to very high in the organic layers and high or very high in the loamy layer

Use and Vegetation

Recreation, wildlife habitat; western hemlock and Sitka spruce forest with feather moss understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; extensive throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

Established

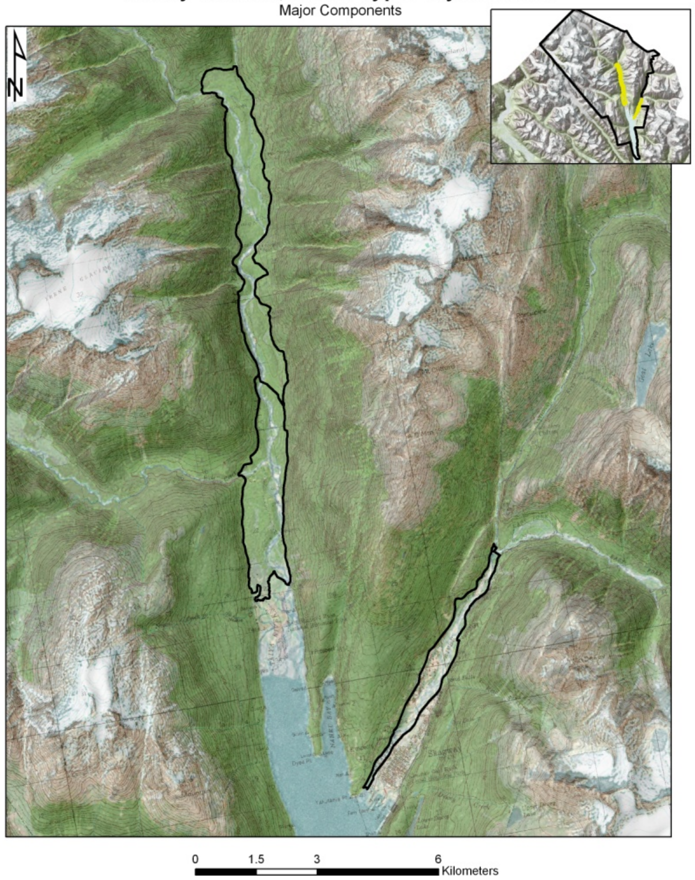
Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Organic material: 0 to 36 centimeters
Depth to lithic contact: 36 centimeters
pH of organic layers: Less than 4.5 (0.01M CaCl)

22—Maritime Scrub Gravelly Floodplains, Depression

Sandy-skeletal, mixed Typic Cryofluvents
Major Components



Depth class: Very deep
Drainage class: Moderately well drained
Landform: Depressions of flood plains
Parent material: Alluvium
Elevation: 0 to 130 meters
Slope: 0 to 2 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Sandy-skeletal, mixed Typic Cryofluvents

Typical Pedon

22—Maritime Scrub Gravelly Floodplains, Depression, on a 1-percent slope with alder vegetation. (Colors are for moist soil.)

A—0 to 16 centimeters; black (7.5YR 2.5/1) highly organic very cobbly fine sandy loam; 60 percent sand, 35 percent silt, and 5 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; 20 percent gravel, 40 percent cobbles, and 1 percent stones; neutral (pH 7); clear smooth boundary.

C1—16 to 30 centimeters; 70 percent strong brown (7.5YR 4/6) and 30 percent dark brown (7.5YR 3/4) extremely cobbly coarse sand; 90 percent sand, 7 percent silt, and 3 percent clay; single grain; loose, nonsticky and nonplastic; common medium and fine roots; 20 percent gravel, 60 percent cobbles, and 1 percent stones; neutral (pH 7.2); clear smooth boundary.

C2—30 to 183 centimeters; variegated extremely cobbly coarse sand; 90 percent sand, 7 percent silt, and 3 percent clay; single grain; loose, nonsticky and nonplastic; 20 percent gravel, 60 percent cobbles, and 7 percent stones; slightly alkaline (pH 7.5).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°27’58.39” north and longitude 135°18’36.14” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Content of organic carbon: Decreases irregularly with depth
Control section: Fine sand to coarse sand with 36 to 90 percent rock fragments

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1or 2
Texture—very cobbly fine sandy loam, extremely cobbly fine sandy loam, extremely gravelly fine sandy loam, highly organic very cobbly fine sandy loam, highly organic extremely cobbly fine sandy loam, highly organic extremely gravelly fine sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 30 percent gravel, 25 to 50 percent cobbles, 0 to 2 percent stones
Reaction—neutral or slightly alkaline

C horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, chroma of 3 to 6; variegated
Texture—very cobbly coarse sand, extremely cobbly coarse sand
Content of clay—2 to 5 percent
Content of rock fragments—15 to 30 percent gravel, 20 to 70 percent cobbles, 1 to 7 percent stones
Reaction—neutral to moderately alkaline

Geographically Associated Soils

22—Maritime Scrub Gravelly Floodplains, Frequently Flooded; 22—Maritime Forest Gravelly Floodplains, Occasionally Flooded; 22—Maritime Forest Gravelly Floodplains, Rarely Flooded

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Moderately well drained; saturated hydraulic conductivity high in loamy layers and very high in sandy and gravelly layers; may be subject to occasional flooding and ponding

Use

Wildlife habitat, recreation, source of gravel, depressions commonly filled for urban development

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

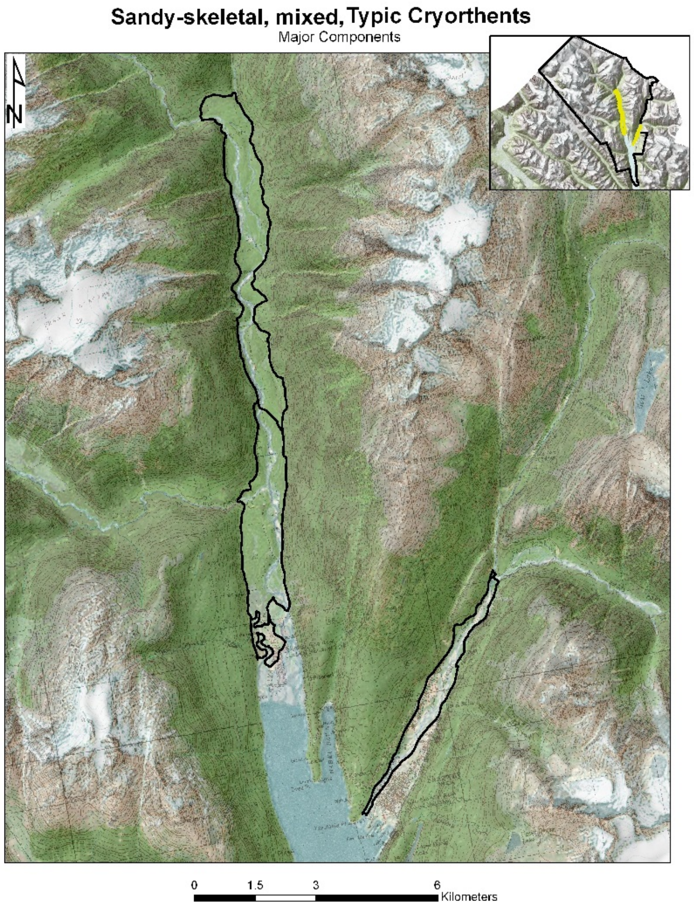
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Ochric epipedon: 0 to 16 centimeters
Assumed irregular decrease in organic carbon based on stratification and color: 16 to 30 centimeters

22—Maritime Scrub Gravelly Floodplains, Frequently Flooded



Depth class: Very deep
Drainage class: Moderately well drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 2 to 130 meters
Slope: 0 to 3 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Family

- Sandy-skeletal, mixed Typic Cryorthents

Typical Pedon

22—Maritime Scrub Gravelly Floodplains, Frequently Flooded, on a 1-percent slope with willow and alder vegetation. (Colors are for moist soil.)

C1—0 to 12 centimeters; variegated extremely cobbly sand; 90 percent sand, 7 percent silt, and 3 percent clay; single grain; loose, nonsticky and nonplastic; common medium and fine roots; 7 percent gravel, 50 percent cobbles, and 3 percent stones; slightly acid (pH 6.1); gradual smooth boundary.

C2—12 to 183 centimeters; variegated extremely cobbly sand; 90 percent sand, 7 percent silt, and 3 percent clay; single grain; loose, nonsticky and nonplastic; 10 percent gravel, 50 percent cobbles, and 5 percent stones; slightly acid (pH 6.1).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°27’51.7” north and longitude 135°18’46.8” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Depth to sand and gravel: 0 to 4 centimeters
Control section: Sand to coarse sand with 36 to 61 percent rock fragments

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 3, chroma of 2 or 3
Texture—fine sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—1 to 10 percent gravel
Reaction—moderately acid to neutral

C horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—very gravelly sand, very cobbly sand
Content of clay—2 to 5 percent
Content of rock fragments—5 to 10 percent gravel, 30 to 50 percent cobbles, 1 to 5 percent stones
Reaction—moderately acid to neutral

Geographically Associated Soils

22—Maritime Scrub Gravelly Floodplains, Depression, 22—Maritime Forest Gravelly Floodplains, Occasionally Flooded, 22—Maritime Forest Gravelly Floodplains, Rarely Flooded

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Moderately well drained; saturated hydraulic conductivity high in loamy layer and very high in sandy and gravelly layers; may be subject to frequent flooding

Use

Wildlife habitat, source of gravel

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

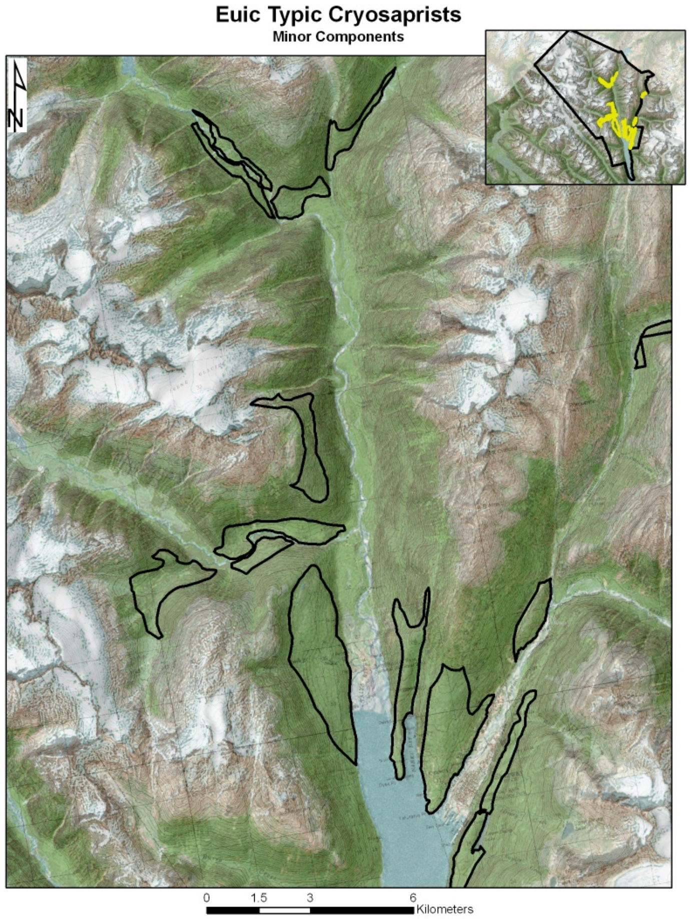
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Weighted average particle size: Sandy-skeletal from 25 to 100 centimeters

22—Maritime Forest Organic Slopes, Depression



Depth class: Very deep
Drainage class: Very poorly drained
Landform: Depressions of mountains
Parent material: Organic material
Elevation: 0 to 1,080 meters
Slope: 0 to 7 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Taxonomic Subgroup

- Euic Typic Cryosaprists

Typical Pedon

D22—Maritime Forest Organic Slopes, Depression, on a 1-percent slope with sphagnum moss and lodgepole pine vegetation. (Colors are for moist soil.)

Oi—0 to 10 centimeters; very dark brown (10YR 2/2) peat; common medium and fine roots; strongly acid (pH 5.4); clear smooth boundary.
Oe—10 to 30 centimeters; (7.5YR 2/2) mucky peat; common medium and fine roots; strongly acid (pH 5.5); clear smooth boundary.
Oa—30 to 183 centimeters; black (10YR 2/1) muck; common medium and fine roots; moderately acid (pH 5.6).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°27'7.6" north and longitude 135°18'18.86" west

Range in Characteristics

Soil moisture class: Aquic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic material: More than 183 centimeters
Surface tier: Dominantly hemic material, but typically fibric material in the upper part
Subsurface tier: Sapric material with hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 4
Reaction: Extremely acid to moderately acid in surface tier, very strongly acid to slightly acid in subsurface tier

Geographically Associated Soils

22—Maritime Forest Gravelly Slopes, Shallow; 22—Maritime Forest Organic Slopes, Dry

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity moderately high to very high in organic layer

Use and Vegetation

Recreation, wildlife habitat; Sphagnum moss and lodgepole pine

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

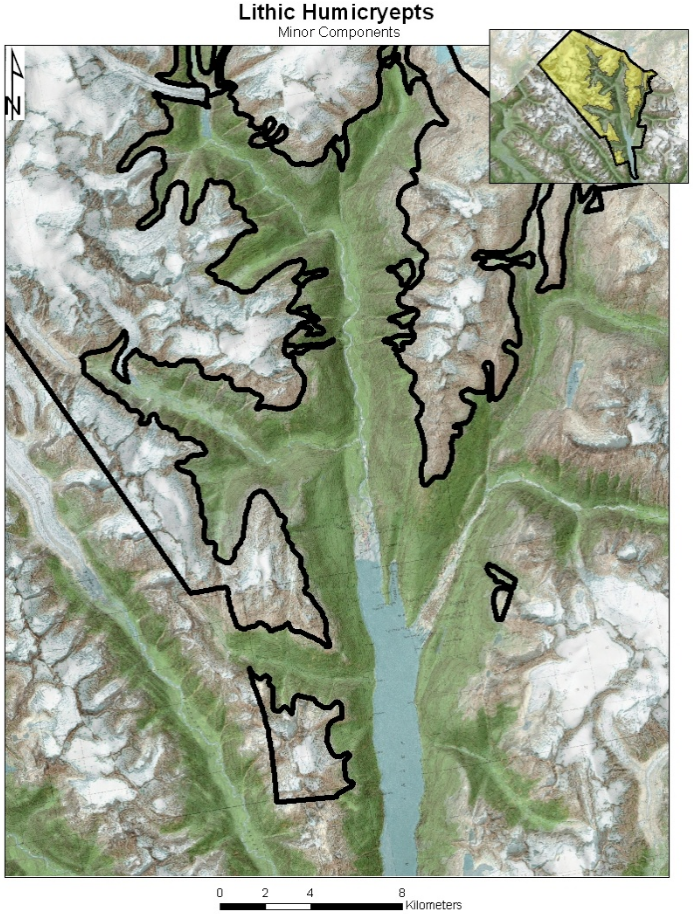
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Organic material: 0 to 20 centimeters
Content of organic matter: More than 20 percent, by weight
Depth to lithic contact: 20 centimeters
pH: More than 4.5 (0.01M CaCl) in one organic layer or more

D22—Alpine Herbaceous Gravelly Diorite Slopes



Depth class: Shallow
Drainage class: Well drained
Landform: Mountains
Parent material: Gravelly colluvium over residuum
Elevation: 757 to 2,477 meters
Slope: 30 to 60 percent
Annual precipitation: 1,500 to 2,880 millimeters
Annual temperature: 1 to 3 degrees C
Frost-free period: 25 to 50 days

Taxonomic Family

- Loamy-skeletal, mixed, superactive Lithic Humicryepts

Typical Pedon

D22—Alpine Herbaceous Gravelly Diorite Slopes on a 1-percent slope with crowberry, moss, and lichen vegetation. (Colors are for moist soil.)

Oe—0 to 3 centimeters; dark reddish brown (5YR 2.5/2) moderately decomposed organic matter; common medium and fine and many very fine roots throughout; very strongly acid (pH 4.7); abrupt smooth boundary.

A—3 to 13 centimeters; very dark brown (7.5YR 2.5/2) highly organic very cobbly sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; moderate fine granular structure; very friable, nonsticky and nonplastic; common medium and fine and many very fine roots throughout; 20 percent gravel, 25 percent cobbles, and 1 percent stones; strongly acid (pH 5.1); abrupt smooth boundary.

C—13 to 24 centimeters; very dark brown (7.5YR 2.5/3) extremely cobbly sandy loam; 70 percent sand, 25 percent silt, and 5 percent clay; moderate medium subangular blocky structure; friable, nonsticky and nonplastic; common fine and very fine roots throughout; 20 percent gravel, 30 percent cobbles, and 25 percent stones strongly acid (pH 5.2); abrupt smooth boundary.

R—24 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°25’20” north and longitude 135°25’7” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 0 to 3 centimeters
Umbric epipedon: 10 to 25 centimeters
Depth to bedrock: 23 to 50 centimeters

O horizon (where present):
Color—hue of 5YR, 7.5YR, or 10YR; value of 2 to 3; chroma of 1 to 3
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid to strongly acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1 to 3
Texture—highly organic very cobbly sandy loam, highly organic extremely cobbly sandy loam, highly organic very stony sandy loam, highly organic extremely stony sandy loam
Content of organic matter—12 to 28 percent
Content of clay—3 to 8 percent
Content of rock fragments—10 to 30 percent gravel, 20 to 40 percent cobbles, 1 to 40 percent stones
Reaction—very strongly acid to moderately acid

C horizon (where present):
Color—hue of 7.5YR, 10YR, or 2.5Y; value of 2.5 to 5; chroma of 3 to 6
Texture—very cobbly sandy loam, extremely cobbly sandy loam, very stony sandy loam, extremely stony sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 30 percent gravel, 25 to 40 percent cobbles, 25 to 40 percent stones
Reaction—strongly acid or moderately acid

R horizon:
Kind of bedrock—diorite

Geographically Associated Soils

D22—Subalpine and Alpine Rubble Land, D22—Subalpine and Alpine Rock Outcrop, D22—Subalpine and Alpine Permanent Ice and Snow

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity high in loamy part and very low in bedrock

Use and Vegetation

Recreation, wildlife habitat; crowberry, moss, lichen

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

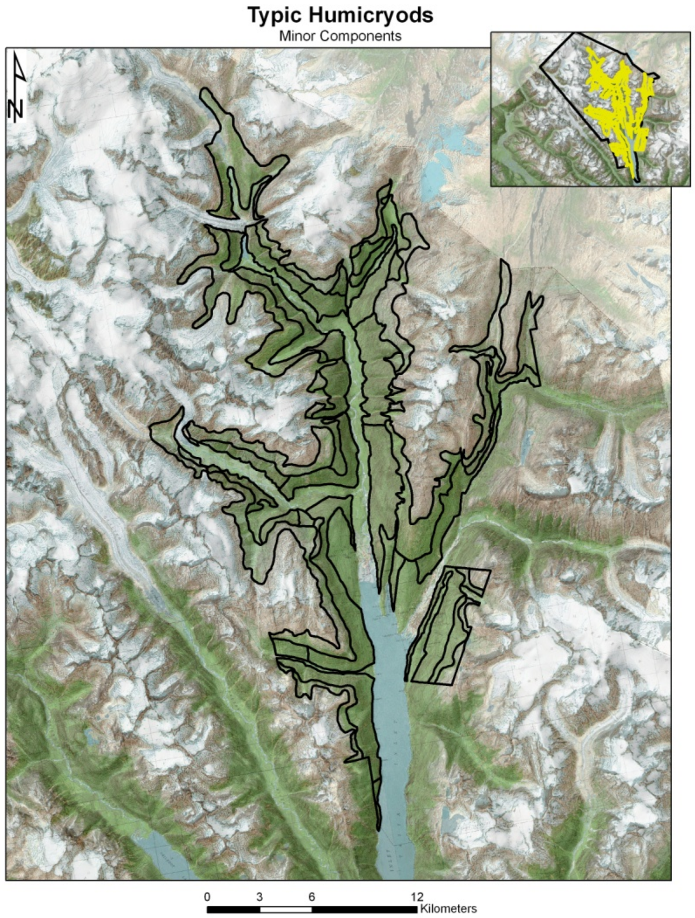
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Umbric epipedon: 3 to 24 centimeters
Weighted average particle size: Loamy-skeletal from 25 to 100 centimeters
Depth to bedrock: 23 to 50 centimeters

D22—Maritime Forest Gravelly Slopes, High Elevation



Depth class: Shallow to very deep
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Gravelly colluvium over bedrock
Elevation: 210 to 1,505 meters
Slope: 20 to 90 percent
Annual precipitation: 711 to 1,244 millimeters
Annual temperature: 3 to 5 degrees C
Frost-free period: 90 to144 days

Taxonomic Families

- Loamy-skeletal, mixed, superactive Typic Humicryods
- Coarse-loamy, mixed, superactive Typic Humicryods

Typical Pedon

D22—Maritime Forest Gravelly Slopes, High Elevation, on a 30-percent slope with mountain hemlock forest and rusty menziesia and feather moss understory. (Colors are for moist soil.)

Oe—0 to 12 centimeters; dark reddish brown (5YR 3/3) moderately decomposed plant material; common coarse, medium, and fine roots; extremely acid (pH 3.6); clear smooth boundary.

A—12 to 26 centimeters; very dark brown (7.5YR 2.5/3) highly organic fine sandy loam; 60 percent sand, 35 percent silt, and 5 percent clay; moderate medium granular structure; friable, nonsticky and nonplastic; common coarse and many medium and fine roots; extremely acid (pH 3.8); abrupt smooth boundary.
E—26 to 32 centimeters; brown (7.5YR 5/3) cobbly sandy loam; 65 percent sand, 23 percent silt, and 12 percent clay; weak medium granular structure; very friable, nonsticky and nonplastic; common fine roots; 10 percent gravel and 15 percent cobbles; extremely acid (pH 3.8); abrupt smooth boundary.
Bhs—32 to 57 centimeters; black (7.5YR 2.5/1) highly organic cobbly sandy loam; 60 percent sand, 32 percent silt, and 8 percent clay; strong medium subangular blocky structure; firm, slightly sticky and slightly plastic; common medium and fine roots; 5 percent gravel and 15 percent cobbles; extremely acid (pH 4.1); abrupt smooth boundary.
Bs—57 to 65 centimeters; dark reddish brown (5YR 3/3) cobbly sandy loam; 70 percent sand, 18 percent silt, and 12 percent clay; weak medium subangular blocky structure; very friable, slightly sticky and slightly plastic; 5 percent gravel and 30 percent cobbles; extremely acid (pH 4.1); abrupt irregular boundary.
R—65 to 183 centimeters; bedrock.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°26’51.07” north and longitude 135°17’5.42” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 3 to 12 centimeters
Content of organic carbon in Bhs horizon: More than 6 percent
Thickness of solum: 20 to 90 centimeters
Depth to bedrock: 50 to 183 centimeters or more

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid or very strongly acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—highly organic sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—0 to 7 percent gravel, 0 to 7 percent cobbles
Reaction—ultra acid or extremely acid

E horizon:
Color—hue of 7.5YR, 10YR, or 2.5Y; value of 5 to 7; chroma of 1 to 3
Texture—very cobbly sandy loam, cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 15 percent gravel, 15 to 30 percent cobbles, 0 to 5 percent stones
Reaction—extremely acid or very strongly acid

Bhs horizon:
Color—hue of 5YR or 7.5YR, value of 2.5 or 3, chroma of 1 to 3
Texture—highly organic very cobbly sandy loam, highly organic cobbly sandy loam
Content of clay—3 to 8 percent

Content of rock fragments—5 to 15 percent gravel, 15 to 30 percent cobbles, 0 to 5 percent stones
Reaction—extremely acid or very strongly acid

Bs horizon:
Color—hue of 5YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture—very cobbly sandy loam, cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 15 percent gravel, 15 to 30 percent cobbles, 0 to 5 percent stones
Reaction—very strongly acid

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—very cobbly sandy loam, cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 15 percent gravel, 15 to 30 percent cobbles, 0 to 5 percent stones
Reaction—extremely acid to moderately acid

Geographically Associated Soils

D22—Maritime Forest Organic Slopes, Dry, High Elevation

Drainage Class and Saturated Hydraulic Conductivity

Well drained or moderately well drained; saturated hydraulic conductivity moderately high to very high in organic layer, moderately high or high in surface layer, and high or very high in subsurface layers

Use and Vegetation

Recreation, wildlife habitat; mountain hemlock forest with rusty menziesia and feather moss understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

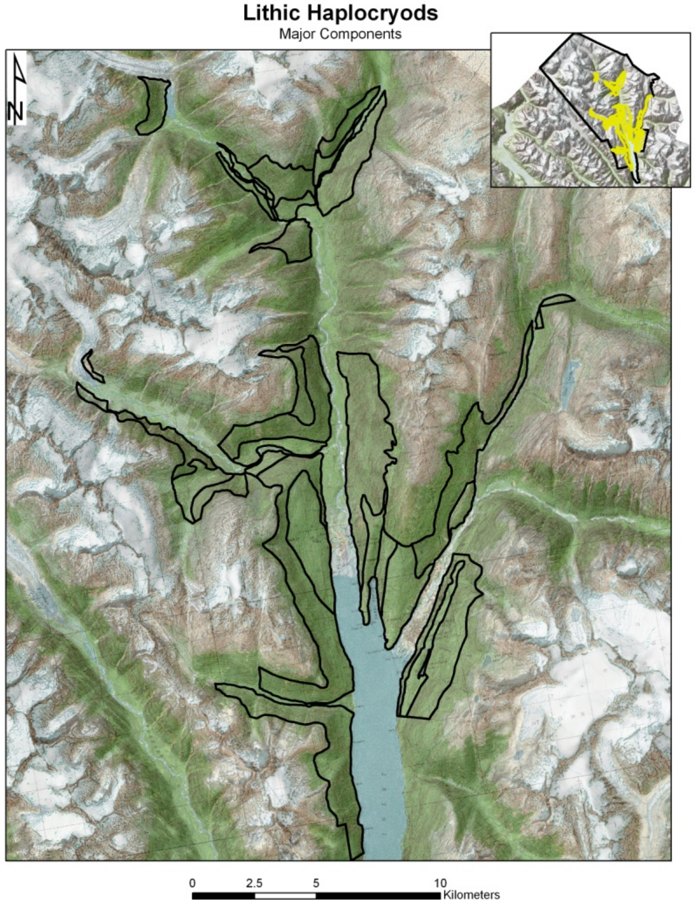
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Albic horizon: 19 to 24 centimeters
Spodic horizon: 24 to 65 centimeters
Organic carbon in Bhs horizon: More than 6 percent
Depth to bedrock: 65 centimeters

D22—Maritime Forest Gravelly Slopes, Shallow, Convex



Depth class: Shallow or moderately deep
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Gravelly colluvium over bedrock
Elevation: 0 to 1,080 meters
Slope: 50 to 90 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Taxonomic Families

- Loamy-skeletal, mixed, superactive Lithic Haplocryods
- Coarse-loamy, mixed, superactive Lithic Haplocryods

Typical Pedon

D22—Maritime Forest Gravelly Slopes, Shallow, Convex, on a 53-percent slope with paper birch and lodgepole pine forest and moss and lichen understory. (Colors are for moist soil.)

Oi—0 to 10 centimeters; dark yellowish brown (10YR 3/4) slightly decomposed plant material; common coarse, medium, fine, and very fine roots throughout; extremely acid (pH 3.8); clear smooth boundary.

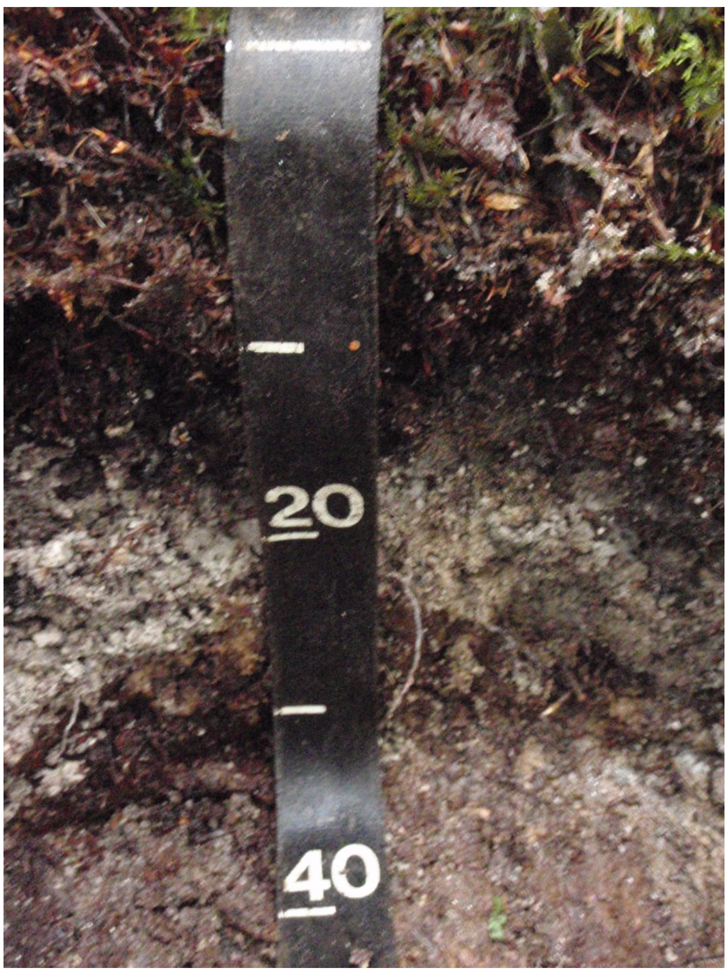
Oe—10 to 12 centimeters; dark brown (7.5YR 3/3) moderately decomposed plant material; common very coarse, coarse, medium, fine, and very fine roots throughout; extremely acid (pH 4.0); abrupt smooth boundary.

A—12 to 15 centimeters; very dark brown (10YR 2/2) gravelly sandy loam; 60 percent sand, 35 percent silt, and 5 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common very fine, medium, coarse, and very coarse roots throughout; 20 percent gravel and 5 percent cobbles; extremely acid (pH 4.3); abrupt smooth boundary.

E—15 to 19 centimeters; gray (10YR 6/1) very gravelly coarse sandy loam; 68 percent sand, 27 percent silt, and 5 percent clay; moderate fine subangular blocky structure; very friable, nonsticky and nonplastic; common coarse, medium, and fine roots throughout; 38 percent gravel and 5 percent cobbles; very strongly acid (pH 4.5); abrupt smooth boundary.

Bs—19 to 30 centimeters; strong brown (7.5YR 4/6) very gravelly sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common very coarse, coarse, medium, and fine roots throughout; 25 percent (common) black (10YR 2/1) organic stains on all faces of peds; 40 percent gravel, 5 percent cobbles, and 5 percent stones; extremely acid (pH 4.3); abrupt smooth boundary.

R—30 to 183 centimeters; diorite.



Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°36’51” north and longitude 135°19’26” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 4 to 9 centimeters
Thickness of solum: 29 to 40 centimeters
Control section: Loamy-skeletal from 25 to 65 centimeters
Depth to bedrock: 30 to 65 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid or very strongly acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—highly organic gravelly sandy loam, highly organic very gravelly sandy loam, highly organic extremely gravely sandy loam,
Content of clay—3 to 8 percent
Content of rock fragments—15 to 70 percent gravel, 1 to 10 percent cobbles, 0 to 2 percent stones
Reaction—ultra acid or extremely acid

E horizon:
Color—hue of 7.5YR, 10YR, or 2.5Y; value of 5 to 7; chroma of 1 to 3
Texture—gravelly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—15 to 70 percent gravel, 1 to 10 percent cobbles, 0 to 2 percent stones
Reaction—extremely acid or very strongly acid

Bs horizon:
Color—hue of 5YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture—gravelly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam, very cobbly sandy loam, cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—15 to 60 percent gravel, 5 to 25 percent cobbles, 5 to 25 percent stones
Reaction—extremely acid or very strongly acid

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—gravelly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam, very cobbly sandy loam, cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—15 to 60 percent gravel, 5 to 25 percent cobbles, 5 to 12 percent stones
Reaction—very strongly acid to moderately acid

Geographically Associated Soils

D22—Maritime Forest Organic Slopes, Dry; D22—Maritime Forest Organic Slopes, Depression; D22—Maritime Forest Gravelly Slopes, Shallow

Drainage Class and Saturated Hydraulic Conductivity

Well drained or moderately well drained; saturated hydraulic conductivity moderately high to very high in the organic layer and high or very high in the subsurface layers

Use and Vegetation

Forestry, urban development, recreation, wildlife habitat; paper birch and lodgepole pine forest with moss and lichen understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

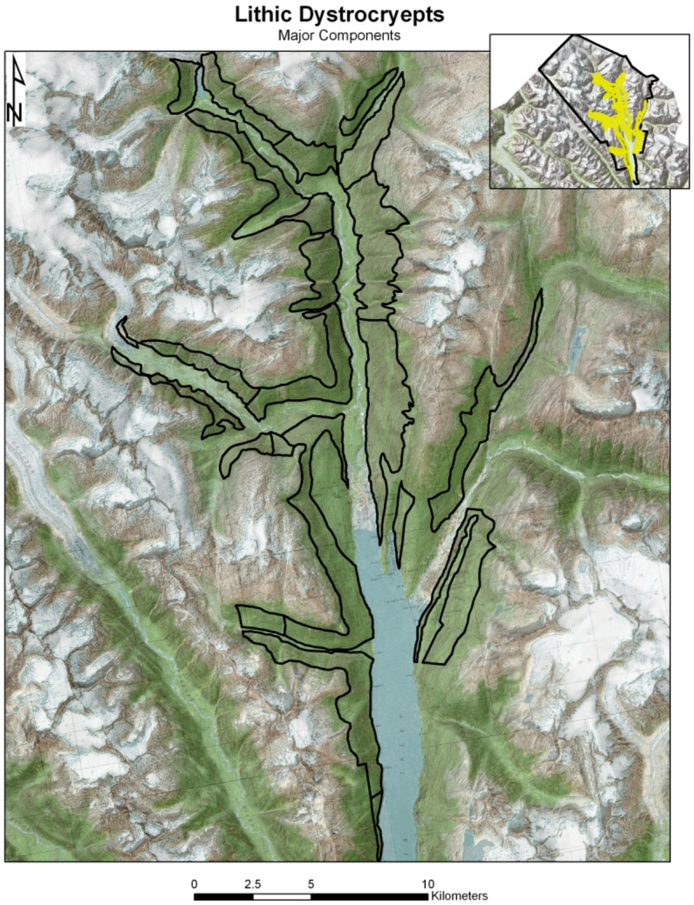
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Albic horizon: 15 to 19 centimeters
Spodic horizon: 19 to 30 centimeters
Depth to bedrock: 30 centimeters
Control section: Loamy-skeletal from 25 to 30 centimeters

D22—Maritime Forest Gravelly Slopes, Shallow



Depth class: Shallow or moderately deep
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Gravelly colluvium over bedrock
Elevation: 0 to 1,080 meters
Slope: 50 to 90 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Taxonomic Families

- Loamy-skeletal, mixed, superactive Lithic Dystrocryepts
- Coarse-loamy, mixed, superactive Lithic Dystrocryepts

Typical Pedon

D22—Maritime Forest Gravelly Slopes, Shallow, on a 53-percent slope with lodgepole pine and western hemlock forest and moss and lichen understory. (Colors are for moist soil.)

Oi—0 to 7 centimeters; very dark brown (7.5YR 2.5/2) slightly decomposed plant material; many medium and fine roots; extremely acid (pH 4.1); abrupt smooth boundary.

A—7 to 10 centimeters; dark brown (10YR 3/3) very gravelly sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common coarse and many medium and fine roots; 30 percent gravel and 10 percent cobbles; very strongly acid (pH 4.5); abrupt irregular boundary.

Bw—10 to 35 centimeters; 70 percent brownish yellow (10YR 6/6) and 30 percent strong brown (7.5YR 4/6) very gravelly sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common coarse, medium, and fine roots; 30 percent gravel and 20 percent cobbles; 1 percent stones; extremely acid (pH 4.4); abrupt broken boundary.

R—35 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°27’6.34” north and longitude 135°18’28.62” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 3 to 12 centimeters
Thickness of solum: 29 to 50 centimeters
Control section: Loamy-skeletal from 25 to 65 centimeters
Depth to bedrock: 30 to 65 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid or very strongly acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—highly organic gravelly sandy loam, highly organic very gravelly sandy loam, highly organic cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 40 percent gravel, 5 to 15 percent cobbles, 0 to 2 percent stones
Reaction—ultra acid or extremely acid

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, chroma of 3 to 6
Texture—extremely gravelly sandy loam, very gravelly sandy loam, very cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—30 to 50 percent gravel, 5 to 20 percent cobbles, 1 to 3 percent stones
Reaction—extremely acid or very strongly acid

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—gravelly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—15 to 55 percent gravel, 5 to 14 percent cobbles, 1 to 14 percent stones
Reaction—very strongly acid to moderately acid

Geographically Associated Soils

D22—Maritime Forest Organic Slopes, Dry; D22—Maritime Forest Organic Slopes, Depression; D22—Maritime Forest Gravelly Slopes, Shallow, Convex

Drainage Class and Saturated Hydraulic Conductivity

Well drained or moderately well drained; saturated hydraulic conductivity moderately high to very high in the organic layer and high or very high below

Use and Vegetation

Forestry, urban development, recreation, wildlife habitat; lodgepole pine and western hemlock forest with moss and lichen understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

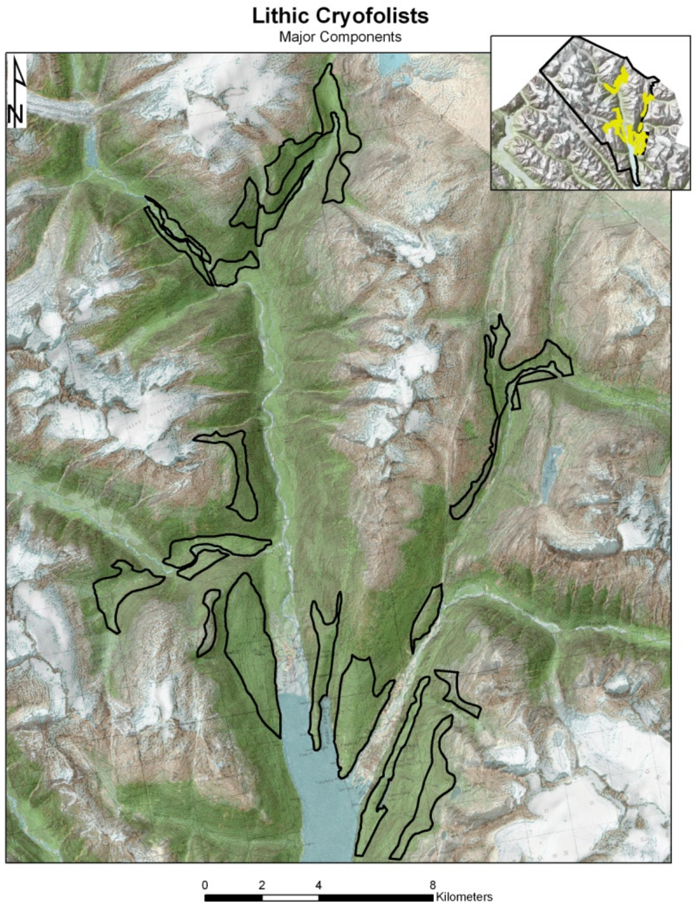
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Ochric epipedon: 7 to 10 centimeters
Cambic horizon: 10 to 35 centimeters
Depth to bedrock: 35 centimeters
Control section: Loamy-skeletal from 25 to 35 centimeters

D22—Maritime Forest Organic Slopes, Dry, High Elevation



Depth class: Very shallow or shallow
Drainage class: Well drained
Landform: Mountains
Parent material: Organic material
Elevation: 210 to 1,505 meters
Slope: 30 to 90 percent
Annual precipitation: 711 to 1,244 millimeters
Annual temperature: 3 to 5 degrees C
Frost-free period: 90 to144 days

Taxonomic Subgroups

- Dysic Lithic Cryofolists
- Euic Lithic Cryofolists

Typical Pedon

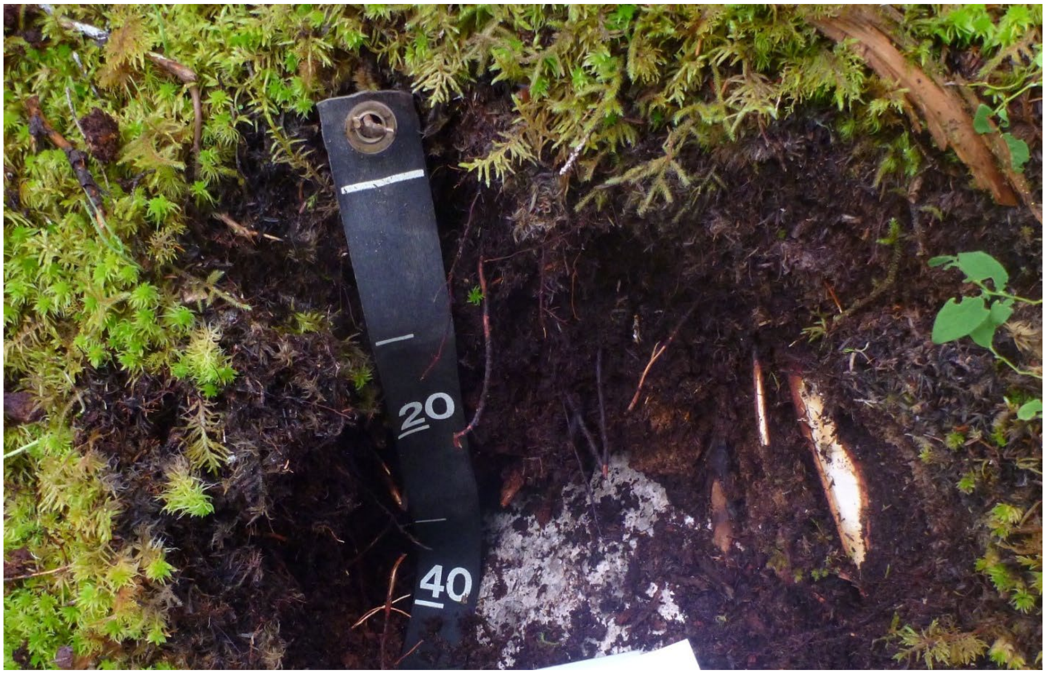
D22—Maritime Forest Organic Slopes, Dry, High Elevation, on a 70-percent slope with mountain hemlock and subalpine fir forest and blueberry and feather moss understory. (Colors are for moist soil.)

Oi—0 to 7 centimeters; black (7.5YR 2.5/1) slightly decomposed plant material; common medium and fine roots; extremely acid (pH 4.1); abrupt smooth boundary.

Oe—7 to 54 centimeters; very dark brown (7.5YR 2.5/2) moderately decomposed plant material; many fine, medium, and coarse roots; ultra acid (pH 3.8); abrupt smooth boundary.

C—54 to 60 centimeters; 70 percent brown (7.5YR 4/3) and 30 percent black (10YR 2/1) very gravelly sandy loam; 60 percent sand, 28 percent silt, and 12 percent clay; massive; friable, slightly sticky and slightly plastic; 45 percent gravel, 5 percent cobbles, and 5 percent stones; extremely acid (pH 3.7); abrupt wavy boundary.

R—60 to 183 centimeters; diorite.



Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°26’48.7” north and longitude 135°16’45.59” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic horizon: 12 to 54 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 or 3
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid or very strongly acid

C horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 to 5, chroma of 1or 3
Texture—gravelly sandy loam, very gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 50 percent gravel, 1 to 10 percent cobbles, 5 to 15 percent stones
Reaction—extremely acid or very strongly acid

Geographically Associated Soils

D22—Maritime Forest Gravelly Slopes, High Elevation

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity moderately high to very high in organic layers and high or very high in loamy layer

Use and Vegetation

Recreation, wildlife habitat; mountain hemlock and subalpine fir forest with blueberry and feather moss understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

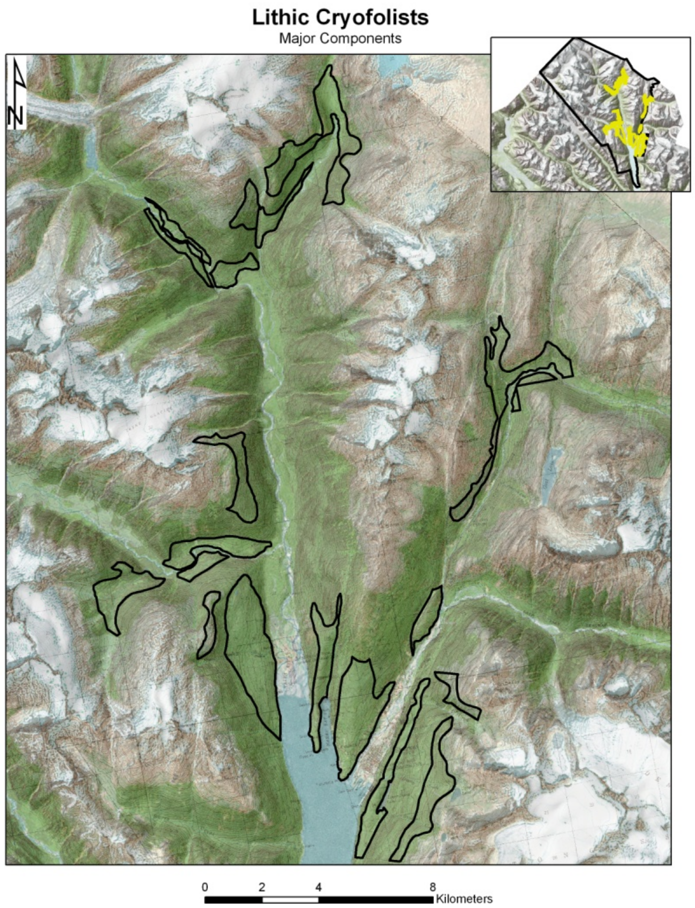
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Organic material: 0 to 54 centimeters
Depth to lithic contact: 60 centimeters
pH in organic layer: Less than 4.5 (0.01M CaCl) Soil

D22—Maritime Forest Organic Slopes, Dry



Depth class: Very shallow or shallow
Drainage class: Well drained
Landform: Mountains
Parent material: Organic material
Elevation: 0 to 1,080 meters
Slope: 50 to 100 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to171 days

Taxonomic Subgroups

- Dysic Lithic Cryofolists
- Euic Lithic Cryofolists

Typical Pedon

D22—Maritime Forest Organic Slopes, Dry, on a 50-percent slope with western hemlock and Sitka spruce forest and feather moss understory. (Colors are for moist soil.)

Oi—0 to 7 centimeters; very dark brown (7.5YR 2.5/2) slightly decomposed plant material; common medium and fine roots throughout; extremely acid (pH 4.1); abrupt wavy boundary.

Oe—7 to 22 centimeters; black (7.5YR 2.5/1) moderately decomposed plant material; many fine and medium and common very fine and coarse roots throughout; extremely acid (pH 4.1); gradual wavy boundary.

OC—22 to 36 centimeters; black (7.5YR 2.5/1) extremely stony moderately decomposed plant material; common medium and fine roots; 5 percent gravel, 10 percent cobbles, and 50 percent stones, extremely acid (pH 4.1).

R—36 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°39’14” north and longitude 135°24’35” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic layers: 14 to 36 centimeters

O horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 or 2
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid or very strongly acid

C horizon *(where present):*
Color—hue of 7.5YR or 10YR, value of 2 to 5, chroma of 1or 3
Texture—very stony sandy loam, extremely stony sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 15 percent gravel, 1 to 10 percent cobbles, 10 to 50 percent stones
Reaction—extremely acid or very strongly acid

Geographically Associated Soils

D22—Maritime Rubble Land; D22—Maritime Forest Gravelly Slopes, High Elevation; D22—Maritime Forest Gravelly Slopes, Shallow; D20-Maritime Rock Outcrop

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity moderately high to very high in organic layer and high or very high in loamy layers

Use and Vegetation

Recreation, wildlife habitat; western hemlock and Sitka spruce forest with feather moss understory

Distribution and Extent

Throughout major land resource area 222; extensive throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

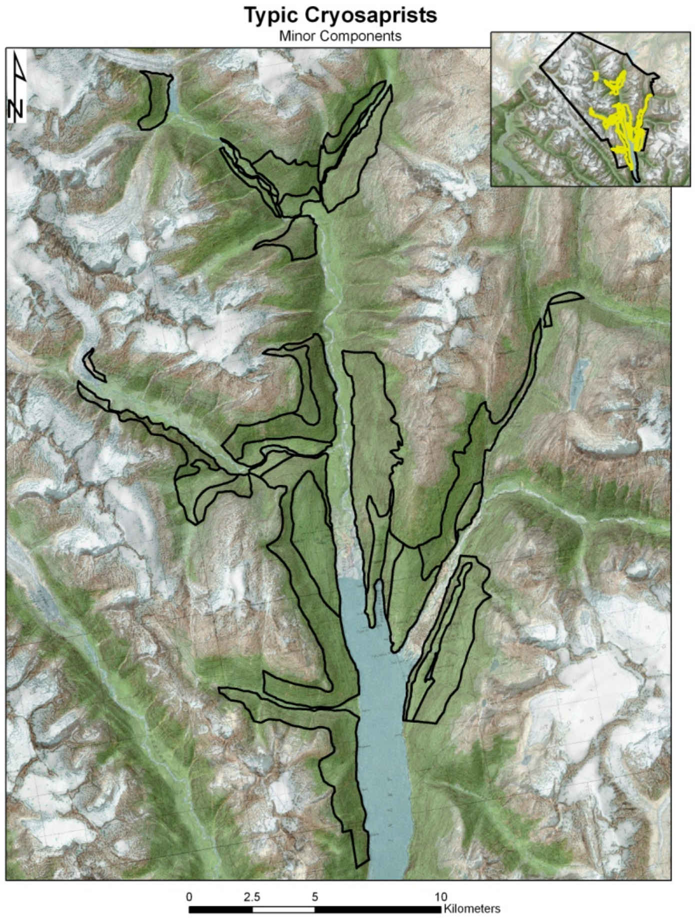
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Organic material: 0 to 36 centimeters
Depth to lithic contact: 36 centimeters
pH of organic layer: Less than 4.5 (0.01M CaCl)

D22—Maritime Forest Organic Slopes, Depression



Depth class: Very deep
Drainage class: Very poorly drained
Landform: Depressions of mountains
Parent material: Organic material
Elevation: 0 to 1,080 meters
Slope: 0 to 7 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Taxonomic Subgroups

- Dysic Typic Cryosaprists
- Euic Typic Cryosaprists

Typical Pedon

D22—Maritime Forest Organic Slopes, Depression, on a 1-percent slope with sphagnum moss and lodgepole pine vegetation. (Colors are for moist soil.)

Oi—0 to 10 centimeters; very dark brown (10YR 2/2) peat; common medium and fine roots; strongly acid (pH 5.4); clear smooth boundary.

Oe—10 to 30 centimeters; (7.5YR 2/2) mucky peat; common medium and fine roots; strongly acid (pH 5.5); clear smooth boundary.

Oa—30 to 183 centimeters; black (10YR 2/1) muck; common medium and fine roots; moderately acid (pH 5.6).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°27’7.6” north and longitude 135°18’18.86” west

Range in Characteristics

Soil moisture class: Aquic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic material: More than 183 centimeters
Surface tier: Dominantly hemic material, but fibric material in upper part
Subsurface tier: Sapric material with hue of 5YR to 10YR; value of 2 or 3, and chroma of 1 to 4
Reaction: Extremely acid to moderately acid in surface tier, very strongly acid to slightly acid in subsurface tier

Geographically Associated Soils

D22—Maritime Forest Gravelly Slopes, Shallow; D22—Maritime Forest Gravelly Slopes, Shallow, Convex; D22—Maritime Forest Organic Slopes, Dry; D22—Maritime Forest Gravelly Slopes, High Elevation

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity moderately high to very high in organic layers

Use and Vegetation

Recreation, wildlife habitat; Sphagnum moss and lodgepole pine vegetation

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

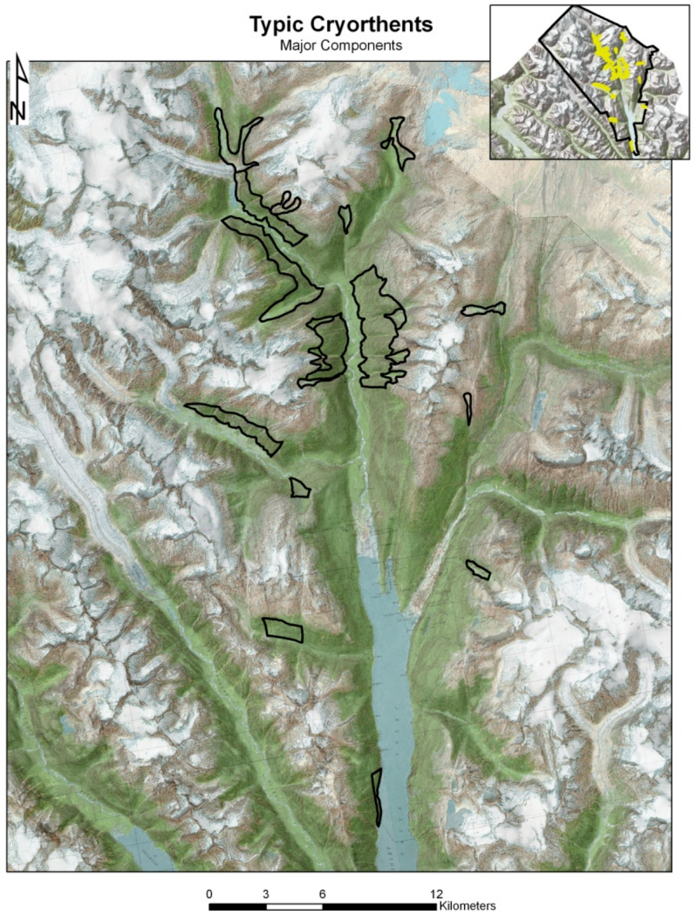
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Organic material: 0 to 20 centimeters
Content of organic matter in A horizon: More than 20 percent, by weight
Depth to lithic contact: 20 centimeters
pH: More than 4.5 (0.01M CaCl) in one organic layer or more

D22—Maritime Scrub/Herb Gravelly Slopes, Depositional



Depth class: Very deep
Drainage class: Well drained
Landform: Talus cones on mountains
Parent material: Colluvium
Elevation: 300 to 1,600 meters
Slope: 20 to 40 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 65 to 100 days

Taxonomic Family

- Loamy-skeletal, mixed, superactive Typic Cryorthents

Typical Pedon

D22—Maritime Shrub/Herb Gravelly Slopes, Depositional, on a 27-percent slope with alder, willow, and sagebrush vegetation. (Colors are for moist soil.)

C1—0 to 24 centimeters; brown (10YR 4/3) extremely gravelly sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; weak medium subangular blocky structure; very friable, nonsticky and nonplastic; common medium and fine and many very fine roots throughout; 50 percent gravel and 10 percent cobbles; neutral (pH 7.0); abrupt, wavy boundary.

Oeb—24 to 30 centimeters; black (10YR 2/1) extremely gravelly moderately decomposed plant material; common fine and many very fine roots throughout; 55 percent gravel and 12 percent cobbles; neutral (pH 6.9); abrupt wavy boundary.

C′2—30 to 183 centimeters; dark yellowish brown (10YR 4/4) extremely gravelly sandy loam; 70 percent sand, 25 percent silt, and 5 percent clay; massive; very friable, nonsticky and nonplastic; few fine roots throughout; 60 percent gravel and 15 percent cobbles; neutral (pH 7.1).

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°39’10” north and longitude 135°24’42” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Control section: Loamy-skeletal from 25 to 100 centimeters

C1 horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 5, chroma of 1or 3
Texture—very gravelly sandy loam, extremely gravelly sandy loam
Content of clay—3 to 8 percent

Content of rock fragments—50 to 75 percent gravel, 10 to 25 percent cobbles
Reaction—moderately acid to neutral

Oeb horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 or 2
Texture—very gravelly or extremely gravelly moderately decomposed plant material
Content of rock fragments—50 to 75 percent gravel, 10 to 25 percent cobbles
Reaction—strongly acid to neutral

C'2 horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—very gravelly sandy loam, extremely gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—50 to 75 percent gravel, 10 to 25 percent cobbles
Reaction—extremely acid to slightly acid

Geographically Associated Soils

D22—Maritime Rubble Land; D22—Maritime Forest Gravelly Slopes, High Elevation; D22—Maritime Forest Organic Slopes, Dry; D22—Maritime Forest Gravelly Slopes, Shallow

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity high or very high in loamy layers and moderately high to very high in organic layer

Use and Vegetation

Recreation, wildlife habitat, source of gravel; alder, willow, and sagebrush

Distribution and Extent

Throughout major land resource area (MLRA) 222; minimal extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

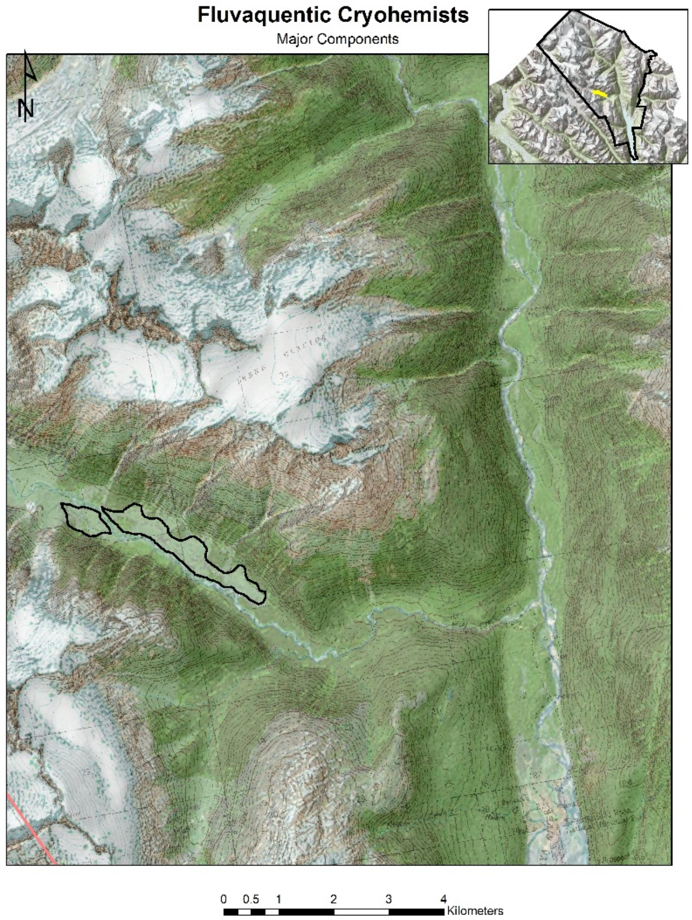
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Weighted average particle size: Loamy-skeletal from 25 to 100 centimeters

D22—Maritime Scrub/Herb Mosaic Organic Floodplains



Depth class: Very deep
Drainage class: Very poorly drained
Landform: Flood plains
Parent material: Alluvium
Elevation: 210 to 260 meters
Slope: 0 to 2 percent
Annual precipitation: 660 to 703 millimeters
Annual temperature: 4 to 6 degrees C
Frost-free period: 98 to 171 days

Taxonomic Subgroup

- Euic Fluvaquentic Cryohemists

Typical Pedon

D22—Maritime Scrub/Herb Mosaic Organic Floodplains on a 0-percent slope with water sedge and willow vegetation. (Colors are for moist soil.)

Oi—0 to 10 centimeters; very dark grayish brown (10YR 3/2) peat; strongly acid (pH 5.4); abrupt smooth boundary.

Cg—10 to 20 centimeters; gray (2.5Y 5/1) silt loam; 40 percent sand, 55 percent silt, and 5 percent clay; massive; friable, nonsticky and nonplastic; moderately acid (pH 5.6); abrupt smooth boundary.

Oe—20 to 125 centimeters; very dark grayish brown (10YR 3/2) mucky peat; moderately acid (pH 5.7); clear smooth boundary.

2C—125 to 183 centimeters; variegated gravel; single grain; loose, nonsticky and nonplastic; 95 percent gravel; moderately acid, pH 6.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°32’27.6” north and longitude 135°26’20.4” west

Range in Characteristics

Soil moisture class: Aquic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic material: 125 to 183 centimeters
pH (0.01M CaCl2) of organic material: More than 4.5 throughout control section

Thin layers of mineral soil are in control section.

Oi horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1 to 3
Texture—peat, mucky peat
Reaction—strongly acid to slightly acid

Cg horizon:
Color—hue of 10YR or 2.5Y, value of 2.5 to 5, chroma of 3 to 6
Texture—silt loam, fine sandy loam
Content of clay—3 to 8 percent
Reaction—moderately acid or slightly acid

Oe horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1 to 3
Texture—mucky peat
Reaction—slightly acid

2*C horizon (where present):*
Color—variegated; hue of 10YR or 2.5Y, value of 2.5 to 5, chroma of 3 to 6
Texture—gravel, extremely gravelly sand
Content of rock fragments—60 to 90 percent gravel, 0 to 10 percent cobbles
Reaction—slightly acid

Drainage Class, Saturated Hydraulic Conductivity, and Flooding

Very poorly drained; saturated hydraulic conductivity moderately high to very high in organic layers, moderately high or high in loamy layer, and very high in sand and gravel; may be subject to frequent flooding and frequent ponding

Use and Vegetation

Wildlife habitat; water sedge and willow

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

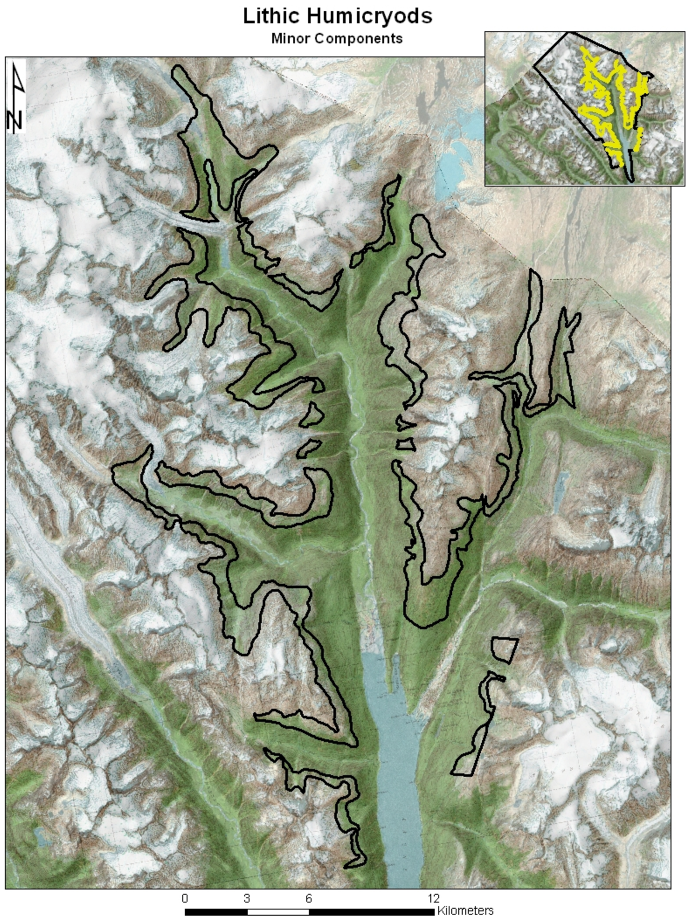
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Fibric material: From 0 to 10 centimeters
Strata of silt loam: From 10 to 20 centimeters
Hemic material: From 20 to 125 centimeters
pH (0.01M CaCl2): More than 4.5 throughout control section
Water table: At or near surface throughout the year
Temperature regime: Cryic

D22—Subalpine Forest Gravelly Slopes



Depth class: Very shallow or shallow
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Colluvium over bedrock
Elevation: 300 to 1,600 meters
Slope: 20 to 50 percent
Annual precipitation: 980 to 1,900 millimeters
Annual temperature: 2 to 4 degrees C
Frost-free period: 65 to 100 days

Taxonomic Families

- Loamy-skeletal, mixed, superactive Lithic Humicryods
- Coarse-loamy, mixed, superactive Lithic Humicryods

Typical Pedon

D22—Subalpine Forest Gravelly Slopes on a 40-percent slope with stunted mountain hemlock forest and crowberry, heather, and lichen understory. (Colors are for moist soil.)

