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Natural
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Conservation
Service



National Park
Service

Soil Survey of Apostle Islands National Lakeshore, Wisconsin



How To Use This Soil Survey

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

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

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

National Cooperative Soil Survey

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

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

Literature Citation

The correct citation for this survey is as follows:

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Cover Caption

The area around Raspberry Island Light is mapped as Portwing-Herbster complex, 0 to 6 percent slopes, on till plains.

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Preface

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

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

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

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

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

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

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

How This Survey Was Made

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

The soil survey data was clipped from the county-based soil surveys of Bayfield County, Wisconsin, and Ashland County, Wisconsin. Both of these surveys were mapped at a scale of 1:12,000. Bayfield County was correlated in October 2005, and Ashland County was correlated in May 2006. The data was last SSURGO-certified in May 2010. The data for this document was extracted in January 2013. In some instances, because data was clipped from more than one county-based set of soil maps, some same-named detailed soil map units may have more than one map symbol and their properties may vary. There are 46 different map units mapped in the park and 197 map unit components.

Sections of this report were reviewed by State-based staff of the Natural Resources Conservation Service, National Park Service personnel, and the soils faculty at the University of California, Davis.

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

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

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by

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an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

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

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

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

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

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

Detailed Soil Map Units

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

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

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

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

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

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

of a soil phase commonly indicates a feature that affects use or management. For example, Allendale loamy fine sand, 0 to 3 percent slopes, is a phase of the Allendale series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Lerch-Herbster complex, 0 to 3 percent slopes, is an example.

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

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

433292—Lerch-Herbster complex, 0 to 3 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 36 to 43 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Lerch and similar soils: 50 percent

Herbster and similar soils: 35 percent

Dissimilar minor components: 15 percent

Description of the Lerch Soil

Taxonomic Classification

Very fine, mixed, active, nonacid, frigid Vertic Epiaquepts

Setting

Landform: Lake plains and till plains

Landform position (two-dimensional): Toeslope

Slope range: 0 to 2 percent

Down-slope shape: Linear and concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Clayey till and/or clayey lacustrine deposits modified by wave action over loamy and/or sandy stratified lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: Frequent

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

Drainage class: Poorly drained

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Shrink-swell potential: Very high (about 10.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 8
Available water capacity: High (about 9.6 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, speckled alder, redosier dogwood, balsam poplar, quaking aspen, willow, and eastern arborvitae

Typical Profile

Oa—0 to 3 inches; muck
Bg—3 to 7 inches; clay
Btg—7 to 12 inches; clay
Btk—12 to 29 inches; clay
Bk—29 to 56 inches; clay
2C—56 to 80 inches; stratified silt loam to very fine sandy loam to loamy fine sand

Description of the Herbster Soil

Taxonomic Classification

Fine, mixed, active, frigid Aeric Glossaqualfs

Setting

Landform: Till plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 3 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: High
Parent material: Clayey till and underlying loamy and sandy stratified lacustrine deposits
Restrictive feature(s): Abrupt textural change at a depth of 40 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): At the soil surface, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 5
Available water capacity: High (about 10.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, redosier dogwood, and fragrant bedstraw

Typical Profile

A—0 to 5 inches; silt loam

E—5 to 10 inches; silt loam

B/E—10 to 13 inches; silty clay loam

Bt1—13 to 28 inches; clay

2Bt2—28 to 33 inches; stratified silty clay loam to clay to silty clay

2Btk—33 to 55 inches; stratified silty clay loam to clay to silty clay

3C—55 to 80 inches; stratified very fine sandy loam to silt loam to loamy very fine sand

Minor Components

Munuscong soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: Yes

Pickford soils

Percent of map unit: 5 percent

Landform: Depressions and drainageways

Representative aspect: North

Meets hydric soil criteria: Yes

Shag soils

Percent of map unit: 5 percent

Landform: Depressions and drainageways

Representative aspect: North

Meets hydric soil criteria: Yes

433296—Cublake-Croswell-Ashwabay complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,150 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Cublake and similar soils: 35 percent

Croswell and similar soils: 20 percent

Ashwabay and similar soils: 20 percent

Dissimilar minor components: 25 percent

Description of the Cublake Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent

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Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 24 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 5.4 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, starry false Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 3 inches; sand
E—3 to 4 inches; sand
Bs—4 to 23 inches; sand
BC—23 to 32 inches; sand
C1—32 to 40 inches; sand
C2—40 to 48 inches; stratified fine sand to very fine sand
2C3—48 to 60 inches; stratified very fine sandy loam to silt loam

Description of the Croswell Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform: Outwash plains, stream terraces, lake plains, and lake terraces
Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy glacial drift

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: About 24 inches (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.1 inches)

Interpretive Groups

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

Vegetation

Existing plants: Kinnikinnick, swordfern, trailing arbutus, eastern teaberry, twinflower, pin cherry, brackenfern, thimbleberry, starflower, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 7 inches; sand
Bs—7 to 16 inches; sand
BC—16 to 39 inches; sand
C—39 to 60 inches; sand

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand

E—4 to 5 inches; sand

Bhs—5 to 12 inches; sand

Bs—12 to 32 inches; sand

Bw—32 to 45 inches; sand

2Bt1—45 to 62 inches; clay

2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Rubicon soils

Percent of map unit: 10 percent

Representative aspect: North

Meets hydric soil criteria: No

Flink soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sayner soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sultz soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

433299—Cublake-Croswell-Ashwabay complex, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,150 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Cublake and similar soils: 35 percent

Croswell and similar soils: 20 percent

Ashwabay and similar soils: 20 percent

Dissimilar minor components: 25 percent

Description of the Cublake Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 24 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.4 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, starry false Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 3 inches; sand

E—3 to 4 inches; sand

Bs—4 to 23 inches; sand

BC—23 to 32 inches; sand

C1—32 to 40 inches; sand

C2—40 to 48 inches; stratified fine sand to very fine sand

2C3—48 to 60 inches; stratified very fine sandy loam to silt loam

Description of the Croswell Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform: Outwash plains, stream terraces, lake plains, and lake terraces

Landform position (two-dimensional): Backslope

Slope range: 6 to 12 percent

Down-slope shape: Convex

Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy glacial drift
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: About 24 inches (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.1 inches)

Interpretive Groups

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

Vegetation

Existing plants: Kinnikinnick, swordfern, trailing arbutus, eastern teaberry, twinflower, pin cherry, brackenfern, thimbleberry, starflower, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 7 inches; sand
Bs—7 to 16 inches; sand
BC—16 to 39 inches; sand
C—39 to 60 inches; sand

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Water table (depth, kind): About 24 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand

E—4 to 5 inches; sand

Bhs—5 to 12 inches; sand

Bs—12 to 32 inches; sand

Bw—32 to 45 inches; sand

2Bt1—45 to 62 inches; clay

2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Rubicon soils

Percent of map unit: 10 percent

Representative aspect: North

Meets hydric soil criteria: No

Flink soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sayner soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sultz soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

433300—Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,695 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Kellogg and similar soils: 35 percent

Allendale and similar soils: 25 percent

Ashwabab and similar soils: 20 percent

Dissimilar minor components: 20 percent

Description of the Kellogg Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 3

Available water capacity: High (about 10.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; sand

Bs—6 to 26 inches; sand

2B/E—26 to 29 inches; silty clay

2Bt—29 to 40 inches; silty clay

2C—40 to 80 inches; silty clay

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Lake terraces, outwash plains, ground moraines, and lake plains

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy sediments and underlying clayey lacustrine or till deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand

E—3 to 10 inches; sand

Bhs—10 to 13 inches; sand

Bs—13 to 26 inches; sand

E'—26 to 28 inches; sand

2Bt—28 to 34 inches; clay

2C—34 to 60 inches; clay

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 5 inches; sand
Bhs—5 to 12 inches; sand
Bs—12 to 32 inches; sand
Bw—32 to 45 inches; sand
2Bt1—45 to 62 inches; clay
2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Portwing soils

Percent of map unit: 8 percent
Representative aspect: North
Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 7 percent
Representative aspect: North
Meets hydric soil criteria: No

Wakeley soils

Percent of map unit: 5 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

433301—Kellogg-Allendale-Ashwabay complex, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,695 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Kellogg and similar soils: 40 percent

Allendale and similar soils: 25 percent

Ashwabay and similar soils: 20 percent

Dissimilar minor components: 15 percent

Description of the Kellogg Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 3

Available water capacity: High (about 10.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Serviceberry, sedge, lily-of-the-valley, hawthorn, strawberry, eastern teaberry, western brackenfern, starflower, and blueberry

Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 6 inches; sand
Bs—6 to 26 inches; sand
2B/E—26 to 29 inches; silty clay
2Bt—29 to 40 inches; silty clay
2C—40 to 80 inches; silty clay

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Lake terraces, outwash plains, ground moraines, and lake plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 12 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy sediments and underlying clayey lacustrine or till deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand

E—3 to 10 inches; sand

Bhs—10 to 13 inches; sand

Bs—13 to 26 inches; sand

E'—26 to 28 inches; sand

2Bt—28 to 34 inches; clay

2C—34 to 60 inches; clay

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 5 inches; sand
Bhs—5 to 12 inches; sand
Bs—12 to 32 inches; sand
Bw—32 to 45 inches; sand
2Bt1—45 to 62 inches; clay
2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Portwing soils

Percent of map unit: 7 percent
Representative aspect: North
Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Wakeley soils

Percent of map unit: 3 percent

Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

433304—Sedgwick-Munuscong complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 60 to 120 days

Map Unit Composition

Sedgwick and similar soils: 50 percent
Munuscong and similar soils: 30 percent
Dissimilar minor components: 20 percent

Description of the Sedgwick Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Epiaquods

Setting

Landform: Till plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Loamy alluvium and underlying clayey till
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 19
Available water capacity: High (about 9.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, threeseeded sedge, yellow bluebeadlily, bunchberry dogwood, water horsetail, eastern teaberry, fragrant bedstraw, western brackenfern, willow, and blueberry

Typical Profile

A—0 to 5 inches; sandy loam
E—5 to 8 inches; loamy sand
Bs—8 to 16 inches; sandy loam
2B/E—16 to 19 inches; clay
2B—19 to 53 inches; clay
2Btk—53 to 80 inches; silty clay

Description of the Munuscong Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, nonacid, frigid Mollic Epiaquepts

Setting

Landform: Lake plains and ground moraines
Landform position (two-dimensional): Toeslope
Slope range: 0 to 2 percent
Down-slope shape: Concave
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium
Parent material: Loamy glaciofluvial deposits over calcareous clayey materials
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Water table (depth, kind): At the soil surface, perched (see table 19)
Drainage class: Poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 20
Available water capacity: Moderate (about 8.3 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, willow, eastern hemlock, and American elm

Typical Profile

A—0 to 8 inches; fine sandy loam
Bg—8 to 30 inches; sandy loam
2C—30 to 60 inches; silty clay

Minor Components

Allendale soils

Percent of map unit: 8 percent

Representative aspect: North

Meets hydric soil criteria: No

Superior soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Herbster soils

Percent of map unit: 4 percent

Representative aspect: North

Meets hydric soil criteria: No

Pickford soils

Percent of map unit: 3 percent

Landform: Depressions and drainageways

Representative aspect: North

Meets hydric soil criteria: Yes

433305—Superior-Sedgwick complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 135 days

Map Unit Composition

Superior and similar soils: 50 percent

Sedgwick and similar soils: 30 percent

Dissimilar minor components: 20 percent

Description of the Superior Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Loamy water-laid deposits and underlying clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Drainage class: Moderately well drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 13
Available water capacity: Moderate (about 6.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Bigleaf aster, yellow bluebeadlily, bunchberry dogwood, fragrant bedstraw, American fly honeysuckle, Canada beadruby, blackberry, American starflower, and blueberry

Typical Profile

A—0 to 3 inches; fine sandy loam
E—3 to 6 inches; sandy loam
Bs—6 to 14 inches; sandy loam
2B/E—14 to 19 inches; clay
2Bt—19 to 26 inches; clay
2C—26 to 60 inches; clay

Description of the Sedgwick Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Epiaquods

Setting

Landform: Till plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 3 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Loamy alluvium and underlying clayey till
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 19
Available water capacity: High (about 9.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, threeseeded sedge, yellow bluebeadlily, bunchberry dogwood, water horsetail, eastern teaberry, fragrant bedstraw, western brackenfern, willow, and blueberry

Typical Profile

A—0 to 5 inches; loamy sand
E—5 to 8 inches; loamy sand
Bs—8 to 16 inches; sandy loam
2B/E—16 to 19 inches; clay
2Bt—19 to 53 inches; clay
2Btk—53 to 80 inches; silty clay

Minor Components

Allendale soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Portwing soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Munuscong soils

Percent of map unit: 3 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

Herbster soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

433309—Superior-Sedgwick complex, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 135 days

Map Unit Composition

Superior and similar soils: 50 percent
Sedgwick and similar soils: 30 percent
Dissimilar minor components: 20 percent

Description of the Superior Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Loamy water-laid deposits and underlying clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 13

Available water capacity: Moderate (about 6.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4e

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Bigleaf aster, yellow bluebeadlily, bunchberry dogwood, fragrant bedstraw, American fly honeysuckle, Canada beadruby, blackberry, American starflower, and blueberry

Typical Profile

A—0 to 3 inches; fine sandy loam

E—3 to 6 inches; sandy loam

Bs—6 to 14 inches; sandy loam

2B/E—14 to 19 inches; clay

2Bt—19 to 26 inches; clay

2C—26 to 60 inches; clay

Description of the Sedgwick Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Epiaquods

Setting

Landform: Till plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 15 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Loamy alluvium and underlying clayey till
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 19
Available water capacity: High (about 9.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, threeseeded sedge, yellow bluebeadlily, bunchberry
dogwood, water horsetail, eastern teaberry, fragrant bedstraw, western
brackenfern, willow, and blueberry

Typical Profile

A—0 to 5 inches; loamy sand
E—5 to 8 inches; loamy sand
Bs—8 to 16 inches; sandy loam
2B/E—16 to 19 inches; clay
2Bt—19 to 53 inches; clay
2Btk—53 to 80 inches; silty clay

Minor Components

Kellogg soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Cornucopia soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Allendale soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Lerch soils

Percent of map unit: 2 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

433310—Sultz-Ashwabay-Rubicon complex, 15 to 45 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,950 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Sultz and similar soils: 35 percent

Ashwabay and similar soils: 25 percent

Rubicon and similar soils: 20 percent

Dissimilar minor components: 20 percent

Description of the Sultz Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Outwash plains, outwash terraces, lake plains, and lake terraces

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy outwash underlain by stratified loamy or loamy and sandy alluvium or lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Moderate (about 6.3 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Spreading dogbane, bigleaf aster, American hazelnut, eastern teaberry, clubmoss, partridgeberry, western brackenfern, starry false Solomon's seal, and blueberry

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material
E—2 to 6 inches; sand
Bs—6 to 18 inches; sand
BC—18 to 25 inches; sand
C—25 to 43 inches; sand
2C—43 to 60 inches; stratified sand to fine sand to loamy sand to very fine sandy loam

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Shoulder and backslope
Slope range: 15 to 30 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 5 inches; sand
Bhs—5 to 12 inches; sand
Bs—12 to 32 inches; sand
Bw—32 to 45 inches; sand
2Bt1—45 to 62 inches; clay
2Bt2—62 to 80 inches; stratified clay to silt to sand

Description of the Rubicon Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Outwash plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 3.4 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, Pennsylvania sedge, beaked hazelnut, eastern teaberry, sweet fern, pin cherry, western brackenfern, and blueberry

Typical Profile

A—0 to 1 inch; sand

E—1 to 6 inches; sand

B—6 to 18 inches; sand

BC—18 to 36 inches; sand

C—36 to 60 inches; sand

Minor Components

Sayner soils

Percent of map unit: 10 percent

Representative aspect: North

Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Manistee soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

433314—Manistee-Kellogg-Ashwabay complex, 15 to 45 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,400 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Manistee and similar soils: 40 percent

Kellogg and similar soils: 30 percent

Ashwabay and similar soils: 20 percent

Dissimilar minor components: 10 percent

Description of the Manistee Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy lacustrine and outwash sediments underlain by clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 15

Available water capacity: Low (about 5.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Sugar maple, eastern white pine, and eastern hemlock

Typical Profile

A—0 to 3 inches; sand
E—3 to 11 inches; sand
Bs—11 to 28 inches; sand
E'—28 to 30 inches; sand
2Bt—30 to 38 inches; clay
2C—38 to 60 inches; clay

Description of the Kellogg Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake terraces
Landform position (two-dimensional): Shoulder and backslope
Slope range: 15 to 30 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 18 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 3
Available water capacity: High (about 10.1 inches)

Interpretive Groups

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

Vegetation

Existing plants: Serviceberry, sedge, lily-of-the-valley, hawthorn, strawberry, eastern teaberry, western brackenfern, starflower, and blueberry

Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 6 inches; sand
Bs—6 to 26 inches; sand
2B/E—26 to 29 inches; silty clay
2Bt—29 to 40 inches; silty clay
2C—40 to 80 inches; silty clay

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Shoulder and backslope
Slope range: 15 to 45 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 5 inches; sand
Bhs—5 to 12 inches; sand
Bs—12 to 32 inches; sand
Bw—32 to 45 inches; sand
2Bt1—45 to 62 inches; clay
2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Superior soils

Percent of map unit: 4 percent
Representative aspect: North
Meets hydric soil criteria: No

Cornucopia soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Sultz soils

Percent of map unit: 3 percent

Representative aspect: North

Meets hydric soil criteria: No

433326—Rubicon sand, 0 to 6 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 91B—Wisconsin and Minnesota Sandy Outwash;
92—Superior Lake Plain

Elevation: 600 to 1,800 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 80 to 140 days

Map Unit Composition

Rubicon and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Rubicon Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Outwash plains

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Outwash sands

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 4.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, Pennsylvania sedge, beaked hazelnut, eastern teaberry, sweet fern, pin cherry, western brackenfern, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 6 inches; sand
Bs—6 to 18 inches; sand
BC—18 to 36 inches; sand
C—36 to 60 inches; sand

Minor Components

Croswell soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Karlin soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Sayner soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Sultz soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

433379—Allendale loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,695 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 41 to 46 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Allendale and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Outwash plains, lake terraces, ground moraines, and lake plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 3 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy sediments and underlying clayey lacustrine or till deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand

E—3 to 10 inches; sand

Bhs—10 to 13 inches; sand

Bs—13 to 26 inches; sand

E'—26 to 28 inches; sand

2Bt—28 to 34 inches; clay

2C—34 to 60 inches; clay

Minor Components

Kellogg soils

Percent of map unit: 6 percent

Representative aspect: North

Meets hydric soil criteria: No

Flink soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Wakeley soils

Percent of map unit: 5 percent

Landform: Depressions and drainageways

Representative aspect: North

Meets hydric soil criteria: Yes

Herbster soils

Percent of map unit: 2 percent

Representative aspect: North

Meets hydric soil criteria: No

Sedgwick soils

Percent of map unit: 2 percent

Representative aspect: North

Meets hydric soil criteria: No

433515—Lupton, Cathro, and Tawas soils, 0 to 1 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 90A—Wisconsin and Minnesota Thin Loess and Till, Northern Part; 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Elevation: 600 to 1,600 feet
Mean annual precipitation: 27 to 43 inches
Mean annual air temperature: 36 to 46 degrees F
Frost-free period: 70 to 145 days

Map Unit Composition

Lupton and similar soils: 40 percent
Cathro and similar soils: 30 percent
Tawas and similar soils: 25 percent
Dissimilar minor components: 5 percent

Description of the Lupton Soil

Taxonomic Classification

Euic, frigid Typic Haplosaprists

Setting

Landform: Depressions on disintegration moraines
Slope range: 0 to 1 percent
Down-slope shape: Concave
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Herbaceous and woody organic material more than 51 inches thick
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Depth to water table: At the soil surface
Drainage class: Very poorly drained
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Very high (about 26.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, Pennsylvania sedge, willow, eastern arborvitae, and American elm

Typical Profile

Oa—0 to 65 inches; muck

Description of the Cathro Soil

Taxonomic Classification

Loamy, mixed, euic, frigid Terric Haplosaprists

Setting

Landform: Depressions on disintegration moraines

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Herbaceous organic material 16 to 51 inches thick underlain by loamy deposits

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

Frequency of flooding: None

Frequency of ponding: Frequent

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 16.6 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Speckled alder and redosier dogwood

Typical Profile

Oa—0 to 28 inches; muck

Cg1—28 to 49 inches; loam

Cg2—49 to 60 inches; sandy loam

Description of the Tawas Soil

Taxonomic Classification

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

Setting

Landform: Depressions on disintegration moraines

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Parent material: Herbaceous organic material 16 to 51 inches thick over sandy deposits

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

Frequency of flooding: None

Frequency of ponding: Frequent

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 14.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Northern maidenhair, speckled alder, bluejoint, sedge, eastern teaberry, tamarack, balsam poplar, quaking aspen, brackenfern, purple pitcherplant, eastern arborvitae, and American elm

Typical Profile

Oa—0 to 31 inches; muck

Cg—31 to 60 inches; fine sand

Minor Components

Seelyeville soils

Percent of map unit: 5 percent

Landform: Depressions on outwash plains and depressions

Representative aspect: North

Meets hydric soil criteria: Yes

433572—Portwing-Herbster complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 36 to 43 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Portwing and similar soils: 50 percent

Herbster and similar soils: 30 percent

Dissimilar minor components: 20 percent

Description of the Portwing Soil

Taxonomic Classification

Fine, mixed, active, frigid Oxyaquic Glossudalfs

Setting

Landform: Till plains

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: High

Parent material: Clayey till over underlying stratified loamy and sandy lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 11

Available water capacity: High (about 10.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, beaked hazelnut, and western brackenfern

Typical Profile

A—0 to 4 inches; silt loam

E/B—4 to 9 inches; silt loam

Bt—9 to 32 inches; clay

Btk—32 to 51 inches; clay

2C—51 to 80 inches; stratified very fine sand to silt

Description of the Herbster Soil

Taxonomic Classification

Fine, mixed, active, frigid Aeric Glossaqualfs

Setting

Landform: Till plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 3 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: High

Parent material: Clayey till and underlying loamy and sandy stratified lacustrine deposits

Restrictive feature(s): Abrupt textural change at a depth of 40 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): At the soil surface, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 5
Available water capacity: High (about 10.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, redosier dogwood, and fragrant bedstraw