Oe—0 to 2 centimeters; black (10YR 2/1) moderately decomposed plant material; common medium and fine and many very fine roots throughout; strongly acid (pH 5.2); abrupt smooth boundary.

E—2 to 7 centimeters; brown (7.5YR 5/2) gravelly sandy loam; 62 percent sand, 33 percent silt, and 5 percent clay; weak medium subangular blocky structure; very friable, nonsticky and nonplastic; common medium, fine, and very fine roots throughout; 25 percent gravel and 5 percent cobbles; strongly acid (pH 5.5); abrupt smooth boundary.

Bhs—7 to 11 centimeters; black (5YR 2.5/1) highly organic gravelly fine sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; moderate medium subangular blocky structure; very friable, nonsticky and nonplastic; common coarse, medium, and fine and many very fine roots throughout; 25 percent gravel, 7 percent cobbles, and 1 percent stones; moderately acid (pH 5.8); abrupt wavy boundary.

Bs—11 to 40 centimeters; dark reddish brown (5YR 3/3) very gravelly fine sandy loam; 65 percent sand, 30 percent silt, and 5 percent clay; moderate medium subangular blocky structure; very friable, nonsticky and nonplastic; common medium and fine roots throughout; 30 percent gravel and 10 percent cobbles; moderately acid (pH 5.7); clear wavy boundary.

R—40 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°31’55” north and longitude 135°28’7” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 2 to 11 centimeters
Content of organic carbon in Bhs horizon: More than 6 percent
Thickness of solum: 20 to 50 centimeters
Depth to bedrock: 20 to 50 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid to moderately acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—highly organic sandy loam, highly organic gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—15 to 30 percent gravel, 1 to 5 percent cobbles
Reaction—extremely acid to neutral

E horizon:
Color—hue of 7.5 YR, 10YR, or 2.5Y; value of 5 to 7; chroma of 1 to 3
Texture—sandy loam, gravelly sandy loam, very gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 40 percent gravel, 5 to 20 percent cobbles, 0 to 2 percent stones
Reaction—extremely acid to strongly acid

Bhs horizon:
Color—hue of 5YR or 7.5YR, value of 2.5 or 3, chroma of 1 to 3
Texture—highly organic very gravelly sandy loam, highly organic gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 40 percent gravel, 5 to 20 percent cobbles, 1 to 2 percent stones
Reaction—extremely acid to moderately acid

Bs horizon:
Color—hue of 5YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture—sandy loam, gravelly sandy loam, very gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 40 percent gravel, 5 to 20 percent cobbles, 0 to 2 percent stones
Reaction—very strongly acid to moderately acid

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—extremely gravelly sandy loam, very gravelly sandy loam, very cobbly sandy loam, extremely cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—35 to 60 percent gravel, 5 to 25 percent cobbles, 5 to 10 percent stones
Reaction—very strongly acid to slightly acid

Geographically Associated Soils

D22—Subalpine Scrub Organic Slopes; D22—Subalpine Shrub Loamy Slopes, Concave; D22—Subalpine Scrub Organic Slopes, Wet

Drainage Class and Saturated Hydraulic Conductivity

Well drained to moderately well drained; saturated hydraulic conductivity moderately high to very high in organic layer and moderately high or high in loamy layers

Use and Vegetation

Recreation, wildlife habitat; stunted mountain hemlock forest with crowberry, heather, and lichen understory

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

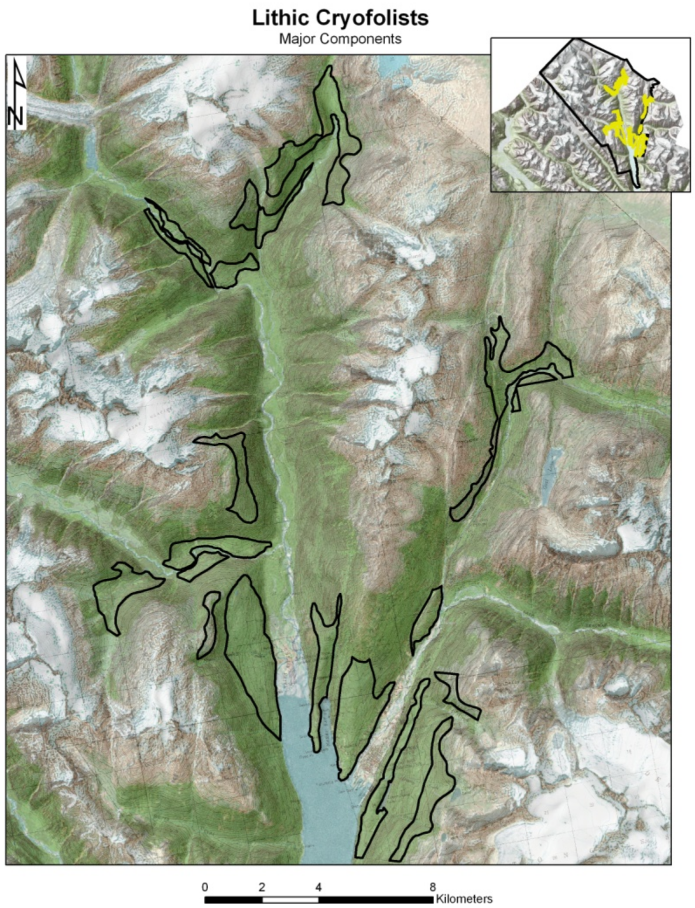
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Albic horizon: 2 to 7 centimeters
Spodic horizon: 7 to 40 centimeters
Content of organic carbon in Bhs horizon: More than 6 percent
Control section: Loamy-skeletal
Depth to bedrock: 40 centimeters

D22—Subalpine Scrub Organic Slopes



Depth class: Very shallow or shallow
Drainage class: Well drained
Landform: Mountains
Parent material: Organic material
Elevation: 300 to 1,600 meters
Slope: 50 to 100 percent
Annual precipitation: 980 to 1,900 millimeters
Annual temperature: 2 to 4 degrees C
Frost-free period: 65 to 100 days

Taxonomic Subgroups

- Dysic Lithic Cryofolists
- Euic Lithic Cryofolists

Typical Pedon

D22—Subalpine Scrub Organic Slopes on a 70-percent slope with blueberry, crowberry, and lichen vegetation. (Colors are for moist soil.)

Oe—0 to 5 centimeters; dark reddish brown (5YR 2.5/2) moderately decomposed plant material; common fine and many very fine roots throughout; extremely acid (pH 4.4).
Oa—5 to 20 centimeters; dark reddish brown (5YR 2.5/2) extremely stony highly decomposed plant material; common coarse, medium, and fine and many very fine

roots throughout; 10 percent gravel, 5 percent cobbles, and 60 percent stones; very strongly acid (pH 5).

R—20 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°36’23” north and longitude 135°10’44” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic layers: 17 to 30 centimeters

O horizon:
Color—hue of 5YR, 7.5YR, or 10YR; value of 2 or 3; chroma of 1 or 3
Texture—slightly decomposed to moderately decomposed plant material, very stony highly decomposed plant material, extremely stony highly decomposed plant material
Content of rock fragments—5 to 15 percent gravel, 5 to 10 percent cobbles, 25 to 65 percent stones
Reaction—extremely acid to neutral

A horizon (where present):
Color—hue of 5YR, 7.5YR, or 10YR; value of 1 or 2; chroma of 1 or 3
Texture—highly organic very stony sandy loam, highly organic extremely stony sandy loam
Content of rock fragments—5 to 15 percent gravel, 5 to 10 percent cobbles, 25 to 65 percent stones
Reaction—extremely acid to neutral

Geographically Associated Soils

D22—Subalpine Scrub Gravelly Slopes; D22—Subalpine Forest Gravelly Slopes; D22—Subalpine Scrub Loamy Slopes, Concave; D22—Subalpine Scrub Organic Slopes

Drainage Class and Saturated Hydraulic Conductivity

Well drained; saturated hydraulic conductivity moderately high to very high in organic layers and high or very high in loamy layer

Use and Vegetation

Recreation, wildlife habitat; blueberry, crowberry, lichen

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

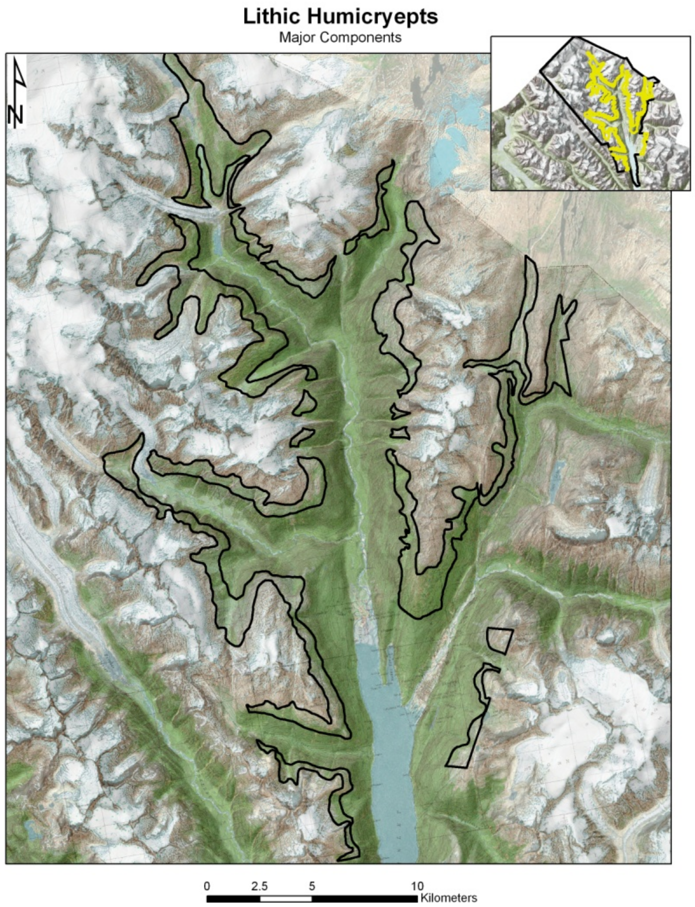
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Well drained organic material: From 0 to 20 centimeters
Content of organic matter in A horizon: More than 20 percent, by weight
Depth to lithic contact: 20 centimeters
pH in organic layers: More than 4.5 (0.01M CaCl)

D22—Subalpine Scrub Gravelly Slopes, Depositional



Depth class: Very shallow or shallow
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Gravelly colluvium over bedrock
Elevation: 300 to 1,600 meters
Slope: 5 to 70 percent
Annual precipitation: 980 to 1,900 millimeters
Annual temperature: 2 to 4 degrees C
Frost-free period: 65 to 100 days

Taxonomic Families

- Loamy-skeletal, mixed, superactive Lithic Humicryepts
- Coarse-loamy, mixed, superactive Lithic Humicryepts

Typical Pedon

D22—Maritime Scrub Gravelly Slopes, Depositional, on a 45-percent slope with crowberry and mountain heather. (Colors are for moist soil.)

Oi—0 to 1 centimeter; black (10YR 2/1) slightly decomposed plant material; common medium and many fine and very fine roots throughout; strongly acid (pH 5.3).
A1—1 to 7 centimeters; black (10YR 2/1) highly organic very gravelly sandy loam; 66 percent sand, 31 percent silt, and 3 percent clay; weak very fine granular structure; very friable, nonsticky and nonplastic; common medium, fine, and very fine roots

throughout; 40 percent gravel and 5 percent cobbles; moderately acid (pH 5.9); clear smooth boundary.

AC—7 to 26 centimeters; dark grayish brown (2.5Y 3/2) extremely cobbly sandy loam; 67 percent sand, 31 percent silt, and 2 percent clay; weak fine granular structure; very friable, nonsticky and nonplastic; common fine and very fine roots throughout; 40 percent gravel and 30 percent cobbles; moderately acid (pH 5.9); clear irregular boundary.

R—26 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°40’48” north and longitude 135°15’11” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 0 to 12 centimeters
Depth to bedrock: 20 to 50 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—very strongly acid or strongly acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—highly organic very gravelly sandy loam, highly organic very cobbly sandy loam
Content of clay—2 to 8 percent
Content of rock fragments—25 to 44 percent gravel, 15 to 30 percent cobbles, 0 to 5 percent stones
Reaction—very strongly acid to moderately acid

AC horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 2 to 4
Texture—very gravelly sandy loam, very cobbly sandy loam
Content of clay—2 to 8 percent
Content of rock fragments—25 to 44 percent gravel, 15 to 30 percent cobbles, 0 to 5 percent stones
Reaction—very strongly acid to moderately acid

Geographically Associated Soils

D22—Maritime Scrub/Herb Gravelly Slopes, Depositional

Drainage Class and Saturated Hydraulic Conductivity

Well drained to moderately well drained; saturated hydraulic conductivity moderately high to very high in organic layer and high or very high below

Use and Vegetation

Forestry, urban development, recreation, wildlife habitat; crowberry, mountain heather

Distribution and Extent

Throughout major land resource area (MLRA) 222; minor extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

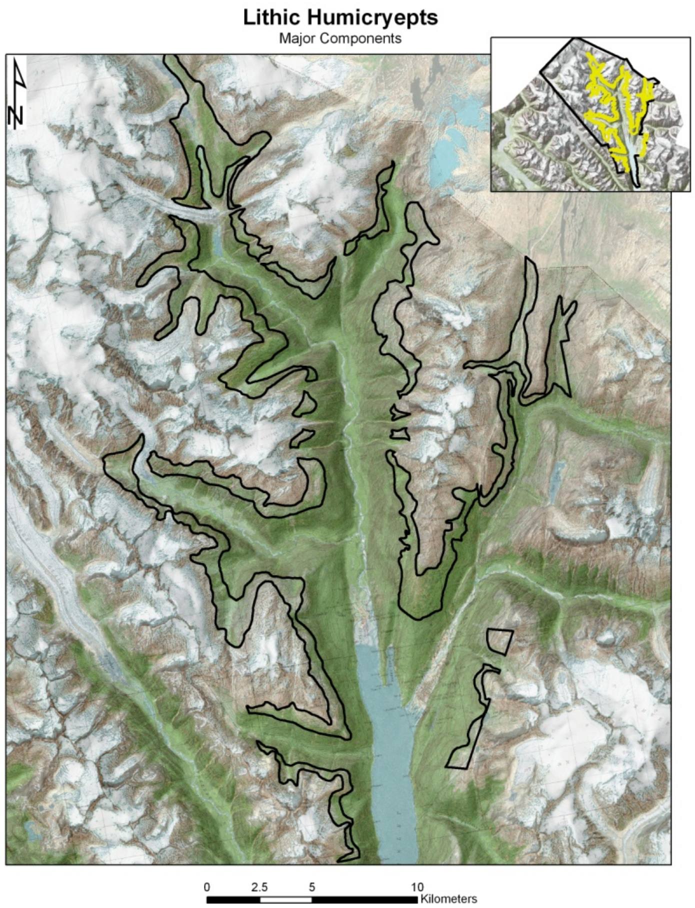
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Umbric epipedon: 7 to 19 centimeters
Depth to bedrock: 26 centimeters
Control section: Loamy-skeletal

D22—Subalpine Scrub Gravelly Slopes, Convex



Depth class: Shallow
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Gravelly colluvium over bedrock
Elevation: 300 to 1,600 meters
Slope: 50 to 90 percent
Annual precipitation: 980 to 1,900 millimeters
Annual temperature: 2 to 4 degrees C
Frost-free period: 65 to 100 days

Taxonomic Families

- Loamy-skeletal, mixed, superactive Lithic Humicryepts
- Coarse-loamy, mixed, superactive Lithic Humicryepts

Typical Pedon

D22—Subalpine Shrub Gravelly Slopes, Convex, on a 79-percent slope with spirea, crowberry, and moss vegetation. (Colors are for moist soil.)

Oi—0 to 7 centimeters; very dark brown (7.5YR 2.5/3) slightly decomposed plant material; common medium, fine, and very fine roots; very strongly acid (pH 4.6); clear wavy boundary.

Oe—7 to 13 centimeters; black (7.5YR 2.5/1) moderately decomposed plant material; common coarse and medium, many fine, and common very fine roots; extremely acid (pH 4.3); abrupt broken boundary.

A—13 to 22 centimeters; very dark brown (7.5YR 2.5/2) very cobbly coarse sandy loam; 70 percent sand and 7 percent clay; weak medium granular structure; very friable, nonsticky and nonplastic; common coarse, medium, fine, and very fine roots; 10 percent gravel, 30 percent cobbles, and 2 percent stones; clear broken boundary.

R—22 to 183 centimeters; diorite.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°36’14.98” north and longitude 135°10’38.78” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 0 to 17 centimeters
Depth to bedrock: 25 to 50 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid to moderately acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 3, chroma of 1 to 3
Texture—highly organic sandy loam, highly organic gravelly sandy loam, organic very gravelly sandy loam, highly organic cobbly sandy loam, organic very cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—5 to 10 percent gravel, 10 to 30 percent cobbles, 0 to 2 percent stones
Reaction—extremely acid to neutral

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—extremely gravelly sandy loam, very gravelly sandy loam, very cobbly sandy loam, extremely cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—35 to 60 percent gravel, 5 to 25 percent cobbles, 5 to 10 percent stones
Reaction—very strongly acid to slightly acid

Geographically Associated Soils

D22—Subalpine Scrub Organic Slopes; D22—Subalpine Forest Gravelly Slopes

Drainage Class and Saturated Hydraulic Conductivity

Well drained or moderately well drained; saturated hydraulic conductivity moderately high to very high in organic layers and moderately high or high in loamy layers

Use and Vegetation

Recreation, wildlife habitat; spirea, crowberry, moss

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

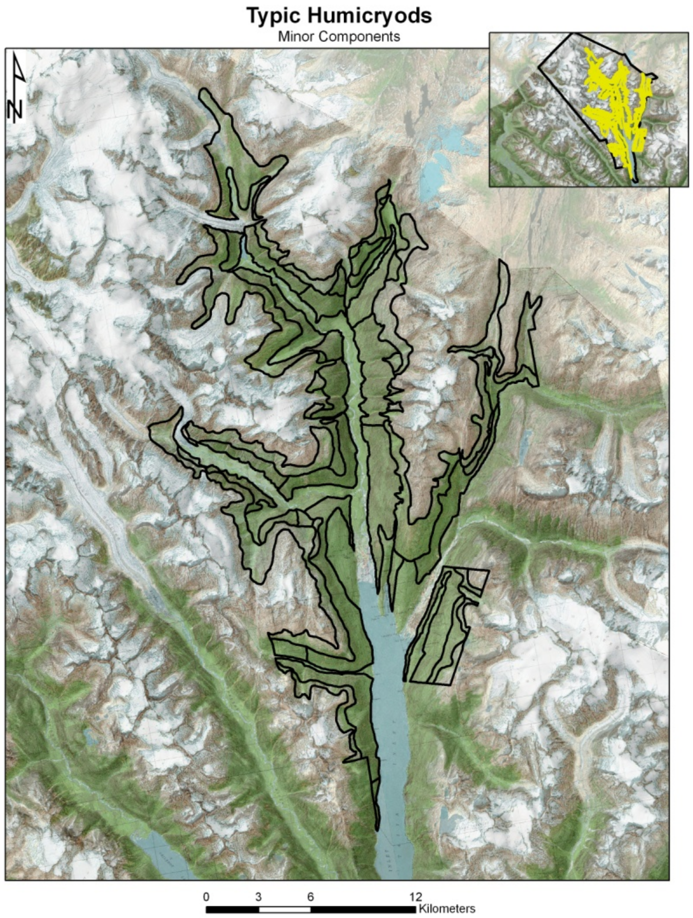
Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Umbric epipedon: 13 to 22 centimeters
Control section: Loamy-skeletal
Depth to bedrock: 22 centimeters

D22—Subalpine Shrub Gravelly Slopes



Depth class: Moderately deep to very deep
Drainage class: Well drained or moderately well drained
Landform: Mountains
Parent material: Gravelly colluvium over bedrock
Elevation: 300 to 1,600 meters
Slope: 5 to 70 percent
Annual precipitation: 980 to 1,900 millimeters
Annual temperature: 2 to 4 degrees C
Frost-free period: 65 to 100 days

Taxonomic Families

- Loamy-skeletal, mixed, superactive Typic Humicryods
- Coarse-loamy, mixed, superactive Typic Humicryods

Typical Pedon

D22—Subalpine Shrub Gravelly Slopes on a 30-percent slope with stunted Sitka spruce and western hemlock and mountain heath, heather, crowberry, and lichen. (Colors are for moist soil.)

Oe—0 to 4 centimeters; dark brown (7.5YR 3/2) stony moderately decomposed plant material; many very fine and common fine, medium, and coarse roots; 10 percent cobbles and 25 percent stones; extremely acid (pH 3.9); abrupt smooth boundary.

A—4 to 7 centimeters; black (10YR 2/1) highly organic gravelly sandy loam; 55 percent sand, 40 percent silt, and 5 percent clay; moderate medium granular structure; very friable, nonsticky and nonplastic; many very fine and common fine, medium, and coarse roots; 25 percent gravel, 10 percent cobbles, and 2 percent stones; extremely acid (pH 3.9); abrupt smooth boundary.

E—7 to 10 centimeters; pink (7.5YR 7/3) very gravelly sandy loam; 60 percent sand, 33 percent silt, and 7 percent clay; moderate medium angular blocky structure; very friable, nonsticky and nonplastic; 25 percent cobbles and 10 percent stones; extremely acid (pH 4.2); abrupt broken boundary.

Bhs—10 to 12 centimeters; black (7.5YR 2.5/1) highly organic very gravelly sandy loam; 40 percent sand, 51 percent silt, and 9 percent clay; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; 25 percent gravel and 10 percent cobbles; extremely acid (pH 4.1); abrupt wavy boundary.

Bs—12 to 62 centimeters; dark reddish brown (5YR 2.5/2) very gravelly sandy loam; 65 percent sand, 28 percent silt, and 7 percent clay; moderate medium subangular blocky structure; friable, nonsticky and nonplastic; common fine and medium roots; 50 percent gravel, 10 percent cobbles, and 2 percent stones; very strongly acid (pH 4.6); clear smooth boundary.

R—62 to 183 centimeters; bedrock.

Type Location

Soil survey of Skagway-Klondike Gold Rush National Historical Park; latitude 59°35’30.05” north and longitude 135°11’13.67” west

Range in Characteristics

Soil moisture class: Udic
Annual soil temperature: 1 to 3 degrees C
Thickness of organic mat: 2 to 7 centimeters
Content of organic carbon in Bhs horizon: More than 6 percent
Thickness of solum: 13 to 60 centimeters
Depth to bedrock: 50 to 80 centimeters

O horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 4
Texture—slightly decomposed to moderately decomposed plant material
Reaction—extremely acid to moderately acid

A horizon (where present):
Color—hue of 7.5YR or 10YR, value of 2 or 3, chroma of 1 to 3
Texture—highly organic sandy loam, highly organic gravelly sandy loam, organic very gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—15 to 40 percent gravel, 1 to 20 percent cobbles, 0 to 2 percent stones
Reaction—extremely acid to neutral

E horizon:
Color—hue of 7.5 YR, 10YR, or 2.5Y; value of 5 to 7; chroma of 1 to 3
Texture—sandy loam, gravelly sandy loam, very gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 40 percent gravel, 5 to 20 percent cobbles, 0 to 2 percent stones
Reaction—extremely acid to strongly acid

Bhs horizon:
Color—hue of 5YR or 7.5YR, value of 2.5 or 3, chroma of 1 to 3
Texture—highly organic gravelly sandy loam, highly organic very gravelly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—10 to 40 percent gravel, 5 to 20 percent cobbles, 0 to 2 percent stones
Reaction—extremely acid to moderately acid

Bs horizon:
Color—hue of 5YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture—sandy loam, gravelly sandy loam, very gravelly sandy loam
Content of rock fragments—10 to 40 percent gravel, 5 to 20 percent cobbles, 0 to 2 percent stones
Reaction—very strongly acid to moderately acid
Content of clay—3 to 8 percent

C horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 3 to 6; variegated
Texture—extremely gravelly sandy loam, very gravelly sandy loam, very cobbly sandy loam, extremely cobbly sandy loam
Content of clay—3 to 8 percent
Content of rock fragments—35 to 60 percent gravel, 5 to 25 percent cobbles, 5 to 10 percent stones
Reaction—very strongly acid to slightly acid

Geographically Associated Soils

D22—Subalpine Scrub Organic Slopes; D22—Subalpine Forest Gravelly Slopes; D22—Subalpine Shrub Loamy Slopes, Concave

Drainage Class and Saturated Hydraulic Conductivity

Well drained or moderately well drained; saturated hydraulic conductivity moderately high to very high in organic layer and moderately high or high in loamy layers

Use and Vegetation

Recreation, wildlife habitat; stunted Sitka spruce and western hemlock with mountain heath, heather, crowberry, and lichen

Distribution and Extent

Throughout major land resource area (MLRA) 222; moderate extent throughout southeast Alaska

MLRA Soil Survey Regional Office (MO) Responsible

Palmer, Alaska

Established

Soil survey of Skagway-Klondike Gold Rush National Historical Park, Alaska; 2012

Remarks

Albic horizon: 7 to 10 centimeters
Spodic horizon: 10 to 62 centimeters
Content of organic carbon in Bhs horizon: More than 6 percent
Control section: Loamy-skeletal
Depth to bedrock: 62 centimeters

Formation of the Soils

Soil is a natural, three-dimensional body on the earth's surface. It has properties that result from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over a period of time (Jenny, 1941). Although there are many different soils, each soil is the result of the interaction of the same five factors. These factors are the physical and chemical composition of the parent material; the effect of climate on the parent material; the kinds of plants and other organisms living in or on the soil; relief, or topography; and the length of time the soils have been forming. The combination of these factors varies within relatively short distances. Consequently, the soils that form differ in fertility, productivity, and physical and chemical characteristics. In the following paragraphs, the factors of soil formation are related to the soils in the survey area.

Climate

Climate, mainly temperature and precipitation, is an active force in the formation of soils. Because of the height of the mountains, the survey area crosses three different life zones—maritime, subalpine, and alpine. Each of these zones is characterized by a different climate, which decreases in temperature and increases in precipitation as elevation increases. Alternating periods of freezing and thawing break down rock into material in which soils form. Precipitation and temperature also affect the kind and amount of vegetation that will grow.

An example of a soil in the maritime zone is D22—Maritime Forest Gravelly Slopes, Shallow. This soil is at sea level to an elevation of 3,500 feet (0 to 1,080 meters). The mean annual air temperature is 39 to 39 degrees F (4 to 6 degrees C), and the mean annual precipitation is 25 to 28 inches (66 to 70 centimeters).

An example of a soil in the subalpine zone is D22—Subalpine Scrub/Herb Gravelly Slopes, Depositional. This soil is at an elevation of about 985 to 5,250 feet (300 to 1,600 meters). The mean annual air temperature is 35 to 42 degrees F (2 to 4 degrees C), and the mean annual precipitation is 38 to 75 inches (100 to 190 centimeters).

An example of a soil in the alpine zone is D22—Alpine Herbaceous Gravelly Diorite Slopes. This soil is at an elevation of about 2,484 to 8,125 feet (757 to 2,477 meters). The mean annual air temperature is 32 to 37 degrees F (0.5 to 3 degrees C), and the mean annual precipitation is 60 to 200 inches (150 to 500 centimeters).

Most of the soils in the survey area have a udic moisture regime because of the amount and distribution of the precipitation (Soil Survey Staff, 1975). Soils in poorly drained or very poorly drained areas have an aquic moisture regime because of the high level of the groundwater, which keeps the soils saturated for prolonged periods. All of the soils in the survey area have a cryic temperature regime because of the cool average annual temperature.

Living Organisms

Living organisms are active in the formation of soils. Plants, animals, insects, and micro-organisms contribute to the gains or losses in organic matter, plant nutrients in the soil, and changes in porosity and structure. Roots, rodents, worms, and insects penetrate the soil and alter its structure. Animals increase porosity by burrowing through the soil and leaving open channels for the movement of water and air. Common burrowing animals in the survey area include ground squirrels and marmot. Soils are churned when trees are blown over with their root systems intact. Leaves, roots, and entire plants that remain in the surface layer are changed to humus by micro-organisms, chemicals in the soil, and insects. Fungi and algae also contribute to the decomposition of bedrock.

Topography

Topography, or relief, of the survey area is determined by past glaciations. Topography influences soil development through its effect on drainage, runoff, and colluvial action.

Soils that formed on steep side slopes have rock fragments incorporated into the loamy matrix from downhill movement, called colluviation. An example is D22—Maritime Forest Gravelly Slopes, Shallow. Soils that formed in concave positions from which water cannot freely move away commonly are wet. An example is D22—Maritime Shrub Organic Slopes, Depression, which formed in depressions of hills. Soils that are on broad floodplains have a seasonal high water table near the surface. An example is 22—Estuarine Graminoid Sandy Floodplains, Depression. Soils that formed on moderately sloping fans commonly are drier because the slope allows water to drain freely. An example is D22—Maritime Forest Gravelly Floodplains, Fans.

Parent Material

Parent material is the unconsolidated and chemically weathered mineral or organic material in which soils form.

Soils on mountain slopes and hillsides formed in a thin mantle of colluvium or residuum over bedrock. These soils commonly have angular fragments throughout as a result of downslope movement. D22—Maritime Forest Gravelly Slopes, Shallow, is an example.

Soils on floodplains and alluvial fans formed in alluvium. Alluvium in the survey area typically is comprised of rounded gravel and cobbles in a sandy or loamy matrix. The size of the fragments and texture of the material is determined by the energy of the water that caused the deposition. Soils on fans and in relatively steep mountain valleys have larger stones and a sandier texture. D22—Maritime Forest Gravelly Floodplains is an example. Soils that formed on broad, level floodplains have smaller stones and a loamier texture. 22—Estuarine Graminoid Sandy Floodplains is an example.

Some soils formed almost entirely in dead, decomposing plant material. These soils commonly are very poorly drained, which restricts the ability of microbes to break down the material. D22—Maritime Shrub Organic Slopes, Depression, formed in thick deposits of moss and sedge peat.

Time

The changes that take place in a soil over long periods of time are referred to as soil genesis. Distinct horizons, or layers, develop in soils as a result of these changes. The length of time that the parent material has been in place and exposed to climate and living organisms is generally reflected in the degree of development in the soil profile. The kinds and arrangement of layers, or soil morphology, are described in terms of color, texture, structure, consistence, thickness, permeability, and chemistry. Soils are classified as young to mature. The relative age of a soil can be determined by the thickness of its horizons, the types of minerals that have developed, and the depth to which soluble material is leached. In terms of geologic time, all of the soils in the survey area are young because they have been recently glaciated and then mantled by colluvial and alluvial deposits. Erosional processes have redistributed some of material on active landforms, such as alluvial fans and floodplains. The youngest soils on these landforms, such as 22—Maritime Shrub Gravelly Floodplains, Frequently Flooded, exhibit very little profile development other than the accumulation of organic matter in the surface horizon. In contrast, D22—Maritime Forest Gravelly Slopes, High Elevation, which is on mountain slopes that are mantled by thin to moderately deep colluvial deposits, have horizons that are strongly leached by organic acids. Minerals and organic matter have been translocated to the lower horizons by the process of podzolization. This is the dominant soil-forming process in the survey area, and it takes place relatively rapidly in this environment.