Typical Profile

A—0 to 5 inches; silt loam
E—5 to 10 inches; silt loam
B/E—10 to 13 inches; silty clay loam
Bt1—13 to 28 inches; clay
2Bt2—28 to 33 inches; stratified silty clay loam to clay to silty clay
2Btk—33 to 55 inches; stratified silty clay loam to clay to silty clay
3C—55 to 80 inches; stratified very fine sandy loam to silt loam to loamy very fine sand

Minor Components

Cornucopia soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Lerch soils

Percent of map unit: 5 percent
Landform: Depressions on till plains and drainageways on till plains
Representative aspect: North
Meets hydric soil criteria: Yes

Sanborg soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Sedgwick soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Allendale soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

Badriver soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

433573—Cornucopia silt loam, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Cornucopia and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Cornucopia Soil

Taxonomic Classification

Fine, mixed, active, frigid Haplic Glossudalfs

Setting

Landform: Till plains
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Clayey till and underlying stratified loamy and sandy lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Well drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 11
Available water capacity: High (about 9.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4e
Meets hydric soil criteria: No
Hydrologic soil group: D

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, spinulose woodfern, American fly honeysuckle, Canada beadruby, western brackenfern, and starflower

Typical Profile

A—0 to 3 inches; silt loam
E/B—3 to 10 inches; very fine sandy loam
Bt—10 to 32 inches; clay
Btk—32 to 45 inches; clay
2Bk—45 to 50 inches; stratified very fine sandy loam to silt loam
2C—50 to 72 inches; stratified very fine sand to silt loam

Minor Components

Manistee soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Odanah soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Portwing soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Superior soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

433582—Crowell sand, 0 to 6 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 91B—Wisconsin and Minnesota Sandy Outwash;
92—Superior Lake Plain
Elevation: 600 to 1,465 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Crowell and similar soils: 82 percent
Dissimilar minor components: 18 percent

Description of the Crowell Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform: Outwash plains, stream terraces, lake terraces, and lake plains
Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy glacial drift
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: About 24 inches (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.1 inches)

Interpretive Groups

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

Vegetation

Existing plants: Kinnikinnick, swordfern, trailing arbutus, eastern teaberry, twinflower, pin cherry, brackenfern, thimbleberry, starflower, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 7 inches; sand
Bs—7 to 16 inches; sand
BC—16 to 39 inches; sand
C—39 to 60 inches; sand

Minor Components

Ashwabay soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Au Gres soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Rubicon soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

433599—Annalake fine sandy loam, lake terrace, 2 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,945 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Annalake and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Annalake Soil

Taxonomic Classification

Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Haploorthods

Setting

Landform: Lake terraces

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Stratified sandy and loamy glaciofluvial and glaciolacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 30 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Moderate (about 8.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 2e

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: White baneberry, wild sarsaparilla, Canada beadruby, Clayton's sweetroot, hairy Solomon's seal, twistedstalk, and snow trillium

Typical Profile

A—0 to 3 inches; fine sandy loam

E—3 to 6 inches; fine sandy loam

Bs1,Bs2—6 to 17 inches; fine sandy loam

E/B—17 to 31 inches; fine sandy loam

Bt—31 to 39 inches; sandy loam
C—39 to 60 inches; stratified fine sand to silt loam

Minor Components

Alcona soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Robago soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Neconish soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

433600—Annalake fine sandy loam, lake terrace, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,945 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Annalake and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Annalake Soil

Taxonomic Classification

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

Setting

Landform: Lake terraces
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium
Parent material: Stratified sandy and loamy glaciofluvial and glaciolacustrine deposits

Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 8.9 inches)

Interpretive Groups

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

Vegetation

Existing plants: White baneberry, wild sarsaparilla, Canada beadruby, Clayton's sweetroot, hairy Solomon's seal, twistedstalk, and snow trillium

Typical Profile

A—0 to 3 inches; fine sandy loam
E—3 to 6 inches; fine sandy loam
Bs1,Bs2—6 to 17 inches; fine sandy loam
E/B—17 to 31 inches; fine sandy loam
Bt—31 to 39 inches; sandy loam
C—39 to 60 inches; stratified fine sand to silt loam

Minor Components

Alcona soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Karlin soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Neconish soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Robago soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

433671—Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

Major land resource areas (MLRAs): 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part

Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 35 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 60 to 110 days

Map Unit Composition

Arnheim and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Arnheim Soil

Taxonomic Classification

Coarse-loamy, mixed, superactive, nonacid, frigid Typic Fluvaquents

Setting

Landform: Flood plains
Slope range: 0 to 1 percent
Down-slope shape: Linear
Across-slope shape: Linear
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Loamy alluvium
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Depth to water table: At the soil surface
Drainage class: Poorly drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: High (about 11.2 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, red maple, speckled alder, common ladyfern, sedge, jewelweed, mint, cinnamon fern, willow, sphagnum moss, and nettle

Typical Profile

A—0 to 5 inches; mucky silt loam
Cg—5 to 10 inches; silt loam
C1—10 to 15 inches; very fine sandy loam
C2—15 to 24 inches; silt loam
C3—24 to 60 inches; stratified loamy fine sand to fine sandy loam to very fine sandy loam

Minor Components

Dechamps soils

Percent of map unit: 10 percent

Representative aspect: North

Meets hydric soil criteria: No

Moquah soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

**433676—Redrim very cobbly sand, 0 to 6 percent slopes,
very stony**

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,000 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Redrim and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Redrim Soil

Taxonomic Classification

Sandy-skeletal, mixed, frigid Entic Lithic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sandy-skeletal beach deposits or residuum from sandstone, or both

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very low (about 2.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Bigleaf aster, yellow bluebeadlily, eastern teaberry, clubmoss, Canada beadruby, western brackenfern, starflower, and mapleleaf viburnum

Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material
Oa—1 to 3 inches; highly decomposed plant material
E—3 to 11 inches; very cobbly sand
Bs—11 to 18 inches; very cobbly loamy sand
2R—18 to 80 inches; unweathered bedrock

Minor Components

Brownstone soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Deerton soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Abbaye soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

433679—Lapoin loam, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Lapoin and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Lapoin Soil

Taxonomic Classification

Fine, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Hills
Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium
Parent material: Loamy alluvium and clayey till and underlying loamy till
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 18 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 3
Available water capacity: Low (about 5.9 inches)

Interpretive Groups

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

Vegetation

Existing plants: Canada beadruby, Clayton's sweetroot, western brackenfern, and mapleleaf viburnum

Typical Profile

Oa—0 to 1 inch; highly decomposed plant material
E—1 to 4 inches; loam
Bs—4 to 7 inches; loam
2B/E—7 to 19 inches; clay
2Bt—19 to 34 inches; clay
3C—34 to 39 inches; sandy loam
4R—39 to 80 inches; unweathered bedrock

Minor Components

Abbaye soils

Percent of map unit: 8 percent
Representative aspect: North
Meets hydric soil criteria: No

Brownstone soils

Percent of map unit: 4 percent
Representative aspect: North
Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

433686—Zeba sandy loam, 0 to 6 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Zeba and similar soils: 90 percent

Dissimilar minor components: 10 percent

Description of the Zeba Soil

Taxonomic Classification

Coarse-loamy, mixed, active, frigid Argic Endoaquods

Setting

Landform: Hills

Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Loamy glacial drift underlain by sandstone bedrock

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: High (about 9.4 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Balsam fir, white baneberry, red maple, wild sarsaparilla, yellow birch, sedge, yellow bluebeadlily, bunchberry dogwood, threeleaf goldthread, spinulose woodfern, shining clubmoss, Canada beadruby, mountain woodsorrel, and American starflower

Typical Profile

A—0 to 2 inches; sandy loam

E—2 to 5 inches; sandy loam

Bs—5 to 13 inches; sandy loam
E'—13 to 21 inches; sandy loam
B/E—21 to 33 inches; sandy loam
2R—33 to 80 inches; unweathered bedrock

Minor Components

Abbaye soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Deerton soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

433729—Sultz sand, 0 to 6 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 91B—Wisconsin and Minnesota Sandy Outwash;
92—Superior Lake Plain
Elevation: 695 to 1,950 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 135 days

Map Unit Composition

Sultz and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Sultz Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Lake terraces
Landform position (two-dimensional): Summit
Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash underlain by stratified loamy or loamy and sandy alluvium or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline

Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 5
Available water capacity: Moderate (about 6.3 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, bigleaf aster, American hazelnut, eastern teaberry, clubmoss, partridgeberry, western brackenfern, starry false Solomon's seal, and blueberry

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material
E—2 to 6 inches; sand
Bs—6 to 18 inches; sand
BC—18 to 25 inches; sand
C—25 to 43 inches; sand
2C—43 to 60 inches; stratified sand to fine sand to loamy sand to very fine sandy loam

Minor Components

Cublake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Karlin soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Rubicon soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

433739—Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 695 to 1,095 feet
Mean annual precipitation: 28 to 35 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Moquah and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Moquah Soil

Taxonomic Classification

Coarse-loamy, mixed, superactive, nonacid, frigid Typic Udifluvents

Setting

Landform: Flood plains
Slope range: 0 to 3 percent
Down-slope shape: Linear
Across-slope shape: Linear
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Loamy alluvium
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Depth to water table: About 30 inches (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 3
Available water capacity: High (about 10.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: White baneberry, wild sarsaparilla, Canada beadruby, naked miterwort, Clayton's sweetroot, hairy Solomon's seal, twistedstalk, and snow trillium

Typical Profile

A—0 to 5 inches; fine sandy loam
C1—5 to 19 inches; stratified fine sandy loam to silt loam to fine sand
C2—19 to 48 inches; stratified very fine sandy loam to silt loam to fine sand
C3—48 to 55 inches; silt loam
C4—55 to 60 inches; stratified sand to fine sand

Minor Components

Dechamps soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Arnheim soils

Percent of map unit: 5 percent
Landform: Flood plains
Representative aspect: North
Meets hydric soil criteria: Yes

433771—Beaches, 2 to 12 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Map Unit Composition

Beaches: 97 percent
Dissimilar minor components: 3 percent

Description of Beaches

This map unit consists of non-vegetated sandy areas along the shoreline.

Minor Components

Psammaquents

Percent of map unit: 3 percent
Landform: Depressions
Representative aspect: North
Meets hydric soil criteria: Yes

433802—Udorthents, ravines and escarpments, 25 to 60 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Map Unit Composition

Udorthents, ravines and escarpments and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of Udorthents, Ravines and Escarpments

Taxonomic Classification

Udorthents

General

This map unit consists of very steep soils of variable depth, along ravines and escarpments. These areas commonly provide good wildlife habitat.

Interpretive Groups

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

Minor Components

Alcona soils

Percent of map unit: 5 percent
Meets hydric soil criteria: No

Moquah soils

Percent of map unit: 5 percent
Meets hydric soil criteria: No

Odanah soils

Percent of map unit: 5 percent
Meets hydric soil criteria: No

452739—Water

Map Unit Setting

Major land resource areas (MLRAs): 90A—Wisconsin and Minnesota Thin Loess and Till, Northern Part; 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part

Map Unit Composition

Water: 100 percent

Description of Water

This map unit consists of freshwater lakes and ponds.

452765—Abbaye-Lapoin complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 26 to 33 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Abbaye and similar soils: 55 percent
Lapoin and similar soils: 40 percent
Dissimilar minor components: 5 percent

Description of the Abbaye Soil

Taxonomic Classification

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

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Till underlain by sandstone bedrock
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 18 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 4.7 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Balsam fir, sugar maple, yellow birch, sedge, yellow bluebeadlily, spinulose woodfern, shining clubmoss, Canada beadruby, hairy Solomon's seal, red elderberry, feather Solomon's seal, twistedstalk, and American starflower

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 4 inches; sandy loam

E—4 to 13 inches; loamy sand

Bs—13 to 25 inches; sandy loam

B/E—25 to 32 inches; sandy loam

2R—32 to 80 inches; unweathered bedrock

Description of the Lapoin Soil

Taxonomic Classification

Fine, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium

Parent material: Loamy alluvium and clayey till and underlying loamy till

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 3

Available water capacity: Low (about 5.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Canada beadruby, Clayton's sweetroot, western brackenfern, and mapleleaf viburnum

Typical Profile

Oa—0 to 1 inch; highly decomposed plant material
E—1 to 4 inches; loam
Bs—4 to 7 inches; loam
2B/E—7 to 19 inches; clay
2Bt—19 to 34 inches; clay
3C—34 to 39 inches; sandy loam
4R—39 to 80 inches; unweathered bedrock

Minor Components

Zeba soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1383557—Au Gres loamy sand, 0 to 3 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 90A—Wisconsin and Minnesota Thin Loess and Till, Northern Part; 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Elevation: 600 to 1,800 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 140 days

Map Unit Composition

Au Gres and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Au Gres Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Endoaquods

Setting

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

Properties and Qualities

Runoff: Very low
Parent material: Sandy outwash
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: About 6 inches (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Leatherleaf, American hazelnut, bunchberry dogwood, common ninebark, blackberry, eastern hemlock, and blueberry

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material
E—2 to 5 inches; loamy sand
Bhs—5 to 8 inches; loamy sand
Bs—8 to 16 inches; loamy sand
BC—16 to 28 inches; sand
C—28 to 60 inches; sand

Minor Components

Croswell soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Kinross soils

Percent of map unit: 5 percent
Landform: Depressions and drainageways
Representative aspect: North
Meets hydric soil criteria: Yes

Flink soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Chinwhisker soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

1383580—Loxley, Beseman, and Dawson soils, 0 to 1 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 90A—Wisconsin and Minnesota Thin Loess and Till, Northern Part; 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Elevation: 600 to 1,400 feet
Mean annual precipitation: 24 to 45 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 60 to 140 days

Map Unit Composition

Loxley and similar soils: 40 percent
Beseman and similar soils: 30 percent
Dawson and similar soils: 28 percent
Dissimilar minor components: 2 percent

Description of the Loxley Soil

Taxonomic Classification

Dysic, frigid Typic Haplosaprists

Setting

Landform: Depressions on disintegration moraines

Landform position (two-dimensional): Toeslope

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Herbaceous organic material more than 51 inches thick

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

Frequency of flooding: None

Frequency of ponding: Occasional

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 26.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Typical Profile

Oe—0 to 13 inches; mucky peat

Oa—13 to 60 inches; muck

Description of the Beseman Soil

Taxonomic Classification

Loamy, mixed, dysic, frigid Terric Haplosaprists

Setting

Landform: Depressions on disintegration moraines

Landform position (two-dimensional): Toeslope

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Herbaceous organic material 16 to 51 inches thick over loamy till

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

Frequency of flooding: None

Frequency of ponding: Occasional

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 18.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Typical Profile

Oa—0 to 36 inches; muck

Cg—36 to 60 inches; loam

Description of the Dawson Soil

Taxonomic Classification

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

Setting

Landform: Depressions on disintegration moraines

Landform position (two-dimensional): Toeslope

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sphagnum moss and herbaceous organic material 16 to 51 inches thick over sandy or sandy and gravelly deposits

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

Frequency of flooding: None

Frequency of ponding: Occasional

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 18.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Typical Profile

Oi—0 to 8 inches; peat
Oa—8 to 38 inches; muck
A—38 to 40 inches; silt loam
2C—40 to 60 inches; sand

Minor Components

Uskabwanka soils

Percent of map unit: 2 percent
Landform: Depressions on disintegration moraines
Representative aspect: North
Meets hydric soil criteria: Yes

1383581—Rifle peat, 0 to 1 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 60 to 110 days

Map Unit Composition

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

Description of the Rifle Soil

Taxonomic Classification

Euic, frigid Typic Haplohemists

Setting

Landform: Depressions on moraines, depressions on outwash plains, and depressions on lake plains
Slope range: 0 to 1 percent
Down-slope shape: Concave
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Organic deposits more than 51 inches thick
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Depth to water table: At the soil surface
Drainage class: Very poorly drained
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Very high (about 30.3 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Balsam fir, sedge, and eastern arborvitae

Typical Profile

Oi—0 to 4 inches; peat

Oe—4 to 60 inches; mucky peat

Minor Components

Dawson soils

Percent of map unit: 5 percent

Landform: Depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, and bogs on outwash plains

Representative aspect: North

Meets hydric soil criteria: Yes

Loxley soils

Percent of map unit: 5 percent

Landform: Depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, and bogs on outwash plains

Representative aspect: North

Meets hydric soil criteria: Yes

1383603—Cornucopia silt loam, 15 to 45 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 36 to 43 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Cornucopia and similar soils: 80 percent

Dissimilar minor components: 20 percent

Description of the Cornucopia Soil

Taxonomic Classification

Fine, mixed, active, frigid Haplic Glossudalfs

Setting

Landform: Till plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Clayey till and underlying stratified loamy and sandy lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 11

Available water capacity: High (about 9.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7e

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, spinulose woodfern, American fly honeysuckle, Canada beadruby, western brackenfern, and starflower

Typical Profile

A—0 to 3 inches; silt loam

E/B—3 to 10 inches; very fine sandy loam

Bt—10 to 32 inches; clay

Btk—32 to 45 inches; clay

2Bk—45 to 50 inches; stratified very fine sandy loam to silt loam

2C—50 to 72 inches; stratified very fine sand to silt loam

Minor Components

Manistee soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Moquah soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Odanah soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Portwing soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1383658—Deerton-Brownstone complex, 0 to 6 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,000 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Deerton and similar soils: 50 percent

Brownstone and similar soils: 40 percent

Dissimilar minor components: 10 percent

Description of the Deerton Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sandy outwash beach deposits or sandy residuum from sandstone

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very low (about 2.6 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Balsam fir, sugar maple, sedge, spinulose woodfern, trailing arbutus, eastern teaberry, Canada beadruby, blackberry, thimbleberry, and American starflower

Typical Profile

Oa—0 to 1 inch; highly decomposed plant material

E—1 to 9 inches; sand

Bhs—9 to 10 inches; loamy sand
Bs—10 to 25 inches; sand
2Cr—25 to 39 inches; weathered bedrock
2R—39 to 80 inches; unweathered bedrock

Description of the Brownstone Soil

Taxonomic Classification

Sandy-skeletal, mixed, frigid Typic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sandy-skeletal beach deposits or residuum from sandstone, or both

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 3.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Aster, sedge, yellow bluebeadlily, running clubmoss, Canada beadruby, Clayton's sweetroot, western brackenfern, blackberry, starry false Solomon's seal, starflower, and mapleleaf viburnum

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 12 inches; very cobbly sand

Bhs—12 to 15 inches; extremely gravelly coarse sand

Bs—15 to 23 inches; extremely cobbly sand

BC—23 to 33 inches; extremely cobbly coarse sand

2R—33 to 80 inches; unweathered bedrock

Minor Components

Redrim soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 3 percent

Representative aspect: North

Meets hydric soil criteria: No

Abbaye soils

Percent of map unit: 2 percent

Representative aspect: North

Meets hydric soil criteria: No

1383660—Deerton-Brownstone complex, 6 to 15 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,000 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Deerton and similar soils: 50 percent

Brownstone and similar soils: 40 percent

Dissimilar minor components: 10 percent

Description of the Deerton Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy outwash beach deposits or sandy residuum from sandstone

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very low (about 2.6 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Balsam fir, sugar maple, sedge, spinulose woodfern, trailing arbutus, eastern teaberry, Canada beadruby, blackberry, thimbleberry, and American starflower

Typical Profile

Oa—0 to 1 inch; highly decomposed plant material

E—1 to 9 inches; sand

Bhs—9 to 10 inches; loamy sand

Bs—10 to 25 inches; sand

2Cr—25 to 39 inches; weathered bedrock

2R—39 to 80 inches; unweathered bedrock

Description of the Brownstone Soil

Taxonomic Classification

Sandy-skeletal, mixed, frigid Typic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy-skeletal beach deposits or residuum from sandstone, or both

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 3.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Aster, sedge, yellow bluebeadlily, running clubmoss, Canada beadruby, Clayton's sweetroot, western brackenfern, blackberry, starry false Solomon's seal, starflower, and mapleleaf viburnum

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 12 inches; very cobbly sand

Bhs—12 to 15 inches; extremely gravelly coarse sand

Bs—15 to 23 inches; extremely cobbly sand
BC—23 to 33 inches; extremely cobbly coarse sand
2R—33 to 80 inches; unweathered bedrock

Minor Components

Redrim soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Abbaye soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

1383662—Abbaye loamy sand, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 26 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

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

Description of the Abbaye Soil

Taxonomic Classification

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

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium
Parent material: Till underlain by sandstone bedrock
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 18 inches, perched (see table 19)
Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.7 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, sugar maple, yellow birch, sedge, yellow bluebeadlily, spinulose woodfern, shining clubmoss, Canada beadruby, hairy Solomon's seal, red elderberry, feather Solomon's seal, twistedstalk, and American starflower

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 4 inches; loamy sand
E—4 to 13 inches; loamy sand
Bs—13 to 25 inches; sandy loam
B/E—25 to 32 inches; sandy loam
2R—32 to 80 inches; unweathered bedrock

Minor Components

Deerton soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1383665—Allendale-Wakeley-Kinross complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,695 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 60 to 120 days

Map Unit Composition

Allendale and similar soils: 35 percent
Wakeley and similar soils: 30 percent
Kinross and similar soils: 20 percent
Dissimilar minor components: 15 percent

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Lake terraces, outwash plains, ground moraines, and lake plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy sediments and underlying clayey lacustrine or till deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand

E—3 to 10 inches; sand

Bhs—10 to 13 inches; sand

Bs—13 to 26 inches; sand

E'—26 to 28 inches; sand

2Bt—28 to 34 inches; clay

2C—34 to 60 inches; clay

Description of the Wakeley Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, nonacid, frigid Aeric Epiaquents

Setting

Landform: Outwash plains and lake plains

Landform position (two-dimensional): Toeslope

Slope range: 0 to 2 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy outwash and lacustrine material underlain by clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: Frequent

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

Drainage class: Very poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 19

Available water capacity: Moderate (about 8.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6w

Meets hydric soil criteria: Yes

Hydrologic soil group: B/D

Vegetation

Existing plants: Speckled alder, marsh marigold, redosier dogwood, threeleaf goldthread, water horsetail, and eastern arborvitae

Typical Profile

Oa—0 to 4 inches; muck

C—4 to 23 inches; loamy sand

Cg—23 to 28 inches; loamy sand

2C—28 to 80 inches; clay

Description of the Kinross Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Endoaquods

Setting

Landform: Stream terraces, outwash plains, and lake plains

Landform position (two-dimensional): Toeslope

Slope range: 0 to 2 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Glaciofluvial material

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

Frequency of flooding: None

Frequency of ponding: Frequent

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

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Balsam fir, speckled alder, jack pine, eastern arborvitae, eastern hemlock, and blueberry

Typical Profile

Oa—0 to 6 inches; muck

E—6 to 10 inches; sand

Bhs—10 to 12 inches; sand

Bs—12 to 24 inches; sand

BC—24 to 42 inches; sand

C—42 to 60 inches; sand

Minor Components

Flink soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sedgwick soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Tawas soils

Percent of map unit: 5 percent

Landform: Depressions

Representative aspect: North

Meets hydric soil criteria: Yes

1383960—Flink sand, 0 to 3 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 91B—Wisconsin and Minnesota Sandy Outwash;
92—Superior Lake Plain

Elevation: 600 to 1,895 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 135 days

Map Unit Composition

Flink and similar soils: 75 percent

Dissimilar minor components: 25 percent

Description of the Flink Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Epiaquods

Setting

Landform: Lake plains, outwash plains, lake terraces, and outwash terraces

Landform position (two-dimensional): Footslope

Slope range: 0 to 3 percent

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 12 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: High (about 10.4 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, sedge, yellow bluebeadlily, American hazelnut, bunchberry dogwood, water horsetail, eastern teaberry, fragrant bedstraw, western brackenfern, blackberry, and blueberry

Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material
Oa—2 to 3 inches; highly decomposed plant material
E—3 to 6 inches; sand
Bhs—6 to 9 inches; sand
Bs—9 to 26 inches; sand
BC—26 to 35 inches; sand
C—35 to 46 inches; sand
2Cg—46 to 52 inches; stratified silt to silty clay loam
2C—52 to 80 inches; stratified silt to silty clay loam to loamy very fine sand

Minor Components

Allendale soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Au Gres soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Kinross soils

Percent of map unit: 5 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

Robago soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1444357—Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

Major land resource areas (MLRAs): 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 35 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 60 to 110 days

Map Unit Composition

Arnheim and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Arnheim Soil

Taxonomic Classification

Coarse-loamy, mixed, superactive, nonacid, frigid Typic Fluvaquents

Setting

Landform: Flood plains
Slope range: 0 to 1 percent
Down-slope shape: Linear
Across-slope shape: Linear
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Loamy alluvium
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Depth to water table: At the soil surface
Drainage class: Poorly drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: High (about 11.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: D

Vegetation

Existing plants: Balsam fir, red maple, speckled alder, common ladyfern, sedge, jewelweed, mint, cinnamon fern, willow, sphagnum moss, and nettle

Typical Profile

A—0 to 5 inches; mucky silt loam

Cg—5 to 10 inches; silt loam

C1—10 to 15 inches; very fine sandy loam

C2—15 to 24 inches; silt loam

C3—24 to 60 inches; stratified loamy fine sand to fine sandy loam to very fine sandy loam

Minor Components

Dechamps soils

Percent of map unit: 10 percent

Representative aspect: North

Meets hydric soil criteria: No

Moquah soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444359—Beaches, 2 to 12 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Map Unit Composition

Beaches: 97 percent

Dissimilar minor components: 3 percent

Description of Beaches

This map unit consist of non-soil areas along the shoreline.

Minor Components

Psammaquents

Percent of map unit: 3 percent

Landform: Depressions

Meets hydric soil criteria: Yes

1444367—Udorthents, ravines and escarpments, 25 to 60 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Map Unit Composition

Udorthents, ravines and escarpments and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of Udorthents, Ravines and Escarpments

Taxonomic Classification

Udorthents

General

This map unit consists of very steep soils of variable depth, along ravines and escarpments. These areas commonly provide good wildlife habitat.

Interpretive Groups

Land capability subclass (nonirrigated): 7e

Meets hydric soil criteria: No

Hydrologic soil group: C

Minor Components

Alcona soils

Percent of map unit: 5 percent

Meets hydric soil criteria: No

Moquah soils

Percent of map unit: 5 percent

Meets hydric soil criteria: No

Odanah soils

Percent of map unit: 5 percent

Meets hydric soil criteria: No

1444378—Wakefield fine sandy loam, 1 to 6 percent slopes, stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 1,295 to 1,600 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Map Unit Composition

Wakefield and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Wakefield Soil

Taxonomic Classification

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

Setting

Landform: Till plains

Landform position (two-dimensional): Summit

Slope range: 1 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

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

Properties and Qualities

Runoff: Very high
Parent material: Modified loamy eolian deposits and underlying loamy till
Restrictive feature(s): Fragipan at a depth of 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 12 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 8.5 inches)

Interpretive Groups

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

Vegetation

Existing plants: Sugar maple and hazelnut

Typical Profile

A—0 to 4 inches; fine sandy loam
E—4 to 7 inches; fine sandy loam
Bs—7 to 18 inches; fine sandy loam
2Bx—18 to 24 inches; very fine sandy loam
2(E/B)x—24 to 36 inches; fine sandy loam
2Bt—36 to 49 inches; loam
2C—49 to 64 inches; fine sandy loam

Minor Components

Tula soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Morganlake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1444379—Wakefield fine sandy loam, 6 to 18 percent slopes, stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 1,295 to 1,600 feet
Mean annual precipitation: 26 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days

Map Unit Composition

Wakefield and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Wakefield Soil

Taxonomic Classification

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

Setting

Landform: Till plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 18 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Modified loamy eolian deposits and underlying loamy till

Restrictive feature(s): Fragipan at a depth of 16 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Moderate (about 8.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Sugar maple and hazelnut

Typical Profile

A—0 to 4 inches; fine sandy loam

E—4 to 7 inches; fine sandy loam

Bs—7 to 18 inches; fine sandy loam

2Bx—18 to 24 inches; very fine sandy loam

2(E/B)x—24 to 36 inches; fine sandy loam

2Bt—36 to 49 inches; loam

2C—49 to 64 inches; fine sandy loam

Minor Components

Morganlake soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Odanah soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Tula soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444388—Allendale loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,695 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 41 to 46 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Allendale and similar soils: 80 percent

Dissimilar minor components: 20 percent

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Outwash plains, lake terraces, ground moraines, and lake plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 3 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy sediments and underlying clayey lacustrine or till deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand
E—3 to 10 inches; sand
Bhs—10 to 13 inches; sand
Bs—13 to 26 inches; sand
E'—26 to 28 inches; sand
2Bt—28 to 34 inches; clay
2C—34 to 60 inches; clay

Minor Components

Kellogg soils

Percent of map unit: 6 percent
Representative aspect: North
Meets hydric soil criteria: No

Flink soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Wakeley soils

Percent of map unit: 5 percent
Landform: Depressions and drainageways
Representative aspect: North
Meets hydric soil criteria: Yes

Herbster soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

Sedgwick soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

1444402—Tonkey sandy loam, 0 to 2 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 30 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

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

Description of the Tonkey Soil

Taxonomic Classification

Coarse-loamy, mixed, semiactive, nonacid, frigid Mollic Endoaquepts

Setting

Landform: Depressions on lake plains and drainageways on lake plains

Slope range: 0 to 2 percent

Down-slope shape: Linear and concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Stratified loamy and sandy glaciofluvial deposits

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

Frequency of flooding: None

Frequency of ponding: Frequent

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

Drainage class: Poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Moderate (about 7.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6w

Meets hydric soil criteria: Yes

Hydrologic soil group: B/D

Vegetation

Existing plants: Speckled alder, bluejoint, sedge, redosier dogwood, willow, eastern arborvitae, American elm, and American cranberrybush

Typical Profile

Ap—0 to 8 inches; sandy loam

Bg1—8 to 14 inches; sandy loam

Bg2—14 to 28 inches; loam

2C—28 to 60 inches; stratified sand to loam to silt loam

Minor Components

Robago soils

Percent of map unit: 6 percent

Representative aspect: North

Meets hydric soil criteria: No

Shag soils

Percent of map unit: 4 percent

Landform: Drainageways and depressions

Representative aspect: North

Meets hydric soil criteria: Yes

1444410—Tula fine sandy loam, 1 to 6 percent slopes, stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 1,295 to 1,595 feet

Mean annual precipitation: 30 to 34 inches

Mean annual air temperature: 41 to 45 degrees F

Frost-free period: 100 to 120 days

Map Unit Composition

Tula and similar soils: 80 percent

Dissimilar minor components: 20 percent

Description of the Tula Soil

Taxonomic Classification

Coarse-loamy, mixed, superactive, frigid Argic Fragiaquods

Setting

Landform: End moraines and ground moraines

Landform position (two-dimensional): Footslope

Slope range: 0 to 4 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: High

Parent material: Modified loamy eolian material and underlying loamy till

Restrictive feature(s): Fragipan at a depth of 15 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 2w

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Bigleaf aster, common ladyfern, sedge, yellow bluebeadlily, threeleaf goldthread, spinulose woodfern, clubmoss, rare clubmoss, Canada beadruby, mountain woodsorrel, western brackenfern, and claspleaf twistedstalk

Typical Profile

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 5 inches; fine sandy loam

E—5 to 8 inches; fine sandy loam

Bs1—8 to 20 inches; cobbly very fine sandy loam
2Bs2—20 to 28 inches; gravelly sandy loam
2(E/B)x—28 to 37 inches; gravelly sandy loam
2(B/E)x—37 to 62 inches; gravelly loam
2C—62 to 80 inches; gravelly sandy loam

Minor Components

Gogebic soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Pleine soils

Percent of map unit: 5 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

Iosco soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Herbster soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

144414—Lupton, Cathro, and Tawas soils, 0 to 1 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 90A—Wisconsin and Minnesota Thin Loess and Till, Northern Part; 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Elevation: 600 to 1,600 feet
Mean annual precipitation: 27 to 43 inches
Mean annual air temperature: 36 to 46 degrees F
Frost-free period: 70 to 145 days

Map Unit Composition

Lupton and similar soils: 40 percent
Cathro and similar soils: 30 percent
Tawas and similar soils: 25 percent
Dissimilar minor components: 5 percent

Description of the Lupton Soil

Taxonomic Classification

Euic, frigid Typic Haplosaprists

Setting

Landform: Depressions on disintegration moraines
Slope range: 0 to 1 percent
Down-slope shape: Concave
Across-slope shape: Concave

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

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

Properties and Qualities

Runoff: Negligible
Parent material: Herbaceous and woody organic material more than 51 inches thick
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Depth to water table: At the soil surface
Drainage class: Very poorly drained
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Very high (about 26.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, Pennsylvania sedge, willow, eastern arborvitae, and American elm

Typical Profile

Oa—0 to 65 inches; muck

Description of the Cathro Soil

Taxonomic Classification

Loamy, mixed, euic, frigid Terric Haplosaprists

Setting

Landform: Depressions on disintegration moraines
Slope range: 0 to 1 percent
Down-slope shape: Concave
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Herbaceous organic material 16 to 51 inches thick underlain by loamy deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Depth to water table: At the soil surface
Drainage class: Very poorly drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Very high (about 16.6 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Speckled alder and redosier dogwood

Typical Profile

Oa—0 to 28 inches; muck

Cg1—28 to 49 inches; loam

Cg2—49 to 60 inches; sandy loam

Description of the Tawas Soil

Taxonomic Classification

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

Setting

Landform: Depressions on disintegration moraines

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Herbaceous organic material 16 to 51 inches thick over sandy deposits

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

Frequency of flooding: None

Frequency of ponding: Frequent

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 14.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Northern maidenhair, speckled alder, bluejoint, sedge, eastern teaberry, tamarack, balsam poplar, quaking aspen, brackenfern, purple pitcherplant, eastern arborvitae, and American elm

Typical Profile

Oa—0 to 31 inches; muck

Cg—31 to 60 inches; fine sand

Minor Components

Seelyeville soils

Percent of map unit: 5 percent

Landform: Depressions on outwash plains
Representative aspect: North
Meets hydric soil criteria: Yes

144425—Lerch-Herbster complex, 0 to 3 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Lerch and similar soils: 50 percent
Herbster and similar soils: 35 percent
Dissimilar minor components: 15 percent

Description of the Lerch Soil

Taxonomic Classification

Very fine, mixed, active, nonacid, frigid Vertic Epiaquepts

Setting

Landform: Lake plains and till plains
Landform position (two-dimensional): Toeslope
Slope range: 0 to 2 percent
Down-slope shape: Linear and concave
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Clayey till and/or clayey lacustrine deposits modified by wave action
over loamy and/or sandy stratified lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Water table (depth, kind): At the soil surface, perched (see table 19)
Drainage class: Poorly drained
Shrink-swell potential: Very high (about 10.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 8
Available water capacity: High (about 9.6 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, speckled alder, redosier dogwood, balsam poplar, quaking aspen, willow, and eastern arborvitae

Typical Profile

Oa—0 to 3 inches; muck

Bg—3 to 7 inches; clay

Btg—7 to 12 inches; clay

Btk—12 to 29 inches; clay

Bk—29 to 56 inches; clay

2C—56 to 80 inches; stratified silt loam to very fine sandy loam to loamy fine sand

Description of the Herbster Soil

Taxonomic Classification

Fine, mixed, active, frigid Aeric Glossaqualfs

Setting

Landform: Till plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 3 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: High

Parent material: Clayey till and underlying loamy and sandy stratified lacustrine deposits

Restrictive feature(s): Abrupt textural change at a depth of 40 to 60 inches

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: High (about 10.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Speckled alder, wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, redosier dogwood, and fragrant bedstraw

Typical Profile

A—0 to 5 inches; silt loam

E—5 to 10 inches; silt loam

B/E—10 to 13 inches; silty clay loam

Bt1—13 to 28 inches; clay

2Bt2—28 to 33 inches; stratified silty clay loam to clay to silty clay

2Btk—33 to 55 inches; stratified silty clay loam to clay to silty clay

3C—55 to 80 inches; stratified very fine sandy loam to silt loam to loamy very fine sand

Minor Components

Munuscong soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: Yes

Pickford soils

Percent of map unit: 5 percent

Landform: Depressions and drainageways

Representative aspect: North

Meets hydric soil criteria: Yes

Shag soils

Percent of map unit: 5 percent

Landform: Depressions and drainageways

Representative aspect: North

Meets hydric soil criteria: Yes

144426—Portwing-Herbster complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 36 to 43 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Portwing and similar soils: 50 percent

Herbster and similar soils: 30 percent

Dissimilar minor components: 20 percent

Description of the Portwing Soil

Taxonomic Classification

Fine, mixed, active, frigid Oxyaquic Glossudalfs

Setting

Landform: Till plains

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: High

Parent material: Clayey till over underlying stratified loamy and sandy lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

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

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 11

Available water capacity: High (about 10.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, beaked hazelnut, and western brackenfern

Typical Profile

A—0 to 4 inches; silt loam

E/B—4 to 9 inches; silt loam

Bt—9 to 32 inches; clay

Btk—32 to 51 inches; clay

2C—51 to 80 inches; stratified very fine sand to silt

Description of the Herbster Soil

Taxonomic Classification

Fine, mixed, active, frigid Aeric Glossaqualfs

Setting

Landform: Till plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 3 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: High

Parent material: Clayey till and underlying loamy and sandy stratified lacustrine deposits

Restrictive feature(s): Abrupt textural change at a depth of 40 to 60 inches

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: High (about 10.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Speckled alder, wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, redosier dogwood, and fragrant bedstraw

Typical Profile

A—0 to 5 inches; silt loam

E—5 to 10 inches; silt loam

B/E—10 to 13 inches; silty clay loam

Bt1—13 to 28 inches; clay

2Bt2—28 to 33 inches; stratified silty clay loam to clay to silty clay

2Btk—33 to 55 inches; stratified silty clay loam to clay to silty clay

3C—55 to 80 inches; stratified very fine sandy loam to silt loam to loamy very fine sand

Minor Components

Cornucopia soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Lerch soils

Percent of map unit: 5 percent

Landform: Depressions on till plains and drainageways on till plains

Representative aspect: North

Meets hydric soil criteria: Yes

Sanborg soils

Percent of map unit: 3 percent

Representative aspect: North

Meets hydric soil criteria: No

Sedgwick soils

Percent of map unit: 3 percent

Representative aspect: North

Meets hydric soil criteria: No

Allendale soils

Percent of map unit: 2 percent

Representative aspect: North

Meets hydric soil criteria: No

Badriver soils

Percent of map unit: 2 percent

Representative aspect: North

Meets hydric soil criteria: No

144427—Cornucopia silt loam, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 36 to 43 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Cornucopia and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Cornucopia Soil

Taxonomic Classification

Fine, mixed, active, frigid Haplic Glossudalfs

Setting

Landform: Till plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Clayey till and underlying stratified loamy and sandy lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 11

Available water capacity: High (about 9.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4e

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, spinulose woodfern, American fly honeysuckle, Canada beadruby, western brackenfern, and starflower

Typical Profile

A—0 to 3 inches; silt loam

E/B—3 to 10 inches; very fine sandy loam

Bt—10 to 32 inches; clay

Btk—32 to 45 inches; clay

2Bk—45 to 50 inches; stratified very fine sandy loam to silt loam

2C—50 to 72 inches; stratified very fine sand to silt loam

Minor Components

Manistee soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Odanah soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Portwing soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Superior soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

144428—Cornucopia silt loam, 15 to 45 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Cornucopia and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Cornucopia Soil

Taxonomic Classification

Fine, mixed, active, frigid Haplic Glossudalfs

Setting

Landform: Till plains
Landform position (two-dimensional): Shoulder and backslope
Slope range: 15 to 45 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Clayey till and underlying stratified loamy and sandy lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Well drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 11

Available water capacity: High (about 9.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7e

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, yellow bluebeadlily, bunchberry dogwood, beaked hazelnut, spinulose woodfern, American fly honeysuckle, Canada beadruby, western brackenfern, and starflower

Typical Profile

A—0 to 3 inches; silt loam

E/B—3 to 10 inches; very fine sandy loam

Bt—10 to 32 inches; clay

Btk—32 to 45 inches; clay

2Bk—45 to 50 inches; stratified very fine sandy loam to silt loam

2C—50 to 72 inches; stratified very fine sand to silt loam

Minor Components

Manistee soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Moquah soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Odanah soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Portwing soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444431—Crowell sand, 0 to 6 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 91B—Wisconsin and Minnesota Sandy Outwash;
92—Superior Lake Plain

Elevation: 600 to 1,465 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 41 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Crowell and similar soils: 82 percent

Dissimilar minor components: 18 percent

Description of the Croswell Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform: Outwash plains, stream terraces, lake terraces, and lake plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sandy glacial drift

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 4.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Kinnikinnick, swordfern, trailing arbutus, eastern teaberry, twinflower, pin cherry, brackenfern, thimbleberry, starflower, and blueberry

Typical Profile

A—0 to 1 inch; sand

E—1 to 7 inches; sand

Bs—7 to 16 inches; sand

BC—16 to 39 inches; sand

C—39 to 60 inches; sand

Minor Components

Ashwabay soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Au Gres soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Rubicon soils

Percent of map unit: 3 percent

Representative aspect: North

Meets hydric soil criteria: No

1444432—Gogebic fine sandy loam, 1 to 6 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 1,295 to 1,595 feet

Mean annual precipitation: 30 to 34 inches

Mean annual air temperature: 41 to 45 degrees F

Frost-free period: 100 to 120 days

Map Unit Composition

Gogebic and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Gogebic Soil

Taxonomic Classification

Coarse-loamy, isotic, frigid Alfic Oxyaquic Fragiorthods

Setting

Landform: End moraines

Landform position (two-dimensional): Shoulder

Slope range: 1 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: High

Parent material: Modified loamy eolian deposits and underlying loamy till

Restrictive feature(s): Fragipan at a depth of 18 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Sugar maple and hazelnut

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 5 inches; fine sandy loam
E—5 to 7 inches; fine sandy loam
Bhs—7 to 17 inches; fine sandy loam
Bs—17 to 26 inches; sandy loam
E/Bx—26 to 36 inches; sandy loam
B/Ex—36 to 53 inches; fine sandy loam
BC—53 to 71 inches; fine sandy loam
C—71 to 80 inches; fine sandy loam

Minor Components

Tula soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Morganlake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1444435—losco loamy sand, 0 to 4 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

losco and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the losco Soil

Taxonomic Classification

Sandy over loamy, mixed, active, frigid Argic Endoaquods

Setting

Landform: Lake plains, ground moraines, and outwash plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 4 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Parent material: Sandy lacustrine or outwash deposits overlying loamy lacustrine or till deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: About 6 inches (see table 19)

Drainage class: Somewhat poorly drained

Shrink-swell potential: Moderate (about 4.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 23

Available water capacity: Moderate (about 8.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Sugar maple and eastern white pine

Typical Profile

Ap—0 to 7 inches; loamy sand

E—7 to 9 inches; loamy sand

Bhs—9 to 11 inches; loamy sand

Bs—11 to 28 inches; sand

E'—28 to 34 inches; sand

2Bt—34 to 40 inches; silty clay loam

2C—40 to 60 inches; silty clay loam

Minor Components

Allendale soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Morganlake soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Tonkey soils

Percent of map unit: 5 percent

Landform: Drainageways and depressions

Representative aspect: North

Meets hydric soil criteria: Yes

144457—Redrim very cobbly sand, 0 to 6 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,000 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Redrim and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Redrim Soil

Taxonomic Classification

Sandy-skeletal, mixed, frigid Entic Lithic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sandy-skeletal beach deposits or residuum from sandstone, or both

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very low (about 2.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Bigleaf aster, yellow bluebeadlily, eastern teaberry, clubmoss, Canada beadruby, western brackenfern, starflower, and mapleleaf viburnum

Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material

Oa—1 to 3 inches; highly decomposed plant material

E—3 to 11 inches; very cobbly sand

Bs—11 to 18 inches; very cobbly loamy sand

2R—18 to 80 inches; unweathered bedrock

Minor Components

Brownstone soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Deerton soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Abbaye soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

1444459—Zeba sandy loam, 0 to 6 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 26 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

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

Description of the Zeba Soil

Taxonomic Classification

Coarse-loamy, mixed, active, frigid Argic Endoaquods

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Loamy glacial drift underlain by sandstone bedrock
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 12 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: High (about 9.4 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Balsam fir, white baneberry, red maple, wild sarsaparilla, yellow birch, sedge, yellow bluebeadlily, bunchberry dogwood, threeleaf goldthread, spinulose woodfern, shining clubmoss, Canada beadruby, mountain woodsorrel, and American starflower