Soil Processes and Indicators

Soil processes are a combination of physiochemical and biological reactions that transform material into soil horizons. The factors of soil formation are thought of as controls on processes that result in observable and measurable soil features. Simplified concepts of solution, oxidation, reduction, hydrolysis, hydration, chelation, ionic substitution, synthesis, and crystallization have been applied to the transformation of individual compounds and components of soils. Combinations of these elementary processes are believed to occur in the development of soils. Combinations in which a particular process is dominant or the rate of a particular process is distinct have been named (Wilding and others, 1984). Braunification, colluviation, fluvial processes, hydromorphism, and podzolization are described in this section. Each process is related to observable sets of soil properties, or field indicators.

Colluviation is a depositional process as a result of mass wasting or overland flow. Sediment deposited by mass wasting generally is unsorted and nonstratified. Individual particles are not rounded. These characteristics distinguish colluvium from sediment deposited by fluvial processes (Longwell and others, 1969). Colluvial material includes talus and solifluction deposits. In this survey area, this process is enhanced by extreme temperature variations throughout the year. Multiple freeze-thaw cycles fracture exposed bedrock and destabilize the slopes on which the rock fragments accumulate. This process is extensive throughout the mountains and along river escarpments. Field indicators of this process include long plain slopes or conical features extending downslope from steep exposures of bedrock to the base of the slope. Soils within colluvial cones consist of nonsorted material with 30 percent angular rock fragments or more, by volume. Soils on steep colluvial slopes are characterized by an absence of horizons and a lack of vegetation because of the unstable surface. On more stable, or metastable, colluvial slopes, a continuous organic mat underlain by an A, Bw, C, and R horizon sequence is common.

Fluvial processes include erosion, transportation, and deposition of alluvium by water. These processes are a good example of the topographic and time factors of soil formation. Soils that are subject to periodic flooding exhibit minimal horizon development. Along low-gradient streams, low-velocity floodwaters deposit stratified sandy and silty sediment. Soils such as 22—Maritime Forest Loamy Floodplains, Rarely Flooded, formed in this sediment. Along higher gradient streams, such as those along the upper reaches of the Skagway River, high-velocity floodwaters deposit gravelly and cobbly alluvium as channel deposits. Landscape indicators of fluvial processes include the presence of barren or sparsely vegetated gravel bars, channels, and alluvial flats adjacent to active river channels and debris, ice-gouged trees, and watermarked vegetation. Vegetation indicators of fluvial processes include the presence of young stands of feltleaf willow and alder shrub, herbaceous vegetation, or balsam poplar forests adjacent to stream channels. Soil indicators include stratification of sandy and silty sediment and buried organic layers and relatively high soil reaction (pH) as compared to soils in adjacent upland positions.

Hydromorphism is associated with near-surface saturated conditions. This process occurs extensively throughout the survey area. Hydromorphism is a good example of the topographic factor of soil formation. Water collects locally in small, concave micro-positions on all landforms above restrictive layers with low permeability, such as bedrock, that act as regional features that may underlie river valleys. This process includes the chemical reduction, mobilization, and movement of soluble minerals and the formation of a thick organic mat on the surface under saturated anaerobic conditions.

Plant roots and soil microbes deplete the oxygen in these saturated soils, causing anaerobic conditions. Subsequently, iron and manganese, the primary pigments in mineral soils, are converted to reduced forms. These reduced compounds are mobile in the soil solution and are easily stripped from the soil by the water table. Soils stripped of mineral pigments have a neutral gray to bluish color, which is referred to as redoximorphic depletions. A soil morphological feature indicative of this process is the Cg horizon. The mobilized minerals are transported through the soil by groundwater to an oxidized zone. Mineral oxidation and precipitation occur, imparting a yellowish to reddish color to the soil. This feature is referred to as redoximorphic concentrations. In areas where the water table fluctuates near the surface, the soil environment commonly alternates between reduced and oxidized states and the soils commonly display a complex mottled pattern of both reddish oxidized colors (concentrations) and grayish reduced colors (depletions). Permanently saturated soils commonly have a thick organic layer. The accumulation and stability of the organic deposits in these soils is attributed to prolonged saturation and the associated anaerobic environment.

Two general groups of hydromorphic soils are in the survey area. These include aquifer-wet soils and topographically-wet soils. Aquifer-wet soils include those on floodplains and in broad depressions. A local or regional water table is present within the soil profile. Evidence of aquifer-wet or extensive aquifer systems include the presence of multiple oxbows and cutoff meanders on floodplains. Soil indicators of hydromorphism on these landforms include a water table near the surface during much of the year, abundant redoximorphic depletions and concentrations, and a thick, saturated organic horizon. Vegetation indicators include a prevalence of wet sedge meadow or willow/sedge meadow.

Topographically-wet soils include those in open swales and closed depressions, where the source of water is run-in from adjacent uplands or from precipitation. Water is near the surface for prolonged periods because of the relatively low rate of permeability in the underlying material. Topographically-wet mineral soils in swales or nivation hollows with snowbeds are common in the alpine and subalpine biomes. Saturated conditions result from melting snowdrifts that persist into summer and saturate soils downslope. Soils in these depressions commonly are slightly more nutrient rich than adjacent well drained soils and have a water table at or near the surface some time during the growing season. Soil indicators of hydromorphism in these soils include a thick organic layer at the surface or an organic-rich mineral layer 8 inches thick or more. Soil indicators of these seasonally saturated, topographically-wet soils include a thick, dark-colored mineral surface horizon and faint reddish redoximorphic concentrations in the subsoil.

Braunification is the release of iron from primary minerals by oxidation or hydration, which gives the soil matrix a brownish, reddish brown, or red color (Wilding and others, 1984). This process is a good example of the time and topographic factors of soil formation. Braunification is common on vegetated mountain slopes, terraces, plains, and hills throughout the uplands of the survey area. The process is common in soils on relatively stable surfaces that are not influenced by flooding or excessive downslope movement of soil material. The downward movement of water through the soil profile and free movement of oxygen promote weathering of primary iron minerals. Surface stability promotes the removal of excess basic metal cations from the soil through leaching and plant use. This normally is accompanied by a reduction in soil reaction (pH) in the upper part of the soil. The weathering and translocation of primary soil minerals, including iron and organic matter, accompany soil acidification. Indicators of braunification include the presence of a continuous organic mat on the surface or a cover of dwarf shrub and a thin, dark surface mineral horizon, which are a result of surface stability. Additional soil indicators include the presence of a light brown to yellowish brown subsurface layer as a result of the weathering and translocation of primary soil minerals. Soil reaction also gradually increases as depth increases.

Podzolization includes the chelation and chemical migration of aluminum and iron and organic matter downward in the soil profile, leaving silica in the leached layer (Wilding and others, 1984). This process is a good example of the climate and parent material factors of soil formation. This alteration and translocation normally is active under extremely acid soil conditions, which generally are associated with high precipitation. Indicators of this process include a thin, gray, leached surface E horizon over a brown Bs horizon. Podzolization is dependent on specific site and soil properties, including coarse texture and the presence of shrub birch, a known soil acidifier.

The following table is an overview of the soils in the survey area.

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Glossary

Acidification (process). A subprocess of braunification in which excess basic metal cations are removed from the soil profile by leaching or plant use. Acidification normally is accompanied by a reduction in soil reaction (pH).

Active layer. The top layer of ground subject to annual thawing and freezing in areas underlain by permafrost.

Aerobic. A condition in which molecular oxygen is in the soil.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. A body of alluvium, with overflow of water and debris flow deposits, whose surface forms a segment of a cone that radiates downslope from the point where the stream emerges from a narrow valley onto a less sloping surface. Source uplands range in relief and areal extent from mountains to gullied terrains on hillslopes.

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

Alpine. Land and related resources above the upper elevation limit of trees (treeline).

Anaerobic. A condition in which molecular oxygen is absent in the soil.

Aspect. The direction in which a slope faces. Also, the general physical appearance of a vegetation cover type.

Association, soil. A group of soils or miscellaneous areas 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

Basal area. For trees, the area of the cross section of a single tree or of all trees in a stand, usually measured at breast height (see breast height), expressed as square feet per acre or square meters per hectare. For herbs and shrubs, the area or proportion of the ground surface covered by the stems of plants at about ground level, expressed as square feet per acre or square meters per hectare or as a percentage.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Biome. A continental-scale ecosystem characterized by similarities in plant lifeforms and environment. Examples are boreal, subalpine, and alpine.

Bog. A peat-forming ecosystem influenced solely by water, which falls directly onto it as rain or snow. Bog vegetation is dominantly herbs, shrubs, and stunted trees. *Sphagnum spp*. commonly is dominant in the moss layer.

Boreal. The biome of North America that stretches from Alaska and the Rocky Mountains eastward to the Atlantic Ocean. It is bounded by the treeline to the north and by aspen parkland to the south, which is a transition zone to the prairie grassland. The boreal biome supports dominantly forest vegetation.

Braunification (process). Release of iron from primary minerals in soil by hydration or oxidation, giving the soil a yellowish, brownish, or reddish brown color.

Breast height. A standard height for measurement of tree diameter and age, or 1.5 meters above the average ground level.

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

Canopy. The cover of leaves and branches formed by the tops or crowns of plants as viewed from above.

Canopy cover. The proportion of the ground area covered by the vertical projections of the canopy, express as a percentage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Coarse fragments. Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 7.6 to 25 centimeters in diameter.

Codominant trees. Trees whose crowns form the general level of the forest canopy and that receive full light from above but comparatively little from the sides.

Colluviation (processes). Processes associated with transportation and/or deposition by mass movement (direct gravitational action) and local, unconcentrated runoff on side slopes and/or at the base of slopes.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit with two or more soils or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

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

Sticky—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.

Cover type. A unit of vegetation essentially similar in composition and development throughout its extent. Synonyms: community type, vegetation type.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cryic. Soil temperature regime in which the mean annual soil temperature is 0 to 8 degrees C.

Cryoturbation (frost churning). The churning of soil material by frost action, resulting in disrupted or broken horizons, incorporation of material from other horizons, organic matter accumulation on the permafrost table, and oriented rock fragments.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Diffusion. Movement from a zone of high concentration to one of lower concentration.

Dominant trees. Trees whose crown forms the general level of the forest canopy and receives full light from above and from the sides.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage. Altered drainage is commonly the result of artificial drainage or irrigation, but it 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. These soils 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, have a high water table, receive additional water from seepage, receive 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. In areas where rainfall is high and nearly continuous, they can have a moderate or high slope gradient.

Effervescence. A bubbling reaction upon addition of dilute hydrochloric acid.

Enrichment (process). A fluvial subprocess that includes the accumulation of bases such as calcium carbonate in the soil. The process includes fluvial deposits of base-rich material and concentration in the surface layer due to evaporation.

Ericaceous. Refers primarily to the heath family, *Ericaceae* (for example, Labrador-tea), but usually includes the crowberry family, *Empetraceae*.

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).

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. The term is most often applied to cliffs resulting from differential erosion.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Evapotranspiration. The combined loss of water from a given area and during a specific period of time by evaporation from the soil surface and by transpiration from plants.

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.

Fine textured soil. Sandy clay, silty clay, or clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to inundation under flood-stage conditions unless protected artificially. It is usually a constructional landform built of sediment deposited during overflow and lateral migration of the stream.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Fluvial (processes). Processes including erosion, transportation, deposition, and enrichment of alluvium by water.

Footslope. The geomorphic component that forms the inner, gently inclined surface at the base of a hillslope. The surface profile is dominantly concave. In terms of gradational processes, a footslope is a transition zone between an upslope site of erosion (backslope) and a downslope site of deposition (toeslope).

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

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A unit of forest vegetation essentially similar in composition and development throughout its extent.

Frost boil. A small mound of fresh soil material formed by frost action. A type of nonsorted circle commonly found in fine grained sediment underlain by permafrost.

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.

Geomorphic processes. Natural processes that form the landscape and surficial sediment. For example, colluvial processes, deposition, and erosion.

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.

Glaciated uplands. Land areas that were previously covered by continental or alpine glaciers and that are at a higher elevation than the flood plain.

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 kames, eskers, deltas, and outwash plains.

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.

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.

Gravel. Rounded or angular fragments of rock as much as 3 inches in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 7.6 centimeters in diameter.

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

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

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

Herb. Grasses, sedges, forbs, and any other non-woody herbaceous plants.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well-defined outline. Hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons of mineral soil are as follows:

O horizon—An organic layer of fresh and decaying plant residue.

A horizon—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

E horizon—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

C horizon—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

Cr horizon—Sedimentary beds of consolidated sandstone and semiconsolidated and consolidated shale. Generally, roots can penetrate this horizon only along fracture planes.

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.

Hummock. A rounded or conical mound or other small elevation. Also, a slight rise of ground above a level surface.

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. Group A soils have a high infiltration rate when thoroughly wet and have a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. Group D soils, at the other extreme, have 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.

Hydromorphism (process). Soil process associated with saturated conditions that includes accumulation of organic material and formation of redoximorphic features (gray and red soil mottles caused by saturation or alternating saturated and unsaturated conditions in soils).

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 centimeters per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interior (Alaska). Physiographic area north of the summit of the Alaska Range and south of the summit of the Brooks Range that has a dominantly continental climate.

Interstitial (ice cyrstals). Ice formation in voids between soil particles.

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

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

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

Loess. Fine grained material, consisting dominantly of silt-sized particles, deposited by wind.

Maritime-continental (climate). A blend of two climate types in which either the maritime or continental climate may be the dominant local weather for extended periods of time.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minor components. A component of limited extent that may or may not be present in any given area.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

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. Descriptive terms for abundance are *few, common,* and *many;* for size are *fine, medium,* and *coarse;* and for contrast are *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,* 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 305 meters above surrounding lowlands, commonly of limited summit area and generally having steep sides (slopes of more than 25 percent) and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are primarily formed by deep-seated earth movements or volcanic action and secondarily by differential erosion.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by 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.

Observed rooting depth. Depth to which roots have been observed to penetrate.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. An extensive area of glaciofluvial material that was deposited by meltwater streams.

Overstory. The trees in a forest that form the upper canopy layer or layers.

Oxbow. The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

Oxidation. Combination with oxygen; addition of oxygen or other atom or group; removal of hydrogen or other atom or group.

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

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture conditions. (See Fibric soil material.)

Pedon. The smallest volume that can be called "soil." A pedon is three-dimensional and large enough to permit study of all the horizons. Its area ranges from about 10 to 100 square feet, depending on the variability of the soil.

Pergelic. Soil temperature regime where the mean annual soil temperature is below freezing or lower.

Permafrost. Layers of soil, or bedrock, in arctic or subarctic regions in which a temperature below freezing has existed continuously for 2 years or more.

Permafrost extent or distribution. The percentage of a map unit consisting of soils with permafrost.

Continuous—More than 80 percent of the composition of a map unit consists of soils with permafrost.

Discontinuous—20 to 80 percent of a map unit consists of soils with permafrost.

Sporadic—More than 5 percent but less than 20 percent of a map unit consists of soils with permafrost.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the *Soil Survey Manual*. In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

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

Physiochemical. Related to physical and chemical soil properties.

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.

Podzolization (process). The removal and translocation of iron and aluminum from surface layers into underlying soil material. The soils typically have a gray, leached surface mineral layer a few centimeters thick underlain by a dark red layer of accumulated iron, aluminum, and organic compounds.

Ponding. Standing water on soils in closed depressions. Only percolation or evapotranspiration can remove the water.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential natural community. The assemblage of plants that most nearly achieves a long-term steady state of productivity, structure, and composition on a site. Synonyms: potential plant community, climax plant community, and plant association.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil. 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	4.6 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Bodies of apparent accumulation of iron-manganese oxides.

Redoximorphic depletions. Bodies of low chroma (≤1) having value of 4 or more where iron-manganese oxides alone have been stripped out or where both iron-manganese oxides and clay have been stripped out.

Redoximorphic features. Patches of contrasting colors and low chroma colors formed by the processes of reduction, translocation, and oxidation of iron and manganese oxides.

Regeneration. The new growth of a natural plant community, developing from seed.

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

Riparian (or riparian zone). Land in close proximity to a watercourse, lake, or spring and influenced by surface water and groundwater during all or part of the year.

Riverine. Associated with a river system; active river channel, and land adjacent to the river that is inundated when stream discharge exceeds channel capacity.

Riverwash. Unstable areas of sandy, silty, clayey, or gravelly sediment. These areas are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.

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

Rock outcrop. Exposures of bare bedrock other than lava flows and rock-lined pits.

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.

Representative value (RV). Used in the map unit descriptions to designate a representative value of the composition of each major component within a map unit. This value is expressed as a percentage.

Sand. s 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.

Sandy soil. Sand or loamy sand.

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.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scrub type. A unit of scrub vegetation essentially similar in composition and development throughout its extent.

Shoulder slope. The uppermost inclined surface at the top of a hillside. It is the transition zone from the backslope to the summit of a hill or mountain. The surface is dominantly convex in profile and erosional in origin.

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 have similar 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.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by the horizontal distance and then multiplied by 100. Thus, a slope of 20 percent is a drop of about 6 meters in 30.5 meters of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 4 percent
Moderately sloping	4 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 45 percent
Very steep	More than 45 percent

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 group. A collection of soils that form under the influence of similar soil and geomorphic processes and share similar chemical and physical properties.

Soil process. A physical or chemical change in soil brought about by exterior influences.

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 underlying material. The living roots and plant and animal activity are largely confined to the solum.

Species. A single, distinct kind of plant or animal having certain distinguishing characteristics.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment thick or more. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches in diameter if rounded or 15 to 24 inches in length if flat.

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

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

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 adhere without any regular cleavage, as in many hardpans).

Subalpine. The biome between the boreal and alpine biomes that consists of alder scrub.

Subarctic continental. The climate of interior Alaska that is characterized by long, cold winters and short, warm summers.

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 soil horizon (A, E, AB, or EB) below the surface layer.

Summit. A general term for the top, or highest level, of an upland feature, such as a hill or mountain. It commonly refers to a higher area that has a gentle slope and is flanked by steeper slopes.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches. 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.

Taiga. A Russian term meaning “land of little sticks” that is applied to the dwarf or stunted open conifer woodland and forests that are typically underlain by permafrost.

Talus. Rock fragments of any size or shape, commonly coarse and angular, derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose, broken rock formed mainly by falling, rolling, or sliding.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by the terms "coarse," "fine," or "very fine."

Thermal conductivity. A measure of heat transfer through soil.

Thermokarst. Subsidence of the ground surface due to melting of ice masses.

Till plain. An extensive, nearly level to gently rolling or moderately sloping area that is underlain by or consists of till and that has a slope of 0 to 8 percent.

Toeslope. The outermost inclined surface at the base of a hill. Toeslopes are commonly gentle and linear in profile.

Tussock. A pedestal or rounded mound or other small elevation consisting of sedges and sedge detritus.

Understory. Any plants in a forest or scrub community that grow below the tree or shrub overstory and are partially shaded by the overstory.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowland along streams.

Valley. An elongated depressional area primarily developed by stream action.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than a result of poor drainage.

Tables

Table 1.--Temperature

(Recorded in the period 1950 to 2012 at Skagway 1 NW [508525], Alaska.)

Month	Monthly average			Daily extreme				Monthly extreme				Maximum temperature		Minimum temperature	
	Maxi-mum	Mini-mum	Mean	High	Date	Low	Date	Highest mean	Year	Lowest mean	Year	≥90 °F	≤32 °F	≤32 °F	≤0 °F
	°F	*°F*	*°F*	*°F*	*Day/year*	*°F*	*Day/year*	*°F*		*°F*		*Days*	*Days*	*Days*	*Days*
January----	28.1	18.7	23.6	55	19/2009	-16	03/1965	31.9	2001	11.0	1959	0.0	15.9	28.0	3.1
February---	33.5	22.0	27.7	48	24/1963	-7	09/2008	35.1	1964	20.5	1965	0.0	9.0	24.7	1.1
March------	37.6	23.6	30.5	58	29/1954	-5	05/1951	37.2	2005	24.7	2007	0.0	7.0	27.1	0.3
April------	50.4	31.0	40.8	76	27/1958	10	06/1954	45.1	1958	34.9	2002	0.0	0.2	17.6	0.0
May--------	60.4	39.2	49.8	82	31/1958	22	11/1952	54.6	2005	46.3	2012	0.0	0.0	4.0	0.0
June-------	66.7	46.5	56.6	87	20/2004	5	19/1962	60.1	1958	51.4	1962	0.0	0.0	0.2	0.0
July-------	67.1	49.6	58.3	85	10/1953	38	20/1963	60.9	2004	55.8	2008	0.0	0.0	0.0	0.0
August-----	65.5	48.3	56.9	91	17/2004	28	26/1952	60.7	2004	55.2	2011	0.1	0.0	0.0	0.0
September--	58.1	42.5	50.3	83	04/1957	22	28/1954	55.7	1957	48.3	2000	0.0	0.0	2.1	0.0
October----	48.4	35.8	42.1	68	07/1957	20	20/1961	45.5	1957	39.0	1961	0.0	0.1	9.2	0.0
November---	37.2	27.1	31.9	56	01/2003	-6	23/1963	38.6	1957	18.1	2006	0.0	6.2	20.9	0.4
December---	32.1	22.4	27.3	50	02/1963	-20	15/1964	34.1	2005	10.2	1964	0.0	12.5	27.4	1.3

Table 1.--Temperature--Continued

Month	Monthly average			Daily extreme				Monthly extreme				Maximum temperature		Minimum temperature	
	Maximum	Minimum	Mean	High	Date	Low	Date	Highest mean	Year	Lowest mean	Year	≥90 °F	≤32 °F	≤32 °F	≤0 °F
	°F	*°F*	*°F*	*°F*	*Day/year*	*°F*	*Day/year*	*°F*		*°F*		*Days*	*Days*	*Days*	*Days*
Yearly:															
Annual----	48.8	33.9	41.3	91	08/17/2004	-20	12/15/1964	43.6	2005	40.0	1961	0.1	50.8	161.2	6.2
Winter----	31.2	21.0	26.2	55	01/19/2009	-20	12/15/1964	30.8	1960	16.1	1965	0.0	37.4	80.0	5.5
Spring----	49.5	31.3	40.4	82	05/31/1958	-5	03/05/1951	45.6	2005	37.3	2002	0.0	7.2	48.6	0.3
Summer----	66.5	48.1	57.3	91	08/17/2004	5	06/19/1962	60.4	2004	55.4	2012	0.1	0.0	0.2	0.0
Fall------	47.9	35.1	41.4	83	09/04/1957	-6	11/23/1963	46.6	1957	37.2	2006	0.0	6.2	32.2	0.4

This table was updated on October 31, 2012. For monthly and annual means, thresholds, and sums, months with 5 missing days or more and years with 1 missing month or more were not considered. Seasons are climatologic, not calendar. Winter consists of December, January, and February; spring of March, April, and May; summer of June, July, and August; and fall of September, October, and November.

Table 2.--Precipitation

(Recorded in the period 1950 to 2012 at Skagway 1 NW [508525], Alaska.)

Month	Precipitation											Total snowfall		
	Mean	High	Year	Low	Year	1-day maximum		≥0.01 in.	≥0.10 in.	≥0.50 in.	≥1.00 in.	Mean	High	Year
	In	*In*		*In*		*In*	*Day/year*	*Days*	*Days*	*Days*	*Days*	*In*	*In*	
January----	2.43	5.62	2009	0.39	1958	1.60	06/2003	11	7	1	0	12.6	34.7	2012
February---	1.65	3.56	2004	0.23	2007	1.50	09/2004	9	5	1	0	7.3	24.0	2009
March------	1.87	6.75	2010	0.00	1958	3.50	10/2007	8	5	1	0	8.9	26.0	2010
April------	1.23	3.28	2006	0.00	1958	0.99	03/2004	8	4	1	0	0.6	2.5	2002
May--------	0.89	2.12	2012	0.09	1952	0.69	15/2008	8	3	0	0	0.0	0.0	1952
June-------	1.09	2.22	2010	0.00	1952	0.95	28/2008	8	4	0	0	0.0	0.0	1952
July-------	1.64	4.34	2007	0.12	1963	1.21	01/2000	11	5	1	0	0.0	0.0	1952
August-----	2.32	5.42	2011	0.00	1963	1.19	20/2011	13	7	1	0	0.0	0.0	1952
September--	4.04	7.66	2011	0.43	1963	1.65	02/2006	17	10	3	1	0.0	0.0	1957
October----	3.88	7.15	2008	1.40	2012	1.75	21/2002	16	10	2	0	0.5	3.0	2004
November---	3.45	10.74	2005	0.08	2006	2.70	23/2005	13	8	2	1	3.8	20.9	2011
December---	2.85	7.35	2006	0.78	2010	2.65	24/2001	11	8	1	0	12.5	44.5	2006

Table 2.--Precipitation--Continued

Month	Precipitation											Total snowfall		
	Mean	High	Year	Low	Year	1-day maximum		≥0.01 in.	≥0.10 in.	≥0.50 in.	≥1.00 in.	Mean	High	Year
	In	*In*		*In*		*In*	*Day/year*	*Days*	*Days*	*Days*	*Days*	*In*	*In*	
Yearly:														
Annual-----	27.33	37.69	2005	26.50	2002	3.50	03/10/2007	132	77	13	3	46.3	63.6	2006
Winter-----	6.92	12.59	2007	2.06	1958	2.65	12/24/2001	31	19	3	1	32.4	68.8	2007
Spring-----	3.99	8.21	2010	0.45	1958	3.50	03/10/2007	24	12	1	0	9.5	27.0	2010
Summer-----	5.05	7.45	2008	0.57	1963	1.21	07/01/2000	32	16	2	0	0.0	0.0	1952
Fall-------	11.37	19.78	2005	5.42	1963	2.70	11/23/2005	45	29	7	2	4.3	8.4	2003

This table was updated on October 31, 2012. For monthly and annual means, thresholds, and sums, months with 5 missing days or more and years with 1 missing month or more were not considered. Seasons are climatologic, not calendar. Winter consists of December, January, and February; spring of March, April, and May; summer of June, July, and August; and fall of September, October, and November.

Table 3.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
22CF1	Estuarine Floodplains	215	0.1
22CP3	Estuarine Coastal Plains	126	0.1
22FF1	Maritime Fans	773	0.4
22HF1	Maritime Floodplains, High Gradient	836	0.4
22LF1	Maritime Floodplains, Gravelly	1,891	0.9
22LF2	Maritime Floodplains, Loamy	1,072	0.5
22LM1	Maritime Mountains, Steep	6,695	3.3
22UF1	Maritime Floodplains, Urban Land	359	0.2
D22AM1	Alpine Diorite Mountains	125,305	62.6
D22BF1	Maritime Floodplains, High Gradient, Jokulhlaup	1,085	0.5
D22DW1	Maritime Organic Floodplains	350	0.2
D22HM2	Maritime Mountains, High Elevation	3,326	1.7
D22LM2	Maritime Mountains, Very Steep, Smooth	17,666	8.8
D22LM3	Maritime Mountains, Very Steep, Dissected	7,305	3.7
D22SA1	Subalpine Mountains	23,551	11.8
D22SA2	Subalpine Mountains, Avalanche Chutes	2,517	1.3
D22WF1	Maritime Water, Lakes and Ponds	207	0.1
D22WS1	Estuarine Water, Salt	6,853	3.4
	Total-------------------------------------	200,131	100.0

Table 4.--Soil-Ecological Site Correlation

Map unit symbol and soil name	Ecological site identification number	Ecological site name
22CF1:		
22-Estuarine Graminoid Loamy Floodplains	R222XY329AK	Estuarine Graminoid Loamy Floodplain
22-Maritime Water, Flowing	R222XY304AK	Maritime Water, Flowing
22-Estuarine Graminoid Loamy Floodplains, Depression	R222XY330AK	Estuarine Graminoid Loamy Floodplain, Depression
22CP3:		
22-Estuarine Graminoid Gravelly Coastal Plain	R222XY323AK	Estuarine Graminoid Gravelly Coastal Plain
22-Estuarine Graminoid Loamy Floodplains	R222XY329AK	Estuarine Graminoid Loamy Floodplain
22-Estuarine Water, Saline	R222XY300AK	Estuarine Water Saline
22FF1:		
22-Maritime Forest Gravelly Alluvial Fan, Fan Terrace	F222XY327AK	*Tsuga heterophylla-Picea sitchensis/Viburnum edule/Gymnocarpium dryopteris*
22-Maritime Water, Flowing	R222XY304AK	Maritime Water, Flowing
22HF1:		
22-Maritime Riverwash, Bouldery	R222XY306AK	Maritime Riverwash, Bouldery
22-Maritime Water, Flowing	R222XY304AK	Maritime Water, Flowing
D22-Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	F222XY325AK	*Picea sitchensis-Tsuga heterophylla/Menziesia ferruginea-Oplopanax horridus/Gymnocarpium dryopteris-Athyrium filix-femina*
22LF1:		
22-Maritime Forest Gravelly Floodplains, Rarely Flooded	F222XY334AK	*Betula papyrifera-Picea sitchensis/Dryopteris expansa-Pyrola asarifolia*
22-Maritime Forest Gravelly Floodplains, Occasionally Flooded	F222XY333AK	*Populus balsamifera-Picea sitchensis/Alnus viridis ssp. sinuata-Viburnum edule/Gymnocarpium dryopteris*
22-Maritime Riverwash, Gravelly	R222XY307AK	Maritime Gravelly Floodplains
22-Maritime Water, Flowing	R222XY304AK	Maritime Water, Flowing
22-Maritime Scrub Gravelly Floodplains, Frequently Flooded	R222XY332AK	Maritime Scrub Gravelly Floodplains, Frequently Flooded
22-Maritime Scrub Gravelly Floodplains, Depression	R222XY331AK	Maritime Scrub Gravelly Floodplain, Depression
22-Maritime Gravel Pit	R222XY312AK	Maritime Gravel Pits

Table 4.--Soil-Ecological Site Correlation--Continued

Map unit symbol and soil name	Ecological site identification number	Ecological site name
22LF2:		
22-Maritime Forest Loamy Floodplains, Rarely Flooded	F222XY334AK	*Betula papyrifera-Picea sitchensis/Dryopteris expansa-Pyrola asarifolia*
22-Maritime Forest Gravelly Floodplains, Rarely Flooded	F222XY334AK	*Betula papyrifera-Picea sitchensis/Dryopteris expansa-Pyrola asarifolia*
22-Maritime Forest Gravelly Floodplains, Occasionally Flooded	F222XY333AK	*Populus balsamifera-Picea sitchensis/Alnus viridis ssp. sinuata-Viburnum edule/Gymnocarpium dryopteris*
22-Maritime Riverwash, Gravelly	R222XY307AK	Maritime Gravelly Floodplains
22-Maritime Water, Flowing	R222XY304AK	Maritime Water, Flowing
22-Maritime Scrub Gravelly Floodplains, Depression	R222XY331AK	Maritime Scrub Gravelly Floodplain, Depression
22-Maritime Scrub Gravelly Floodplains, Frequently Flooded	R222XY332AK	Maritime Scrub Gravelly Floodplains, Frequently Flooded
22LM1:		
22-Maritime Forest Gravelly Slopes, Shallow	F222XY337AK	*Picea sitchensis-Pinus contorta/Menziesia ferruginea-Vaccinium ovalifolium/Orthilia secunda*
22-Maritime Forest Organic Slopes, Dry	F222XY337AK	*Picea sitchensis-Pinus contorta/Menziesia ferruginea-Vaccinium ovalifolium/Orthilia secunda*
22-Maritime Rock Outcrop	R222XY313AK	Maritime Rock Outcrop
22-Maritime Forest Organic Slopes, Depression	F222XY341AK	*Picea sitchensis-Betula papyrifera/Menziesia ferruginea-Viburnum edule/Gymnocarpium dryopteris*
22UF1:		
22-Maritime Urban Land	R222XY332AK	Maritime Scrub Gravelly Floodplains, Frequently Flooded
22-Maritime Urban Land, Flooded	R222XY332AK	Maritime Scrub Gravelly Floodplains, Frequently Flooded
22-Maritime Gravel Pit	R222XY312AK	Maritime Gravel Pits
22-Maritime Levees	R222XY309AK	Maritime Levees
D22AM1:		
D22-Subalpine and Alpine Permanent Ice and Snow	R222XY321AK	Subalpine and Alpine Permanent Ice and Snow
D22-Subalpine and Alpine Rock Outcrop	R222XY317AK	Subalpine and Alpine Rock Outcrop
D22-Subalpine and Alpine Rubble Land	R222XY318AK	Subalpine and Alpine Rubble Land
D22-Alpine Herbaceous Gravelly Diorite Slopes	R222XY356AK	Alpine Herbaceous Gravelly Slopes

Table 4.—Soil-Ecological Site Correlation—Continued

Map unit symbol and soil name	Ecological site identification number	Ecological site name
D22BF1:		
D22-Maritime Riverwash, Bouldery	R222XY306AK	Maritime Riverwash, Bouldery
D22-Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	F222XY325AK	*Picea sitchensis-Tsuga heterophylla/Menziesia ferruginea-Oplopanax horridus/Gymnocarpium dryopteris-Athyrium filix-femina*
D22-Maritime Water, Flowing	R222XY304AK	Maritime Water, Flowing
D22DW1:		
D22-Maritime Scrub/Herb Mosaic Organic Floodplains	R222XY328AK	Maritime Scrub/Herb Mosaic Organic Floodplain
D22-Maritime Water, Lakes and Ponds	R222XY305AK	Maritime Water, Lakes and Ponds
D22HM2:		
D22-Maritime Forest Organic Slopes, Dry, High Elevation	F222XY338AK	*Tsuga mertensiana-Abies lasiocarpa/Vaccinium ovalifolium-Menziesia ferruginea/Dryopteris expansa*
D22-Maritime Rock Outcrop	R222XY313AK	Maritime Rock Outcrop
D22-Maritime Rubble Land	R222XY314AK	Maritime Rubble Land
D22-Maritime Forest Gravelly Slopes, High Elevation	F222XY338AK	*Tsuga mertensiana-Abies lasiocarpa/Vaccinium ovalifolium-Menziesia ferruginea/Dryopteris expansa*
D22LM2:		
D22-Maritime Forest Gravelly Slopes, Shallow	F222XY337AK	*Picea sitchensis-Pinus contorta/Menziesia ferruginea-Vaccinium ovalifolium/Orthilia secunda*
D22-Maritime Forest Gravelly Slopes, Shallow, Convex	F222XY337AK	*Picea sitchensis-Pinus contorta/Menziesia ferruginea-Vaccinium ovalifolium/Orthilia secunda*
D22-Maritime Rock Outcrop	R222XY313AK	Maritime Rock Outcrop
D22-Maritime Forest Organic Slopes, Dry	F222XY337AK	*Picea sitchensis-Pinus contorta/Menziesia ferruginea-Vaccinium ovalifolium/Orthilia secunda*
D22-Maritime Forest Gravelly Slopes, High Elevation	F222XY338AK	*Tsuga mertensiana-Abies lasiocarpa/Vaccinium ovalifolium-Menziesia ferruginea/Dryopteris expansa*
D22-Maritime Forest Organic Slopes, Depression	F222XY341AK	*Picea sitchensis-Betula papyrifera/Menziesia ferruginea-Viburnum edule/Gymnocarpium dryopteris*

Table 4.--Soil-Ecological Site Correlation--Continued

Map unit symbol and soil name	Ecological site identification number	Ecological site name
D22LM3:		
D22-Maritime Forest Gravelly Slopes, Shallow	F222XY337AK	*Picea sitchensis-Pinus contorta/Menziesia ferruginea-Vaccinium ovalifolium/Orthilia secunda*
D22-Maritime Rubble Land	R222XY314AK	Maritime Rubble Land
D22-Maritime Scrub/Herb Gravelly Slopes, Depositional	R222XY342AK	Maritime Scrub/Herb Gravelly Slopes, Depositional
D22-Maritime Rock Outcrop	R222XY313AK	Maritime Rock Outcrop
D22-Maritime Forest Organic Slopes, Dry	F222XY337AK	*Picea sitchensis-Pinus contorta/Menziesia ferruginea-Vaccinium ovalifolium/Orthilia secunda*
D22-Maritime Forest Gravelly Slopes, High Elevation	F222XY338AK	*Tsuga mertensiana-Abies lasiocarpa/Vaccinium ovalifolium-Menziesia ferruginea/Dryopteris expansa*
D22SA1:		
D22-Subalpine and Alpine Rubble Land	R222XY318AK	Subalpine and Alpine Rubble Land
D22-Subalpine and Alpine Rock Outcrop	R222XY317AK	Subalpine and Alpine Rock Outcrop
D22-Subalpine Scrub Gravelly Slopes, Convex	R222XY355AK	Subalpine Scrub Gravelly Slopes
D22-Subalpine Scrub Organic Slopes	R222XY352AK	Subalpine Scrub Organic Slopes
D22-Subalpine Scrub Gravelly Slopes	R222XY355AK	Subalpine Scrub Gravelly Slopes
D22-Subalpine Scrub Gravelly Slopes, Depositional	R222XY349AK	Subalpine Scrub Gravelly Slopes, Depositional
D22-Subalpine and Alpine Permanent Ice and Snow	R222XY321AK	Subalpine and Alpine Permanent Ice and Snow
D22-Subalpine Forest Gravelly Slopes	R222XY350AK	Subalpine Forest Gravelly Slopes
D22SA2:		
D22-Subalpine and Alpine Rubble Land	R222XY318AK	Subalpine and Alpine Rubble Land
D22-Subalpine and Alpine Rock Outcrop	R222XY317AK	Subalpine and Alpine Rock Outcrop
D22-Maritime Scrub/Herb Gravelly Slopes, Depositional	R222XY342AK	Maritime Scrub/Herb Gravelly Slopes, Depositional
D22-Subalpine Scrub Gravelly Slopes, Depositional	R222XY349AK	Subalpine Scrub Gravelly Slopes, Depositional
D22WF1:		
D22-Maritime Water, Lakes and Ponds	222XY305AK	Maritime Water, Lakes and Ponds
D22WS1:		
D22-Estuarine Water, Saline	R222XY300AK	Estuarine Water, Saline
D22-Estuarine Gravelly Tidal Flats	R222XY302AK	Estuarine Gravelly Tidal Flats

Table 5.--Engineering Properties

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	cm				Pct	Pct					Pct	
22CF1:												
22—Estuarine Graminoid Loamy Floodplains----	0-2	Highly organic silt loam, silt loam	OL, ML	A-5, A-4	0	0	100	100	87-91	60-66	0-43	NP-4
	2-66	Very fine sandy loam, stratified silt loam	ML	A-4	0	0	100	100	88-97	64-76	0-25	NP-6
	66-90	Very fine sandy loam, silt loam	ML	A-4	0	0	100	100	88-96	64-75	0-23	NP-4
	90-183	Extremely gravelly coarse sand	GP	A-1-a	0	7-31	11-25	8-23	3-10	0-2	0-14	NP
22—Maritime Water, Flowing	0-183				---	---	---	---	---	---	---	---
22—Estuarine Graminoid Loamy Floodplains, Depression-----	0-23	Very fine sandy loam, silt loam	ML	A-4	0	0	88-100	88-100	76-96	55-75	0-25	NP-6
	23-43	Silt loam	ML	A-4	0	0	77-100	76-100	67-95	51-75	0-23	NP-4
	43-183	Extremely gravelly coarse sand	GP	A-1-a	0	7-31	11-25	8-23	3-10	0-2	0-14	NP
22CP3:												
22—Estuarine Graminoid Gravelly Coastal Plain--	0-55	Very gravelly Loamy sand, gravelly sandy loam	SP-SM, GP-GM, SM, GM	A-1-b, A-2-4	0	0	39-71	37-70	26-54	10-26	0-23	NP-4
	55-183	Extremely gravelly sand, very gravelly sand	GP-GM, GP	A-1-a	0	0-4	16-44	13-42	10-34	2-7	0-14	NP

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	cm				*Pct*	*Pct*					*Pct*	
22FF1:												
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace----	0-4	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	4-13	Highly organic sandy loam, highly organic gravelly sandy loam, sandy loam, gravelly sandy loam	SP-SM, GP-GM, GM, SM	A-1-b, A-2-4	0	0	34-63	31-61	23-49	11-27	0-43	NP-4
	13-43	Gravelly Loamy sand, very gravelly Loamy sand	SP-SM, GP-GM, GM, SM	A-2-4, A-1-b	0	0	29-69	27-68	21-55	8-24	0-23	NP-2
	43-183	Extremely cobbly sandy loam, very cobbly sandy loam	GM, SM	A-2-4	2-10	33-46	53-80	51-79	38-63	18-34	0-21	NP-2
22HF1:												
22—Maritime Riverwash, Bouldery-------	0-183	Very cobbly coarse sand, extremely cobbly coarse sand, stratified very stony coarse sand, stratified extremely stony coarse sand	SW-SM	A-1-b	45-60	2-11	62-95	61-95	26-45	5-12	0-14	NP
22—Maritime Water, Flowing	0-183				---	---	---	---	---	---	---	---

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	cm				*Pct*	*Pct*					*Pct*	
22HF1:												
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded--------	0-7	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	7-21	Stratified highly organic very Gravelly sandy loam, stratified highly organic gravelly sandy loam, stratified very gravelly sandy loam, stratified gravelly sandy loam	SP-SM, GP-GM, GM, SM	A-2-4, A-1-b	0	0	34-63	31-61	23-49	11-27	0-43	NP-4
	21-183	Extremely bouldery coarse sand, very bouldery coarse sand, very stony coarse sand, extremely stony coarse sand	GP-GM, SP, SW-SM, GP	A-1-a, A-1-b	12-68	25-42	34-80	32-79	14-37	2-10	0-14	NP
22LF1:												
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	0-5	Slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	5-9	Highly organic silt loam, highly organic very fine sandy loam, silt loam, very fine sandy loam	OL, ML	A-5, A-4	0	0	74-91	73-91	64-87	47-68	0-43	NP-4
	9-183	Very gravelly Loamy coarse sand, very gravelly coarse sand	GP, SP, SP-SM, GP-GM	A-1-b, A-1-a	2-9	6-12	43-58	40-56	18-28	4-9	0-18	NP-2

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	cm				*Pct*	*Pct*					*Pct*	
22LF1: 22—Maritime Forest Gravelly Floodplains, Occasionally Flooded--------	0-3	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	3-5	Highly organic sandy loam, highly organic silt loam, sandy loam, silt loam	SM	A-5, A-4	0	0-17	80-86	79-85	59-69	38-48	0-43	NP-4
	5-183	Cobbly sand, extremely cobbly sand, very cobbly Loamy sand, very gravelly sand, gravelly Loamy sand, very gravelly Loamy sand, gravelly sand	GM, SP, SM, SP-SM, GP-GM, GP	A-1-b, A-2-4	0-3	8-55	18-84	15-84	12-68	2-17	0-17	NP-1
22LF2: 22—Maritime Forest Loamy Floodplains, Rarely Flooded	0-5	Slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	5-45	Highly organic silt loam, highly organic very fine sandy loam, silt loam, very fine sandy loam	OL, ML	A-5, A-4	0	0	74-91	73-91	64-87	47-68	0-43	NP-4
	45-183	Very gravelly Loamy coarse sand, very gravelly coarse sand	GP, SP, SP-SM, GP-GM	A-1-b, A-1-a	2-9	6-12	43-58	40-56	18-28	4-9	0-18	NP-2

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >250 mm	Fragments 75-250 mm	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	cm				Pct	Pct					Pct	
22LF2:												
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded--------	0-3	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	3-5	Highly organic sandy loam, highly organic silt loam, sandy loam, silt loam	SM	A-5, A-4	0	0-17	80-86	79-85	59-69	38-48	0-43	NP-4
	5-183	Cobbly sand, extremely cobbly sand, very cobbly Loamy sand, very gravelly sand, gravelly Loamy sand, very gravelly Loamy sand, gravelly sand	GM, SP, SM, SP-SM, GP-GM, GP	A-1-b, A-2-4	0-3	8-55	18-84	15-84	12-68	2-17	0-17	NP-1
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	0-5	Slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	5-9	Highly organic silt loam, highly organic very fine sandy loam, silt loam, very fine sandy loam	OL, ML	A-5, A-4	0	0	74-91	73-91	64-87	47-68	0-43	NP-4
	9-183	Very gravelly Loamy coarse sand, very gravelly coarse sand	GP, SP, SP-SM, GP-GM	A-1-b, A-1-a	2-9	6-12	43-58	40-56	18-28	4-9	0-18	NP-2

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	cm				*Pct*	*Pct*					*Pct*	
22LM1:												
22—Maritime Forest Gravelly Slopes, Shallow	0-8	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	8-12	Highly organic very gravelly sandy loam, highly organic gravelly sandy loam, highly organic sandy loam	SM, SP-SM, GM, GP-GM	A-5, A-4, A-2-5, A-2-4, A-1-b	0-3	0-30	26-83	23-82	17-67	11-47	0-52	NP-4
	12-17	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SM, GM	A-2-4, A-1-b, A-4	0-4	0-25	36-89	34-89	25-72	13-42	0-28	NP-4
	17-22	Very gravelly sandy loam, gravelly sandy loam	SM, GM	A-4, A-2-4, A-1-b	0-4	9-30	37-79	35-78	26-64	13-37	0-28	NP-4
	27-40	Very gravelly sandy loam, gravelly sandy loam, extremely gravelly sandy loam	SP-SM, GP-GM, GM, SM	A-2-4, A-1-b, A-1-a	2-20	7-20	20-75	17-74	12-60	6-33	0-23	NP-4
	40-183	Bedrock			---	---	---	---	---	---	---	---
22—Maritime Forest Organic Slopes, Dry----	0-22	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	22—28	Very stony sandy loam, stony sandy loam	GM, SM	A-2-4, A-4, A-1-b	16-62	1-12	63-91	62-90	45-71	21-37	0-23	NP-4
	28-183	Bedrock			---	---	---	---	---	---	---	---
22UF1: Maritime Urban Land.												
D22AM1: D22—Subalpine and Alpine Permanent Ice and Snow-------	0-183				---	---	---	---	---	---	---	---

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >250 mm	Fragments 75-250 mm	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	cm				*Pct*	*Pct*					*Pct*	
D22AM1:												
D22—Subalpine and Alpine Rock Outcrop---	0-183	Bedrock			---	---	---	---	---	---	---	---
D22—Subalpine and Alpine Rubble Land----	0-183	Boulders			84-100	0	0	0	0	0	---	---
D22BF1:												
D22—Maritime Riverwash, Bouldery-------	0-183	Very cobbly coarse sand, extremely cobbly coarse sand, stratified very stony coarse sand, stratified extremely stony coarse sand	SW-SM	A-1-b	45-60	2-11	62-95	61-95	26-45	5-12	0-14	NP
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded--------	0-7	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	7-21	Stratified highly organic very Gravelly sandy loam, stratified highly organic gravelly sandy loam, stratified very gravelly sandy loam, stratified gravelly sandy loam	SP-SM, GP-GM, GM, SM	A-2-4, A-1-b	0	0	34-63	31-61	23-49	11-27	0-43	NP-4
	21-183	Extremely bouldery coarse sand, very bouldery coarse sand, very stony coarse sand, extremely stony coarse sand	GP-GM, SP, SW-SM, GP	A-1-a, A-1-b	12-68	25-42	34-80	32-79	14-37	2-10	0-14	NP

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	cm				*Pct*	*Pct*					*Pct*	
D22BF1:												
D22—Maritime Water, Flowing	0-183				---	---	---	---	---	---	---	---
D22DW1:												
D22—Maritime Scrub/Herb Mosaic Organic Floodplains----	0-10	Mucky peat, peat	PT	A-8	---	---	---	---	---	---	---	---
	10-32	Fine sandy loam, silt loam	ML	A-4	0	0	100	100	82-88	53-61	0-26	NP-4
	32-125	Mucky peat, peat	PT	A-8	---	---	---	---	---	---	---	---
	125-183	Extremely gravelly sand, gravel	GP	A-1-a	0	0-16	7-32	3-29	3-23	0-3	0-14	NP
D22HM2:												
D22—Maritime Forest Organic Slopes, Dry, High Elevation	0-31	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	31-36	Very gravelly sandy loam, gravelly sandy loam	SP-SM, GP-GM, GM, SM	A-1-b	8-18	1-12	35-83	33-82	24-65	11-34	0-23	NP-4
	36-183	Bedrock			---	---	---	---	---	---	---	---
D22—Maritime Rock Outcrop---	0-183	Bedrock			---	---	---	---	---	---	---	---
D22—Maritime Rubble Land----	0-183	Boulders			84-100	0	0	0	0	0	---	---

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	cm				Pct	Pct					Pct	
D22LM2:												
D22—Maritime Forest Gravelly Slopes, Shallow	0-8	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	8-15	Highly organic very gravelly sandy loam, highly organic gravelly sandy loam, highly organic cobbly sandy loam	GP-GM, GM, SM, SP-SM	A-2-4, A-2-5, A-1-b	0-3	13-30	24-69	21-68	16-54	10-37	0-52	NP-4
	15-39	Very gravelly sandy loam, extremely gravelly sandy loam, very cobbly sandy loam	GP-GM, GM	A-1-a	2-5	8-25	23-51	20-49	15-40	7-23	0-28	NP-4
	39-40	Gravelly sandy loam, extremely gravelly sandy loam, very gravelly sandy loam	SM, SP-SM, GM, GP-GM	A-2-4, A-1-b, A-1-a	2-20	7-20	20-75	17-74	12-60	6-33	0-23	NP-4
	40-183	Bedrock			---	---	---	---	---	---	---	---

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >250 mm	Fragments 75-250 mm	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	cm				Pct	Pct					Pct	
D22LM2:												
D22—Maritime Forest Gravelly Slopes, Shallow, Convex	0-6	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	6-7	Highly organic extremely gravelly sandy loam, highly organic very Gravelly sandy loam, highly organic gravelly sandy loam	SP, SP-SM, GP-GM, GM, SM, GP	A-1-b, A-1-a	0-3	2-28	9-60	6-58	4-46	3-32	0-52	NP-4
	7-12	Extremely gravelly sandy loam, very gravelly sandy loam, gravelly sandy loam	GP-GM, GP, SP, GM, SM, SP-SM	A-2-4, A-1-a, A-1-b	0-14	2-25	13-71	10-70	7-57	4-33	0-28	NP-4
	12-33	Very cobbly sandy loam, extremely gravelly sandy loam, cobbly sandy loam, gravelly sandy loam, very gravelly sandy loam	SP, GP, GM, GP-GM, SP-SM, SM	A-1-b, A-1-a	10-17	10-28	13-69	10-68	7-55	4-32	0-28	NP-4
	33-40	Very gravelly sandy loam, gravelly sandy loam, extremely gravelly sandy loam	SW-SM, GM, GW-GM, SM	A-1-b, A-1-a	7-12	7-26	15-74	12-73	9-59	5-33	0-23	NP-4
	40-183	Bedrock			---	---	---	---	---	---	---	---
D22—Maritime Rock Outcrop---	0-183	Bedrock			---	---	---	---	---	---	---	---

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	cm				*Pct*	*Pct*					*Pct*	
D22LM3:												
D22—Maritime Forest Gravelly Slopes, Shallow	0-8	Moderately decomposed plant material, slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	8-15	Highly organic very gravelly sandy loam, highly organic gravelly sandy loam, highly organic cobbly sandy loam	GP-GM, GM, SM, SP-SM	A-2-4, A-2-5, A-1-b	0-3	13-30	24-69	21-68	16-54	10-37	0-52	NP-4
	15-39	Very gravelly sandy loam, extremely gravelly sandy loam, very cobbly sandy loam	GP-GM, GM	A-1-a	2-5	8-25	23-51	20-49	15-40	7-23	0-28	NP-4
	39-40	Gravelly sandy loam, extremely gravelly sandy loam, very gravelly sandy loam	SM, SP-SM, GM, GP-GM	A-2-4, A-1-b, A-1-a	2-20	7-20	20-75	17-74	12-60	6-33	0-23	NP-4
	40-183	Bedrock			---	---	---	---	---	---	---	---
D22—Maritime Rubble Land----	0-183	Boulders			84-100	0	0	0	0	0	---	---
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional---	0-24	Very gravelly sandy loam, extremely gravelly sandy loam	GP-GM, GM, GP	A-1-a	0	15-50	11-34	8-32	6-25	3-13	0-23	NP-4
	24-30	Very Gravelly moderately decomposed plant material, extremely gravelly moderately decomposed plant material	PT	A-8	0	15-30	---	---	---	---	---	---
	30-183	Very gravelly sandy loam, extremely gravelly sandy loam	GM, GP, GP-GM	A-1-a	0	15-30	11-34	8-32	6-26	3-14	0-23	NP-4
D22—Maritime Rock Outcrop---	0-183	Bedrock			---	---	---	---	---	---	---	---

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>250 mm	75-250 mm	4	10	40	200		
	cm				*Pct*	*Pct*					*Pct*	
D22SA1:												
D22—Subalpine and Alpine Rubble Land----	0-183	Boulders			84-100	0	0	0	0	0	---	---
D22—Subalpine and Alpine Rock Outcrop---	0-183	Bedrock			---	---	---	---	---	---	---	---
D22—Subalpine Scrub Gravelly Slopes, Convex	0-3	Slightly decomposed plant material, moderately decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	3-38	Cobbly sandy loam, cobbly silt loam	SM	A-4	0-3	20-45	80-91	79-90	56-72	32-48	0-23	NP-4
	38-183	Bedrock			---	---	---	---	---	---	---	---
D22SA2:												
D22—Subalpine and Alpine Rubble Land----	0-183	Boulders			84-100	0	0	0	0	0	---	---
D22—Subalpine and Alpine Rock Outcrop---	0-183	Bedrock			---	---	---	---	---	---	---	---
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional---	0-24	Very gravelly sandy loam, extremely gravelly sandy loam	GP-GM, GM, GP	A-1-a	0	15-50	11-34	8-32	6-25	3-13	0-23	NP-4
	24-30	Very Gravelly moderately decomposed plant material, extremely gravelly moderately decomposed plant material	PT	A-8	0	15-30	---	---	---	---	---	---
	30-183	Very gravelly sandy loam, extremely gravelly sandy loam	GM, GP, GP-GM	A-1-a	0	15-30	11-34	8-32	6-26	3-14	0-23	NP-4

Table 5.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>250 mm	75-250 mm	4	10	40	200		
	cm				*Pct*	*Pct*					*Pct*	
D22WF1: Maritime Water, Lakes and Ponds.												
D22WS1: Estuarine Water, Saline.												

Table 6.--Erosion Properties

(Entries under "Erosion factors" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer.)

Map symbol and soil name	Depth	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
		Kw	Kf	T		
	cm					
22CF1:						
22—Estuarine Graminoid Loamy Floodplains	0-2	.37	.37	2	2	134
	2-66	.55	.55			
	66-90	.55	.55			
	90-183	.02	.02			
22—Maritime Water, Flowing	0-183	---	---	---	---	---
22—Estuarine Graminoid Loamy Floodplains, Depression	0-23	.55	.55	1	5	56
	23-43	.55	.55			
	43-183	.02	.02			
22CP3:						
22—Estuarine Graminoid Gravelly Coastal Plain	0-55	.10	.24	2	5	56
	55-183	.02	.02			
22FF1:						
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	0-4	---	---	5	5	56
	4-13	.10	.17			
	13-43	.10	.24			
	43-183	.10	.32			
22HF1:						
22—Maritime Riverwash, Bouldery	0-183	.02	.02	---	---	---
22—Maritime Water, Flowing	0-183	---	---	---	---	---
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	0-7	---	---	1	5	56
	7-21	.10	.17			
	21-183	.02	.02			
22LF1:						
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	0-5	---	---	5	5	56
	5-9	.37	.37			
	9-183	.02	.02			
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	0-3	---	---	5	3	86
	3-5	.28	.28			
	5-183	.02	.02			
22LF2:						
22—Maritime Forest Loamy Floodplains, Rarely Flooded	0-5	---	---	5	5	56
	5-45	.37	.37			
	45-183	.02	.02			
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	0-3	---	---	5	3	86
	3-5	.28	.28			
	5-183	.02	.02			

Table 6.--Erosion Properties--Continued

Map symbol and soil name	Depth	Erosion factors: Kw	Erosion factors: Kf	Erosion factors: T	Wind erodi-bility group	Wind erodi-bility index
	cm					
22LF2:						
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	0-5	---	---	5	5	56
	5-9	.37	.37			
	9-183	.02	.02			
22LM1:						
22—Maritime Forest Gravelly Slopes, Shallow	0-8	---	---	1	5	56
	8-12	.20	.32			
	12-17	.15	.37			
	17-22	.15	.37			
	27-40	.10	.43			
	40-183	---	---			
22—Maritime Forest Organic Slopes, Dry	0-22	---	---	1	8	0
	22—28	.10	.43			
	28-183	---	---			
22UF1:						
Maritime Urban Land.						
D22AM1:						
D22—Subalpine and Alpine Permanent Ice and Snow	0-183	---	---	---	---	---
D22—Subalpine and Alpine Rock Outcrop	0-183	---	---	---	---	---
D22—Subalpine and Alpine Rubble Land	0-183	---	---	---	---	---
D22BF1:						
D22—Maritime Riverwash, Bouldery	0-183	.02	.02	---	---	---
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	0-7	---	---	1	5	56
	7-21	.10	.17			
	21-183	.02	.02			
D22—Maritime Water, Flowing	0-183	---	---	---	---	---
D22DW1:						
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	0-10	---	---	1	7	38
	10-32	.43	.43			
	32-125	---	---			
	125-183	.02	.02			
D22HM2:						
D22—Maritime Forest Organic Slopes, Dry, High Elevation	0-31	---	---	1	8	0
	31-36	.15	.43			
	36-183	---	---			
D22—Maritime Rock Outcrop	0-183	---	---	---	---	---
D22—Maritime Rubble Land	0-183	---	---	---	---	---

Table 6.--Erosion Properties--Continued

Map symbol and soil name	Depth	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	cm					
D22LM2:						
D22—Maritime Forest Gravelly Slopes, Shallow	0-8	---	---	1	6	48
	8-15	.15	.32			
	15-39	.10	.37			
	39-40	.10	.43			
	40-183	---	---			
D22—Maritime Forest Gravelly Slopes, Shallow, Convex	0-6	---	---	1	8	0
	6-7	.10	.32			
	7-12	.10	.37			
	12-33	.05	.37			
	33-40	.05	.43			
	40-183	---	---			
D22—Maritime Rock Outcrop	0-183	---	---	---	---	---
D22LM3:						
D22—Maritime Forest Gravelly Slopes, Shallow	0-8	---	---	1	6	48
	8-15	.15	.32			
	15-39	.10	.37			
	39-40	.10	.43			
	40-183	---	---			
D22—Maritime Rubble Land	0-183	---	---	---	---	---
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	0-24	.02	.32	5	8	0
	24-30	---	---			
	30-183	.02	.32			
D22—Maritime Rock Outcrop	0-183	---	---	---	---	---
D22SA1:						
D22—Subalpine and Alpine Rubble Land	0-183	---	---	---	---	---
D22—Subalpine and Alpine Rock Outcrop	0-183	---	---	---	---	---
D22—Subalpine Scrub Gravelly Slopes, Convex	0-3	---	---	1	2	134
	3-38	.24	.49			
	38-183	---	---			
D22SA2:						
D22—Subalpine and Alpine Rubble Land	0-183	---	---	---	---	---
D22—Subalpine and Alpine Rock Outcrop	0-183	---	---	---	---	---
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	0-24	.02	.32	5	8	0
	24-30	---	---			
	30-183	.02	.32			
D22WF1:						
Maritime Water, Lakes and Ponds.						
D22WS1:						
Estuarine Water, Saline.						