Typical Profile

A—0 to 2 inches; sandy loam

E—2 to 5 inches; sandy loam

Bs—5 to 13 inches; sandy loam

E'—13 to 21 inches; sandy loam

B/E—21 to 33 inches; sandy loam

2R—33 to 80 inches; unweathered bedrock

Minor Components

Abbaye soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Deerton soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444460—Abbaye-Lapoin complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 36 to 43 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Abbaye and similar soils: 55 percent

Lapoin and similar soils: 40 percent

Dissimilar minor components: 5 percent

Description of the Abbaye Soil

Taxonomic Classification

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

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Till underlain by sandstone bedrock
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 18 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.7 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, sugar maple, yellow birch, sedge, yellow bluebeadlily, spinulose woodfern, shining clubmoss, Canada beadruby, hairy Solomon's seal, red elderberry, feather Solomon's seal, twistedstalk, and American starflower

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 4 inches; sandy loam
E—4 to 13 inches; loamy sand
Bs—13 to 25 inches; sandy loam
B/E—25 to 32 inches; sandy loam
2R—32 to 80 inches; unweathered bedrock

Description of the Lapoin Soil

Taxonomic Classification

Fine, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium
Parent material: Loamy alluvium and clayey till and underlying loamy till
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 3

Available water capacity: Low (about 5.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Canada beadruby, Clayton's sweetroot, western brackenfern, and mapleleaf viburnum

Typical Profile

Oa—0 to 1 inch; highly decomposed plant material

E—1 to 4 inches; loam

Bs—4 to 7 inches; loam

2B/E—7 to 19 inches; clay

2Bt—19 to 34 inches; clay

3C—34 to 39 inches; sandy loam

4R—39 to 80 inches; unweathered bedrock

Minor Components

Zeba soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444461—Abbaye-Zeba complex, 0 to 6 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Abbaye and similar soils: 55 percent

Zeba and similar soils: 40 percent

Dissimilar minor components: 5 percent

Description of the Abbaye Soil

Taxonomic Classification

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

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Till underlain by sandstone bedrock
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 18 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.7 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, sugar maple, yellow birch, sedge, yellow bluebeadlily, spinulose woodfern, shining clubmoss, Canada beadruby, hairy Solomon's seal, red elderberry, feather Solomon's seal, twistedstalk, and American starflower

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 4 inches; sandy loam
E—4 to 13 inches; loamy sand
Bs—13 to 25 inches; sandy loam
B/E—25 to 32 inches; sandy loam
2R—32 to 80 inches; unweathered bedrock

Description of the Zeba Soil

Taxonomic Classification

Coarse-loamy, mixed, active, frigid Argic Endoaquods

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Loamy glacial drift underlain by sandstone bedrock
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Frequency of ponding: None
Water table (depth, kind): About 12 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: High (about 9.4 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, white baneberry, red maple, wild sarsaparilla, yellow birch, sedge, yellow bluebeadlily, bunchberry dogwood, threeleaf goldthread, spinulose woodfern, shining clubmoss, Canada beadruby, mountain woodsorrel, and American starflower

Typical Profile

A—0 to 2 inches; sandy loam
E—2 to 5 inches; sandy loam
Bs—5 to 13 inches; sandy loam
E'—13 to 21 inches; sandy loam
B/E—21 to 33 inches; sandy loam
2R—33 to 80 inches; unweathered bedrock

Minor Components

Lapoin soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

144477—Cublake-Croswell-Ashwabay complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,150 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 140 days

Map Unit Composition

Cublake and similar soils: 35 percent
Croswell and similar soils: 20 percent
Ashwabay and similar soils: 20 percent
Dissimilar minor components: 25 percent

Description of the Cublake Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 24 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.4 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, starry false Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 3 inches; sand

E—3 to 4 inches; sand

Bs—4 to 23 inches; sand

BC—23 to 32 inches; sand

C1—32 to 40 inches; sand

C2—40 to 48 inches; stratified fine sand to very fine sand

2C3—48 to 60 inches; stratified very fine sandy loam to silt loam

Description of the Croswell Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform: Outwash plains, stream terraces, lake plains, and lake terraces

Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy glacial drift
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: About 24 inches (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.1 inches)

Interpretive Groups

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

Vegetation

Existing plants: Kinnikinnick, swordfern, trailing arbutus, eastern teaberry, twinflower, pin cherry, brackenfern, thimbleberry, starflower, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 7 inches; sand
Bs—7 to 16 inches; sand
BC—16 to 39 inches; sand
C—39 to 60 inches; sand

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand

E—4 to 5 inches; sand

Bhs—5 to 12 inches; sand

Bs—12 to 32 inches; sand

Bw—32 to 45 inches; sand

2Bt1—45 to 62 inches; clay

2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Rubicon soils

Percent of map unit: 10 percent

Representative aspect: North

Meets hydric soil criteria: No

Flink soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sayner soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sultz soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

144478—Cublake-Croswell-Ashwabay complex, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,150 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Cublake and similar soils: 35 percent

Croswell and similar soils: 20 percent

Ashwabay and similar soils: 20 percent
Dissimilar minor components: 25 percent

Description of the Cublake Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 24 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.4 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, starry false Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 3 inches; sand

E—3 to 4 inches; sand

Bs—4 to 23 inches; sand

BC—23 to 32 inches; sand

C1—32 to 40 inches; sand

C2—40 to 48 inches; stratified fine sand to very fine sand

2C3—48 to 60 inches; stratified very fine sandy loam to silt loam

Description of the Croswell Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform: Outwash plains, stream terraces, lake plains, and lake terraces

Landform position (two-dimensional): Backslope

Slope range: 6 to 12 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy glacial drift
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: About 24 inches (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.1 inches)

Interpretive Groups

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

Vegetation

Existing plants: Kinnikinnick, swordfern, trailing arbutus, eastern teaberry, twinflower, pin cherry, brackenfern, thimbleberry, starflower, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 7 inches; sand
Bs—7 to 16 inches; sand
BC—16 to 39 inches; sand
C—39 to 60 inches; sand

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Frequency of ponding: None
Water table (depth, kind): About 24 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 5 inches; sand
Bhs—5 to 12 inches; sand
Bs—12 to 32 inches; sand
Bw—32 to 45 inches; sand
2Bt1—45 to 62 inches; clay
2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Rubicon soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Flink soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Sayner soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Sultz soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

144479—Morganlake loamy sand, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 695 to 1,095 feet
Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Morganlake and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Morganlake Soil

Taxonomic Classification

Sandy over loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Moraines

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy outwash and underlying loamy till

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Moderate (about 4.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 15

Available water capacity: Moderate (about 7.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Wild sarsaparilla, common ladyfern, beaked hazelnut, lily-of-the-valley, Austrian woodfern, and western brackenfern

Typical Profile

A—0 to 4 inches; loamy sand

E—4 to 8 inches; loamy sand

Bs—8 to 26 inches; loamy fine sand

Bw—26 to 31 inches; loamy fine sand

2B/E—31 to 40 inches; silty clay loam

2C—40 to 60 inches; silty clay loam

Minor Components

losco soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Kellogg soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Menominee soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444480—Morganlake loamy sand, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 695 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Morganlake and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Morganlake Soil

Taxonomic Classification

Sandy over loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy outwash and underlying loamy till

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Moderate (about 4.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 15

Available water capacity: Moderate (about 7.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Wild sarsaparilla, common ladyfern, beaked hazelnut, lily-of-the-valley, Austrian woodfern, and western brackenfern

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 8 inches; loamy sand
Bs—8 to 26 inches; loamy fine sand
Bw—26 to 31 inches; loamy fine sand
2B/E—31 to 40 inches; silty clay loam
2C—40 to 60 inches; silty clay loam

Minor Components

losco soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Kellogg soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Menominee soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1444481—Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,695 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 140 days

Map Unit Composition

Kellogg and similar soils: 35 percent
Allendale and similar soils: 25 percent
Ashwabay and similar soils: 20 percent
Dissimilar minor components: 20 percent

Description of the Kellogg Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Slope range: 2 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex

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

Properties and Qualities

Runoff: Very low
Parent material: Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 18 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 3
Available water capacity: High (about 10.1 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 6 inches; sand
Bs—6 to 26 inches; sand
2B/E—26 to 29 inches; silty clay
2Bt—29 to 40 inches; silty clay
2C—40 to 80 inches; silty clay

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Lake terraces, outwash plains, ground moraines, and lake plains
Landform position (two-dimensional): Summit
Slope range: 2 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy sediments and underlying clayey lacustrine or till deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None

Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 5
Available water capacity: Low (about 5.5 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand
E—3 to 10 inches; sand
Bhs—10 to 13 inches; sand
Bs—13 to 26 inches; sand
E'—26 to 28 inches; sand
2Bt—28 to 34 inches; clay
2C—34 to 60 inches; clay

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines
Landform position (two-dimensional): Summit
Slope range: 2 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 30 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand

E—4 to 5 inches; sand

Bhs—5 to 12 inches; sand

Bs—12 to 32 inches; sand

Bw—32 to 45 inches; sand

2Bt1—45 to 62 inches; clay

2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Portwing soils

Percent of map unit: 8 percent

Representative aspect: North

Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 7 percent

Representative aspect: North

Meets hydric soil criteria: No

Wakeley soils

Percent of map unit: 5 percent

Landform: Drainageways and depressions

Representative aspect: North

Meets hydric soil criteria: Yes

1444482—Kellogg-Allendale-Ashwabay complex, 0 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,695 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Kellogg and similar soils: 40 percent

Allendale and similar soils: 25 percent

Ashwabay and similar soils: 20 percent

Dissimilar minor components: 15 percent

Description of the Kellogg Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 3

Available water capacity: High (about 10.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Serviceberry, sedge, lily-of-the-valley, hawthorn, strawberry, eastern teaberry, western brackenfern, starflower, and blueberry

Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; sand

Bs—6 to 26 inches; sand

2B/E—26 to 29 inches; silty clay

2Bt—29 to 40 inches; silty clay

2C—40 to 80 inches; silty clay

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Lake terraces, outwash plains, ground moraines, and lake plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 12 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy sediments and underlying clayey lacustrine or till deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand

E—3 to 10 inches; sand

Bhs—10 to 13 inches; sand

Bs—13 to 26 inches; sand

E'—26 to 28 inches; sand

2Bt—28 to 34 inches; clay

2C—34 to 60 inches; clay

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 30 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 5 inches; sand
Bhs—5 to 12 inches; sand
Bs—12 to 32 inches; sand
Bw—32 to 45 inches; sand
2Bt1—45 to 62 inches; clay
2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Portwing soils

Percent of map unit: 7 percent
Representative aspect: North
Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Wakeley soils

Percent of map unit: 3 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

1444486—Sedgwick-Munuscong complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 60 to 120 days

Map Unit Composition

Sedgwick and similar soils: 50 percent
Munuscong and similar soils: 30 percent
Dissimilar minor components: 20 percent

Description of the Sedgwick Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Epiaquods

Setting

Landform: Till plains

Landform position (two-dimensional): Footslope

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Loamy alluvium and underlying clayey till

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Somewhat poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 19

Available water capacity: High (about 9.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: D

Vegetation

Existing plants: Speckled alder, threeseeded sedge, yellow bluebeadlily, bunchberry
dogwood, water horsetail, eastern teaberry, fragrant bedstraw, western
brackenfern, willow, and blueberry

Typical Profile

A—0 to 5 inches; sandy loam

E—5 to 8 inches; loamy sand

Bs—8 to 16 inches; sandy loam

2B/E—16 to 19 inches; clay

2B—19 to 53 inches; clay

2Btk—53 to 80 inches; silty clay

Description of the Munuscong Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, nonacid, frigid Mollic Epiaquepts

Setting

Landform: Lake plains and ground moraines

Landform position (two-dimensional): Toeslope

Slope range: 0 to 2 percent

Down-slope shape: Concave

Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium
Parent material: Loamy glaciofluvial deposits over calcareous clayey materials
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Water table (depth, kind): At the soil surface, perched (see table 19)
Drainage class: Poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 20
Available water capacity: Moderate (about 8.3 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, willow, eastern hemlock, and American elm

Typical Profile

A—0 to 8 inches; fine sandy loam
Bg—8 to 30 inches; sandy loam
2C—30 to 60 inches; silty clay

Minor Components

Allendale soils

Percent of map unit: 8 percent
Representative aspect: North
Meets hydric soil criteria: No

Superior soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Herbster soils

Percent of map unit: 4 percent
Representative aspect: North
Meets hydric soil criteria: No

Pickford soils

Percent of map unit: 3 percent
Landform: Depressions and drainageways
Representative aspect: North
Meets hydric soil criteria: Yes

1444487—Superior-Sedgwick complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 135 days

Map Unit Composition

Superior and similar soils: 50 percent

Sedgwick and similar soils: 30 percent

Dissimilar minor components: 20 percent

Description of the Superior Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Summit

Slope range: 2 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high

Parent material: Loamy water-laid deposits and underlying clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 13

Available water capacity: Moderate (about 6.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3e

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Bigleaf aster, yellow bluebeadlily, bunchberry dogwood, fragrant bedstraw, American fly honeysuckle, Canada beadruby, blackberry, American starflower, and blueberry

Typical Profile

A—0 to 3 inches; fine sandy loam

E—3 to 6 inches; sandy loam

Bs—6 to 14 inches; sandy loam
2B/E—14 to 19 inches; clay
2Bt—19 to 26 inches; clay
2C—26 to 60 inches; clay

Description of the Sedgwick Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Epiaquods

Setting

Landform: Till plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 3 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Loamy alluvium and underlying clayey till
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 19
Available water capacity: High (about 9.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, threeseeded sedge, yellow bluebeadlily, bunchberry
dogwood, water horsetail, eastern teaberry, fragrant bedstraw, western
brackenfern, willow, and blueberry

Typical Profile

A—0 to 5 inches; loamy sand
E—5 to 8 inches; loamy sand
Bs—8 to 16 inches; sandy loam
2B/E—16 to 19 inches; clay
2Bt—19 to 53 inches; clay
2Btk—53 to 80 inches; silty clay

Minor Components

Allendale soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Portwing soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Munuscong soils

Percent of map unit: 3 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

Herbster soils

Percent of map unit: 2 percent
Representative aspect: North
Meets hydric soil criteria: No

1444488—Superior-Sedgwick complex, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,095 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 135 days

Map Unit Composition

Superior and similar soils: 50 percent
Sedgwick and similar soils: 30 percent
Dissimilar minor components: 20 percent

Description of the Superior Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake plains
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Loamy water-laid deposits and underlying clayey lacustrine deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 13
Available water capacity: Moderate (about 6.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4e
Meets hydric soil criteria: No
Hydrologic soil group: C

Vegetation

Existing plants: Bigleaf aster, yellow bluebeadlily, bunchberry dogwood, fragrant bedstraw, American fly honeysuckle, Canada beadruby, blackberry, American starflower, and blueberry

Typical Profile

A—0 to 3 inches; fine sandy loam
E—3 to 6 inches; sandy loam
Bs—6 to 14 inches; sandy loam
2B/E—14 to 19 inches; clay
2Bt—19 to 26 inches; clay
2C—26 to 60 inches; clay

Description of the Sedgwick Soil

Taxonomic Classification

Coarse-loamy over clayey, mixed, active, frigid Alfic Epiaquods

Setting

Landform: Till plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 15 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very high
Parent material: Loamy alluvium and underlying clayey till
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 19
Available water capacity: High (about 9.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Speckled alder, threeseeded sedge, yellow bluebeadlily, bunchberry dogwood, water horsetail, eastern teaberry, fragrant bedstraw, western brackenfern, willow, and blueberry

Typical Profile

A—0 to 5 inches; loamy sand
E—5 to 8 inches; loamy sand
Bs—8 to 16 inches; sandy loam
2B/E—16 to 19 inches; clay
2Bt—19 to 53 inches; clay
2Btk—53 to 80 inches; silty clay

Minor Components

Kellogg soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Cornucopia soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Allendale soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Lerch soils

Percent of map unit: 2 percent
Landform: Drainageways and depressions
Representative aspect: North
Meets hydric soil criteria: Yes

1444489—Sultz-Ashwabay-Rubicon complex, 15 to 45 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,950 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 140 days

Map Unit Composition

Sultz and similar soils: 35 percent
Ashwabay and similar soils: 25 percent
Rubicon and similar soils: 20 percent
Dissimilar minor components: 20 percent

Description of the Sultz Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Outwash plains, outwash terraces, lake plains, and lake terraces

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy outwash underlain by stratified loamy or loamy and sandy alluvium or lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Moderate (about 6.3 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Spreading dogbane, bigleaf aster, American hazelnut, eastern teaberry, clubmoss, partridgeberry, western brackenfern, starry false Solomon's seal, and blueberry

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 6 inches; sand

Bs—6 to 18 inches; sand

BC—18 to 25 inches; sand

C—25 to 43 inches; sand

2C—43 to 60 inches; stratified sand to fine sand to loamy sand to very fine sandy loam

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 30 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 30 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand

E—4 to 5 inches; sand

Bhs—5 to 12 inches; sand

Bs—12 to 32 inches; sand

Bw—32 to 45 inches; sand

2Bt1—45 to 62 inches; clay

2Bt2—62 to 80 inches; stratified clay to silt to sand

Description of the Rubicon Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Outwash plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 3.4 inches)

Interpretive Groups

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

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, Pennsylvania sedge, beaked hazelnut, eastern teaberry, sweet fern, pin cherry, western brackenfern, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 6 inches; sand
B—6 to 18 inches; sand
BC—18 to 36 inches; sand
C—36 to 60 inches; sand

Minor Components

Sayner soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Cublake soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Manistee soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

144492—Manistee-Kellogg-Ashwabay complex, 15 to 45 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,400 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 140 days

Map Unit Composition

Manistee and similar soils: 40 percent
Kellogg and similar soils: 30 percent
Ashwabay and similar soils: 20 percent
Dissimilar minor components: 10 percent

Description of the Manistee Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Haplorthods

Setting

Landform: Lake plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy lacustrine and outwash sediments underlain by clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 15

Available water capacity: Low (about 5.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Sugar maple, eastern white pine, and eastern hemlock

Typical Profile

A—0 to 3 inches; sand

E—3 to 11 inches; sand

Bs—11 to 28 inches; sand

E'—28 to 30 inches; sand

2Bt—30 to 38 inches; clay

2C—38 to 60 inches; clay

Description of the Kellogg Soil

Taxonomic Classification

Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Lake terraces

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 30 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 3

Available water capacity: High (about 10.1 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Serviceberry, sedge, lily-of-the-valley, hawthorn, strawberry, eastern teaberry, western brackenfern, starflower, and blueberry

Typical Profile

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; sand

Bs—6 to 26 inches; sand

2B/E—26 to 29 inches; silty clay

2Bt—29 to 40 inches; silty clay

2C—40 to 80 inches; silty clay

Description of the Ashwabay Soil

Taxonomic Classification

Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

Setting

Landform: Outwash plains, lake plains, and ground moraines

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 45 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low

Parent material: Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 30 inches, perched (see table 19)

Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, feather Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 4 inches; loamy sand
E—4 to 5 inches; sand
Bhs—5 to 12 inches; sand
Bs—12 to 32 inches; sand
Bw—32 to 45 inches; sand
2Bt1—45 to 62 inches; clay
2Bt2—62 to 80 inches; stratified clay to silt to sand

Minor Components

Superior soils

Percent of map unit: 4 percent
Representative aspect: North
Meets hydric soil criteria: No

Cornucopia soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

Sultz soils

Percent of map unit: 3 percent
Representative aspect: North
Meets hydric soil criteria: No

1444506—Keweenaw, stony-Rubicon complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,800 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 80 to 140 days

Map Unit Composition

Keweenaw and similar soils: 60 percent

Rubicon and similar soils: 30 percent
Dissimilar minor components: 10 percent

Description of the Keweenaw Soil

Taxonomic Classification

Sandy, mixed, frigid Alfic Haplorthods

Setting

Landform: Disintegration moraines
Landform position (two-dimensional): Summit
Slope range: 2 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Sandy till
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Large-leaved aster, blueberry, decomposition brackenfern, juneberry, lily-of-the-valley, and bellwort

Typical Profile

A—0 to 2 inches; loamy sand
E—2 to 4 inches; loamy sand
Bs1,Bs2—4 to 16 inches; loamy sand
Bs3—16 to 20 inches; loamy sand
E'—20 to 27 inches; loamy sand
E/B—27 to 43 inches; sand
B/E—43 to 75 inches; loamy sand
C—75 to 80 inches; loamy sand

Description of the Rubicon Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Disintegration moraines
Landform position (two-dimensional): Summit
Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Outwash sands
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Excessively drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, Pennsylvania sedge, beaked hazelnut, eastern teaberry, sweet fern, pin cherry, western brackenfern, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 6 inches; sand
Bs—6 to 18 inches; sand
BC—18 to 36 inches; sand
C—36 to 60 inches; sand

Minor Components

Cublake soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

1444507—Keweenaw, stony-Rubicon complex, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,800 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 80 to 140 days

Map Unit Composition

Keweenaw and similar soils: 60 percent
Rubicon and similar soils: 30 percent
Dissimilar minor components: 10 percent

Description of the Keweenaw Soil

Taxonomic Classification

Sandy, mixed, frigid Alfic Haplorthods

Setting

Landform: Disintegration moraines

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium

Parent material: Sandy till

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Moderate (about 7.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Large-leaved aster, blueberry, decomposition brackenfern, juneberry, lily-of-the-valley, and bellwort

Typical Profile

A—0 to 2 inches; loamy sand

E—2 to 4 inches; loamy sand

Bs1,Bs2—4 to 16 inches; loamy sand

Bs3—16 to 20 inches; loamy sand

E'—20 to 27 inches; loamy sand

E/B—27 to 43 inches; sand

B/E—43 to 75 inches; loamy sand

C—75 to 80 inches; loamy sand

Description of the Rubicon Soil

Taxonomic Classification

Sandy, mixed, frigid Entic Haplorthods

Setting

Landform: Disintegration moraines
Landform position (two-dimensional): Summit
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Outwash sands
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Excessively drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.0 inches)

Interpretive Groups

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

Vegetation

Existing plants: Wild sarsaparilla, bigleaf aster, Pennsylvania sedge, beaked hazelnut, eastern teaberry, sweet fern, pin cherry, western brackenfern, and blueberry

Typical Profile

A—0 to 1 inch; sand
E—1 to 6 inches; sand
Bs—6 to 18 inches; sand
BC—18 to 36 inches; sand
C—36 to 60 inches; sand

Minor Components

Cublake soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

1444585—Meehan sand, beaches, 0 to 2 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 665 to 1,950 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 140 days