Table 7.--Physical Soil Properties

(Sand, silt, and clay values are shown either as a range or a representative value (RV). Absence of an entry indicates that data were not estimated. Soil properties are measured or inferred from direct observations in the field or laboratory. Map units and map unit components that are dominantly nonsoil are not included in this table.)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Ksat	Available water capacity	Linear extensi-bility	Organic matter
	cm	*Pct*	*Pct*	*Pct*	*g/cc*	*um/sec*	*cm/cm*	*Pct*	*Pct*
22CF1:									
22—Estuarine Graminoid Loamy Floodplains----	0-2	40-47	45-56	3-8	0.60-1.10	4.0-14.0	0.20-0.24	0.1-0.8	6.0-22
	2-66	35-53	43-62	3-10	1.30-1.50	4.0-14.0	0.16-0.20	0.2-1.1	0.5-2.0
	66-90	35-53	44-62	3-8	1.30-1.54	4.0-14.0	0.08-0.20	0.2-0.9	0.5-2.0
	90-183	90-98	1-9	0-1	1.64-1.80	141.0-705.0	0.00-0.02	0.0-0.0	0.1-1.0
22—Estuarine Graminoid Loamy Floodplains, Depression-----	0-23	35-53	43-62	3-10	1.30-1.50	4.0-14.0	0.16-0.20	0.2-1.1	0.5-2.0
	23-43	30-45	49-67	3-8	1.30-1.48	4.0-14.0	0.16-0.20	0.2-0.9	0.5-2.0
	43-183	90-98	1-9	0-1	1.64-1.80	141.0-705.0	0.00-0.02	0.0-0.0	0.1-1.0
22CP3:									
22—Estuarine Graminoid Gravelly Coastal Plain--	0-55	70-85	10-27	3-8	1.51-1.57	14.0-141.0	0.02-0.10	0.1-0.7	0.5-2.0
	55-183	87-95	3-12	1-3	1.55-1.70	141.0-705.0	0.00-0.02	0.0-0.1	0.1-1.0
22FF1:									
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace----	0-4				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	4-13	62-75	19-35	3-8	0.60-1.10	14.0-42.0	0.08-0.12	0.0-0.7	6.0-22
	13-43	71-80	17-28	1-5	1.23-1.54	42.0-141.0	0.02-0.06	0.0-0.4	2.0-6.0
	43-183	60-73	22—37	1-5	1.53-1.62	14.0-42.0	0.01-0.08	0.0-0.4	0.5-2.0

Table 7.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Ksat	Available water capacity	Linear extensi-bility	Organic matter
	cm	*Pct*	*Pct*	*Pct*	*g/cc*	*um/sec*	*cm/cm*	*Pct*	*Pct*
22HF1:									
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded--------	0-7				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	7-21	62-75	19-35	3-8	0.60-1.10	14.0-42.0	0.05-0.13	0.0-0.7	6.0-22
	21-183	90-99	0-10	0-3	1.59-1.80	141.0-705.0	0.00-0.02	0.0-0.1	0.1-1.0
22LF1:									
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	0-5				0.05-0.10	42.0-141.0	0.05-0.35	---	50-100
	5-9	35-53	43-62	3-8	0.60-1.10	4.0-14.0	0.12-0.24	0.1-0.8	6.0-22
	9-183	85-97	0-13	2-5	1.56-1.80	42.0-705.0	0.01-0.04	0.0-0.3	0.1-1.0
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded--------	0-3				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	3-5	44-60	37-53	3-8	0.60-1.10	4.0-14.0	0.12-0.24	0.1-0.8	6.0-22
	5-183	77-90	6-19	2-4	1.56-1.70	42.0-705.0	0.00-0.04	0.0-0.3	0.1-1.0
22LF2:									
22—Maritime Forest Loamy Floodplains, Rarely Flooded	0-5				0.05-0.10	42.0-141.0	0.05-0.35	---	50-100
	5-45	35-53	43-62	3-8	0.60-1.10	4.0-14.0	0.12-0.24	0.1-0.8	0.5-2.0
	45-183	85-97	0-13	2-5	1.56-1.80	42.0-705.0	0.01-0.04	0.0-0.3	0.1-1.0
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded--------	0-3				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	3-5	44-60	37-53	3-8	0.60-1.10	4.0-14.0	0.12-0.24	0.1-0.8	6.0-22
	5-183	77-90	6-19	2-4	1.56-1.70	42.0-705.0	0.00-0.04	0.0-0.3	0.1-1.0

Table 7.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Ksat	Available water capacity	Linear extensi- bility	Organic matter
	cm	*Pct*	*Pct*	*Pct*	*g/cc*	*um/sec*	*cm/cm*	*Pct*	*Pct*
22LF2:									
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	0-5				0.05-0.10	42.0-141.0	0.05-0.35	---	50-100
	5-9	35-53	43-62	3-8	0.60-1.10	4.0-14.0	0.12-0.24	0.1-0.8	6.0-22
	9-183	85-97	0-13	2-5	1.56-1.80	42.0-705.0	0.01-0.04	0.0-0.3	0.1-1.0
22LM1:									
22—Maritime Forest Gravelly Slopes, Shallow	0-8				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	8-12	50-60	33-47	3-8	0.50-0.90	14.0-42.0	0.08-0.24	0.0-0.5	12-28
	12-17	52-70	22—42	3-8	0.90-1.30	14.0-42.0	0.03-0.12	0.1-0.8	2.0-4.0
	17-22	52-70	22—42	3-8	0.90-1.39	14.0-42.0	0.03-0.10	0.1-0.7	4.0-8.0
	27-40	61-71	22—36	3-8	1.53-1.62	14.0-42.0	0.01-0.12	0.0-0.6	0.5-2.0
	40-183				---	0.0-0.0	---	---	---
22—Maritime Forest Organic Slopes, Dry----	0-22				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	22—28	60-73	19-34	3-8	1.53-1.62	14.0-42.0	0.03-0.10	0.1-0.6	0.5-2.0
	28-183				---	0.0-0.0	---	---	---
D22BF1:									
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded--------	0-7				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	7-21	62-75	19-35	3-8	0.60-1.10	14.0-42.0	0.05-0.13	0.0-0.7	6.0-22
	21-183	90-99	0-10	0-3	1.59-1.80	141.0-705.0	0.00-0.02	0.0-0.1	0.1-1.0
D22DW1:									
D22—Maritime Scrub/Herb Mosaic Organic Floodplains----	0-10				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	10-32	46-56	38-51	3-8	1.30-1.50	4.0-14.0	0.12-0.20	0.2-0.9	1.0-3.0
	32-125				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	125-183	93-98	0-6	0-2	1.62-1.80	141.0-705.0	0.00-0.02	0.0-0.1	0.1-1.0

Table 7.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Ksat	Available water capacity	Linear extensi-bility	Organic matter
	cm	*Pct*	*Pct*	*Pct*	*g/cc*	*um/sec*	*cm/cm*	*Pct*	*Pct*
D22HM2:									
D22—Maritime Forest Organic Slopes, Dry, High Elevation	0-31				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	31-36	60-73	19-34	3-8	1.53-1.62	14.0-42.0	0.03-0.10	0.1-0.6	0.5-2.0
	36-183				---	0.0-0.0	---	---	---
D22LM2:									
D22—Maritime Forest Gravelly Slopes, Shallow	0-8				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	8-15	50-60	33-47	3-8	0.50-0.90	14.0-42.0	0.01-0.13	0.0-0.5	12-28
	15-39	52-70	22—42	3-8	0.90-1.39	14.0-42.0	0.01-0.08	0.0-0.5	4.0-8.0
	39-40	61-71	22—36	3-8	1.53-1.62	14.0-42.0	0.01-0.12	0.0-0.6	0.5-2.0
	40-183				---	0.0-0.0	---	---	---
D22—Maritime Forest Gravelly Slopes, Shallow, Convex	0-6				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	6-7	50-60	33-47	3-8	0.50-0.90	14.0-42.0	0.01-0.13	0.0-0.5	12-28
	7-12	52-70	22—42	3-8	0.90-1.30	14.0-42.0	0.01-0.10	0.0-0.7	2.0-4.0
	12-33	52-70	22—42	3-8	0.90-1.39	14.0-42.0	0.01-0.10	0.0-0.6	4.0-8.0
	33-40	61-71	22—36	3-8	1.53-1.62	14.0-42.0	0.01-0.12	0.0-0.5	0.5-2.0
	40-183				---	0.0-0.0	---	---	---
D22LM3:									
D22—Maritime Forest Gravelly Slopes, Shallow	0-8				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	8-15	50-60	33-47	3-8	0.50-0.90	14.0-42.0	0.01-0.13	0.0-0.5	12-28
	15-39	52-70	22—42	3-8	0.90-1.39	14.0-42.0	0.01-0.08	0.0-0.5	4.0-8.0
	39-40	61-71	22—36	3-8	1.53-1.62	14.0-42.0	0.01-0.12	0.0-0.6	0.5-2.0
	40-183				---	0.0-0.0	---	---	---
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional---	0-24	60-73	19-34	3-8	1.53-1.62	14.0-42.0	0.01-0.08	0.0-0.4	0.5-2.0
	24-30				0.07-0.18	4.0-14.0	0.05-0.50	---	50-100
	30-183	61-71	22—36	3-8	1.53-1.59	14.0-42.0	0.01-0.08	0.0-0.4	0.5-2.0

Table 7.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Ksat	Available water capacity	Linear extensi-bility	Organic matter
	cm	*Pct*	*Pct*	*Pct*	*g/cc*	*um/sec*	*cm/cm*	*Pct*	*Pct*
D22SA1:									
D22—Subalpine Scrub Gravelly Slopes, Convex	0-3				0.05-0.18	4.0-141.0	0.05-0.50	---	50-100
	3-38	45-70	22—50	3-8	1.30-1.62	4.0-42.0	0.05-0.17	0.1-0.8	0.5-2.0
	38-183				---	0.0-0.0	---	---	---
D22SA2:									
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional---	0-24	60-73	19-34	3-8	1.53-1.62	14.0-42.0	0.01-0.08	0.0-0.4	0.5-2.0
	24-30				0.07-0.18	4.0-14.0	0.05-0.50	---	50-100
	30-183	61-71	22—36	3-8	1.53-1.59	14.0-42.0	0.01-0.08	0.0-0.4	0.5-2.0

Table 8.--Chemical Soil Properties

(Absence of an entry indicates that data were not estimated. Map units and map unit components that are dominantly nonsoil are not included in this table.)

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	cm	*meq/100 g*	*meq/100 g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
22CF1:								
22—Estuarine Graminoid Loamy Floodplains---------	0-2	5.0-25.0	---	7.1-7.4	0	0	4.0-16.0	0-2
	2-66	2.0-10.0	---	7.1-7.5	0	0	4.0-16.0	0-2
	66-90	2.0-10.0	---	7.1-7.5	0	0	4.0-16.0	0-2
	90-183	0.5-2.0	---	7.3-7.7	0	0	4.0-16.0	0-2
22—Estuarine Graminoid Loamy Floodplains, Depression----------	0-23	2.0-10.0	---	7.1-7.7	0	0	4.0-16.0	0-2
	23-43	2.0-10.0	---	7.1-7.7	0	0	4.0-16.0	0-2
	43-183	0.5-2.0	---	7.4-7.9	0	0	4.0-16.0	0-2
22CP3:								
22—Estuarine Graminoid Gravelly Coastal Plain-------	0-55	1.0-10.0	---	7.0-7.7	0	0	16.0-50.0	1-3
	55-183	0.5-2.0	---	7.0-7.7	0	0	16.0-50.0	1-3
22FF1:								
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace----	0-4	---	17.0-55.0	3.8-6.3	---	---	---	---
	4-13	---	1.0-10.0	4.3-6.4	0	0	0.0-2.0	0
	13-43	1.0-5.0	---	5.2-6.2	0	0	0.0-2.0	0
	43-183	2.0-10.0	---	5.2-6.9	0	0	0.0-2.0	0
22HF1:								
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	0-7	---	17.0-55.0	3.9-5.9	---	---	---	---
	7-21	---	1.0-10.0	4.2-6.4	0	0	0.0-2.0	0
	21-183	0.5-2.0	---	4.4-6.5	0	0	0.0-2.0	0
22LF1:								
22—Maritime Forest Gravelly Floodplains, Rarely Flooded-------------	0-5	75.0-150.0	---	4.3-6.3	---	---	---	---
	5-9	5.0-25.0	---	5.4-7.0	0	0	0.0-2.0	0
	9-183	0.5-5.0	---	5.7-7.0	0	0	0.0-2.0	0
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	0-3	75.0-210.0	---	4.8-6.3	---	---	---	---
	3-5	5.0-25.0	---	5.4-7.0	0	0	0.0-2.0	0
	5-183	0.5-5.0	---	5.7-7.0	0	0	0.0-2.0	0
22LF2:								
22—Maritime Forest Loamy Floodplains, Rarely Flooded------	0-5	75.0-150.0	---	4.3-6.3	---	---	---	---
	5-45	5.0-25.0	---	5.4-7.0	0	0	0.0-2.0	0
	45-183	0.5-5.0	---	5.7-7.0	0	0	0.0-2.0	0

Table 8.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	cm	*meq/100 g*	*meq/100 g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
22LF2:								
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	0-3	75.0-210.0	---	4.8-6.3	---	---	---	---
	3-5	5.0-25.0	---	5.4-7.0	0	0	0.0-2.0	0
	5-183	0.5-5.0	---	5.7-7.0	0	0	0.0-2.0	0
22—Maritime Forest Gravelly Floodplains, Rarely Flooded-------------	0-5	75.0-150.0	---	4.3-6.3	---	---	---	---
	5-9	5.0-25.0	---	5.4-7.0	0	0	0.0-2.0	0
	9-183	0.5-5.0	---	5.7-7.0	0	0	0.0-2.0	0
22LM1:								
22—Maritime Forest Gravelly Slopes, Shallow-------------	0-8	---	17.0-55.0	3.7-4.7	---	---	---	---
	8-12	---	1.0-10.0	3.2-4.3	0	0	0.0-2.0	0
	12-17	---	1.0-10.0	3.6-4.6	0	0	0.0-2.0	0
	17-22	---	1.0-10.0	4.3-5.0	0	0	0.0-2.0	0
	27-40	---	1.0-7.0	4.4-5.7	0	0	0.0-2.0	0
	40-183	---	---	---	---	---	---	---
22—Maritime Forest Organic Slopes, Dry	0-22	---	17.0-55.0	3.8-5.0	---	---	---	---
	22—28	---	1.0-7.0	3.7-4.8	0	0	0.0-2.0	0
	28-183	---	---	---	---	---	---	---
D22BF1:								
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	0-7	---	17.0-55.0	3.9-5.9	---	---	---	---
	7-21	---	1.0-10.0	4.2-6.4	0	0	0.0-2.0	0
	21-183	0.5-2.0	---	4.4-6.5	0	0	0.0-2.0	0
D22DW1:								
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	0-10	75.0-210.0	---	5.3-6.2	---	---	---	---
	10-32	2.0-10.0	---	5.6-6.2	0	0	0.0-2.0	0
	32-125	90.0-210.0	---	6.0-6.2	---	---	---	---
	125-183	0.5-2.0	---	6.0-6.2	0	0	0.0-2.0	0
D22HM2:								
D22—Maritime Forest Organic Slopes, Dry, High Elevation------	0-31	---	17.0-55.0	3.8-5.0	---	---	---	---
	31-36	---	1.0-7.0	3.7-4.8	0	0	0.0-2.0	0
	36-183	---	---	---	---	---	---	---
D22LM2:								
D22—Maritime Forest Gravelly Slopes, Shallow-------------	0-8	---	17.0-55.0	3.7-4.7	---	---	---	---
	8-15	---	1.0-10.0	3.2-4.3	0	0	0.0-2.0	0
	15-39	---	1.0-10.0	4.3-5.0	0	0	0.0-2.0	0
	39-40	---	1.0-7.0	4.4-5.7	0	0	0.0-2.0	0
	40-183	---	---	---	---	---	---	---

Table 8.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	cm	*meq/100 g*	*meq/100 g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
D22LM2:								
D22—Maritime Forest Gravelly Slopes, Shallow, Convex-----	0-6	---	17.0-55.0	3.7-4.7	---	---	---	---
	6-7	---	1.0-10.0	3.2-4.3	0	0	0.0-2.0	0
	7-12	---	1.0-10.0	3.6-4.6	0	0	0.0-2.0	0
	12-33	---	1.0-10.0	4.3-5.0	0	0	0.0-2.0	0
	33-40	---	1.0-7.0	4.4-5.7	0	0	0.0-2.0	0
	40-183	---	---	---	---	---	---	---
D22LM3:								
D22—Maritime Forest Gravelly Slopes, Shallow-------------	0-8	---	17.0-55.0	3.7-4.7	---	---	---	---
	8-15	---	1.0-10.0	3.2-4.3	0	0	0.0-2.0	0
	15-39	---	1.0-10.0	4.3-5.0	0	0	0.0-2.0	0
	39-40	---	1.0-7.0	4.4-5.7	0	0	0.0-2.0	0
	40-183	---	---	---	---	---	---	---
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	0-24	2.0-10.0	---	6.0-7.0	0	0	0.0-2.0	0
	24-30	75.0-150.0	---	5.4-6.9	---	---	---	---
	30-183	2.0-10.0	---	6.0-7.0	0	0	0.0-2.0	0
D22SA1:								
D22—Subalpine Scrub Gravelly Slopes, Convex--------------	0-3	---	17.0-55.0	3.7-5.7	---	---	---	---
	3-38	2.0-10.0	---	4.9-6.4	0	0	0.0-2.0	0
	38-183	---	---	---	---	---	---	---
D22SA2:								
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	0-24	2.0-10.0	---	6.0-7.0	0	0	0.0-2.0	0
	24-30	75.0-150.0	---	5.4-6.9	---	---	---	---
	30-183	2.0-10.0	---	6.0-7.0	0	0	0.0-2.0	0

Table 9.--Total Soil Carbon

(This table gives soil organic carbon (SOC) and soil inorganic carbon (SIC) in kilograms per square meter to a depth of 2 meters or to the representative top depth of any kind of bedrock or any cemented soil horizon. SOC and SIC are given on a volumetric whole soil basis, corrected for representative rock fragments indicated in the database. SOC is converted from horizon soil organic matter of the fraction of the soil less than 2 millimeters in diameter. If the SOC indicated in the database is NULL, SOC is assumed to be zero. SIC is converted from horizon calcium carbonate content fraction of the soil less than 2 millimeters in diameter. If the horizon calcium carbonate indicated in the database is NULL, SIC is assumed to be zero. A weighted average of all horizons is used in the calculations. Only major components of a map unit are shown in this table.)

Map unit symbol, component name, and percentage of map unit	SOC	SIC
	kg/m2	*kg/m2*
22CF1:		
22—Estuarine Graminoid Loamy Floodplains (65 percent)	9	0
22—Maritime Water, Flowing (20 percent)	0	0
22—Estuarine Graminoid Loamy Floodplains, Depression (15 percent)	4	0
22CP3:		
22—Estuarine Graminoid Gravelly Coastal Plain (95 percent)	5	0
22FF1:		
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace (95 percent)	19	0
22HF1:		
22—Maritime Riverwash, Bouldery (45 percent)	4	0
22—Maritime Water, Flowing (30 percent)	0	0
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded (25 percent)	12	0
22LF1:		
22—Maritime Forest Gravelly Floodplains, Rarely Flooded (60 percent)	8	0
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded (20 percent)	6	0
22LF2:		
22—Maritime Forest Loamy Floodplains, Rarely Flooded (40 percent)	6	0
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded (20 percent)	6	0
22—Maritime Forest Gravelly Floodplains, Rarely Flooded (20 percent)		

Table 9.--Total Soil Carbon--Continued

Map unit symbol, component name, and percentage of map unit	SOC	SIC
	kg/m2	*kg/m2*
22LM1:		
22—Maritime Forest Gravelly Slopes, Shallow (60 percent)	7	0
22—Maritime Forest Organic Slopes, Dry (20 percent)	7	0
22UF1:		
Maritime Urban Land.		
D22AM1:		
D22—Subalpine and Alpine Permanent Ice and Snow (33 percent)	0	0
D22—Subalpine and Alpine Rock Outcrop (33 percent)	0	0
D22—Subalpine and Alpine Rubble Land (30 percent)	0	0
D22BF1:		
D22—Maritime Riverwash, Bouldery (45 percent)	4	0
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded (40 percent)	12	0
D22—Maritime Water, Flowing (15 percent)	0	0
D22DW1:		
D22—Maritime Scrub/Herb Mosaic Organic Floodplains (90 percent)	37	0
D22HM2:		
D22—Maritime Forest Organic Slopes, Dry, High Elevation (50 percent)	10	0
D22—Maritime Rock Outcrop (20 percent)	0	0
D22—Maritime Rubble Land (20 percent)	0	0
D22LM2:		
D22—Maritime Forest Gravelly Slopes, Shallow (35 percent)	10	0
D22—Maritime Forest Gravelly Slopes, Shallow, Convex (25 percent)	5	0
D22—Maritime Rock Outcrop (20 percent)	0	0
D22LM3:		
D22—Maritime Forest Gravelly Slopes, Shallow (30 percent)	10	0
D22—Maritime Rubble Land (20 percent)	0	0
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional (20 percent)	3	0
D22—Maritime Rock Outcrop (15 percent)	0	0
D22SA1:		
D22—Subalpine and Alpine Rubble Land (25 percent)	0	0

Table 9.--Total Soil Carbon--Continued

Map unit symbol, component name, and percentage of map unit	SOC	SIC
	kg/m2	*kg/m2*
D22SA1:		
D22—Subalpine and Alpine Rock Outcrop (20 percent)	0	0
D22—Subalpine Scrub Gravelly Slopes, Convex (15 percent)	4	0
D22SA2:		
D22—Subalpine and Alpine Rubble Land (34 percent)	0	0
D22—Subalpine and Alpine Rock Outcrop (33 percent)	0	0
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional (30 percent)	3	0
D22WF1:		
Maritime Water, Lakes and Ponds.		
D22WS1:		
Estuarine Water, Saline.		

Table 10.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	*In*		*In*	*In*			
22CF1:									
22-Estuarine Graminoid Loamy Floodplains-----	---	---	---	---	0	0	Moderate	High	Moderate
22-Maritime Water, Flowing---------------	---	---	---	---	---	---	---	---	---
22-Estuarine Graminoid Loamy Floodplains, Depression------------	---	---	---	---	0	0	High	High	Moderate
22CP3:									
22-Estuarine Graminoid Gravelly Coastal Plain	---	---	---	---	0	0	Low	High	High
22-Estuarine Graminoid Loamy Floodplains-----	---	---	---	---	0	0	Moderate	High	Moderate
22-Estuarine Water, Saline----------------	---	---	---	---	---	---	---	---	---
22FF1:									
22-Maritime Forest Gravelly Alluvial Fan, Fan Terrace------	---	---	---	---	0	0	Moderate	High	High
22-Maritime Water, Flowing---------------	---	---	---	---	---	---	---	---	---
22HF1:									
22-Maritime Riverwash Bouldery--------------	---	---	---	---	---	---	---	---	---
22-Maritime Water, Flowing---------------	---	---	---	---	---	---	---	---	---
22-Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded--	---	---	---	---	0	0	Low	High	High

Table 10.—Soil Features—Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	*In*		*In*	*In*			
22LF1:									
22-Maritime Forest Gravelly Floodplains, Rarely Flooded	---	---	---	---	0	0	Low	Moderate	Moderate
22-Maritime Forest Gravelly Floodplains, Occasionally Flooded	---	---	---	---	0	0	Low	Moderate	Moderate
22-Maritime Riverwash Gravelly	---	---	---	---	---	---	---	---	---
22-Maritime Water, Flowing	---	---	---	---	---	---	---	---	---
22-Maritime Scrub Gravelly Floodplains, Frequently Flooded	---	---	---	---	0	0	Low	Low	Moderate
22-Maritime Scrub Gravelly Floodplains, Depression	---	---	---	---	0	0	Low	Moderate	Low
22-Maritime Gravel Pit	---	---	---	---	---	---	---	---	---
22LF2:									
22-Maritime Forest Loamy Floodplains, Rarely Flooded	---	---	---	---	0	0	Low	Moderate	Moderate
22-Maritime Forest Gravelly Floodplains, Occasionally Flooded	---	---	---	---	0	0	Low	Moderate	Moderate
22-Maritime Forest Gravelly Floodplains, Rarely Flooded	---	---	---	---	0	0	Low	Moderate	Moderate
22-Maritime Riverwash, Gravelly	---	---	---	---	---	---	---	---	---
22-Maritime Water, Flowing	---	---	---	---	---	---	---	---	---

Table 10.—Soil Features—Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	*In*		*In*	*In*			
22LF2:									
22-Maritime Scrub Gravelly Floodplains, Depression	---	---	---	---	0	0	Low	Moderate	Low
22-Maritime Scrub Gravelly Floodplains, Frequently Flooded	---	---	---	---	0	0	Low	Low	Moderate
22LM1:									
22-Maritime Forest Gravelly Slopes, Shallow	Lithic bedrock	12-26	---	Indurated	0	0	Moderate	High	High
22-Maritime Forest Organic Slopes, Dry	Lithic bedrock	7-14	---	Indurated	---	---	High	High	High
22-Maritime Rock Outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---	---	---
22-Maritime Forest Organic Slopes, Depression	---	---	---	---	28-55	39-79	High	High	High
22UF1:									
22-Maritime Urban Land	---	---	---	---	---	---	---	---	---
22-Maritime Urban Land, Flooded	---	---	---	---	---	---	---	---	---
22-Maritime Gravel Pit	---	---	---	---	---	---	---	---	---
22-Maritime Levees	---	---	---	---	---	---	---	---	---
D22AM1:									
D22-Subalpine and Alpine Permanent Ice and Snow	---	---	---	---	---	---	---	---	---
D22-Subalpine and Alpine Rock Outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---	---	---
D22-Subalpine and Alpine Rubble Land	---	---	---	---	---	---	---	---	---

Table 10.—Soil Features—Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	*In*		*In*	*In*			
D22AM1:									
D22-Alpine Herbaceous Gravelly Diorite Slopes	Lithic bedrock	9-20	---	Indurated	0	0	Moderate	High	High
D22BF1:									
D22-Maritime Riverwash Bouldery	---	---	---	---	---	---	---	---	---
D22-Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	---	---	---	---	0	0	Low	High	High
D22-Maritime Water, Flowing	---	---	---	---	---	---	---	---	---
D22DW1:									
D22-Maritime Scrub/Herb Mosaic Organic Floodplains	---	---	---	---	19-31	26-44	High	High	Moderate
D22-Maritime Water, Lakes and Ponds	---	---	---	---	---	---	---	---	---
D22HM2:									
D22-Maritime Forest Organic Slopes, Dry, High Elevation	Lithic bedrock	7-24	---	Indurated	2-11	4-16	High	Moderate	High
D22-Maritime Rock Outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---	---	---
D22-Maritime Rubble Land	---	---	---	---	---	---	---	---	---
D22-Maritime Forest Gravelly Slopes, High Elevation	Lithic bedrock	21-72	---	Indurated	0	0	Moderate	High	High
D22LM2:									
D22-Maritime Forest Gravelly Slopes, Shallow	Lithic bedrock	12-26	---	Indurated	0	0	Moderate	High	High

Table 10.—Soil Features—Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	*In*		*In*	*In*			
D22LM2:									
D22-Maritime Forest Gravelly Slopes, Shallow, Convex-------	Lithic bedrock	12-26	---	Indurated	0	0	Moderate	High	High
D22-Maritime Rock Outcrop---------------	Lithic bedrock	0-0	---	Indurated	---	---	---	---	---
D22-Maritime Forest Organic Slopes, Dry---	Lithic bedrock	7-14	---	Indurated	3-6	4-8	High	Moderate	High
D22-Maritime Forest Gravelly Slopes, High Elevation-------------	Lithic bedrock	21-72	---	Indurated	0	0	Moderate	High	High
D22-Maritime Forest Organic Slopes, Depression------------	---	---	---	---	28-55	39-79	High	High	High
D22LM3:									
D22-Maritime Forest Gravelly Slopes, Shallow---------------	Lithic bedrock	12-26	---	Indurated	0	0	Moderate	High	High
D22-Maritime Rubble Land------------------	---	---	---	---	---	---	---	---	---
D22-Maritime Scrub/Herb Gravelly Slopes, Depositional--	---	---	---	---	0	0	Moderate	Low	Moderate
D22-Maritime Rock Outcrop---------------	Lithic bedrock	0-0	---	Indurated	---	---	---	---	---
D22-Maritime Forest Organic Slopes, Dry---	Lithic bedrock	7-14	---	Indurated	3-6	4-8	High	Moderate	High
D22-Maritime Forest Gravelly Slopes, High Elevation-------------	Lithic bedrock	21-72	---	Indurated	0	0	Moderate	High	High
D22SA1:									
D22-Subalpine and Alpine Rubble Land----	---	---	---	---	---	---	---	---	---

Table 10.—Soil Features—Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	*In*		*In*	*In*			
D22SA1:									
D22-Subalpine and Alpine Rock Outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---	---	---
D22-Subalpine Scrub Gravelly Slopes, Convex	Lithic bedrock	10-22	---	Indurated	0	0	Moderate	High	Moderate
D22-Subalpine Scrub Organic Slopes	Lithic bedrock	7-12	---	Indurated	1-5	2-5	High	High	High
D22-Subalpine Scrub Gravelly Slopes	Lithic bedrock	20-31	---	Indurated	0	0	Moderate	High	High
D22-Subalpine Scrub Gravelly Slopes, Depositional	Lithic bedrock	8-20	---	Indurated	0	0	Moderate	Moderate	Moderate
D22-Subalpine and Alpine Permanent Ice and Snow	---	---	---	---	---	---	---	---	---
D22-Subalpine Forest Gravelly Slopes	Lithic bedrock	8-20	---	Indurated	0	0	Moderate	High	High
D22SA2:									
D22-Subalpine and Alpine Rubble Land	---	---	---	---	---	---	---	---	---
D22-Subalpine and Alpine Rock Outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---	---	---
D22-Maritime Scrub/Herb Gravelly Slopes, Depositional	---	---	---	---	0	0	Moderate	Low	Moderate
D22-Subalpine Scrub Gravelly Slopes, Depositional	Lithic bedrock	8-20	---	Indurated	0	0	Moderate	Moderate	Moderate
D22WF1:									
D22-Maritime Water, Lakes and Ponds	---	---	---	---	---	---	---	---	---

Table 10.—Soil Features—Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	*In*		*In*	*In*			
D22WS1:									
D22-Estuarine Water, Saline	---	---	---	---	---	---	---	---	---
D22-Estuarine Gravelly Tidal Flats	---	---	---	---	---	---	---	---	---

Table 11.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated. Depth to water table is based on a representative value.)

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			cm	*cm*	*cm*				
22CF1:									
22—Estuarine Graminoid Loamy Floodplains	B								
		January	130	>200	---	---	None	---	---
		February	130	>200	---	---	None	---	---
		March	130	>200	---	---	None	---	---
		April	130	>200	---	---	None	---	---
		May	130	>200	---	---	None	Long	Frequent
		June	130	>200	---	---	None	Long	Frequent
		July	130	>200	---	---	None	Long	Frequent
		August	16	>200	---	---	None	Long	Frequent
		September	16	>200	---	---	None	Long	Frequent
		October	16	>200	---	---	None	Long	Frequent
		November	130	>200	---	---	None	---	---
		December	130	>200	---	---	None	---	---
22—Maritime Water, Flowing---------------	---								
		January	0	>200	---	---	None	---	---
		February	0	>200	---	---	None	---	---
		March	0	>200	---	---	None	---	---
		April	0	>200	---	---	None	---	---
		May	0	>200	---	---	None	Very long	Very frequent
		June	0	>200	---	---	None	Very long	Very frequent
		July	0	>200	---	---	None	Very long	Very frequent
		August	0	>200	---	---	None	Very long	Very frequent
		September	0	>200	---	---	None	Very long	Very frequent
		October	0	>200	---	---	None	Very long	Very frequent
		November	0	>200	---	---	None	---	---
		December	0	>200	---	---	None	---	---

Table 11.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			cm	*cm*	*cm*				
22CF1:									
22—Estuarine Graminoid Loamy Floodplains, Depression	B								
		January	10	>200	---	---	---	---	---
		February	10	>200	---	---	---	---	---
		March	10	>200	---	---	---	---	---
		April	10	>200	---	---	---	---	---
		May	0	>200	2-25	Very long	Frequent	Long	Frequent
		June	0	>200	2-25	Very long	Frequent	Long	Frequent
		July	0	>200	2-25	Very long	Frequent	Long	Frequent
		August	0	>200	2-25	Very long	Frequent	Long	Frequent
		September	0	>200	2-25	Very long	Frequent	Long	Frequent
		October	0	>200	2-25	Very long	Frequent	Long	Frequent
		November	10	>200	---	---	---	---	---
		December	10	>200	---	---	---	---	---
22CP3:									
22—Estuarine Graminoid Gravelly Coastal Plain	A								
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
22FF1:									
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	A								
		Jan-Dec	---	---	---	---	None	---	None

Table 11.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			cm	*cm*	*cm*				
22HF1:									
22—Maritime Riverwash, Bouldery----------	---								
		January	40	>200	---	---	None	---	---
		February	40	>200	---	---	None	---	---
		March	40	>200	---	---	None	---	---
		April	40	>200	---	---	None	---	---
		May	10	>200	---	---	None	Long	Very frequent
		June	10	>200	---	---	None	Long	Very frequent
		July	10	>200	---	---	None	Long	Very frequent
		August	10	>200	---	---	None	Long	Very frequent
		September	10	>200	---	---	None	Long	Very frequent
		October	10	>200	---	---	None	Long	Very frequent
		November	10	>200	---	---	None	---	---
		December	40	>200	---	---	None	---	---
22—Maritime Water, Flowing---------------	---								
		January	0	>200	---	---	None	---	---
		February	0	>200	---	---	None	---	---
		March	0	>200	---	---	None	---	---
		April	0	>200	---	---	None	---	---
		May	0	>200	---	---	None	Very long	Very frequent
		June	0	>200	---	---	None	Very long	Very frequent
		July	0	>200	---	---	None	Very long	Very frequent
		August	0	>200	---	---	None	Very long	Very frequent
		September	0	>200	---	---	None	Very long	Very frequent
		October	0	>200	---	---	None	Very long	Very frequent
		November	0	>200	---	---	None	---	---
		December	0	>200	---	---	None	---	---

Table 11.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			cm	*cm*	*cm*				
22HF1:									
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	A								
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
22LF1:									
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	B								
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	B								
		May	100	>200	---	---	None	Brief	Occasional
		June	100	>200	---	---	None	Brief	Occasional
		July	100	>200	---	---	None	Brief	Occasional
		August	100	>200	---	---	None	Brief	Occasional
		September	100	>200	---	---	None	Brief	Occasional
		October	100	>200	---	---	None	Brief	Occasional

Table 11.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			cm	*cm*	*cm*				
22LF2:									
22—Maritime Forest Loamy Floodplains, Rarely Flooded	B								
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	B								
		May	100	>200	---	---	None	Brief	Occasional
		June	100	>200	---	---	None	Brief	Occasional
		July	100	>200	---	---	None	Brief	Occasional
		August	100	>200	---	---	None	Brief	Occasional
		September	100	>200	---	---	None	Brief	Occasional
		October	100	>200	---	---	None	Brief	Occasional
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	B								
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
22LM1:									
22—Maritime Forest Gravelly Slopes, Shallow	D								
		Jan-Dec	---	---	---	---	None	---	None
22—Maritime Forest Organic Slopes, Dry	D								
		Jan-Dec	---	---	---	---	None	---	None

Table 11.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			cm	*cm*	*cm*				
22UF1:									
Maritime Urban Land.									
D22AM1:									
D22—Subalpine and Alpine Permanent Ice and Snow	---								
		January	0	>200	---	---	None	---	None
		February	0	>200	---	---	None	---	None
		March	0	>200	---	---	None	---	None
		April	0	>200	---	---	None	---	None
		May	0	>200	---	---	None	---	None
		June	0	>200	---	---	None	---	None
		July	0	>200	---	---	None	---	None
		August	0	>200	---	---	None	---	None
		September	0	>200	---	---	None	---	None
		October	0	>200	---	---	None	---	None
		November	0	>200	---	---	None	---	None
		December	0	>200	---	---	None	---	None
D22—Subalpine and Alpine Rock Outcrop	---								
		Jan-Dec	---	---	---	---	None	---	None
D22—Subalpine and Alpine Rubble Land	---								
		Jan-Dec	---	---	---	---	None	---	None
D22BF1:									
D22—Maritime Riverwash, Bouldery	---								
		January	40	>200	---	---	None	---	---
		February	40	>200	---	---	None	---	---
		March	40	>200	---	---	None	---	---
		April	40	>200	---	---	None	---	---
		May	10	>200	---	---	None	Long	Very frequent
		June	10	>200	---	---	None	Long	Very frequent
		July	10	>200	---	---	None	Long	Very frequent
		August	10	>200	---	---	None	Long	Very frequent
		September	10	>200	---	---	None	Long	Very frequent
		October	10	>200	---	---	None	Long	Very frequent
		November	10	>200	---	---	None	---	---
		December	40	>200	---	---	None	---	---

Table 11.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			cm	cm	cm				
D22BF1:									
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	A								
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
D22—Maritime Water, Flowing	---								
		January	0	>200	---	---	None	---	---
		February	0	>200	---	---	None	---	---
		March	0	>200	---	---	None	---	---
		April	0	>200	---	---	None	---	---
		May	0	>200	---	---	None	Very long	Very frequent
		June	0	>200	---	---	None	Very long	Very frequent
		July	0	>200	---	---	None	Very long	Very frequent
		August	0	>200	---	---	None	Very long	Very frequent
		September	0	>200	---	---	None	Very long	Very frequent
		October	0	>200	---	---	None	Very long	Very frequent
		November	0	>200	---	---	None	---	---
		December	0	>200	---	---	None	---	---
D22DW1:									
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	B								
		January	10	>200	---	---	---	---	---
		February	10	>200	---	---	---	---	---
		March	10	>200	---	---	---	---	---
		April	10	>200	---	---	---	---	---
		May	0	>200	5-35	Very long	Frequent	Long	Frequent
		June	0	>200	5-35	Very long	Frequent	Long	Frequent
		July	0	>200	5-35	Very long	Frequent	Long	Frequent
		August	0	>200	5-35	Very long	Frequent	Long	Frequent
		September	0	>200	5-35	Very long	Frequent	Long	Frequent
		October	0	>200	5-35	Very long	Frequent	Long	Frequent
		November	10	>200	---	---	---	---	---
		December	10	>200	---	---	---	---	---

Table 11.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			cm	*cm*	*cm*				
D22HM2:									
D22—Maritime Forest Organic Slopes, Dry, High Elevation	D								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Rock Outcrop	---								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Rubble Land	---								
		Jan-Dec	---	---	---	---	None	---	None
D22LM2:									
D22—Maritime Forest Gravelly Slopes, Shallow	D								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Forest Gravelly Slopes, Shallow, Convex	D								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Rock Outcrop	---								
		Jan-Dec	---	---	---	---	None	---	None
D22LM3:									
D22—Maritime Forest Gravelly Slopes, Shallow	D								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Rubble Land	---								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	B								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Rock Outcrop	---								
		Jan-Dec	---	---	---	---	None	---	None
D22SA1:									
D22—Subalpine and Alpine Rubble Land	---								
		Jan-Dec	---	---	---	---	None	---	None
D22—Subalpine and Alpine Rock Outcrop	---								
		Jan-Dec	---	---	---	---	None	---	None

Table 11.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			cm	*cm*	*cm*				
D22SA1:									
D22—Subalpine Scrub Gravelly Slopes, Convex	D								
		Jan-Dec	---	---	---	---	None	---	None
D22SA2:									
D22—Subalpine and Alpine Rubble Land	---								
		Jan-Dec	---	---	---	---	None	---	None
D22—Subalpine and Alpine Rock Outcrop	---								
		Jan-Dec	---	---	---	---	None	---	None
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	B								
		Jan-Dec	---	---	---	---	None	---	None
D22WF1:									
Maritime Water, Lakes and Ponds.									
D22WS1:									
Estuarine Water, Saline.									