Map Unit Composition

Meehan, beaches and similar soils: 90 percent

Dissimilar minor components: 10 percent

Description of the Meehan, Beaches Soil

Taxonomic Classification

Mixed, frigid Aquic Udipsammments

Setting

Landform: Beach ridges

Landform position (two-dimensional): Footslope

Slope range: 0 to 2 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Parent material: Sandy alluvium

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: About 6 inches (see table 19)

Drainage class: Somewhat poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 4.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4w

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Leadplant, field pussytoes, Pennsylvania sedge, American hazelnut, Richards comandra, and flowering spurge

Typical Profile

A—0 to 4 inches; sand

Bw—4 to 29 inches; sand

C—29 to 60 inches; sand

Minor Components

Newson, beaches soils

Percent of map unit: 5 percent

Landform: Depressions

Representative aspect: North

Meets hydric soil criteria: Yes

Wurtsmith, beaches soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444586—Wurtsmith sand, beaches, 0 to 3 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,400 feet

Mean annual precipitation: 24 to 30 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 130 days

Map Unit Composition

Wurtsmith, beaches and similar soils: 90 percent

Dissimilar minor components: 10 percent

Description of the Wurtsmith, Beaches Soil

Taxonomic Classification

Mixed, frigid Oxyaquic Udipsamments

Setting

Landform: Dunes and beach ridges

Landform position (two-dimensional): Footslope

Slope range: 0 to 3 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Parent material: Sandy outwash and lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: None

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

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.7 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Serviceberry, bigleaf aster, strawberry, eastern teaberry, Canada beadruby, western brackenfern, blackberry, American starflower, and velvetleaf huckleberry

Typical Profile

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 4 inches; sand

Bw—4 to 24 inches; sand

BC—24 to 48 inches; sand

C—48 to 80 inches; sand

Minor Components

Grayling, beaches soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Meehan, beaches soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1444587—Grayling sand, beaches, 2 to 12 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,400 feet

Mean annual precipitation: 27 to 34 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 90 to 130 days

Map Unit Composition

Grayling, beaches and similar soils: 95 percent

Dissimilar minor components: 5 percent

Description of the Grayling, Beaches Soil

Taxonomic Classification

Isotic, frigid Typic Udipsamments

Setting

Landform: Beach ridges

Landform position (two-dimensional): Shoulder and backslope

Slope range: 2 to 12 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Parent material: Sandy deposits

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 8

Available water capacity: Low (about 3.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Eastern teaberry, sweet fern, American starflower, and blueberry

Typical Profile

A—0 to 3 inches; sand

Bw—3 to 15 inches; sand

BC—15 to 23 inches; sand

C—23 to 60 inches; sand

Minor Components

Wurtsmith, beaches soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1529830—Meehan sand, beaches, 0 to 2 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 665 to 1,950 feet

Mean annual precipitation: 25 to 35 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 90 to 140 days

Map Unit Composition

Meehan, beaches and similar soils: 90 percent

Dissimilar minor components: 10 percent

Description of the Meehan, Beaches Soil

Taxonomic Classification

Mixed, frigid Aquic Udipsamments

Setting

Landform: Beach ridges

Landform position (two-dimensional): Footslope

Slope range: 0 to 2 percent

Down-slope shape: Linear

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Parent material: Sandy alluvium

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: About 6 inches (see table 19)

Drainage class: Somewhat poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 4.2 inches)

Interpretive Groups

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

Vegetation

Existing plants: Leadplant, field pussytoes, Pennsylvania sedge, American hazelnut, Richards comandra, and flowering spurge

Typical Profile

A—0 to 4 inches; sand
Bw—4 to 29 inches; sand
C—29 to 60 inches; sand

Minor Components

Newson, beaches soils

Percent of map unit: 5 percent
Landform: Depressions
Representative aspect: North
Meets hydric soil criteria: Yes

Wurtsmith, beaches soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1700372—Loxley, Beseman, and Dawson soils, 0 to 1 percent slopes

Map Unit Setting

Major land resource areas (MLRAs): 90A—Wisconsin and Minnesota Thin Loess and Till, Northern Part; 91B—Wisconsin and Minnesota Sandy Outwash; 92—Superior Lake Plain; 93B—Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Elevation: 600 to 1,400 feet
Mean annual precipitation: 24 to 45 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 60 to 140 days

Map Unit Composition

Loxley and similar soils: 40 percent
Beseman and similar soils: 30 percent
Dawson and similar soils: 28 percent
Dissimilar minor components: 2 percent

Description of the Loxley Soil

Taxonomic Classification

Dysic, frigid Typic Haplosaprists

Setting

Landform: Depressions on disintegration moraines

Landform position (two-dimensional): Toeslope

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Herbaceous organic material more than 51 inches thick

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

Frequency of flooding: None

Frequency of ponding: Occasional

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 26.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Typical Profile

Oe—0 to 13 inches; mucky peat

Oa—13 to 60 inches; muck

Description of the Beseman Soil

Taxonomic Classification

Loamy, mixed, dysic, frigid Terric Haplosaprists

Setting

Landform: Depressions on disintegration moraines

Landform position (two-dimensional): Toeslope

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Herbaceous organic material 16 to 51 inches thick over loamy till

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

Frequency of flooding: None

Frequency of ponding: Occasional

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 18.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Typical Profile

Oa—0 to 36 inches; muck

Cg—36 to 60 inches; loam

Description of the Dawson Soil

Taxonomic Classification

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

Setting

Landform: Depressions on disintegration moraines

Landform position (two-dimensional): Toeslope

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Sphagnum moss and herbaceous organic material 16 to 51 inches thick over sandy or sandy and gravelly deposits

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

Frequency of flooding: None

Frequency of ponding: Occasional

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 18.2 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Typical Profile

Oi—0 to 8 inches; peat

Oa—8 to 38 inches; muck

A—38 to 40 inches; silt loam

2C—40 to 60 inches; sand

Minor Components

Uskabwanka soils

Percent of map unit: 2 percent

Landform: Depressions on disintegration moraines

Representative aspect: North

Meets hydric soil criteria: Yes

1700373—Rifle peat, 0 to 1 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 60 to 110 days

Map Unit Composition

Rifle and similar soils: 90 percent

Dissimilar minor components: 10 percent

Description of the Rifle Soil

Taxonomic Classification

Euic, frigid Typic Haplohemists

Setting

Landform: Depressions on moraines, depressions on outwash plains, and depressions on lake plains

Slope range: 0 to 1 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Organic deposits more than 51 inches thick

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

Frequency of flooding: None

Frequency of ponding: Frequent

Depth to water table: At the soil surface

Drainage class: Very poorly drained

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Very high (about 30.3 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Balsam fir, sedge, and eastern arborvitae

Typical Profile

Oi—0 to 4 inches; peat

Oe—4 to 60 inches; mucky peat

Minor Components

Dawson soils

Percent of map unit: 5 percent

Landform: Depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, and bogs on outwash plains
Representative aspect: North
Meets hydric soil criteria: Yes

Loxley soils

Percent of map unit: 5 percent
Landform: Depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, and bogs on outwash plains
Representative aspect: North
Meets hydric soil criteria: Yes

1700374—Allendale-Wakeley-Kinross complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,695 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 60 to 120 days

Map Unit Composition

Allendale and similar soils: 35 percent
Wakeley and similar soils: 30 percent
Kinross and similar soils: 20 percent
Dissimilar minor components: 15 percent

Description of the Allendale Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods

Setting

Landform: Lake terraces, outwash plains, ground moraines, and lake plains
Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy sediments and underlying clayey lacustrine or till deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 6 inches, perched (see table 19)
Drainage class: Somewhat poorly drained
Shrink-swell potential: High (about 7.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 5

Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 3w

Meets hydric soil criteria: No

Hydrologic soil group: C

Vegetation

Existing plants: Speckled alder, bunchberry dogwood, gray dogwood, eastern poison ivy, American elm, and violet

Typical Profile

A—0 to 3 inches; loamy fine sand

E—3 to 10 inches; sand

Bhs—10 to 13 inches; sand

Bs—13 to 26 inches; sand

E'—26 to 28 inches; sand

2Bt—28 to 34 inches; clay

2C—34 to 60 inches; clay

Description of the Wakeley Soil

Taxonomic Classification

Sandy over clayey, mixed, semiactive, nonacid, frigid Aeric Epiaquents

Setting

Landform: Outwash plains and lake plains

Landform position (two-dimensional): Toeslope

Slope range: 0 to 2 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy outwash and lacustrine material underlain by clayey lacustrine deposits

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

Frequency of flooding: None

Frequency of ponding: Frequent

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

Drainage class: Very poorly drained

Shrink-swell potential: High (about 7.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 19

Available water capacity: Moderate (about 8.9 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6w

Meets hydric soil criteria: Yes

Hydrologic soil group: B/D

Vegetation

Existing plants: Speckled alder, marsh marigold, redosier dogwood, threeleaf goldthread, water horsetail, and eastern arborvitae

Typical Profile

Oa—0 to 4 inches; muck
C—4 to 23 inches; loamy sand
Cg—23 to 28 inches; loamy sand
2C—28 to 80 inches; clay

Description of the Kinross Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Endoaquods

Setting

Landform: Stream terraces, outwash plains, and lake plains

Landform position (two-dimensional): Toeslope

Slope range: 0 to 2 percent

Down-slope shape: Concave

Across-slope shape: Concave

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible

Parent material: Glaciofluvial material

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

Frequency of flooding: None

Frequency of ponding: Frequent

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

Drainage class: Very poorly drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 5.8 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6w

Meets hydric soil criteria: Yes

Hydrologic soil group: A/D

Vegetation

Existing plants: Balsam fir, speckled alder, jack pine, eastern arborvitae, eastern hemlock, and blueberry

Typical Profile

Oa—0 to 6 inches; muck
E—6 to 10 inches; sand
Bhs—10 to 12 inches; sand
Bs—12 to 24 inches; sand
BC—24 to 42 inches; sand
C—42 to 60 inches; sand

Minor Components

Flink soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Sedgwick soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Tawas soils

Percent of map unit: 5 percent

Landform: Depressions

Representative aspect: North

Meets hydric soil criteria: Yes

1702605—Menominee loamy sand, 15 to 30 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 28 to 32 inches

Mean annual air temperature: 41 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Menominee and similar soils: 85 percent

Dissimilar minor components: 15 percent

Description of the Menominee Soil

Taxonomic Classification

Sandy over loamy, mixed, active, frigid Alfic Haplorthods

Setting

Landform: End moraines, ground moraines, lake plains, and outwash plains

Landform position (two-dimensional): Shoulder and backslope

Slope range: 15 to 30 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium

Parent material: Sandy glaciofluvial material over loamy till or lacustrine sediments

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Well drained

Shrink-swell potential: Moderate (about 4.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 15

Available water capacity: High (about 10.7 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: A

Vegetation

Existing plants: Sugar maple, serviceberry, silky dogwood, eastern teaberry, American witchhazel, Canada beadruby, eastern white pine, hairy Solomon's seal, brackenfern, blackberry, blueberry, and mapleleaf viburnum

Typical Profile

A—0 to 4 inches; loamy sand

E—4 to 7 inches; sand

Bs—7 to 23 inches; sand

2B/E—23 to 39 inches; clay loam

2Bt—39 to 59 inches; clay loam

2C—59 to 80 inches; loam

Minor Components

Ashwabay soils

Percent of map unit: 10 percent

Representative aspect: North

Meets hydric soil criteria: No

Morganlake soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

1702606—Deerton-Brownstone complex, 0 to 6 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,000 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Deerton and similar soils: 50 percent

Brownstone and similar soils: 40 percent

Dissimilar minor components: 10 percent

Description of the Deerton Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

Setting

Landform: Hills

Landform position (two-dimensional): Summit

Slope range: 0 to 6 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash beach deposits or sandy residuum from sandstone
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Very low (about 2.6 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, sugar maple, sedge, spinulose woodfern, trailing arbutus, eastern teaberry, Canada beadruby, blackberry, thimbleberry, and American starflower

Typical Profile

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

Description of the Brownstone Soil

Taxonomic Classification

Sandy-skeletal, mixed, frigid Typic Haplorthods

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Slope range: 0 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy-skeletal beach deposits or residuum from sandstone, or both
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Excessively drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 3.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 6s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Aster, sedge, yellow bluebeadlily, running clubmoss, Canada beadruby, Clayton's sweetroot, western brackenfern, blackberry, starry false Solomon's seal, starflower, and mapleleaf viburnum

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 12 inches; very cobbly sand

Bhs—12 to 15 inches; extremely gravelly coarse sand

Bs—15 to 23 inches; extremely cobbly sand

BC—23 to 33 inches; extremely cobbly coarse sand

2R—33 to 80 inches; unweathered bedrock

Minor Components

Redrim soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 3 percent

Representative aspect: North

Meets hydric soil criteria: No

Abbaye soils

Percent of map unit: 2 percent

Representative aspect: North

Meets hydric soil criteria: No

1702607—Deerton-Brownstone complex, 6 to 15 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,000 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

Deerton and similar soils: 50 percent

Brownstone and similar soils: 40 percent

Dissimilar minor components: 10 percent

Description of the Deerton Soil

Taxonomic Classification

Sandy, mixed, frigid Typic Haplorthods

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low
Parent material: Sandy outwash beach deposits or sandy residuum from sandstone
Restrictive feature(s): Lithic bedrock at a depth of 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Very low (about 2.6 inches)

Interpretive Groups

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

Vegetation

Existing plants: Balsam fir, sugar maple, sedge, spinulose woodfern, trailing arbutus, eastern teaberry, Canada beadruby, blackberry, thimbleberry, and American starflower

Typical Profile

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

Description of the Brownstone Soil

Taxonomic Classification

Sandy-skeletal, mixed, frigid Typic Haplorthods

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder and backslope
Slope range: 6 to 15 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Very low

Parent material: Sandy-skeletal beach deposits or residuum from sandstone, or both

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

Frequency of flooding: None

Frequency of ponding: None

Depth to water table: More than 72 inches

Drainage class: Excessively drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 3.0 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 7s

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Aster, sedge, yellow bluebeadlily, running clubmoss, Canada beadruby, Clayton's sweetroot, western brackenfern, blackberry, starry false Solomon's seal, starflower, and mapleleaf viburnum

Typical Profile

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 12 inches; very cobbly sand

Bhs—12 to 15 inches; extremely gravelly coarse sand

Bs—15 to 23 inches; extremely cobbly sand

BC—23 to 33 inches; extremely cobbly coarse sand

2R—33 to 80 inches; unweathered bedrock

Minor Components

Redrim soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Abbaye soils

Percent of map unit: 3 percent

Representative aspect: North

Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 2 percent

Representative aspect: North

Meets hydric soil criteria: No

1702608—Abbaye loamy sand, 6 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain

Elevation: 600 to 1,095 feet

Mean annual precipitation: 26 to 33 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 120 days

Map Unit Composition

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

Description of the Abbaye Soil

Taxonomic Classification

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

Setting

Landform: Hills

Landform position (two-dimensional): Shoulder and backslope

Slope range: 6 to 15 percent

Down-slope shape: Convex

Across-slope shape: Convex

Representative aspect: North

Soil temperature class: Frigid

Soil temperature regime: Frigid

Properties and Qualities

Runoff: Medium

Parent material: Till underlain by sandstone bedrock

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

Frequency of flooding: None

Frequency of ponding: None

Water table (depth, kind): About 18 inches, perched (see table 19)

Drainage class: Moderately well drained

Shrink-swell potential: Low (about 1.5 LEP)

Salinity maximum: Not saline

Sodicity maximum: Not sodic

Calcium carbonate equivalent (maximum weight percentage): 0

Available water capacity: Low (about 4.7 inches)

Interpretive Groups

Land capability subclass (nonirrigated): 4e

Meets hydric soil criteria: No

Hydrologic soil group: B

Vegetation

Existing plants: Balsam fir, sugar maple, yellow birch, sedge, yellow bluebeadlily, spinulose woodfern, shining clubmoss, Canada beadruby, hairy Solomon's seal, red elderberry, feather Solomon's seal, twistedstalk, and American starflower

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 4 inches; loamy sand

E—4 to 13 inches; loamy sand

Bs—13 to 25 inches; sandy loam

B/E—25 to 32 inches; sandy loam

2R—32 to 80 inches; unweathered bedrock

Minor Components

Deerton soils

Percent of map unit: 5 percent

Representative aspect: North

Meets hydric soil criteria: No

Zeba soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

1711685—Cublake-Keweenaw, stony complex, 0 to 6 percent slopes

Map Unit Setting

Major land resource area (MLRA): 92—Superior Lake Plain
Elevation: 600 to 1,945 feet
Mean annual precipitation: 26 to 33 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 135 days

Map Unit Composition

Cublake and similar soils: 50 percent
Keweenaw and similar soils: 30 percent
Dissimilar minor components: 20 percent

Description of the Cublake Soil

Taxonomic Classification

Sandy, mixed, frigid Oxyaquic Haplorthods

Setting

Landform position (two-dimensional): Footslope
Slope range: 0 to 6 percent
Down-slope shape: Linear
Across-slope shape: Concave
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Negligible
Parent material: Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Water table (depth, kind): About 24 inches, perched (see table 19)
Drainage class: Moderately well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Low (about 5.4 inches)

Interpretive Groups

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

Vegetation

Existing plants: Spreading dogbane, American hazelnut, flowering spurge, Virginia strawberry, rose, dwarf red blackberry, starry false Solomon's seal, and lowbush blueberry

Typical Profile

A—0 to 3 inches; sand
E—3 to 4 inches; sand
Bs—4 to 23 inches; sand
BC—23 to 32 inches; sand
C1—32 to 40 inches; sand
C2—40 to 48 inches; stratified fine sand to very fine sand
2C3—48 to 60 inches; stratified very fine sandy loam to silt loam

Description of the Keweenaw Soil

Taxonomic Classification

Sandy, mixed, frigid Alfic Haplorthods

Setting

Landform: Disintegration moraines
Landform position (two-dimensional): Summit
Slope range: 2 to 6 percent
Down-slope shape: Convex
Across-slope shape: Convex
Representative aspect: North
Soil temperature class: Frigid
Soil temperature regime: Frigid

Properties and Qualities

Runoff: Low
Parent material: Sandy till
Restrictive feature(s): None within a depth of 60 inches
Frequency of flooding: None
Frequency of ponding: None
Depth to water table: More than 72 inches
Drainage class: Well drained
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum: Not saline
Sodicity maximum: Not sodic
Calcium carbonate equivalent (maximum weight percentage): 0
Available water capacity: Moderate (about 7.8 inches)

Interpretive Groups

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

Vegetation

Existing plants: Decomposition brackenfern, juneberry, lily-of-the-valley, bellwort, large-leaved aster, and blueberry

Typical Profile

A—0 to 2 inches; loamy sand
E—2 to 4 inches; loamy sand
Bs1,Bs2—4 to 16 inches; loamy sand
Bs3—16 to 20 inches; loamy sand
E'—20 to 27 inches; loamy sand

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

E/B—27 to 43 inches; sand
B/E—43 to 75 inches; loamy sand
C—75 to 80 inches; loamy sand

Minor Components

Annalake soils

Percent of map unit: 10 percent
Representative aspect: North
Meets hydric soil criteria: No

Flink soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Gogebic soils

Percent of map unit: 5 percent
Representative aspect: North
Meets hydric soil criteria: No

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils within Apostle Islands National Lakeshore. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils as farmland and as sites for buildings, sanitary facilities, highways and other transportation systems, and recreational facilities. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the park. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the park for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited*, *slightly limited*, *somewhat limited*, and *very limited*. The suitability ratings are expressed as *well suited*, *moderately well suited*, *poorly suited*, and *unsuited* or as *good*, *fair*, and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact

on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA-SCS, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The capability classification of map units in this park is given in the section “Detailed Soil Map Units” and in table 2.

Prime and Other Important Farmland

Table 3 lists the map units in the park that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some soils identified as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield

as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Hydric Soils

Table 4 lists the map unit components that are rated as hydric soils in the park. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; USDA-NRCS, 2010).

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

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

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2010) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

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

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

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

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

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

Landform and Parent Material

Table 5 displays information about the climate, location, and parent material of each soil in the map units.

Percent of the map unit is the extent of the named soil in the map unit.

Slope is the inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. The table shows the low and high range of slope for the named component or soil.

Elevation is the height of an object or area on the earth's surface in reference to a fixed point, such as mean sea level. The typical low and high range of elevation is displayed for each soil.

MAP is the mean annual precipitation for areas of the soil in the map unit.

Landform is a specific shape of the earth in the area where a soil typically occurs. Examples are a mountain summit and a valley bottom.

Parent material is the material in which soils formed. Examples are the underlying geological material (including bedrock), a surficial deposit (such as volcanic ash), and organic material. Soils inherit their chemical and physical properties from the parent material.

Land Management

In table 6, parts I through IV, interpretive ratings are given for various aspects of land management. The ratings are both verbal and numerical.

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

practice or that extreme measures are needed to overcome the undesirable soil properties.

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

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

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

The paragraphs that follow indicate the soil properties considered in rating the soils for land management practices.

Planting

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

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

Hazard of Erosion and Suitability for Roads

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

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

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings

indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Site Preparation

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

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

Site Restoration

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

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

Recreation

The soils of the park are rated in table 7, parts I and II, according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

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

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

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, and water management.

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

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

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

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

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, landscaping, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for septic tank absorption fields and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, ponds, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 8 shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

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

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

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties

that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Roads and Streets, Shallow Excavations, and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 9 shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and landscaping.

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

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

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on

the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Landscaping requires soils on which turf, trees, and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sewage Disposal

Table 10 shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

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

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (K_{sat}), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity (K_{sat}), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (K_{sat}) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a K_{sat} rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Source of Gravel and Sand

Table 11 gives information about the soils as potential sources of gravel and sand. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. Only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet.

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

Source of Reclamation Material, Roadfill, and Topsoil

Table 12 gives information about the soils as potential sources of reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

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

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not

apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments. The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

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

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

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

Ponds and Embankments

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential

is determined by the saturated hydraulic conductivity (K_{sat}) of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, K_{sat} of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

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

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

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

Engineering Properties

Table 14 gives the engineering classifications and the range of engineering properties for the layers of each soil in the park.

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

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

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

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

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

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement,

the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

Physical Soil Properties

Table 15 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the park. The estimates are based on field observations and on test data for these and similar soils.

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

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

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

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

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

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

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

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $1/3$ - or $1/10$ -bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water

and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, greater than 9 percent.