Table 12.--Planting

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
22CF1:							
22—Estuarine Graminoid Loamy Floodplains	65	Well suited		Well suited		Severe	
						Low strength	1.00
22—Maritime Water, Flowing	20	Not rated		Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Moderately suited		Poorly suited		Severe	
		Wetness	0.50	Wetness	0.75	Low strength	1.00
						Wetness	0.50
22CP3:							
22—Estuarine Graminoid Gravelly Coastal Plain	95	Well suited		Moderately suited		Moderate	
				Rock fragments	0.50	Low strength	0.50
22FF1:							
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Moderately suited		Poorly suited		Slight	
		Rock fragments	0.50	Rock fragments	0.75	Strength	0.10
				Slope	0.50		
22HF1:							
22—Maritime Riverwash, Bouldery	45	Not rated		Not rated		Not rated	
22—Maritime Water, Flowing	30	Not rated		Not rated		Not rated	
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	25	Moderately suited		Unsuited		Slight	
		Sandiness	0.50	Rock fragments	1.00	Strength	0.10
		Rock fragments	0.50	Sandiness	0.50		
22LF1:							
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	60	Moderately suited		Poorly suited		Moderate	
		Sandiness	0.50	Rock fragments	0.75	Low strength	0.50
		Rock fragments	0.50	Sandiness	0.50		

Table 12.--Planting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
22LF1:							
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded-----------	20	Moderately suited		Poorly suited		Slight	
		Sandiness	0.50	Rock fragments	0.75	Strength	0.10
		Rock fragments	0.50	Sandiness	0.50		
22LF2:							
22—Maritime Forest Loamy Floodplains, Rarely Flooded-----	40	Moderately suited		Poorly suited		Severe	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	1.00
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded-----------	20	Moderately suited		Poorly suited		Slight	
		Sandiness	0.50	Rock fragments	0.75	Strength	0.10
		Rock fragments	0.50	Sandiness	0.50		
22—Maritime Forest Gravelly Floodplains, Rarely Flooded-----	20	Moderately suited		Poorly suited		Moderate	
		Sandiness	0.50	Rock fragments	0.75	Low strength	0.50
		Rock fragments	0.50	Sandiness	0.50		
22LM1:							
22—Maritime Forest Gravelly Slopes, Shallow------------	60	Moderately suited		Unsuited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Rock fragments	0.50	Rock fragments	0.75		
22—Maritime Forest Organic Slopes, Dry	20	Unsuited		Unsuited		Moderate	
		Restrictive layer	1.00	Rock fragments	1.00	Low strength	0.50
		Rock fragments	0.50	Restrictive layer	1.00		
				Slope	0.50		
22UF1:							
Maritime Urban Land.							
D22AM1:							
D22—Subalpine and Alpine Permanent Ice and Snow-------	33	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rubble Land	30	Not rated		Not rated		Not rated	

Table 12.--Planting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
D22BF1:							
D22—Maritime Riverwash, Bouldery	45	Not rated		Not rated		Not rated	
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	40	Moderately suited		Unsuited		Slight	
		Sandiness	0.50	Rock fragments	1.00	Strength	0.10
		Rock fragments	0.50	Sandiness	0.50		
D22—Maritime Water, Flowing	15	Not rated		Not rated		Not rated	
D22DW1:							
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Moderately suited		Poorly suited		Severe	
		Wetness	0.50	Wetness	0.75	Low strength	1.00
						Wetness	0.50
D22HM2:							
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Moderately suited		Unsuited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Rock fragments	0.50	Rock fragments	0.75		
D22—Maritime Rock Outcrop	20	Not rated		Not rated		Not rated	
D22—Maritime Rubble Land	20	Not rated		Not rated		Not rated	
D22LM2:							
D22—Maritime Forest Gravelly Slopes, Shallow	35	Moderately suited		Unsuited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Rock fragments	0.50	Rock fragments	0.75		
D22—Maritime Forest Gravelly Slopes, Shallow, Convex	25	Unsuited		Unsuited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Restrictive layer	1.00		
		Sandiness	0.50	Rock fragments	0.75		
		Rock fragments	0.50	Sandiness	0.50		
D22—Maritime Rock Outcrop	20	Not rated		Not rated		Not rated	
D22LM3:							
D22—Maritime Forest Gravelly Slopes, Shallow	30	Moderately suited		Unsuited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Rock fragments	0.50	Rock fragments	0.75		

Table 12.--Planting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
D22LM3:							
D22—Maritime Rubble Land	20	Not rated		Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	20	Moderately suited		Unsuited		Slight	
		Rock fragments	0.50	Slope	1.00	Strength	0.10
				Rock fragments	1.00		
D22—Maritime Rock Outcrop	15	Not rated		Not rated		Not rated	
D22SA1:							
D22—Subalpine and Alpine Rubble Land	25	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex	15	Moderately suited		Unsuited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Rock fragments	0.50	Rock fragments	0.75		
D22SA2:							
D22—Subalpine and Alpine Rubble Land	34	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	30	Moderately suited		Unsuited		Slight	
		Rock fragments	0.50	Slope	1.00	Strength	0.10
				Rock fragments	1.00		
D22WF1:							
Maritime Water, Lakes and Ponds.							
D22WS1:							
Estuarine Water, Saline.							

Table 13.--Hazard of Erosion and Suitability for Roads

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
22CF1:							
22—Estuarine Graminoid Loamy Floodplains	65	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
						Dusty	0.01
22—Maritime Water, Flowing	20	Not rated		Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Slight		Slight		Poorly suited	
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
						Low strength	0.50
						Dusty	0.01
22CP3:							
22—Estuarine Graminoid Gravelly Coastal Plain	95	Slight		Slight		Well suited	
22FF1:							
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Rock fragments	0.50
22HF1:							
22—Maritime Riverwash, Bouldery	45	Not rated		Not rated		Not rated	
22—Maritime Water, Flowing	30	Not rated		Not rated		Not rated	
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	25	Slight		Slight		Poorly suited	
						Flooding	1.00
						Rock fragments	0.50
22LF1:							
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	60	Slight		Slight		Well suited	

Table 13.--Hazard of Erosion and Suitability for Roads--Continued

Map symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
22LF1:							
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Slight		Slight		Poorly suited	
						Flooding	1.00
						Sandiness	0.50
22LF2:							
22—Maritime Forest Loamy Floodplains, Rarely Flooded	40	Slight		Slight		Moderately suited	
						Low strength	0.50
						Dusty	0.01
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Slight		Slight		Poorly suited	
						Flooding	1.00
						Sandiness	0.50
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	20	Slight		Slight		Well suited	
22LM1:							
22—Maritime Forest Gravelly Slopes, Shallow	60	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Dusty	0.01
22—Maritime Forest Organic Slopes, Dry	20	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Low strength	1.00
						Slope	1.00
						Rock fragments	0.50
						Dusty	0.01
22UF1:							
Maritime Urban Land.							
D22AM1:							
D22—Subalpine and Alpine Permanent Ice and Snow	33	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rubble Land	30	Not rated		Not rated		Not rated	

Table 13.--Hazard of Erosion and Suitability for Roads--Continued

Map symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Hazard of erosion: Value	Hazard of erosion on roads and trails: Rating class and limiting features	Hazard of erosion on roads and trails: Value	Suitability for roads (natural surface): Rating class and limiting features	Suitability for roads (natural surface): Value
D22BF1:							
D22—Maritime Riverwash, Bouldery	45	Not rated		Not rated		Not rated	
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	40	Slight		Slight		Poorly suited	
						Flooding	1.00
						Rock fragments	0.50
D22—Maritime Water, Flowing	15	Not rated		Not rated		Not rated	
D22DW1:							
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
						Dusty	0.01
D22HM2:							
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Rock fragments	0.50
D22—Maritime Rock Outcrop	20	Not rated		Not rated		Not rated	
D22—Maritime Rubble Land	20	Not rated		Not rated		Not rated	
D22LM2:							
D22—Maritime Forest Gravelly Slopes, Shallow	35	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Dusty	0.01
D22—Maritime Forest Gravelly Slopes, Shallow, Convex	25	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Sandiness	0.50
						Dusty	0.01
D22—Maritime Rock Outcrop	20	Not rated		Not rated		Not rated	

Table 13.--Hazard of Erosion and Suitability for Roads--Continued

Map symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
D22LM3:							
D22—Maritime Forest Gravelly Slopes, Shallow	30	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Dusty	0.01
D22—Maritime Rubble Land	20	Not rated		Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	20	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Sandiness	0.50
						Rock fragments	0.50
D22—Maritime Rock Outcrop	15	Not rated		Not rated		Not rated	
D22SA1:							
D22—Subalpine and Alpine Rubble Land	25	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex	15	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
D22SA2:							
D22—Subalpine and Alpine Rubble Land	34	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	30	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Sandiness	0.50
						Rock fragments	0.50
D22WF1:							
Maritime Water, Lakes and Ponds.							
D22WS1:							
Estuarine Water, Saline.							

Table 14.--Site Preparation

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value
22CF1:					
22—Estuarine Graminoid Loamy Floodplains	65	Unsuited		Well suited	
		Wetness	1.00		
22—Maritime Water, Flowing	20	Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Unsuited		Poorly suited	
		Wetness	1.00	Wetness	0.50
22CP3:					
22—Estuarine Graminoid Gravelly Coastal Plain	95	Well suited		Well suited	
22FF1:					
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.50
22HF1:					
22—Maritime Riverwash, Bouldery	45	Not rated		Not rated	
22—Maritime Water, Flowing	30	Not rated		Not rated	
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	25	Poorly suited		Poorly suited	
		Rock fragments	0.50	Rock fragments	0.50
22LF1:					
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	60	Well suited		Well suited	
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Well suited		Poorly suited	
				Rock fragments	0.50

Table 14.--Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value
22LF2:					
22—Maritime Forest Loamy Floodplains, Rarely Flooded-----	40	Well suited		Well suited	
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded------------	20	Well suited		Poorly suited	
				Rock fragments	0.50
22—Maritime Forest Gravelly Floodplains, Rarely Flooded-----	20	Well suited		Well suited	
22LM1:					
22—Maritime Forest Gravelly Slopes, Shallow------------	60	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	0.50
22—Maritime Forest Organic Slopes, Dry	20	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.50
22UF1:					
Maritime Urban Land.					
D22AM1:					
D22—Subalpine and Alpine Permanent Ice and Snow-------	33	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Subalpine and Alpine Rubble Land	30	Not rated		Not rated	
D22BF1:					
D22—Maritime Riverwash, Bouldery	45	Not rated		Not rated	
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded------------	40	Poorly suited		Poorly suited	
		Rock fragments	0.50	Rock fragments	0.50
D22—Maritime Water, Flowing------------	15	Not rated		Not rated	

Table 14.--Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value
D22DW1:					
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Unsuited		Poorly suited	
		Wetness	1.00	Wetness	0.50
D22HM2:					
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Restrictive layer	1.00	Rock fragments	0.50
		Rock fragments	0.50		
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	
D22—Maritime Rubble Land---------------	20	Not rated		Not rated	
D22LM2:					
D22—Maritime Forest Gravelly Slopes, Shallow------------	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Restrictive layer	1.00	Rock fragments	0.50
D22—Maritime Forest Gravelly Slopes, Shallow, Convex----	25	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Restrictive layer	1.00	Restrictive layer	1.00
				Rock fragments	0.50
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	
D22LM3:					
D22—Maritime Forest Gravelly Slopes, Shallow------------	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Restrictive layer	1.00	Rock fragments	0.50
D22—Maritime Rubble Land---------------	20	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional-------	20	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.50
D22—Maritime Rock Outcrop------------	15	Not rated		Not rated	
D22SA1:					
D22—Subalpine and Alpine Rubble Land	25	Not rated		Not rated	

Table 14.--Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
D22SA1:					
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex	15	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Restrictive layer	1.00	Rock fragments	0.50
		Rock fragments	0.50		
D22SA2:					
D22—Subalpine and Alpine Rubble Land	34	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	30	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.50
D22WF1:					
Maritime Water, Lakes and Ponds.					
D22WS1:					
Estuarine Water, Saline.					

Table 15.--Site Restoration

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
22CF1:					
22—Estuarine Graminoid Loamy Floodplains	65	Low		High	
				Wetness	1.00
				Salinity	0.50
22—Maritime Water, Flowing	20	Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Low		High	
				Wetness	1.00
				Salinity	0.50
22CP3:					
22—Estuarine Graminoid Gravelly Coastal Plain	95	Low		High	
				Salinity	1.00
22FF1:					
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Low		Low	
22HF1:					
22—Maritime Riverwash, Bouldery	45	Not rated		Not rated	
22—Maritime Water, Flowing	30	Not rated		Not rated	
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	25	Low		Low	
22LF1:					
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	60	Low		Low	
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Low		Moderate	
				Available water	0.50

Table 15.--Site Restoration--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
22LF2:					
22—Maritime Forest Loamy Floodplains, Rarely Flooded	40	Low		Low	
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Low		Moderate	
				Available water	0.50
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	20	Low		Low	
22LM1:					
22—Maritime Forest Gravelly Slopes, Shallow	60	Low		Moderate	
				Soil reaction	0.50
22—Maritime Forest Organic Slopes, Dry	20	Low		Moderate	
				Soil reaction	0.50
22UF1:					
Maritime Urban Land.					
D22AM1:					
D22—Subalpine and Alpine Permanent Ice and Snow	33	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Subalpine and Alpine Rubble Land	30	Not rated		Not rated	
D22BF1:					
D22—Maritime Riverwash, Bouldery	45	Not rated		Not rated	
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	40	Low		Low	
D22—Maritime Water, Flowing	15	Not rated		Not rated	
D22DW1:					
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Low		High	
				Wetness	1.00

Table 15.--Site Restoration--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
D22HM2:					
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Low		Moderate	
				Soil reaction	0.50
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	
D22—Maritime Rubble Land---------------	20	Not rated		Not rated	
D22LM2:					
D22—Maritime Forest Gravelly Slopes, Shallow------------	35	Low		Moderate	
				Soil reaction	0.50
D22—Maritime Forest Gravelly Slopes, Shallow, Convex----	25	Low		Moderate	
				Soil reaction	0.50
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	
D22LM3:					
D22—Maritime Forest Gravelly Slopes, Shallow------------	30	Low		Moderate	
				Soil reaction	0.50
D22—Maritime Rubble Land---------------	20	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional-------	20	Low		Low	
D22—Maritime Rock Outcrop------------	15	Not rated		Not rated	
D22SA1:					
D22—Subalpine and Alpine Rubble Land	25	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex-------------	15	Low		Low	

Table 15.--Site Restoration--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
D22SA2:					
D22—Subalpine and Alpine Rubble Land	34	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional-------	30	Low		Low	
D22WF1:					
Maritime Water, Lakes and Ponds.					
D22WS1:					
Estuarine Water, Saline.					

Table 16.--Source of Reclamation Material, Roadfill, and Topsoil

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
22CF1:							
22—Estuarine Graminoid Loamy Floodplains	65	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.32	Dusty	0.95	Hard to reclaim (rock fragments)	0.00
		Water erosion	0.37			Salinity	0.50
22—Maritime Water, Flowing	20	Not rated		Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Fair		Poor		Poor	
		Droughty	0.10	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.32			Hard to reclaim (rock fragments)	0.00
		Water erosion	0.37			Rock fragments	0.00
22CP3:							
22—Estuarine Graminoid Gravelly Coastal Plain	95	Poor		Good		Poor	
		Salinity	0.00			Hard to reclaim (rock fragments)	0.00
		Droughty	0.00			Rock fragments	0.00
		Too sandy	0.09			Salinity	0.00
22FF1:							
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Fair		Fair		Poor	
		Droughty	0.02	Cobble content	0.78	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50			Rock fragments	0.00
		Cobble content	0.95			Slope	0.00
22HF1:							
22—Maritime Riverwash, Bouldery	45	Poor		Poor		Poor	
		Too sandy	0.00	Wetness	0.00	Wetness	0.00
		Stone content	0.00	Stones	0.00	Too sandy	0.00
		Low content of organic matter	0.32			Rock fragments	0.92
22—Maritime Water, Flowing	30	Not rated		Not rated		Not rated	

Table 16.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
22HF1:							
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	25	Poor		Poor		Poor	
		Too sandy	0.00	Stones	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.00	Cobble content	0.27	Too sandy	0.00
		Stone content	0.00			Rock fragments	0.00
22LF1:							
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	60	Poor		Fair		Poor	
		Too sandy	0.00	Stones	0.96	Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.32			Hard to reclaim (rock fragments)	0.08
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.19	Too sandy	0.00
		Droughty	0.00			Rock fragments	0.00
		Low content of organic matter	0.32			Hard to reclaim (rock fragments)	0.00
22LF2:							
22—Maritime Forest Loamy Floodplains, Rarely Flooded	40	Fair		Good		Poor	
		Low content of organic matter	0.32			Rock fragments	0.00
		Droughty	0.74			Hard to reclaim (rock fragments)	0.08
		Too acid	0.84				
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.19	Too sandy	0.00
		Droughty	0.00			Rock fragments	0.00
		Low content of organic matter	0.32			Hard to reclaim (rock fragments)	0.00
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	20	Poor		Fair		Poor	
		Too sandy	0.00	Stones	0.96	Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.32			Hard to reclaim (rock fragments)	0.08

Table 16.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
22LM1:							
22—Maritime Forest Gravelly Slopes, Shallow	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50			Rock fragments	0.00
22—Maritime Forest Organic Slopes, Dry	20	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	High content of organic matter	0.00
		Droughty	0.00	Dusty	0.80	Depth to bedrock	0.00
		Too acid	0.50			Slope	0.00
22UF1:							
Maritime Urban Land.							
D22AM1:							
D22—Subalpine and Alpine Permanent Ice and Snow	33	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated		Not rated	
D22—Subalpine and Alpine Rubble Land	30	Not rated		Poor		Not rated	
				Stones	0.00		
				Slope	0.00		
				Dusty	0.80		
D22BF1:							
D22—Maritime Riverwash, Bouldery	45	Poor		Poor		Poor	
		Too sandy	0.00	Wetness	0.00	Wetness	0.00
		Stone content	0.00	Stones	0.00	Too sandy	0.00
		Low content of organic matter	0.32			Rock fragments	0.92
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	40	Poor		Poor		Poor	
		Too sandy	0.00	Stones	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.00	Cobble content	0.27	Too sandy	0.00
		Stone content	0.00			Rock fragments	0.00
D22—Maritime Water, Flowing	15	Not rated		Not rated		Not rated	
D22DW1:							
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Fair		Poor		Poor	
		Too acid	0.80	Wetness	0.00	Wetness	0.00
		Water erosion	0.90	Dusty	0.80	High content of organic matter	0.00

Table 16.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
D22HM2:							
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	High content of organic matter	0.00
		Droughty	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50	Dusty	0.80	Depth to bedrock	0.00
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated		Not rated	
D22—Maritime Rubble Land---------------	20	Not rated		Poor		Not rated	
				Slope	0.00		
				Stones	0.00		
				Dusty	0.80		
D22LM2:							
D22—Maritime Forest Gravelly Slopes, Shallow------------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50			Depth to bedrock	0.00
D22—Maritime Forest Gravelly Slopes, Shallow, Convex----	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Too acid	0.50	Stones	0.48	Slope	0.00
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated		Not rated	
D22LM3:							
D22—Maritime Forest Gravelly Slopes, Shallow------------	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50			Depth to bedrock	0.00
D22—Maritime Rubble Land---------------	20	Not rated		Poor		Not rated	
				Slope	0.00		
				Stones	0.00		
				Dusty	0.80		
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional-------	20	Fair		Poor		Poor	
		Droughty	0.18	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.92	Cobble content	0.50	Rock fragments	0.00
						Slope	0.00

Table 16.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
D22LM3:							
D22—Maritime Rock Outcrop	15	Not rated		Not rated		Not rated	
D22SA1:							
D22—Subalpine and Alpine Rubble Land	25	Not rated		Poor		Not rated	
				Stones	0.00		
				Slope	0.00		
				Dusty	0.80		
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex	15	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.00	Slope	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.27	Rock fragments	0.00
D22SA2:							
D22—Subalpine and Alpine Rubble Land	34	Not rated		Poor		Not rated	
				Stones	0.00		
				Slope	0.00		
				Dusty	0.80		
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	30	Fair		Poor		Poor	
		Droughty	0.18	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.92	Cobble content	0.50	Rock fragments	0.00
						Slope	0.00
D22WF1:							
Maritime Water, Lakes and Ponds.							
D22WS1:							
Estuarine Water, Saline.							

Table 17.--Source of Gravel and Sand

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Gravel source: Value	Sand source: Rating class and limiting features	Sand source: Value
22CF1:					
22—Estuarine Graminoid Loamy Floodplains	65	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.09
		Bottom layer	0.54	Bottom layer	0.54
22—Maritime Water, Flowing	20	Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.30
		Bottom layer	0.54	Bottom layer	0.54
22CP3:					
22—Estuarine Graminoid Gravelly Coastal Plain	95	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.38
		Bottom layer	0.68	Thickest layer	0.53
22FF1:					
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
22HF1:					
22—Maritime Riverwash, Bouldery	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
22—Maritime Water, Flowing	30	Not rated		Not rated	
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08

Table 17.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Gravel source: Value	Sand source: Rating class and limiting features	Sand source: Value
22LF1:					
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	60	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.47
		Bottom layer	0.00	Thickest layer	0.80
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.14
		Bottom layer	0.00	Thickest layer	0.15
22LF2:					
22—Maritime Forest Loamy Floodplains, Rarely Flooded	40	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.17
		Bottom layer	0.00	Bottom layer	0.47
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.14
		Bottom layer	0.00	Thickest layer	0.15
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	20	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.47
		Bottom layer	0.00	Thickest layer	0.80
22LM1:					
22—Maritime Forest Gravelly Slopes, Shallow	60	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.02
		Bottom layer	0.25	Thickest layer	0.08
22—Maritime Forest Organic Slopes, Dry	20	Not rated		Poor	
				Thickest layer	0.00
				Bottom layer	0.00
22UF1:					
Maritime Urban Land.					
D22AM1:					
D22—Subalpine and Alpine Permanent Ice and Snow	33	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	

Table 17.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Gravel source: Value	Sand source: Rating class and limiting features	Sand source: Value
D22AM1:					
D22—Subalpine and Alpine Rubble Land	30	Not rated		Not rated	
D22BF1:					
D22—Maritime Riverwash, Bouldery	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded------------	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08
D22—Maritime Water, Flowing------------	15	Not rated		Not rated	
D22DW1:					
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Not rated		Fair	
				Thickest layer	0.00
				Bottom layer	0.80
D22HM2:					
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Not rated		Fair	
				Thickest layer	0.00
				Bottom layer	0.04
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	
D22—Maritime Rubble Land---------------	20	Not rated		Not rated	
D22LM2:					
D22—Maritime Forest Gravelly Slopes, Shallow------------	35	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.02
		Bottom layer	0.25	Thickest layer	0.07
D22—Maritime Forest Gravelly Slopes, Shallow, Convex----	25	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.02
		Bottom layer	0.26	Thickest layer	0.08
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	

Table 17.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Gravel source: Value	Sand source: Rating class and limiting features	Sand source: Value
D22LM3:					
D22—Maritime Forest Gravelly Slopes, Shallow	30	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.02
		Bottom layer	0.25	Thickest layer	0.07
D22—Maritime Rubble Land	20	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	20	Fair		Fair	
		Bottom layer	0.29	Bottom layer	0.02
		Thickest layer	0.29	Thickest layer	0.09
D22—Maritime Rock Outcrop	15	Not rated		Not rated	
D22SA1:					
D22—Subalpine and Alpine Rubble Land	25	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex	15	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
D22SA2:					
D22—Subalpine and Alpine Rubble Land	34	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	30	Fair		Fair	
		Bottom layer	0.29	Bottom layer	0.02
		Thickest layer	0.29	Thickest layer	0.09
D22WF1:					
Maritime Water, Lakes and Ponds.					
D22WS1:					
Estuarine Water, Saline.					

Table 18.--Camp and Picnic Areas

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
22CF1:					
22—Estuarine Graminoid Loamy Floodplains	65	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Salinity	0.50
		Salinity	0.50	Flooding	0.40
		Dusty	0.01	Dusty	0.01
22—Maritime Water, Flowing	20	Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Salinity	0.50
		Salinity	0.50	Flooding	0.40
		Dusty	0.01	Dusty	0.01
22CP3:					
22—Estuarine Graminoid Gravelly Coastal Plain	95	Very limited		Very limited	
		Salinity	1.00	Salinity	1.00
		Flooding	1.00	Gravel content	0.68
		Gravel content	0.68	Too sandy	0.13
		Too sandy	0.13		
22FF1:					
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
22HF1:					
22—Maritime Riverwash, Bouldery	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Large stones content	1.00
		Flooding	1.00	Too sandy	1.00
		Large stones content	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Flooding	0.60
22—Maritime Water, Flowing	30	Not rated		Not rated	

Table 18.--Camp and Picnic Areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
22HF1:					
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	25	Very limited		Very limited	
		Flooding	1.00	Gravel content	1.00
		Gravel content	1.00	Large stones content	1.00
		Large stones content	1.00		
22LF1:					
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	60	Very limited		Not limited	
		Flooding	1.00		
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Very limited		Not limited	
		Flooding	1.00		
22LF2:					
22—Maritime Forest Loamy Floodplains, Rarely Flooded	40	Very limited		Somewhat limited	
		Flooding	1.00	Dusty	0.01
		Dusty	0.01		
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded	20	Very limited		Not limited	
		Flooding	1.00		
22—Maritime Forest Gravelly Floodplains, Rarely Flooded	20	Very limited		Not limited	
		Flooding	1.00		
22LM1:					
22—Maritime Forest Gravelly Slopes, Shallow	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	0.36	Gravel content	0.36
		Dusty	0.01	Dusty	0.01
22—Maritime Forest Organic Slopes, Dry	20	Not rated		Not rated	

Table 18.--Camp and Picnic Areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
22UF1:					
Maritime Urban Land.					
D22AM1:					
D22—Subalpine and Alpine Permanent Ice and Snow-------	33	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Subalpine and Alpine Rubble Land	30	Not rated		Not rated	
D22BF1:					
D22—Maritime Riverwash, Bouldery	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Large stones content	1.00
		Flooding	1.00	Too sandy	1.00
		Large stones content	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Flooding	0.60
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded------------	40	Very limited		Very limited	
		Flooding	1.00	Gravel content	1.00
		Gravel content	1.00	Large stones content	1.00
		Large stones content	1.00		
D22—Maritime Water, Flowing------------	15	Not rated		Not rated	
D22DW1:					
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Not rated		Not rated	
D22HM2:					
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Not rated		Not rated	
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	
D22—Maritime Rubble Land---------------	20	Not rated		Not rated	
D22LM2:					
D22—Maritime Forest Gravelly Slopes, Shallow------------	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	0.96	Gravel content	0.96
		Dusty	0.01	Dusty	0.01

Table 18.--Camp and Picnic Areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
D22LM2:					
D22—Maritime Forest Gravelly Slopes, Shallow, Convex----	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	1.00	Gravel content	1.00
		Dusty	0.01	Dusty	0.01
D22—Maritime Rock Outcrop------------	20	Not rated		Not rated	
D22LM3:					
D22—Maritime Forest Gravelly Slopes, Shallow------------	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	0.96	Gravel content	0.96
		Dusty	0.01	Dusty	0.01
D22—Maritime Rubble Land---------------	20	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional-------	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel content	1.00	Gravel content	1.00
D22—Maritime Rock Outcrop------------	15	Not rated		Not rated	
D22SA1:					
D22—Subalpine and Alpine Rubble Land	25	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex-------------	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
D22SA2:					
D22—Subalpine and Alpine Rubble Land	34	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	

Table 18.--Camp and Picnic Areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
D22SA2:					
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional-------	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel content	1.00	Gravel content	1.00
D22WF1:					
Maritime Water, Lakes and Ponds.					
D22WS1:					
Estuarine Water, Saline.					