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

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

Erosion Properties

Table 16 shows estimates of some erosion factors that affect a soil's potential for different uses. These estimates are given for each layer of every soil for K factors and are given as one rating for the entire soil for the T factor, the wind erodibility group, and the wind erodibility index. Values are reported for each soil in the park. Estimates are based on field observations and on test data for these and similar soils.

Erosion factors are shown in the table as the K factor (K_w and K_f) and the T factor. Soil erosion factors K_w and K_f quantify soil detachment by runoff and raindrop impact. These erosion factors are indexes used to predict the long-term average soil loss from sheet and rill erosion under crop systems and conservation techniques. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and K_{sat} . Values

of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

The procedure for determining the Kf factor is outlined in Agriculture Handbook 703, "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)," USDA, Agricultural Research Service, 1997.

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

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments. In horizons where total rock fragments are 15 percent or more, by volume, the Kw factor is always less than the Kf factor.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size. Soil horizons that do not have rock fragments are assigned equal Kw and Kf factors.

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

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

Total Soil Carbon

Table 17 gives estimates of total soil carbon. Soil carbon occurs as organic and inorganic carbon.

Soil organic carbon (SOC) is carbon (C) in soil that originated from a biological source, such as plants, animals, or micro-organisms. SOC is found in both organic and mineral soil layers. The term "soil organic carbon" refers only to the carbon occurring in soil organic matter (SOM). Soil organic carbon makes up about one-half the weight of soil organic matter. The rest of SOM is mostly oxygen, nitrogen, and hydrogen.

Soil inorganic carbon (SIC) is carbon found in soil carbonates, typically as calcium carbonate layers in the soil or as clay-sized fractions throughout the soil. Carbonates in soils are most common in areas where evaporation rates exceed precipitation, as is the case in most desert environments. Typically, the carbonates accumulated from carbonatic dust or from solution during periods of wetter climates. Soil inorganic carbon also occurs in soils that formed in marl in all regions of the country.

The SOC and SIC contents are reported in kilograms per square meter to a depth of 2 meters or to a representative depth of either hard bedrock or a cemented horizon. The SOC and SIC values are on a whole soil basis, corrected for rock fragments.

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

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

Greater SOC levels improve not only soil quality but also the quality of air and water. Soil acts as a filter and improves water quality. Fertile soils that support plant life remove CO₂ from the atmosphere and increase oxygen levels through photosynthesis. Maintaining the level of soil organic carbon reduces C release into the atmosphere and thus can lessen the effects of global warming.

SIC influences the types of plants that will grow. High SIC levels are commonly associated with a higher soil pH, which limits the types of plants that will thrive.

Like SOM, soil carbonates, the source of SIC, also bind soil particles together. They fill voids in the soil and thus can reduce soil porosity. Compacted soil carbonates may restrict root penetration and waterflow into the soil.

Chemical Soil Properties

Table 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the park. The estimates are based on field observations and on test data for these and similar soils.

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

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

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

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

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil.

Water Features

Table 19 gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

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

Water table refers to a saturated zone in the soil. Table 19 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

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

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

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

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

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 20 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the thickness and hardness of the restrictive layer, both of

which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

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

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

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

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

Formation and Classification of the Soils

This section relates the soils in Apostle Islands National Lakeshore to the major factors of soil formation and describes the system of soil classification.

Factors of Soil Formation

By Susan Burlew Southard, Natural Resources Conservation Service.

Soil covers the surface of the earth as a three-dimensional body of varying thickness and is made up of different proportions of organic and mineral material, pore space with gases, and water. Soils differ in their appearance, productivity, and management requirements due to their chemical and physical properties. The characteristics and properties of soils are determined by physical and chemical processes that result from the interaction of five soil-forming factors. These factors of soil formation are interdependent, and few generalizations can be made regarding any one factor unless the effects of the other factors are known. The term “pedogenesis” is often used to connote the processes of soil formation.

The interacting soil-forming factors are parent material, climate, organisms, time, and relief or topography (Jenny, 1941). *Parent material* is the source material in which soils formed. Soils are influenced by the texture and structure of the parent material and its mineralogical and chemical composition. *Climate* is predominantly the temperature and kind and amount of precipitation. It is also seasonal distribution of temperatures and precipitation. *Organisms* are the plants and other organisms living in and on the soil, including humans. *Time* refers to how long the soil-forming factors have been operating on a particular landscape. *Relief or topography* is the shape and elevation of the landscape. It affects internal and external soil properties, such as soil drainage, aeration, susceptibility to erosion, and the soil’s exposure to the sun and wind.

The processes of soil formation are a sequence of events, involving biogeochemical reactions that are energized by climate and spatially related to relief or topography (Buol et al., 2011). The physical and chemical properties of a soil are altered by these reactions over time. The influence of any one of these factors varies among all parks and within localities of a particular park. Soils may differ significantly from place to place in a park and within very short distances as a result of complex interactions among the five factors. In some cases, however, parks may have vast stretches of the same type of soil because of uniform soil-forming factors.

Setting of Apostle Islands National Lakeshore

Understanding the setting of Apostle Islands National Lakeshore (Apostle Islands NL) helps in understanding the parent materials contributing to the types of soils within it. Understanding the soils of the park also helps in understanding the unique relationship between soils and the environment. Soil-forming processes are influenced by rock type, topographic expression, and the hydrologic properties of the area. Soil formation influences soil properties and behaviors, which are used when determining best management practices.

Apostle Islands NL is located along the southwestern shore of Lake Superior in Wisconsin. In 1970, it was officially designated as National Lakeshore in the park system. The National Lakeshore consists of 21 islands and a strip of the mainland, encompassing about 70,000 acres (see park map). The islands are located at the tip of the Bayfield Peninsula in northern Wisconsin. Part of the park is located along the shoreline of the Bayfield Peninsula. The park's environmental features include a number of regionally rare habitats, including old-growth forest, boreal forest, five types of northern forests, forest seeps, clay bluff communities, sandstone cliff communities, lagoon and bog communities, forested ridge and swale, coastal fen, Great Lakes barrens, and dune communities (USDI-NPS, 2013). All of the Apostle Islands are part of the Chequamegon Sandstone (or Brownstone) Formation, which is part of the Bayfield group of Cambrian sandstones. Chequamegon Sandstone has a reddish brown hue because of the presence of small amounts of iron ore.

The physical geography of the broader landscape of Wisconsin and the Great Lakes, including the park, is the result of the erosion and deposition of materials caused by the advancement and retreat of glaciers over the last 2 million years. Glaciers scoured the surface of the earth, leveled hills, and altered the previous landscape. Valleys created by the river systems of the previous era were deepened and enlarged to form basins of the Great Lakes. As the climate warmed, the glaciers retreated. Glacial retreat was followed by an interglacial period during which vegetation and wildlife thrived. This cycle was repeated several times. The most important glacial advance for northern Wisconsin that affected the landscape of the park today is the Wisconsin stage, which retreated from Wisconsin about 9,500 to 15,000 years ago.

As the glaciers retreated, meltwater formed along the front of the ice. Because the land was greatly depressed from the weight of glaciers, large post-glacial lakes formed at this time. These lakes were much larger than the present-day Great Lakes. Evidence of these lakes can still be seen in the form of beach ridges, eroded bluffs, and flat plains located hundreds of feet above present lake levels. Regional uplift (often referred to as crustal or isostatic rebound) caused dramatic changes in the depth, size, and drainage patterns of the post-glacial lakes. The changing drainage patterns and water velocities also changed the type and sizes of materials deposited. The changes in materials influenced the soils that would subsequently form from the deposits, and different soils have been identified on the different landforms.

The bluffs on some of the islands are characteristic of the Great Lakes regional shoreline. The ice lobes gouged debris from the valley floors and deposited it along the sides of the valleys when the ice finally melted. This debris was eventually deposited by the ice, creating prominent moraines. The park lakeshore and islands today are covered by recent alluvium, some dune sand, and Pleistocene glacial deposits.

Parent Material

Parent material is the unconsolidated mass in which soils form. Mineral soil parent material is a product of weathering of underlying bedrock in place or weathering of material that has been transported. Organic soils form in place from the accumulation and decomposition of plant material, such as wood, leaves, and aquatic plants. Weathering refers to the chemical and physical disintegration and decomposition of parent material.

Few soils weather directly from the underlying rocks, or what is referred to as residuum. More commonly, soils form in materials that have been moved from elsewhere. Soils may have a dominant kind of parent material but were influenced by other types of parent material as well. Material may have been moved only a few feet by gravity (colluvial parent material), deposited by ice, or transported long distances by wind (eolian or loess parent material) or water (alluvial parent material).

Drift is a broad, general term often used in describing glacial parent material. Drift is mineral material (clay, silt, sand, gravel, cobbles, and boulders) transported by a

glacier and deposited directly by or from the ice or by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer have glaciers.

Glaciofluvial deposits are another type of parent material deposited by glaciers and may have also been sorted and redeposited by water. In the northeastern and north-central parts of the United States, soil scientists make a distinction between the glacial fluvial processes of the past and the recent fluvial processes forming alluvium less than 10,000 years old (Holocene age). For example, late Pleistocene glaciofluvial deposits are often termed *outwash*, while Holocene flood plain deposits are termed *alluvium*. In Apostle Islands NL, Cublake soils have glaciofluvial parent material, Kellogg soils formed in glaciolacustrine parent material, and Moquah and Mehan soils on flood plains and beach ridges formed in sandy alluvium. The most common soil parent materials in Apostle Islands NL are glaciolacustrine deposits, outwash, till, and plant residuum. Many of the soils in the park formed in a combination of all of these parent materials.

Table 5 lists the major soils in each map unit of the park and their most common associated landforms and parent material types.

Glaciofluvial or Outwash Parent Material

Outwash deposits are stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end or the margin of a glacier. Outwash can have a variety of particle sizes. The particle-size distribution of outwash depends upon the velocity of the meltwaters carrying the sediment away from the glaciers. In general, the higher the velocity of water the larger the particle the water can transport. Rock fragments in outwash are commonly subrounded to rounded due to the fact that they were tumbled and polished during transport. Soils that formed from outwash may have a high content of rocks. Most of the soils that formed in outwash are predominantly sandy. Certain landforms are associated with outwash, and certain soils occur on these landforms.

An *outwash plain* is an extensive lowland landscape of coarse textured material. It may be pitted with depressions due to melt-out of incorporated glaciers. The depressions commonly occur as kettles that formed by melt-out of incorporated ice blocks of glaciers.

A *lake terrace* is a narrow shelf, partly wave cut and partly wave built, produced along a lake shore in front of a scarp line of low cliffs and later exposed when the water level fell.

An *outwash terrace* is a flat-topped bank of outwash with an abrupt outer face (scarp or riser) extending along a valley downstream from an outwash plain or terminal moraine. It is also termed a valley train deposit.

The assemblage of landforms in the park makes up an ice margin complex that formed next to a relatively static, rapidly wasting continental glacial margin. Landforms include ice-contact slope, ice-contact delta, kame, kame moraine, kettle, outwash fan, small outwash plain, and small proglacial lake. Moraines, if they occur, are of limited occurrence (except kame moraines, which can be extensive). Glaciofluvial sediments dominate, but glaciolacustrine sediments and till can occur in minor amounts. Ice margin complexes also have glacial drainage channels that were formed by an ice-marginal, englacial, or subglacial stream during glaciation.

Cublake soils are very deep, are moderately well drained, and formed in deep sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits on mostly outwash terraces, outwash plains, and glacial lake plains. Permeability is moderately rapid or rapid in the sandy outwash and moderately slow or moderate

in the glaciofluvial deposits. Thickness of the sandy mantle of these soils and depth to the stratified silty, loamy, and sandy horizons range from 40 to 60 inches. Rock fragments typically do not occur, but the volume of gravel ranges from 0 to 15 percent in the sandy mantle and from 0 to 5 percent in the stratified loamy and sandy material. Soils associated with Cublake soils in the park are Au Gres, Croswell, Croswood, Flink, Rubicon, and Sultz. The somewhat poorly drained Au Gres soils, the moderately well drained Croswell soils, and the excessively drained Rubicon and Vilas soils form a drainage sequence (or *drainage catena*) in nearby areas. Croswood soils are on outwash-veneered areas of moraines and drumlins where loamy glacial till occurs at a depth of 40 to 60 inches. The somewhat poorly drained Flink soils and the well drained Sultz soils form a drainage catena with Cublake soils. Most areas are used for woodland. Mature forests growing on these soils are mostly red maple, northern red oak, paper birch, yellow birch, hemlock, eastern white pine, and red pine, but balsam fir and quaking aspen are in most stands. Some areas of Cublake soils were used for cropland and pastureland. Cublake and associated soils are mapped on most of the islands, but most of their acreage is on Oak, Hermit, and southern Bear Islands and in the central part of Outer Island.

Au Gres soils are sandy and formed in sandy outwash on outwash plains (fig. 1). These soils are mapped only on the mainland, in the Bayfield County area of the park, along minor drainages that flow into Sand Bay. They are very deep, are somewhat poorly drained, and formed in sandy fluvial and lacustrine deposits on ice margin complexes, kame moraines, stream terraces, outwash plains, lake terraces, lake plains, and ground moraines. Au Gres soils generally have slopes of 0 to 6 percent. Only a small part of the acreage of Au Gres soils was ever cultivated. Traditionally, some areas were in permanent pasture and others were used for growing specialty crops, such as blueberries and cucumbers. Many areas in the park are in various stages of reforestation. Natural forests are northern white cedar, balsam fir, hemlock, yellow birch, paper birch, aspen, and red maple.

Kinross soils also formed in outwash. These soils are mapped on Outer, Stockton, Oak, Hermit, Raspberry, Basswood, and York Islands and also on the mainland near North Branch and Engholm Roads. They are mapped in a complex with two other soils—Allendale and Wakeley. In the complex, Kinross soils make up about 20 percent of the map unit. The Kinross series consists of very deep, poorly drained and very poorly drained soils that formed in glaciofluvial material on outwash plains, stream terraces, lake plains, kames, and disintegration and ground moraines. Permeability is rapid. Slopes range from 0 to 3 percent. Gravel content ranges from 0 to 5 percent throughout the profile. Soils that are geographically associated with Kinross soils include Allendale, Wakeley, Au Gres, Croswell, Dawson, and Rubicon. These associated soils form a catena with Au Gres soils: Au Gres soils are somewhat poorly drained, Croswell soils are moderately well drained, and Rubicon soils are excessively drained. Dawson soils are shallow and organic and overlie sands. Areas of the Allendale-Wakeley-Kinross map unit typically occur on toeslopes, and their hydraulic regimes are influenced by the upwelling ground water fed from upslope landscape positions.

Glaciolacustrine Deposits

Glaciolacustrine deposits were laid down in post-glacial lakes. Post-glacial lakes formed either by the damming action of a moraine during the retreat of a melting glacier or by meltwater trapped against an ice sheet due to isostatic depression of the earth's crust. Large lakes were once a widespread feature in the northern hemisphere. Glaciolacustrine soils in Apostle Islands NL often have higher contents of silt, sand, or clay because the original lake deposits varied in size.

Lakebeds in the park formed after glacial retreat and during the post-glacial variations in water level in Lake Superior. The relict lake areas are now lake plains.



Figure 1.—Profile of an Au Gres soil. Depths on tape are in feet. Note the water at a depth of 3.5 feet. (Image is from “Landforms of the Upper Peninsula, Michigan,” USDA, 2006.)

Lake plains are defined as nearly level surfaces marking the floor of extinct lakes filled by well sorted, generally fine textured, stratified deposits that commonly contain varves. Varves are sedimentary layers, lamina, or a sequence of laminae deposited in a body of still water within 1 year. Specifically, they are a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier. Lake terraces are narrow shelves, partly cut and partly built, produced along a lake shore in front of a scarp line of low cliffs and later exposed when the lake level fell.

The major soils in the park that formed on lake plains include Lerch, Kellogg, and Manistee. Lerch soils are very deep, are poorly drained and very poorly drained, and formed in clayey till and/or clayey glaciolacustrine deposits modified by wave action over loamy and/or sandy stratified lacustrine deposits. These soils are on till plains and/or lake plains. Permeability is very slow in the clayey till and moderate to rapid in the stratified substratum. Slope ranges from 0 to 2 percent. Lerch soils are mapped on lake plains on Sand, Stockton, Hermit, and Michigan Islands and in small areas on the mainland. Thickness of the clayey till or lacustrine material ranges from 40 to 60 inches over the stratified substratum. Reaction (pH) ranges from strongly acid to slightly acid in the upper part of the solum and is slightly alkaline or moderately alkaline in the lower part of the solum and in the substratum. Depth to the first occurrence of carbonates ranges from 12 to 23 inches and typically extends to 80 inches. Table 18 shows the distribution of carbonates and the ranges in soil pH for the major soils in each map unit. In Lerch soils, the weighted average clay content at a depth of 10 to 40 inches ranges from 60 to 85 percent and the total rock fragment content is less than 3 percent throughout the profile (see table 15). Redoximorphic features are evidence of water saturation, which occurs within 10 inches of the surface at some time in most years. Lerch soils are commonly ponded in the spring or after heavy rainfall events. The redoximorphic features are morphological, and soil color features are indicative of past or present soil wetness. Gray colors form in wet soils from oxidation-reduction reactions.

Other glaciolacustrine soils in the park are Kellogg and Manistee. Kellogg and Manistee soils are mapped extensively in the park on lake plains derived from sandy materials. These soils occur on the mainland and on every island, except Manitou and Michigan Islands. Slope typically ranges from 0 to 12 percent for these soils but, in the park, it ranges to 45 percent on the edges of lake plains and outwash plains on old shorelines that are dissected. These soils formed in sandy lacustrine deposits or outwash and overlie clayey till or lacustrine deposits. Kellogg soils are very deep and moderately well drained, and Manistee soils are moderately deep and well drained. Manistee soils are in landscape positions similar to or slightly higher than those of Kellogg soils and on steeper slopes.

Many soils formed in a combination of lacustrine deposits with other dominant parent materials. Soils with multiple parent materials, such as Allendale, Munuscong, Wakeley, Superior, Ashwabab, Wurtsmith, and Menominee, are common in the park. Table 15 shows the distribution of sand, silt, and clay in the soils. Many of these soils formed in a combination of outwash or alluvial parent material over glaciolacustrine deposits. They commonly have an abrupt change in particle size at depth. For example, the soils may be loamy or sandy over dense clay. The bulk density of the clayey horizon may range to 1.8 g/cc, which can restrict root growth and water movement. Map unit 433301, which is composed of Kellogg, Allendale, and Ashwabab soils, can be used to illustrate particle-size distribution. These three soils have mostly sand in the upper part (80 to 95 percent sand) but below a depth of about 30 to 34 inches, sand content drops to 2 to 15 percent and clay content jumps to as much as 60 percent. This forms a restrictive feature in the soil called an abrupt textural change (see table 20). An abrupt textural change can limit root penetration and also water movement through the soil. This can cause problems for some uses of the soils that require good drainage and no perched water within the soil. An abrupt textural change is a limitation in areas outside of the park boundary used for urban development. It also can cause significant lateral subsurface movement of water through these landscapes because the rapid permeability of the sands results in water saturation and flow above the clay. Landforms with Kellogg, Allendale, and Ashwabab soils often show upwelling ground water at the toe of slopes, particularly where the shape across and downslope is concave.

Till

Till is soil parent material transported, ground up, and subsequently deposited by ice. It is dominantly unsorted and unstratified material deposited directly by a glacier without subsequent reworking by meltwater. It consists of a heterogeneous mixture of clay, silt, sand, gravel, cobbles, stones, and boulders. Till may have rock fragments of various lithologies that are imbedded within a finer matrix that can range from clay to sand (USDA, 2006). The rock fragments generally are angular but can also be subrounded or rounded. The composition of the till depends on the geologic formations over which the ice passed before the till was deposited. The material in the lower part of soils derived from till may be relatively unchanged from when it was deposited by moving water, ice, or wind. The composition of till affects the properties of the soils that form from it. Some of the soil properties affected by till are kind and amount of rock fragments, color, texture, mineralogy, and pH.

Different tills are on different landforms, and different soils are associated with the landforms. The common tills in the park were deposited on *till plains*, *ground moraines*, *end moraines*, or *disintegration moraines*.

Till plains are extensive, flat to gently undulating areas underlain predominantly by till and bounded on the distal end by subordinate recessional or end moraines (USDA-NRCS, National Soil Survey Handbook). Sedgewick soils are mapped on till plains and are derived from loamy alluvium over clayey till. These soils are very deep, are somewhat poorly drained, and are mapped on all the islands, except North Twin Island. Thickness of the loamy mantle ranges from 10 to 24 inches, and the clay content in the clayey till ranges from 35 to 90 percent. The volume of gravel ranges from 0 to 15 percent in the loamy mantle and typically ranges from 1 to 4 percent in the clayey till, but some individual pedons or subhorizons have no gravel. The volume of cobbles ranges from 0 to 2 percent throughout the profile. Carbonates occur within the control section. They are typically at a depth of 20 to 60 inches, but the depth ranges to 80 inches in some pedons. Allendale soils are in landscape positions similar to those of Sedgewick soils but they have a mantle 20 to 40 inches thick.

Large areas of Raspberry Island are identified as till plains. Portwing soils are the major till plain soils on the island. These soils are very deep and moderately well drained and occur on lake plains. They formed in clayey till and/or clayey lacustrine deposits modified by wave action over stratified loamy and/or sandy lacustrine deposits. Permeability is slow in the clayey till and moderate to rapid in the stratified substratum. Slope ranges from 2 to 6 percent. Native vegetation is mixed deciduous and coniferous forest. Raspberry Island is the only island that has never burned, been commercially logged, or been farmed.

A *ground moraine* is an extensive, low relief area of till that has an uneven or undulating surface and is commonly bounded on the distal end by a recessional moraine or an end moraine. The till of a ground moraine is a deposit of rock and mineral debris dragged along, in, on, or beneath a glacier and emplaced by different processes. In some areas the ground moraine consists of large, relatively flat till plains; in other areas the landscape is quite hilly (USDA-NRCS, 2006). This landform occurs throughout the entire Upper Peninsula.

An *end moraine* is a ridge-like accumulation that was produced at the outer margin of an actively flowing glacier at any given time. It is a moraine that has been deposited at the outer or lower end of a valley glacier (USDA, 2006).

A *disintegration moraine* has a drift topography characterized by chaotic mounds and pits that generally are randomly oriented. This random orientation was caused by collapse and flow as underlying stagnant ice melted. Slopes on disintegration moraines may be steep and unstable. This landform has used and unused stream courses and lake depressions interspersed with the morainic ridges. A disintegration moraine characteristically has numerous abrupt, lateral, and vertical changes between unconsolidated materials of differing physical characteristics (USDA, 2006).