Table 19.--Trail Management

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
22CF1:					
22—Estuarine Graminoid Loamy Floodplains	65	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40
		Dusty	0.01	Dusty	0.01
22—Maritime Water, Flowing	20	Not rated		Not rated	
22—Estuarine Graminoid Loamy Floodplains, Depression	15	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00
		Flooding	0.40	Flooding	0.40
		Dusty	0.01	Dusty	0.01
22CP3:					
22—Estuarine Graminoid Gravelly Coastal Plain	95	Somewhat limited		Somewhat limited	
		Too sandy	0.13	Too sandy	0.13
22FF1:					
22—Maritime Forest Gravelly Alluvial Fan, Fan Terrace	95	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
22HF1:					
22—Maritime River Wash, Bouldery	45	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Too sandy	1.00
		Flooding	0.60	Flooding	0.60
22—Maritime Water, Flowing	30	Not rated		Not rated	

Table 19.--Trail Management--Continued

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
22HF1:					
22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded-----------	25	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
22LF1:					
22—Maritime Forest Gravelly Floodplains, Rarely Flooded-----	60	Not limited		Not limited	
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded-----------	20	Not limited		Not limited	
22LF2:					
22—Maritime Forest Loamy Floodplains, Rarely Flooded-----	40	Somewhat limited		Somewhat limited	
		Dusty	0.01	Dusty	0.01
22—Maritime Forest Gravelly Floodplains, Occasionally Flooded-----------	20	Not limited		Not limited	
22—Maritime Forest Gravelly Floodplains, Rarely Flooded-----	20	Not limited		Not limited	
22LM1:					
22—Maritime Forest Gravelly Slopes, Shallow------------	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Dusty	0.01	Dusty	0.01
22—Maritime Forest Organic Slopes, Dry	20	Not rated		Not rated	
22UF1:					
Maritime Urban Land.					
D22AM1:					
D22—Subalpine and Alpine Permanent Ice and Snow-------	33	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Subalpine and Alpine Rubble Land	30	Not rated		Not rated	

Table 19.--Trail Management--Continued

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
D22BF1:					
D22—Maritime Riverwash, Bouldery	45	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Too sandy	1.00
		Flooding	0.60	Flooding	0.60
D22—Maritime Forest Gravelly Floodplains, High Gradient, Occasionally Flooded	40	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
D22—Maritime Water, Flowing	15	Not rated		Not rated	
D22DW1:					
D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Not rated		Not rated	
D22HM2:					
D22—Maritime Forest Organic Slopes, Dry, High Elevation	50	Not rated		Not rated	
D22—Maritime Rock Outcrop	20	Not rated		Not rated	
D22—Maritime Rubble Land	20	Not rated		Not rated	
D22LM2:					
D22—Maritime Forest Gravelly Slopes, Shallow	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Dusty	0.01	Dusty	0.01
D22—Maritime Forest Gravelly Slopes, Shallow, Convex	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Dusty	0.01	Dusty	0.01
D22—Maritime Rock Outcrop	20	Not rated		Not rated	
D22LM3:					
D22—Maritime Forest Gravelly Slopes, Shallow	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Dusty	0.01	Dusty	0.01

Table 19.--Trail Management--Continued

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
D22LM3:					
D22—Maritime Rubble Land	20	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	20	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Slope	0.22
D22—Maritime Rock Outcrop	15	Not rated		Not rated	
D22SA1:					
D22—Subalpine and Alpine Rubble Land	25	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	20	Not rated		Not rated	
D22—Subalpine Scrub Gravelly Slopes, Convex	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
D22SA2:					
D22—Subalpine and Alpine Rubble Land	34	Not rated		Not rated	
D22—Subalpine and Alpine Rock Outcrop	33	Not rated		Not rated	
D22—Maritime Scrub/Herb Gravelly Slopes, Depositional	30	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Slope	0.22
D22WF1:					
Maritime Water, Lakes and Ponds.					
D22WS1:					
Estuarine Water, Saline.					

Table 20.--Hydric Soils

(Only the soils that are rated as hydric are shown in this table.)

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric soils criteria: Hydric criteria code	Hydric soils criteria: Meets saturation criteria	Hydric soils criteria: Meets flooding criteria	Hydric soils criteria: Meets ponding criteria
22CF1: Estuarine Floodplains	22—Estuarine Graminoid Loamy Floodplains	65	Yes	Flood plains	4	No	Yes	No
	22—Estuarine Graminoid Loamy Floodplains, Depression	15	Yes	Depressions of flood plains	3, 4, 2B3	Yes	Yes	Yes
22LM1: Maritime Mountains, Steep	22—Maritime Scrub Organic Slopes, Depression	5	Yes	Depressions of mountains	1	No	No	No
D22DW1: Maritime Organic Floodplains	D22—Maritime Scrub/Herb Mosaic Organic Floodplains	90	Yes	Depressions of flood plains	3, 4, 1	No	Yes	Yes
D22LM2: Maritime Mountains, Very Steep, Smooth	D22—Maritime Scrub Organic Slopes, Depression	5	Yes	Depressions of mountains	1	No	No	No

Table 21.--Taxonomic Classification of the Soils

Soil name	Family or higher taxonomic class
22-Estuarine Graminoid Gravelly Coastal Plain	Sandy-skeletal, mixed Typic Cryorthents
22-Estuarine Graminoid Loamy Floodplains	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Aquic Cryofluvents
22-Estuarine Graminoid Loamy Floodplains, Depression	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Typic Fluvaquents
22-Maritime Forest Gravelly Alluvial Fan, Fan Terrace	Sandy-skeletal, mixed Typic Cryorthents
22-Maritime Forest Gravelly Floodplains	Sandy-skeletal, mixed Typic Cryofluvents Sandy-skeletal, mixed Typic Cryorthents
22-Maritime Forest Gravelly Floodplains, High Gradient	Sandy-skeletal, mixed Typic Cryofluvents
22-Maritime Forest Gravelly Slopes, Shallow	Loamy-skeletal, mixed, superactive Lithic Dystrocryepts
22-Maritime Forest Loamy Floodplains	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid Typic Cryorthents
22-Maritime Forest Organic Slopes, Depression	Euic Typic Cryosaprists
22-Maritime Forest Organic Slopes, Dry	Dysic Lithic Cryofolists
22-Maritime Scrub Gravelly Floodplains	Sandy-skeletal, mixed Typic Cryorthents
22-Maritime Scrub Gravelly Floodplains, Depression	Sandy-skeletal, mixed Aquic Cryofluvents Sandy-skeletal, mixed Typic Cryofluvents
D22-Alpine Herbaceous Gravelly Diorite Slopes	Lithic Humicryepts
D22-Maritime Forest Gravelly Floodplains, High Gradient	Typic Cryofluvents
D22-Maritime Forest Gravelly Slopes, High Elevation	Typic Humicryods
D22-Maritime Forest Gravelly Slopes, Shallow	Lithic Dystrocryepts
D22-Maritime Forest Gravelly Slopes, Shallow, Convex	Lithic Haplocryods

Table 21.--Taxonomic Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
D22-Maritime Forest Organic Slopes, Depression	Typic Cryosaprists
D22-Maritime Forest Organic Slopes, Dry	Lithic Cryofolists
D22-Maritime Forest Organic Slopes, Dry, High Elevation	Lithic Cryofolists
D22-Maritime Scrub/Herb Gravelly Slopes, Depositional	Typic Cryorthents
D22-Maritime Scrub/Herb Mosaic Organic Floodplains	Fluvaquentic Cryohemists
D22-Subalpine Forest Gravelly Slopes	Lithic Humicryods
D22-Subalpine Scrub Gravelly Slopes	Typic Humicryods
D22-Subalpine Scrub Gravelly Slopes, Convex	Lithic Humicryepts
D22-Subalpine Scrub Gravelly Slopes, Depositional	Lithic Humicryepts
D22-Subalpine Scrub Organic Slopes	Lithic Cryofolists

Appendix

Plants Observed in Survey Area

Plant code	Scientific name	Common name
ABLA	*Abies lasiocarpa*	Subalpine fir
ACDE2	*Aconitum delphiniifolium*	Larkspurleaf monkshood
ACGL	*Acer glabrum*	Rocky Mountain maple
ACHIL	*Achillea*	Yarrow
ACMI2	*Achillea millefolium*	Common yarrow
ACMIA	*Achillea millefolium var. alpicola*	Common yarrow
ACONI	*Aconitum*	Monkshood
ACRU2	*Actaea rubra*	Red baneberry
ACRUR2	*Actaea rubra ssp. rubra*	Red baneberry
AGAE	*Agrostis aequivalvis*	Arctic bentgrass
AGEX	*Agrostis exarata*	Spike bentgrass
AGROP2	*Agropyron*	Wheatgrass
AGROS2	*Agrostis*	Bentgrass
AGSC5	*Agrostis scabra*	Rough bentgrass
ALNUS	*Alnus*	Alder
ALVI5	*Alnus viridis*	Green alder
ALVIS	*Alnus viridis ssp. sinuata*	Sitka alder
AMAL2	*Amelanchier alnifolia*	Saskatoon serviceberry
AMALS	*Amelanchier alnifolia var. semiintegrifolia*	Saskatoon serviceberry
ANGE2	*Angelica genuflexa*	Kneeling angelica
ANLU	*Angelica lucida*	Seacoast angelica
ANNA	*Anemone narcissiflora*	Narcissus anemone
ANTEN	*Antennaria*	Pussytoes
AQFO	*Aquilegia formosa*	Western columbine
AQUIL	*Aquilegia*	Columbine
ARAN7	*Argentina anserina*	Silverweed cinquefoil
ARAR9	*Artemisia arctica*	Boreal sagebrush
ARARC	*Artemisia arctica ssp. comata*	Boreal sagebrush
ARDI8	*Aruncus dioicus*	Bride’s feathers
ARFR4	*Artemisia frigida*	Prairie sagewort
ARTEM	*Artemisia*	Sagebrush
ARTI	*Artemisia tilesii*	Tilesius’ wormwood
ARUNC	*Aruncus*	Aruncus
ARUV	*Arctostaphylos uva-ursi*	Kinnikinnick
ASTER	*Aster*	Aster
ATFI	*Athyrium filix-femina*	Ladyfern
BENE4	*Betula neoalaskana*	Resin birch
BEPA	*Betula papyrifera*	Paper birch
BEPAP	*Betula papyrifera var. papyrifera*	Paper birch
BETUL	*Betula*	Birch
BORO	*Boschniakia rossica*	Northern groundcone
BOSCH	*Boschniakia*	Groundcone
BRDI60	*Bryocaulon divergens*	Bryocaulon lichen
CAAN10	*Carex anthoxanthea*	Grassyslope arctic sedge
CAAQ	*Carex aquatilis*	Water sedge
CACA11	*Carex canescens*	Silvery sedge
CACA13	*Carex capitata*	Capitate sedge
CACA4	*Calamagrostis canadensis*	Bluejoint
CACH5	*Carex chordorrhiza*	Creeping sedge
CADI6	*Carex disperma*	Softleaf sedge
CAGM	*Carex gmelinii*	Gmelin’s sedge
CALA7	*Campanula lasiocarpa*	Mountain harebell
CALE4	*Caltha leptosepala*	White marsh marigold
CALI	*Carex livida*	Livid sedge
CALI7	*Carex limosa*	Mud sedge
CALY3	*Carex lyngbyei*	Lyngbye’s sedge
CALY4	*Cassiope lycopodioides*	Clubmoss mountain heather
CALYC6	*Cassiope lycopodioides var. cristapilosa*	Clubmoss mountain heather
CALYL2	*Cassiope lycopodioides var. lycopodioides*	Clubmoss mountain heather
CAMA10	*Carex macrocephala*	Largehead sedge
CAMA11	*Carex macrochaeta*	Longawn sedge
CAME7	*Cassiope mertensiana*	White mountain-heather
CAMI4	*Carex microchaeta*	Smallawned sedge

Plants Observed in Survey Area—Continued

Plant code	Scientific name	Common name
CANA2	*Carex nardina*	Spike sedge
CANI2	*Carex nigricans*	Black alpine sedge
CAPA5	*Caltha palustris*	Yellow marsh marigold
CAPL6	*Carex pluriflora*	Manyflower sedge
CAREX	*Carex*	Sedge
CASP5	*Carex spectabilis*	Showy sedge
CASSI3	*Cassiope*	Mountain heather
CAST10	*Carex stylosa*	Variegated sedge
CHAN9	*Chamerion angustifolium*	Fireweed
CHAR13	*Chrysanthemum arcticum*	Arctic daisy
CHLA13	*Chamerion latifolium*	Dwarf fireweed
CIAL	*Circaea alpina*	Small enchanter's nightshade
CLADI3	*Cladina*	Reindeer lichen
CLADO3	*Cladonia*	Deer moss
CLAR60	*Cladina arbuscula*	Reindeer lichen
CLBE4	*Cladonia bellidiflora*	Cup lichen
CLBO7	*Cladonia borealis*	Boreal cup lichen
CLCH3	*Cladonia chlorophaea*	Cup lichen
CLDE70	*Climacium dendroides*	Tree climacium moss
CLGR13	*Cladonia gracilis*	Cup lichen
CLGRG3	*Cladonia gracilis ssp. gracilis*	Cup lichen
CLMA11	*Cladonia macilenta*	Cup lichen
CLMI60	*Cladina mitis*	Reindeer lichen
CLPL60	*Cladonia pleurota*	Cup lichen
CLPO4	*Cladina portentosa*	Reindeer lichen
CLRA60	*Cladina rangiferina*	Greygreen reindeer lichen
CLSQ60	*Cladonia squamosa*	Cup lichen
CLST5	*Cladina stygia*	Reindeer lichen
CLST60	*Cladina stellaris*	Star reindeer lichen
CLUN60	*Cladonia uncialis*	Cup lichen
COCA13	*Cornus canadensis*	Bunchberry dogwood
CONIO	*Conioselinum*	Hemlockparsley
COPA28	*Comarum palustre*	Purple marshlocks
CORNI	*Cornicularia*	Brittle lichen
CORNU	*Cornus*	Dogwood
COSE16	*Cornus sericea*	Redosier dogwood
COSEO	*Cornus sericea ssp. occidentalis*	Western dogwood
COSES	*Cornus sericea ssp. sericea*	Redosier dogwood
COSU4	*Cornus suecica*	Lapland cornel
CRAC3	*Cryptogramma acrostichoides*	American rockbrake
DELPH	*Delphinium*	Larkspur
DICRA8	*Dicranum*	Dicranum moss
DIFU5	*Dicranum fuscescens*	Dicranum moss
DILA	*Diapensia lapponica*	Pincushion plant
DISC71	*Dicranum scoparium*	Dicranum moss
DOPU	*Dodecatheon pulchellum*	Darkthroat shootingstar
DREX2	*Dryopteris expansa*	Spreading woodfern
DROC	*Dryas octopetala*	White dryad
DROCO	*Dryas octopetala ssp. octopetala*	Eightpetal mountain-avens
DRRO	*Drosera rotundifolia*	Roundleaf sundew
ELGL	*Elymus glaucus*	Blue wildrye
ELPA3	*Eleocharis palustris*	Common Spikerush
ELRE4	*Elymus repens*	Quackgrass
ELYMU	*Elymus*	Wildrye
EMNI	*Empetrum nigrum*	Black crowberry
EMNIN	*Empetrum nigrum ssp. nigrum*	Black crowberry
EPCI	*Epilobium ciliatum*	Fringed willowherb
EPCIC	*Epilobium ciliatum ssp. ciliatum*	Fringed willowherb
EPILO	*Epilobium*	Willowweed
EQAR	*Equisetum arvense*	Field horsetail
EQFL	*Equisetum fluviatile*	Water horsetail
EQHY	*Equisetum hyemale*	Scouringrush horsetail
ERAN6	*Eriophorum angustifolium*	Tall cottongrass

Plants Observed in Survey Area——Continued

Plant code	Scientific name	Common name
ERCH7	*Eriophorum chamissonis*	Chamisso's cottongrass
ERIGE2	*Erigeron*	Fleabane
ERPE3	*Erigeron peregrinus*	Subalpine fleabane
ERVA4	*Eriophorum vaginatum*	Tussock cottongrass
FACR	*Fauria crista-galli*	Deercabbage
FERU2	*Festuca rubra*	Red fescue
GABO2	*Galium boreale*	Northern bedstraw
GATR3	*Galium triflorum*	Sweet-scented bedstraw
GECA6	*Geum calthifolium*	Calthaleaf avens
GELI2	*Geocaulon lividum*	False toadflax
GEMA4	*Geum macrophyllum*	Largeleaf avens
GEUM	*Geum*	Geum
GLMA	*Glaux maritima*	Sea milkwort
GYDR	*Gymnocarpium dryopteris*	Western oakfern
GYMNO	*Gymnocarpium*	Oakfern
HAST3	*Harrimanella stelleriana*	Alaska bellheather
HEGL5	*Heuchera glabra*	Alpine heuchera
HEMA80	*Heracleum maximum*	Cowparsnip
HIAL3	*Hierochloe alpina*	Alpine sweetgrass
HIALA	*Hierochloe alpina ssp. alpina*	Alpine sweetgrass
HOBR2	*Hordeum brachyantherum*	Meadow barley
HOJU	*Hordeum jubatum*	Foxtail barley
HOPE	*Honckenya peploides*	Seaside sandplant
HUCH	*Huperzia chinensis*	Chinese clubmoss
HYLOC2	*Hylocomium*	Hylocomium feather moss
HYSP70	*Hylocomium splendens*	Splendid feather moss
HYSP70	*Hylocomium splendens*	Stairstep moss
ICER	*Icmadophila ericetorum*	Peppermint drop lichen
IRIS	*Iris*	Iris
JUAR2	*Juncus arcticus*	Arctic rush
JUCO6	*Juniperus communis*	Common juniper
JUDR	*Juncus drummondii*	Drummond's rush
JUME3	*Juncus mertensianus*	Mertens' rush
JUNCU	*Juncus*	Rush
KAMI	*Kalmia microphylla*	Alpine laurel
LAJA	*Lathyrus japonicus*	Beach pea
LATHY	*Lathyrus*	Peavine
LAVE	*Lathyrus venosus*	Veiny pea
LEGR	*Ledum groenlandicum*	Bog Labrador tea
LEMOM2	*Leymus mollis ssp. mollis*	American dunegrass
LEPAD	*Ledum palustre ssp. decumbens*	Marsh Labrador tea
LEPY	*Leptarrhena pyrolifolia*	Fireleaf leptarrhena
LEYMU	*Leymus*	Wildrye
LIBO3	*Linnaea borealis*	Twinflower
LICA10	*Listera caurina*	Northwestern twayblade
LICO6	*Listera cordata*	Heartleaf twayblade
LLOYD	*Lloydia*	Alplily
LOOR60	*Lobaria oregana*	Oregon lung lichen
LOPR	*Loiseleuria procumbens*	Alpine azalea
LUAR2	*Lupinus arcticus*	Arctic lupine
LUAR5	*Luzula arcuata*	Curved woodrush
LUPA4	*Luzula parviflora*	Smallflowered woodrush
LUPE	*Luetkea pectinata*	Partridgefoot
LUPI2	*Luzula piperi*	Piper's woodrush
LUWA	*Luzula wahlenbergii*	Wahlenberg's woodrush
LUZUL	*Luzula*	Woodrush
LYAL3	*Lycopodium alpinum*	Alpine clubmoss
LYAN2	*Lycopodium annotinum*	Stiff clubmoss
LYCL	*Lycopodium clavatum*	Running clubmoss
LYCO3	*Lycopodium complanatum*	Groundcedar
LYCOP2	*Lycopodium*	Clubmoss
MABR5	*Malaxis brachypoda*	White adder's-mouth orchid
MADI6	*Matricaria discoidea*	Disc mayweed

Plants Observed in Survey Area—Continued

Plant code	Scientific name	Common name
MEFE	*Menziesia ferruginea*	Rusty menziesia
MEHE6	*Melanelia hepatizon*	Melanelia lichen
MENZI	*Menziesia*	Menziesia
METR3	*Menyanthes trifoliata*	Buckbean
MNIUM2	*Mnium*	Mnium calcareous moss
MOUN2	*Moneses uniflora*	Single delight
NEAR60	*Nephroma arcticum*	Arctic kidney lichen
NECR2	*Nephrophyllidium crista-galli*	Deercabbage
NULUP	*Nuphar lutea ssp. polysepala*	Rocky Mountain pond-lily
OPHO	*Oplopanax horridus*	Devilsclub
OPLOP	*Oplopanax*	Oplopanax
ORSE	*Orthilia secunda*	Sidebells wintergreen
ORTHI	*Orthilia*	Orthilia
OSBE	*Osmorhiza berteroi*	Sweetcicely
OSDE	*Osmorhiza depauperata*	Mountain sweetroot
OSMOR	*Osmorhiza*	Sweetroot
OXCA4	*Oxytropis campestris*	Field locoweed
PAFI3	*Parnassia fimbriata*	Fringed grass of Parnassus
PEAP60	*Peltigera aphthosa*	Felt lichen
PECA2	*Pedicularis capitata*	Capitate lousewort
PEFR5	*Petasites frigidus*	Arctic sweet coltsfoot
PELTI2	*Peltigera*	Felt lichen
PHCO24	Phegopteris connectilis	Long beechfern
PHFO6	*Philonotis fontana*	Philonotis moss
PHGL6	*Phyllodoce glanduliflora*	Yellow mountainheath
PHPR3	*Phleum pratense*	Timothy
PHYLL3	*Phyllodoce*	Mountainheath
PICO	*Pinus contorta*	Lodgepole pine
PICOC	*Pinus contorta var. contorta*	Shore pine
PICOL	*Pinus contorta var. latifolia*	Tall lodgepole pine
PISI	*Picea sitchensis*	Sitka spruce
PLAGI7	*Plagiomnium*	Plagiomnium moss
PLDI3	*Platanthera dilatata*	Scentbottle
PLEUR10	*Pleurozium*	Big red stem moss
PLEUR2	*Pleuropogon*	Semaphoregrass
PLIN11	*Plagiomnium insigne*	Plagiomnium moss
PLLA	*Plantago lanceolata*	Narrowleaf plantain
PLMAJ	*Plantago maritima var. juncoides*	Goose tongue
PLOB	*Platanthera obtusata*	Bluntleaved orchid
PLSC70	*Pleurozium schreberi*	Schreber’s big red stem moss
PLST4	*Platanthera stricta*	Slender bog orchid
PLUN4	*Plagiothecium undulatum*	Undulate plagiothecium moss
POA	*Poa*	Bluegrass
POAL2	*Poa alpina*	Alpine bluegrass
POAR2	*Poa arctica*	Arctic bluegrass
POARA2	*Poa arctica ssp. arctica*	Arctic bluegrass
POBA2	*Populus balsamifera*	Balsam poplar
POBAB2	*Populus balsamifera ssp. balsamifera*	Balsam poplar
POBAT	*Populus balsamifera ssp. trichocarpa*	Black cottonwood
POBR4	*Polystichum braunii*	Braun’s hollyfern
POCO38	*Polytrichum commune*	Polytrichum moss
POGL8	*Polypodium glycyrrhiza*	Licorice fern
POJU70	*Polytrichum juniperinum*	Juniper polytrichum moss
POLE2	*Poa leptocoma*	Marsh bluegrass
POLYS	*Polystichum*	Swordfern
POLYT5	*Polytrichum*	Polytrichum moss
PONU70	*Pohlia nutans*	Pohlia moss
POPA2	*Poa palustris*	Fowl bluegrass
POPR	*Poa pratensis*	Kentucky bluegrass
POPU3	*Polemonium pulcherrimum*	Skunkleaf polemonium
POTEN	*Potentilla*	Cinquefoil
PRAL	*Prenanthes alata*	Western rattlesnakeroot
PTCR70	*Ptilium crista-castrensis*	Knights plume moss

Plants Observed in Survey Area—Continued

Plant code	Scientific name	Common name
PYAS	*Pyrola asarifolia*	Pink wintergreen
PYASA	*Pyrola asarifolia ssp. asarifolia*	Liverleaf wintergreen
PYGR	*Pyrola grandiflora*	Largeflowered wintergreen
RAAQ	*Ranunculus aquatilis*	Whitewater crowfoot
RAES	*Ranunculus eschscholtzii*	Eschscholtz's buttercup
RALA70	*Racomitrium lanuginosum*	Racomitrium moss
RANUN	*Ranunculus*	Buttercup
RAOC	*Ranunculus occidentalis*	Western buttercup
RHGL70	*Rhizomnium glabrescens*	Rhizomnium moss
RHIZO2	*Rhizomnium*	Rhizomnium moss
RHLO70	*Rhytidiadelphus loreus*	Loreus goose neck moss
RHMI13	*Rhinanthus minor*	Little yellowrattle
RHTR70	*Rhytidiadelphus triquetrus*	Rough goose neck moss
RHYTI2	*Rhytidiadelphus*	Goose neck moss
RIBES	*Ribes*	Currant
RIBR	*Ribes bracteosum*	Stink currant
RIGL	*Ribes glandulosum*	Skunk currant
RILA	*Ribes lacustre*	Prickly currant
RILA3	*Ribes laxiflorum*	Trailing black currant
RITR	*Ribes triste*	Red currant
ROAC	*Rosa acicularis*	Prickly rose
RONU	*Rosa nutkana*	Nootka rose
RONUN	*Rosa nutkana var. nutkana*	Nootka rose
ROSA5	*Rosa*	Rose
RUAC2	*Rumex acetosa*	Garden sorrel
RUAC3	*Rumex acetosella*	Common sheep sorrel
RUAR	*Rubus arcticus*	Arctic blackberry
RUCH	*Rubus chamaemorus*	Cloudberry
RUCR	*Rumex crispus*	Curly dock
RUID	*Rubus idaeus*	American red raspberry
RUIDI	*Rubus idaeus ssp. idaeus*	American red raspberry
RULE	*Rubus leucodermis*	Whitebark raspberry
RUMEX	*Rumex*	Dock
RUPE	*Rubus pedatus*	Strawberryleaf raspberry
RUSP	*Rubus spectabilis*	Salmonberry
SAAL	*Salix alaxensis*	Feltleaf willow
SAALA	*Salix alaxensis var. alaxensis*	Feltleaf willow
SAAR27	*Salix arctica*	Arctic willow
SABA3	*Salix barclayi*	Barclay's willow
SABE2	*Salix bebbiana*	Bebb willow
SABR6	*Saxifraga bronchialis*	Yellowdot saxifrage
SACA14	*Sanguisorba canadensis*	Canadian burnet
SACO2	*Salix commutata*	Undergreen willow
SAFE	*Saxifraga ferruginea*	Russethair saxifrage
SALIX	*Salix*	Willow
SALY3	*Saxifraga lyallii*	Redstem saxifrage
SAMA6	*Sagina maxima*	Stickystem pearlwort
SAME7	*Saxifraga mertensiana*	Wood saxifrage
SAOV	*Salix ovalifolia*	Oval-leaf willow
SAPU15	*Salix pulchra*	Tealeaf willow
SARA2	*Sambucus racemosa*	Red elderberry
SARAR3	*Sambucus racemosa var. racemosa*	Red elderberry
SARE2	*Salix reticulata*	Netleaf willow
SARER	*Salix reticulata ssp. reticulata*	Netleaf willow
SARI4	*Salix richardsonii*	Richardson's willow
SARO2	*Salix rotundifolia*	Least willow
SASC	*Salix scouleriana*	Scouler's willow
SASE4	*Salix setchelliana*	Setchell's willow
SASI2	*Salix sitchensis*	Sitka willow
SAST2	*Salix stolonifera*	Sprouting leaf willow
SATR5	*Saxifraga tricuspidata*	Three toothed saxifrage
SAXIF	*Saxifraga*	Saxifrage
SETR	*Senecio triangularis*	Arrowleaf ragwort

Plants Observed in Survey Area—Continued

Plant code	Scientific name	Common name
SHCA	*Shepherdia canadensis*	Russet buffaloberry
SIAC	*Silene acaulis*	Moss campion
SOAR2	*Sonchus arvensis*	Field sowthistle
SOSI2	*Sorbus sitchensis*	western mountain ash
SOSIS2	*Sorbus sitchensis var. sitchensis*	Sitka mountain-ash
SPCA70	*Sphagnum capillifolium*	Sphagnum
SPDO	*Spiraea douglasii*	Rose spirea
SPGI70	*Sphagnum girgensohnii*	Girgensohn's sphagnum
SPHAG2	*Sphagnum*	Sphagnum moss
SPIRA	*Spiraea*	Spirea
SPPA71	*Sphagnum papillosum*	Papillose sphagnum
SPSQ70	*Sphagnum squarrosum*	Sphagnum
SPST3	*Spiraea stevenii*	Beauverd spirea
STAM2	*Streptopus amplexifolius*	Claspleaf twistedstalk
STAMA2	*Streptopus amplexifolius var. amplexifolius*	Claspleaf twistedstalk
STCA	*Stellaria calycantha*	Northern starwort
STCR2	*Stellaria crispa*	Curled starwort
STERE2	*Stereocaulon*	Snow lichen
STME2	*Stellaria media*	Common chickweed
STREP3	*Streptopus*	Twistedstalk
TAOF	*Taraxacum officinale*	Common dandelion
TAOFO	*Taraxacum officinale ssp. officinale*	Common dandelion
THELY2	*Thelypteris*	Maiden fern
THSP	*Thalictrum sparsiflorum*	Fewflower meadow-rue
THUJA	*Thuja*	Red cedar
TITR	*Tiarella trifoliata*	Threeleaf foamflower
TITRU	*Tiarella trifoliata var. unifoliata*	Oneleaf foamflower
TOFIE	*Tofieldia*	Tofieldia
TORTE	*Tortella*	Tortella moss
TORTU	*Tortula*	Tortula moss
TRAL7	*Trichophorum alpinum*	Alpine bulrush
TRCA30	*Trichophorum caespitosum*	Tufted bulrush
TREU	*Trientalis europaea*	Arctic starflower
TREUA	*Trientalis europaea ssp. arctica*	Arctic starflower
TRIEN	*Trientalis*	Starflower
TRIGL	*Triglochin*	Arrowgrass
TRRE3	*Trifolium repens*	White clover
TSHE	*Tsuga heterophylla*	Western hemlock
TSME	*Tsuga mertensiana*	Mountain hemlock
TSUGA	*Tsuga*	Hemlock
USLA60	*Usnea lapponica*	Lapland beard lichen
USNEA2	*Usnea*	Beard lichen
VAAT2	*Vahlodea atropurpurea*	Mountain hairgrass
VACCI	*Vaccinium*	Huckleberry
VAOV	*Vaccinium ovalifolium*	Oval-leaf huckleberry
VAOX	*Vaccinium oxycoccos*	Small cranberry
VASI	*Valeriana sitchensis*	Sitka valerian
VAUL	*Vaccinium uliginosum*	Bog blueberry
VAVI	*Vaccinium vitis-idaea*	Lingonberry
VAVIM	*Vaccinium vitis-idaea ssp. minus*	Northern mountain cranberry
VEAL3	*Veratrum album*	White false hellebore
VEVI	*Veratrum viride*	Green false hellebore
VIBUR	*Viburnum*	Viburnum
VIED	*Viburnum edule*	squashberry
VILA6	*Viola langsdorfii*	Aleutian violet
VIOLA	*Viola*	violet
VIPA4	*Viola palustris*	marsh violet
2FORB	---	Forb (herbaceous, not grass or grasslike)
2FUNGI	---	Fungus
2GRAM	---	Graminoid (grass or grasslike)
2LC	---	Lichen, crustose
2LICHN	---	Lichen

Plants Observed in Survey Area—Continued

Plant code	Scientific name	Common name
2LW	---	Liverwort
2MOSS	---	Moss

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