Soils in the park on moraines include Munuscong, Iosco, Keweenaw, and Rubicon. Some of the moraines are derived from calcareous tills. These soils typically have calcium carbonates in the subsoil (see table 18). The tills are commonly over stratified lacustrine materials that were, in part, calcareous as well.

Table 17 displays the soil carbon content of the soils to a depth of 2 meters. Soil inorganic carbon (SIC) is carbon found in soil carbonates, usually as calcium carbonate layers in the soil or as clay-sized fractions throughout the soil. Carbonates in soils occur in areas where evaporation rates exceed precipitation, as is the case in most desert environments. The carbonates typically accumulated from carbonatic dust or from solution when wetter climates existed. In the area of the country in which the park is located, the SIC is associated with till and lacustrine materials that were calcareous. SIC is measured by treating the soil with HCl then measuring the evolved CO₂ with a manometer. It is reported in table 17 on a volumetric basis. Many of the park soils, based on a representative value of calcium carbonate weight, have carbon contents in the SIC that far exceed soil organic carbon in the soil's organic matter. For example, Sedgwick and Munuscong soils have about three times the amount of soil inorganic carbon as soil organic carbon. Wakeley soils have the highest amount of soil inorganic carbon of the soils in the park. The 44 kg/m² of SIC equates to 196 tons of carbon per acre.

It is difficult to consistently associate tills and soils to specific moraines since numerous advancements and retreats of the ice left a series of moraines that were often partially or completely destroyed. The ice varied in the distance travelled south with each advancement and retreat, and till and lacustrine deposits became mixed. Some soils may be on more than one landform due to the difficulties in consistently identifying the landforms and parent materials.

The Natural Resources Conservation Service has different terms for till. Many of these terms are associated with soils in the park in current soils data (March 2013) and are displayed in table 5.

Eolian Deposits

Eolian material, such as windblown sand, is a type of parent material. Windblown loess, another type of eolian parent material, consists mainly of silt-sized particles. During interglacial periods, strong directional winds deposited silts great distances from their lacustrine or outwash origin. Soils influenced by loess have a high silt content in the upper horizons, whereas soils influenced by eolian parent material have a high sand content. Windblown deposits buried till, outwash, and lacustrine deposits in areas of Apostle Islands NL. Table 15 shows the distribution of sand, silt, and clay in the soils.

Some soils on wooded and active dunes on beach ridges, such as Grayling, Meehan, and Wurtsmith, are comprised of sands. A beach ridge is a low, essentially continuous ridge of beach and dune material that was heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves, and occurs singly or as one of a series of approximately parallel deposits. The ridges are roughly parallel to the shoreline and represent successive positions of the advancing or rising shoreline. Many of the higher ridges are dunes that formed due to the prevailing winds along the lakes. The dunes are either active (moving and unvegetated) or stabilized. Eolian deposits may also be on lake terraces. The eolian soils in the park are mostly on the spit extending into Chequamegon Bay (Long Island) and on the southern tips of several islands, including Michigan, Outer, Otter, Bear, and North Twin.

Residuum

Soils are said to have residual parent material if they formed directly from underlying rocks or from an *in situ* plant (organic) source.

Rock residuum. Soils that formed in rock residuum may have the same general chemistry as the original rocks, depending on the degree of weathering that has occurred. Redrim, Deerton, and Brownstown soils are all on hillslopes and formed, in part, in residuum. These soils have sandy beach deposits over weathered sandstone bedrock. Redrim soils are shallow (depth to reddish brown sandstone is less than 20 inches). Brownstone soils have a sandy-skeletal mantle 20 to 40 inches thick over sandstone. Deerton soils have a sandy mantle 20 to 40 inches thick over sandstone. Most areas are forested with red maple, paper birch, yellow birch, bigtooth aspen, balsam fir, eastern hemlock, and northern white cedar.

Redrim, Deerton, and Brownstown soils formed, in part, in residuum and are generally on the northeastern edge of most of the islands and the southeastern edge of Stockton, Basswood, and Outer Islands. Brownstone soils are named for the sandstone that was mined in the park to build brownstone buildings. Between 1868 and 1898, four sites in the Apostle Islands hosted seven separate brownstone quarry operations. The quarries eventually closed because of national economic problems, changes in architectural tastes, and the development of new types of building materials (USDI-NPS, 2002). The light on Outer Island has a cut-brownstone foundation, made from the parent material of Deerton and Brownstown soils that are mapped 1 mile to the east of the light. During 2004 and 2005, an erosion-control project was implemented at Outer Island Light to stabilize the bluff, mapped as Udorthents. The base of the cliff was armored with a massive stone wall, and drainage on the station grounds was improved to prevent runoff from the eroding Udorthents on the clay bank (fig. 2).

Organic residuum. Many of the soils in the park formed largely from plant residuum. These soils are commonly in depressions on outwash plains, lake plains, or moraines. The depressions are typically kettles that were formed by the melting of a large, detached block of stagnant ice that had been wholly or partly buried in the drift. Kettles are depressions on outwash plains, moraines, and other drift deposits. They are typically steep-sided, bowl-shaped depressions with no surface drainage (closed depressions) and commonly contain a lake or swamp. Kettles range in depth from 1 foot to tens of feet and are as much as a few miles in diameter (USDA, 2006). The lower, wetter landscape position of depressions favors hydrophilic vegetation. Plants grow and die, but their decomposition is retarded by wetness and cold. The result is overall organic matter accumulation in place.

Loxley, Beseman, Dawson, Rifle, Lupton, Cathro, and Tawas soils are organic soils in depressional areas, on kettles, in drainageways, or in bogs. A bog is waterlogged, spongy ground consisting primarily of mosses and containing acidic, decaying vegetation (such as sphagnum, sedges, and heaths) that may develop into peat. The mineral soils in the surrounding uplands are generally derived from acid parent materials. The majority of the organic soils (all but Rifle) in Apostle Islands NL are mapped in depressions on disintegration moraines. Slopes range from 0 to 1 percent. Rifle soils occur in low-lying areas of the Julian Bay Tombolo trail (fig. 3). A tombolo is a sand bar, gravel bar, barrier beach, or swamp that connects an island to the mainland or to another island.

Some of the organic soils, such as Rifle and Loxley, are entirely composed of decaying plant material while some, such as Beseman and Dawson, consist of decaying plant material over till or outwash. Organic soils have chemical and physical properties related to the original plants from which they formed. For example, Loxley soils formed in herbaceous organic material, Dawson soils formed in sphagnum moss and herbaceous material, and Lupton soils formed in woody and herbaceous material (see table 5).

The content of soil organic carbon in each major soil for every map unit in the park is shown in table 17. Soil organic carbon (SOC) is carbon (C) in soil that originated



Figure 2.—Outer Island Light is mapped in an area of Morganlake loamy sand, 0 to 6 percent slopes. The Morganlake soil is a very deep, moderately well drained soil that formed in sandy outwash and in the underlying loamy glacial till on moraines. Permeability is moderately rapid or rapid in the sandy mantle and moderately slow or moderate in the till. The brownstone foundation of the lighthouse was quarried from one of the islands.

from a biological source, such as plants, animals, or micro-organisms. SOC makes up about one-half of the weight of soil organic matter. The term soil organic carbon refers only to the carbon occurring in soil organic matter material.

Lupton and Loxley soils have very high SOC levels because they lie in depressions or kettles on disintegration moraines, are saturated throughout the year, and have organic matter that decomposes very slowly. Loxley soils are mapped most extensively on Stockton Island; a large area is delineated in the north-central part of the island. These soils are also mapped in small areas on Michigan, Bear, Sandy, Rocky, and Devil's Islands. They are mapped in complex with Beseman and Dawson soils. Based on soil survey data (see table 17), Loxley soils have 181 kilograms per square meter (to a depth of 2 meters) of soil organic carbon. This amounts to about 805 tons per acre of stored carbon per acre of land that is 100 percent Loxley soils. In contrast, Sedgwick soils have only 10 kg/m² of soil organic carbon even though they lie on the landscape adjacent to Loxley soils, on till plains. The difference is due to the nature of

the alluvial parent material over clayey till of Sedgwick soils and the higher and drier landscape position.

Carbon is withdrawn from the atmosphere through plant growth, and carbon levels subsequently increase in the soil. This process is known as carbon sequestration. Soil carbon sequestration transfers CO₂ from the atmospheric CO₂ and CH₄ greenhouse gases to the soil.

One way SOC becomes sequestered is through a process called humification. In this process, soil organic matter (SOM), such as leaves, wood, roots, and animals, is decomposed and converted to humic substances. Humic substances are broadly defined products of organic matter decomposition that are relatively resistant to further microbial decomposition. Humic substances with a high content of carbon can persist in the soil for hundreds to thousands of years. Examples of humic substances are humic and fulvic acids and humins. Humification is a common process in the park soils occurring in depressions.



Figure 3.—The Tombolo trail traverses areas mapped as Rifle peat, 0 to 1 percent slopes. Rifle soils are very deep and very poorly drained and formed in organic deposits.

Water can transport both SOC and SIC in soil through the process of eluviation or illuviation. Eluviation is the lateral or downward movement of dissolved or suspended material in soil when rainfall exceeds evaporation. An illuviated zone is where the eluviated materials accumulate. Eluviation is a common soil-forming process in the sandy, humid, forested soils of Apostle Islands NL.

Soil carbon can also be buried. Burial of SOC occurs in different ways. Burial of carbon-containing soil layers limits the exposure of organic carbon to the atmosphere and microbial degradation, thus preserving that in the soil. Flooding can periodically bury and cover old soil surface horizons with new sediment, thus preserving the soil organic carbon.

Erosion is a natural process in soils. Removal of soil from one place often results in burial of soil in another place. Burial of soil horizons that contain soil organic matter sequesters that carbon in the soil. Burial of carbon by dunes or landslides along the bluffs is a common process in the park.

Alluvium

Alluvium is parent material deposited by running water. It can have different textures, depending on whether the water moves quickly or slowly. The types of rocks occurring in the source region of the streams and rivers also determine characteristics of the alluvium. Fast-moving water deposits gravel, cobbles, and sand. Slow-moving water leaves finer textured deposits (clay and silt) when sediments in the water settle out. In Apostle Islands NL, Meehan, Arnheim, and Moquah soils formed in recent alluvium on flood plains receiving deposits during the last 10,000 years (Holocene age). Meehan soils are associated with beaches on Long, Stockton, and Rocky Islands. Arnheim soils are mapped on Stockton, Outer, and Sand Islands and along the mainland. Moquah soils are mapped on the southern tip of the mainland unit of the park. Both Arnheim and Moquah soils are on flood plains that are frequently flooded and are of minor extent in the park.

Climate

Differences in climate can result in differences in soils. Temperature and moisture influence soil formation and are the two most commonly measured features of climate. Weathering is most active when soils are moist and warm because these soil conditions are conducive to rapid chemical reactions and increased biological activity in the soil. Cooler temperatures result in slower chemical reactions. While average temperatures and amounts of precipitation are important in determining soil properties, the extremes of climate in any given locale also play a major role in soil formation.

The climate in Apostle Islands NL is cool and humid. Present-day climate variations are the result of topography and relief and distance from the lakes. The general climate is uniform throughout the area, but microclimates are modified locally by the proximity to Lake Superior. Table 5 gives the mean annual precipitation in the park, and table 19 lists the occurrence of soil saturation or wetness (i.e., depth to water table) for each of the soils. Probable occurrences of flooding and ponding are also listed in table 19.

During periods of rainfall or snowmelt, water carrying dissolved or suspended solids moves through the soil in a process called leaching. Leaching becomes active with the onset of rainfall or snowmelt. Different temperatures and moisture amounts cause different patterns of weathering and leaching in the soil. Colder temperatures result in less chemical weathering. Soil that is frozen part of the year has decreased microbial growth and decreased vegetation. The colder temperatures, however, aid in mechanical weathering due to expansion as water freezes in the soil. Seasonal and daily changes in temperature affect moisture effectiveness, biological activity, rates of chemical reactions, and the kinds of vegetation. Fluctuations in temperature and moisture affect the rate of organic matter production, decomposition, and accumulation and the weathering of minerals.

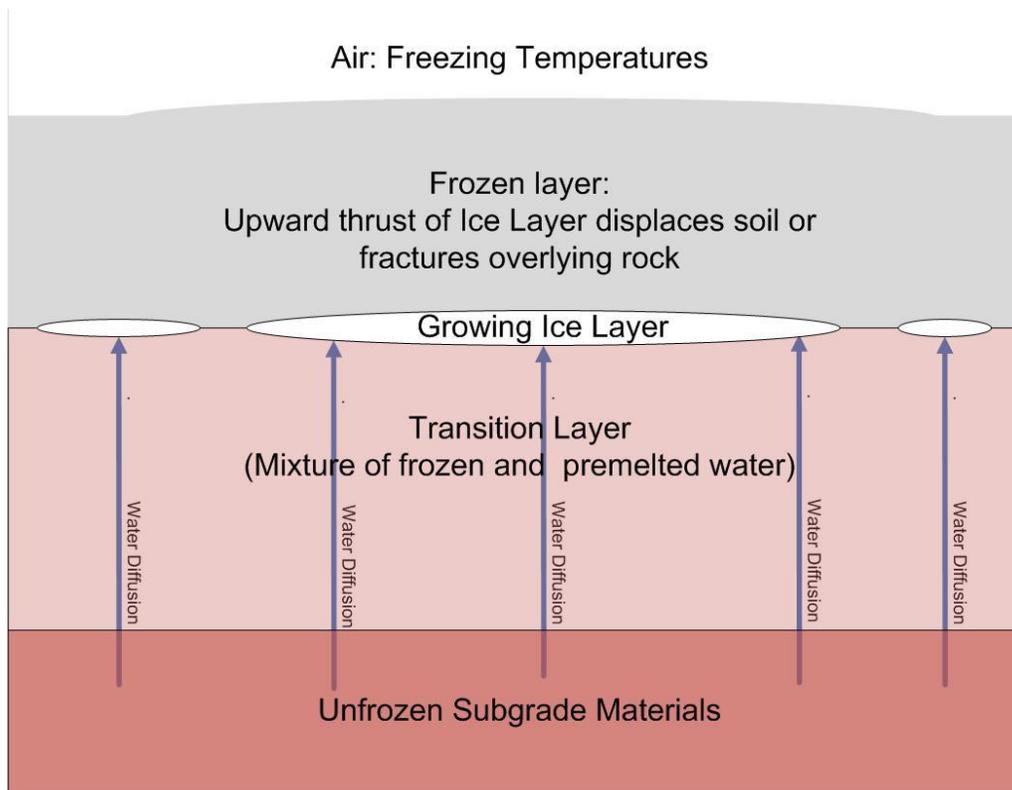


Figure 4.—Diagram illustrating ice lens formation in soils, which results in frost heave or frost action. (Image is from Williamborg [2009].)

Fluctuations in moisture and temperature can also result in frost action. Frost action (or frost heave) results from ice forming beneath the soil surface during atmospheric freezing conditions. The ice grows in the direction of heat loss, which is vertically toward the surface, starting at the freezing boundary in the soil. A water supply is needed to keep the ice crystals growing. The growing ice is restrained by overlying soil, which applies a load that limits its vertical growth and promotes the formation of a lens-shaped area of ice within the soil (fig. 4). The processes of frost heave were more intense during past glacial times than they are today.

A few of the soils in the park have a high potential for frost action, and many have a moderate potential. Frost heave is a natural pedogenic process that mixes and breaks up the soil surface. Table 20 lists the frost heave potential, or frost action, as low, moderate, or high. Some of the soils rated with a high potential for frost action in the park are Lerch, Sedgwick, Munuscong, Lupton, Cathro, Tawas, Arnheim, and Tonkey. These soils are saturated for much of the year, which drives the high frost action.

Frost heave can cause road potholes and cracked pavements and foundations. Table 9 lists the map units and soils that have a limitation for roads and streets due to frost action. This limitation results in higher maintenance costs for park roads and parking lots.

Organisms

Plants, animals, micro-organisms, and humans affect the formation and shape of soils. Plants capture solar energy via photosynthesis and transfer that energy to the soil, energy that is a fundamental driver of many soil processes. Abandoned animal burrows commonly are filled with loose material from the overlying horizons and

transmit water more readily than the surrounding undisturbed soil material. Fungi and bacteria are the primary organisms that decompose organic matter and add nutrients to the soil. Organisms decompose leaves and mix them with the upper part of the soil, resulting in the cycling of nutrients and energy back to vegetation. Micro-organisms affect chemical exchanges between roots and soil. Animals and micro-organisms mix soils and form burrows and pores.

Humans also mix the soil extensively with land management practices such as creating, maintaining, and using roads and trails. Soils in Apostle Islands NL were plowed and mixed for agriculture in the past.

The sand dunes of the park provide a distinctive environment for vegetation. Long roots and dense rhizomes of dune grasses seek out water and help hold the dunes together. Grass roots are fibrous and decompose, adding organic matter and nitrogen to the soil. Thistles, bearberries, and other drought-resistant plants also contribute to dune stability.

Plant roots also help to develop soil structure and aggregate stability. Beach grass and sand cherry are among the first plants to grow on young dunes. Dune grass, Lake Huron tansy, jack pine, and balsam poplar are also common in the dunes. These plants play an important role in dune development. They help build dunes by acting as obstacles that slow sand-laden wind and force it to drop the sand. If a strong wind succeeds in stripping plants from a dune, a bowl-shaped blowout may form in the exposed area. Some dunes migrate, pushed by the wind, and sometimes shifting sands bury trees.

Changes in lake levels coupled with wind and wave regimes drive the geomorphic changes that have influenced coastal vegetation and soil patterns in the park. Many rare or relict plant communities and specific animal species occur within some coastal-zone dune areas.

The large plants of the forested ecosystem of Apostle Islands NL affect soil formation. Besides the mechanical breaking of rocks by large tree roots, the trees capture energy and substance through photosynthesis and then, by the decomposition of plant residue, form organic-mineral complexes that are recycled many times within the ecosystem (Buol et al., 2011).

Differences in natural soil drainage and in parent material affect the composition of vegetation. Apostle Islands NL is located at the northern limit of the hemlock-white pine-northern hardwood forest and the southern limit of the boreal forest and is 96 percent forested (based on a coastal report). This forest type is a transitional area from the more homogeneously deciduous forests to the south and the coniferous boreal forests to the north. The park is dominated with white spruce (*Picea glauca*) and balsam fir (*Abies balsamea*). These plants are commonly mixed with white birch (*Betula papyrifera*), northern white cedar (*Thuja occidentalis*), white pine (*Pinus strobus*), balsam poplar (*Populus balsamifera*) and quaking aspen (*Populus tremuloides*).

On Madeline Island, Stockton Island, and several other islands, a unique bog-dune ecosystem exists near bays and enclosed lagoons. The bogs are made up of Loxley, Beseman, Dawson, and Rifle soils. The dunes commonly include Grayling and Wurtsmith soils on beach ridges and Psammaquents (such as Meehan soils) in depressions.

Apostle Islands NL is officially home to 5 plant species currently considered endangered in Wisconsin, including satiny willow (*Salix pellita*); 12 plant species currently considered threatened, including coastal sedge (*Carex exilis*), lenticular sedge (*Carex lenticularis*), Michaux's sedge (*Carex michauxiana*), drooping sedge (*Carex prasina*), broad-leaved twayblade (*Listera convallarioides*), flat-leaved willow (*Salix planifolia*), and narrow false oats (*Trisetum spicatum*); and 23 plant species of special concern (USDI-NPS, 2013)

Before human settlement, about 90 percent of the islands were covered by an upland mixed coniferous/hardwood forest dominated by hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), and white birch (*Betula papyrifera*). Boreal forest species include white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), tamarack (*Larix laricina*), white cedar (*Thuja occidentalis*), white birch (*Betula papyrifera*), and quaking aspen (*Populus tremuloides*). Additional plant communities include those of sandscapes (dunes, pine savannas, forests, and bogs), alder thickets and beaver flowages, clayscapes, rockscapes, and disturbed areas (Judziewicz and Koch, 1993).

Plant litter, whether leaves, needles, stems, or bark, helps prevent nutrient loss, conserves soil moisture, reduces raindrop impact, and limits frost penetration. Vegetation increases soil stability by protecting the surface against wind and water erosion.

Time

Time for parent material, climate, organisms, and topography to interact with the soil is also a soil-forming factor. Over time, soils exhibit features that reflect the interaction of other soil-forming factors. Recently deposited material, such as material deposited by a flood, exhibits no features from soil development activities and its properties are mostly inherited from the new material. The previous soil surface and underlying horizons become buried. The time clock resets for these soils. The different horizons in a soil profile and the degree of development can be directly related to time. Terraces above the active flood plain, while similar in origin to the flood plain, are older land surfaces of old abandoned flood plains and thus have soils with more horizon development.

Many soils in the park have little soil development because they have only been forming since the last glaciation. For example, Au Gres soils have a thin O horizon and a thin A horizon over pale brown sand. Where accumulation and translocation of organics, iron, aluminum, and clay have occurred, a colorful profile may form. Soils that have a colorful profile due to translocation include the Spodosols in the park (see table 22). Figure 1 is a profile of an Au Gres soil, a Spodosol, that has evident translocation.

Topography and Relief

Topography refers to the shape of the landscape, and relief refers to differences in elevation. The overall landscape in a park, whether it consists of pitted outwash plains, hummocky dune hills, or level lake terraces, is the result of erosion and depositional processes. These processes may have occurred in response to changes in climate, fluctuating sea levels, glaciations, tectonic activities, and/or isostatic rebound. (Isostatic rebound is the elevation of the land surface after the weight of glacial ice has been removed.) Cyclic periods of landscape stability and instability influence the types of soils that form. Development of the current landscape in the park occurred during the last glaciation, approximately 10,000 years ago. The age of soils can be estimated from the age of geomorphic surfaces, such as the age of till and outwash. The youngest geomorphic surfaces generally are flood plains. In areas where sandy alluvium has been deposited, hydric soils commonly are located (see table 4), soils sometimes flood, or ground water is relatively close to the surface. The locations of hydric soils are influenced by topography and relief. Hydric soils are also in low relief depressions and marshes. Most of these soils in Apostle Islands NL are in depressions on outwash, till, lake plains, and moraines.

Slope and aspect of the overall landscape can affect the moisture and temperature of the soil. Steep slopes on moraines, drumlins, or dunes facing the sun are warmer



Figure 5.—Udorthents, ravines and escarpments, 25 to 60 percent slopes, occur along the edges of the Mawikwe Bay shoreline.

than those facing away from the sun. Steep soils may be eroded and lose their surface horizons as they form. Steep soils along the lakeshore in the area of cliffs are mapped Udorthents and are shallow under forested vegetation (fig. 5). As a result, these soils may be shallower than the more nearly level ones that receive deposits from areas upslope, such as along some of the landslide areas of the park. Thicker, darker soils may be expected on the bottom land or in depressions on lake plains or moraines. Relief and topography also influence the location of prime farmland map units. Table 3 lists the map units considered prime farmland or farmland of local importance in the park. Generally, prime farmland soils are in level or gently rolling areas and are thick.

Processes of Soil Horizon Differentiation

A soil profile reflects the activities of the five soil-forming factors. A succession of layers or horizons is formed, extending from the surface down to the parent material. The horizons differ in one or more properties, such as thickness, color, texture, structure, consistence, porosity, and reaction (pH).

Several major processes are involved in the formation of soil horizons. In Apostle Islands National Lakeshore, the main soil-forming processes are illuviation, eluviation, podzolization, enrichment, decomposition, humification, and cumulization.

Illuviation is the movement of material *into* a horizon from another horizon, and *eluviation* is the movement of material *from* a portion of the soil or horizon. Formation of an argillic horizon (Alfisols) is an example of eluviation and illuviation and is

common in many soils in the park. This formation occurs as the clayey fine particles are translocated through the profile with the wetting front from water percolation, resulting in an accumulation of clay in the underlying B horizon.

Podzolization is another process of illuvation and eluviation in which aluminum and iron and/or organic matter are moved through, or *translocated* through, the profile. Podzolization includes the translocation of Al and Fe (due to the presence of acidic organic compounds such as humic and fulvic acids), resulting in the chelating of the metallic ions into organo-metallic complexes. The humus-metal complexes are concentrated into an *illuviated* horizon. Concentration of silica may occur in the layer *eluviated* (Buol et al., 2011). The acidic pine litter is important to podzol formation in northern soils. A large percentage of the soils in the park have podzolization as a major soil-forming process. These processes are identifiable in taxonomic classification (Spodosols) and by chemical and physical properties.

Enrichment is another process of additions to the soil and is often used in describing organic matter enrichment to the soil surface.

Decomposition is the breakdown of mineral and organic materials to weathering by-products.

Humification is the transformation of organic matter into humic substances. Humic substances are broadly defined products of organic matter decomposition that are relatively resistant to further microbial decomposition. Humification is a type of *decomposition*.

Cumulization is the process in which mineral particles are added to the soil. An example would be the cumulization of eolian material in the soils near Cat Island spit.

An excellent example soil for the discussion of soil-forming processes is the Au Gres series. Au Gres soils are mapped on the mainland unit of the park near Sand Bay. These soils are classified as Spodosols. Spodosols are extensive in the United States in cool, humid climates and in areas of quartz-rich sands, which may have fluctuating water tables. They also may have snow cover, which during a spring thaw flushes the soil with water. Most areas are covered by coniferous vegetation or a mix of hardwoods and conifers. Au Gres soils formed in sandy outwash deposits and occur mostly on outwash plains. The soil-forming processes discussed above are shown in italics in the following discussion.

In Au Gres soils (see figure 1), the 3 inches of surface soil has been *enriched* by organic material. Below the organic surface is a horizon that has been *eluviated*. This is evidenced by the light gray zone that extends to a depth of about 9 inches. This light-colored zone is called an albic horizon. Some of the gray material is in small tongue-shaped pockets that extend to deeper depths. Any organics that have been *decomposed* and *humified* in this *eluviated* zone have been moved to an *illuviation* zone. The *illuviation* zone has the darkest colors in the profile and also has a tongue shape at depth. A dark tongue of spodic material visible in the photograph, on the left side of the tape, extends to a depth of just over 1 foot. The illuviated material is called spodic material and forms a spodic horizon.

Soil profiles consist commonly of five major horizons—O, A, E, B, and C horizons. The O horizon consists of decomposing organic materials. The A horizon is a mineral horizon that has a content of organic matter that is greater than that of underlying horizons but less than that of overlying O horizons. The A horizon may be the surface layer if there is no O horizon.

The E horizon is a zone of maximum eluviation of materials. E horizons typically occur in wetter climates or under wetter soil conditions on certain landscapes and may overlie a B horizon. The E horizon is commonly pale or white because it has been stripped of all soil constituents that provide color.

The B horizon is a zone of accumulation of clay, iron, aluminum, or organic matter. B horizons are common in the park. Color plays an important part in distinguishing

B horizons. The B horizon is the horizon of maximum accumulation of dissolved or suspended materials, such as iron, clay, or organic materials.

The C horizon is in the bottom part of a soil profile (it cannot be in figure 1). It is little affected by the soil-forming processes and is most related to the parent material.

These processes and sequences of horizonation are commonly seen in some soils in the park classified as Spodosols. Spodosols, which are common in the park, include Tula, Kinross, Zeba, Iosco, Flink, Kellogg, Crowell, Sedgwick, Allendale, Gogebic, and Wakefield soils (see table 22).

Classification of the Soils

Soils are named and classified on the basis of physical and chemical properties in their horizons (layers). Color, texture, structure, and other properties of the soil to a depth of 2 meters are used to key the soil into a classification system. This system helps people to use soil information and also provides a common language for scientists.

Soils and their horizons differ from one another, depending on how and when they formed. Soil scientists use the five soil-forming factors to help predict where different soils may occur. The degree and expression of the soil horizons reflect the extent of interaction of the soil-forming factors with one or more of the soil-forming processes (Simonson, 1959).

When mapping soils, a soil scientist looks for areas with similar soil-forming factors to find similar soils. The properties of the soils are described. Soils with the same kind of properties are given taxonomic names. Soils are classified, mapped, and interpreted on the basis of various kinds of soil horizons and their arrangement. The distribution of soil orders corresponds with the general patterns of the soil-forming factors within the park.

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2010). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

ORDER. Soil taxonomy at the highest hierarchical level identifies 12 soil orders. The names for the orders and taxonomic soil properties relate to Greek, Latin, or other root words that reveal something about the soil. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Spodosol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. Sixty-four suborders are recognized at the next level of classification. The last syllable in the name of a suborder indicates the order. An example is Orthod (*Orth* meaning common, plus *od*, from Spodosol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. There are about 300 great groups. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplorthods (*Hapl*, meaning minimal horizonation, plus *Orthod*, the suborder of the Spodosols that is common).

SUBGROUP. There are more than 2,400 subgroups. Each great group has a typic subgroup. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Other subgroups are intergrades or extragrades.

Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplorthods.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties for family placement are those of horizons below a traditional agronomic plow depth. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is sandy-skeletal, mixed, frigid Typic Haplorthods.

SERIES. The soil series is the lowest category in the soil classification system. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Most parks are mapped to the series level. The names of soil series are selected by the soil scientists during the course of mapping. An example is the Brownstone series, which is classified as a sandy-skeletal, mixed, frigid Typic Haplorthod. The series names are commonly geographic place names or are coined.

Because of access limitations and soil variability, soils in some remote areas are classified at the great group or subgroup level.

Table 21 indicates the order, suborder, great group, subgroup, and family of the soil series in the park. Table 22 displays the classification as a key sorted by order.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

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

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate.....	6 to 9
High	9 to 12
Very high.....	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Coarse textured soil.** Sand or loamy sand.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.
- Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.
- Crown.** The upper part of a tree or shrub, including the living branches and their foliage.
- Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.
- Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.
- Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained*. These classes are defined in the “Soil Survey Manual.”
- Drainage, surface.** Runoff, or surface flow of water, from an area.
- Ecological site.** An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.
- Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.
- Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.
- Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building

up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

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

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

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

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

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

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential.

The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

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

LEP. See Linear extensibility percent.

Linear extensibility (LE). Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $1/3$ - or $1/10$ -bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Linear extensibility percent. Refers to the percent change in linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

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

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low.....	1.0 to 2.0 percent
Moderate.....	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high.....	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

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

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow.....	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow.....	0.2 to 0.6 inch
Moderate.....	0.6 inch to 2.0 inches
Moderately rapid.....	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid.....	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

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

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

- Plowpan.** A compacted layer formed in the soil directly below the plowed layer.
- Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.
- Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.
- Potential native plant community.** See Climax plant community.
- Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.
- Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.
- Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.
- Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.
- Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid.....	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid.....	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline.....	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline.....	9.1 and higher

- Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.
- Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.
- Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.
- Relief.** The elevations or inequalities of a land surface, considered collectively.
- Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.
- Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.
- Root zone.** The part of the soil that can be penetrated by plant roots.
- Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.
- Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

- Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.
- Sandstone.** Sedimentary rock containing dominantly sand-sized particles.
- Saprolite.** Unconsolidated residual material underlying the soil and grading to hard bedrock below.
- Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.
- Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.
- Series, soil.** A group of soils that have profiles that are almost alike. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.
- Shale.** Sedimentary rock formed by the hardening of a clay deposit.
- Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.
- Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.
- Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.
- Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.
- Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.
- Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.
- Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $\text{Ca}^{++} + \text{Mg}^{++}$. The degrees of sodicity and their respective ratios are:
- | | |
|---------------|----------------|
| Slight..... | less than 13:1 |
| Moderate..... | 13-30:1 |
| Strong | more than 30:1 |
- Sodium adsorption ratio (SAR).** A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.
- Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.
- Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.
- Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay.....	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Tables

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend

Map unit symbol and map unit name	Components in map unit	Percent of map unit
433292: Lerch-Herbster complex, 0 to 3 percent slopes-----	Lerch	50
	Herbster	35
	Munuscong	5
	Pickford	5
	Shag	5
433296: Cublake-Croswell-Ashwabay complex, 0 to 6 percent slopes-----	Cublake	35
	Croswell	20
	Ashwabay	20
	Rubicon	10
	Flink	5
	Sayner	5
	Sultz	5
433299: Cublake-Croswell-Ashwabay complex, 6 to 15 percent slopes-----	Cublake	35
	Croswell	20
	Ashwabay	20
	Rubicon	10
	Flink	5
	Sayner	5
	Sultz	5
433300: Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes-----	Kellogg	35
	Allendale	25
	Ashwabay	20
	Portwing	8
	Cublake	7
	Wakeley	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
433301: Kellogg-Allendale-Ashwabay complex, 6 to 15 percent slopes-----	Kellogg	40
	Allendale	25
	Ashwabay	20
	Portwing	7
	Cublake	5
	Wakeley	3
433304: Sedgwick-Munuscong complex, 0 to 6 percent slopes-----	Sedgwick	50
	Munuscong	30
	Allendale	8
	Superior	5
	Herbster	4
	Pickford	3
433305: Superior-Sedgwick complex, 0 to 6 percent slopes-----	Superior	50
	Sedgwick	30
	Allendale	10
	Portwing	5
	Munuscong	3
	Herbster	2
433309: Superior-Sedgwick complex, 6 to 15 percent slopes-----	Superior	50
	Sedgwick	30
	Kellogg	10
	Cornucopia	5
	Allendale	3
	Lerch	2
433310: Sultz-Ashwabay-Rubicon complex, 15 to 45 percent slopes-----	Sultz	35
	Ashwabay	25
	Rubicon	20
	Sayner	10
	Cublake	5
	Manistee	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
433314: Manistee-Kellogg-Ashwabay complex, 15 to 45 percent slopes-----	Manistee	40
	Kellogg	30
	Ashwabay	20
	Superior	4
	Cornucopia	3
	Sultz	3
433326: Rubicon sand, 0 to 6 percent slopes-----	Rubicon	85
	Croswell	5
	Karlin	5
	Sayner	3
	Sultz	2
433379: Allendale loamy fine sand, 0 to 3 percent slopes-----	Allendale	80
	Kellogg	6
	Flink	5
	Wakeley	5
	Herbster	2
	Sedgwick	2
433515: Lupton, Cathro, and Tawas soils, 0 to 1 percent slopes-----	Lupton	40
	Cathro	30
	Tawas	25
	Seelyeville	5
433572: Portwing-Herbster complex, 0 to 6 percent slopes-----	Portwing	50
	Herbster	30
	Cornucopia	5
	Lerch	5
	Sanborg	3
	Sedgwick	3
	Allendale	2
	Badriver	2

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
433573: Cornucopia silt loam, 6 to 15 percent slopes-----	Cornucopia	80
	Manistee	5
	Odanah	5
	Portwing	5
	Superior	5
433582: Crowell sand, 0 to 6 percent slopes-----	Crowell	82
	Ashwabay	5
	Au Gres	5
	Cublake	5
	Rubicon	3
433599: Annalake fine sandy loam, lake terrace, 2 to 6 percent slopes-----	Annalake	85
	Alcona	5
	Robago	5
	Cublake	3
	Neconish	2
433600: Annalake fine sandy loam, lake terrace, 6 to 15 percent slopes-----	Annalake	80
	Alcona	5
	Karlin	5
	Neconish	5
	Robago	5
433671: Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded-----	Arnheim	85
	Dechamps	10
	Moquah	5
433676: Redrim very cobbly sand, 0 to 6 percent slopes, very stony-----	Redrim	85
	Brownstone	5
	Deerton	5
	Abbaye	3
	Zeba	2

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
433679: Lapoin loam, 0 to 6 percent slopes-----	Lapoin	85
	Abbaye	8
	Brownstone	4
	Zeba	3
433686: Zeba sandy loam, 0 to 6 percent slopes, very stony-----	Zeba	90
	Abbaye	5
	Deerton	5
433729: Sultz sand, 0 to 6 percent slopes-----	Sultz	85
	Cublake	5
	Karlin	5
	Rubicon	5
433739: Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded-----	Moquah	85
	Dechamps	10
	Arnheim	5
433771: Beaches, 2 to 12 percent slopes-----	Beaches	97
	Psammaquents	3
433802: Udorthents, ravines and escarpments, 25 to 60 percent slopes-----	Udorthents, ravines and escarpments	85
	Alcona	5
	Moquah	5
	Odanah	5
452739: Water-----	Water	100
452765: Abbaye-Lapoin complex, 0 to 6 percent slopes-----	Abbaye	55
	Lapoin	40
	Zeba	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1383557: Au Gres loamy sand, 0 to 3 percent slopes-----	Au Gres	85
	Croswell	5
	Kinross	5
	Flink	3
	Chinwhisker	2
1383580: Loxley, Beseman, and Dawson soils, 0 to 1 percent slopes-----	Loxley	40
	Beseman	30
	Dawson	28
	Uskabwanka	2
1383581: Rifle peat, 0 to 1 percent slopes-----	Rifle	90
	Dawson	5
	Loxley	5
1383603: Cornucopia silt loam, 15 to 45 percent slopes-----	Cornucopia	80
	Manistee	5
	Moquah	5
	Odanah	5
	Portwing	5
1383658: Deerton-Brownstone complex, 0 to 6 percent slopes, very stony-----	Deerton	50
	Brownstone	40
	Redrim	5
	Zeba	3
	Abbaye	2
1383660: Deerton-Brownstone complex, 6 to 15 percent slopes, very stony-----	Deerton	50
	Brownstone	40
	Redrim	5
	Abbaye	3
	Zeba	2

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1383662: Abbaye loamy sand, 6 to 15 percent slopes-----	Abbaye	90
	Deerton	5
	Zeba	5
1383665: Allendale-Wakeley-Kinross complex, 0 to 6 percent slopes-----	Allendale	35
	Wakeley	30
	Kinross	20
	Flink	5
	Sedgwick	5
	Tawas	5
1383960: Flink sand, 0 to 3 percent slopes-----	Flink	75
	Allendale	5
	Au Gres	5
	Cublake	5
	Kinross	5
	Robago	5
1444357: Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded-----	Arnheim	85
	Dechamps	10
	Moquah	5
1444359: Beaches, 2 to 12 percent slopes-----	Beaches	97
	Psammaquents	3
1444367: Udorthents, ravines and escarpments, 25 to 60 percent slopes-----	Udorthents, ravines and escarpments	85
	Alcona	5
	Moquah	5
	Odanah	5
1444378: Wakefield fine sandy loam, 1 to 6 percent slopes, stony-----	Wakefield	85
	Tula	10
	Morganlake	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1444379: Wakefield fine sandy loam, 6 to 18 percent slopes, stony-----	Wakefield	85
	Morganlake	5
	Odanah	5
	Tula	5
1444388: Allendale loamy fine sand, 0 to 3 percent slopes-----	Allendale	80
	Kellogg	6
	Flink	5
	Wakeley	5
	Herbster	2
	Sedgwick	2
1444402: Tonkey sandy loam, 0 to 2 percent slopes-----	Tonkey	90
	Robago	6
	Shag	4
1444410: Tula fine sandy loam, 1 to 6 percent slopes, stony-----	Tula	80
	Gogebic	10
	Pleine	5
	Iosco	3
	Herbster	2
1444414: Lupton, Cathro, and Tawas soils, 0 to 1 percent slopes-----	Lupton	40
	Cathro	30
	Tawas	25
	Seelyeville	5
1444425: Lerch-Herbster complex, 0 to 3 percent slopes-----	Lerch	50
	Herbster	35
	Munuscong	5
	Pickford	5
	Shag	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1444426: Portwing-Herbster complex, 0 to 6 percent slopes-----	Portwing	50
	Herbster	30
	Cornucopia	5
	Lerch	5
	Sanborg	3
	Sedgwick	3
	Allendale	2
	Badriver	2
1444427: Cornucopia silt loam, 6 to 15 percent slopes-----	Cornucopia	80
	Manistee	5
	Odanah	5
	Portwing	5
	Superior	5
1444428: Cornucopia silt loam, 15 to 45 percent slopes-----	Cornucopia	80
	Manistee	5
	Moquah	5
	Odanah	5
	Portwing	5
1444431: Crowell sand, 0 to 6 percent slopes-----	Crowell	82
	Ashwabay	5
	Au Gres	5
	Cublake	5
	Rubicon	3
1444432: Gogebic fine sandy loam, 1 to 6 percent slopes, very stony-----	Gogebic	85
	Tula	10
	Morganlake	5
1444435: Iosco loamy sand, 0 to 4 percent slopes-----	Iosco	85
	Allendale	5
	Morganlake	5
	Tonkey	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1444457: Redrim very cobbly sand, 0 to 6 percent slopes, very stony-----	Redrim	85
	Brownstone	5
	Deerton	5
	Abbaye	3
	Zeba	2
1444459: Zeba sandy loam, 0 to 6 percent slopes, very stony-----	Zeba	90
	Abbaye	5
	Deerton	5
1444460: Abbaye-Lapoin complex, 0 to 6 percent slopes-----	Abbaye	55
	Lapoin	40
	Zeba	5
1444461: Abbaye-Zeba complex, 0 to 6 percent slopes, very stony-----	Abbaye	55
	Zeba	40
	Lapoin	5
1444477: Cublake-Croswell-Ashwabay complex, 0 to 6 percent slopes-----	Cublake	35
	Croswell	20
	Ashwabay	20
	Rubicon	10
	Flink	5
	Sayner	5
	Sultz	5
1444478: Cublake-Croswell-Ashwabay complex, 6 to 15 percent slopes-----	Cublake	35
	Croswell	20
	Ashwabay	20
	Rubicon	10
	Flink	5
	Sayner	5
	Sultz	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1444479: Morganlake loamy sand, 0 to 6 percent slopes-----	Morganlake	85
	Iosco	5
	Kellogg	5
	Menominee	5
1444480: Morganlake loamy sand, 6 to 15 percent slopes-----	Morganlake	85
	Iosco	5
	Kellogg	5
	Menominee	5
1444481: Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes-----	Kellogg	35
	Allendale	25
	Ashwabay	20
	Portwing	8
	Cublake	7
	Wakeley	5
1444482: Kellogg-Allendale-Ashwabay complex, 0 to 15 percent slopes-----	Kellogg	40
	Allendale	25
	Ashwabay	20
	Portwing	7
	Cublake	5
	Wakeley	3
1444486: Sedgwick-Munuscong complex, 0 to 6 percent slopes-----	Sedgwick	50
	Munuscong	30
	Allendale	8
	Superior	5
	Herbster	4
	Pickford	3

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1444487: Superior-Sedgwick complex, 0 to 6 percent slopes-----	Superior	50
	Sedgwick	30
	Allendale	10
	Portwing	5
	Munuscong	3
	Herbster	2
1444488: Superior-Sedgwick complex, 6 to 15 percent slopes-----	Superior	50
	Sedgwick	30
	Kellogg	10
	Cornucopia	5
	Allendale	3
	Lerch	2
1444489: Sultz-Ashwabay-Rubicon complex, 15 to 45 percent slopes-----	Sultz	35
	Ashwabay	25
	Rubicon	20
	Sayner	10
	Cublake	5
	Manistee	5
1444492: Manistee-Kellogg-Ashwabay complex, 15 to 45 percent slopes-----	Manistee	40
	Kellogg	30
	Ashwabay	20
	Superior	4
	Cornucopia	3
	Sultz	3
1444506: Keweenaw, stony-Rubicon complex, 0 to 6 percent slopes-----	Keweenaw	60
	Rubicon	30
	Cublake	10
1444507: Keweenaw, stony-Rubicon complex, 6 to 15 percent slopes-----	Keweenaw	60
	Rubicon	30
	Cublake	10

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1444585: Meehan sand, beaches, 0 to 2 percent slopes-----	Meehan, beaches	90
	Newson, beaches	5
	Wurtsmith, beaches	5
1444586: Wurtsmith sand, beaches, 0 to 3 percent slopes-----	Wurtsmith, beaches	90
	Grayling, beaches	5
	Meehan, beaches	5
1444587: Grayling sand, beaches, 2 to 12 percent slopes-----	Grayling, beaches	95
	Wurtsmith, beaches	5
1529830: Meehan sand, beaches, 0 to 2 percent slopes-----	Meehan, beaches	90
	Newson, beaches	5
	Wurtsmith, beaches	5
1700372: Loxley, Beseman, and Dawson soils, 0 to 1 percent slopes-----	Loxley	40
	Beseman	30
	Dawson	28
	Uskabwanka	2
1700373: Rifle peat, 0 to 1 percent slopes-----	Rifle	90
	Dawson	5
	Loxley	5
1700374: Allendale-Wakeley-Kinross complex, 0 to 6 percent slopes-----	Allendale	35
	Wakeley	30
	Kinross	20
	Flink	5
	Sedgwick	5
	Tawas	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 1.—Soil Legend—Continued

Map unit symbol and map unit name	Components in map unit	Percent of map unit
1702605: Menominee loamy sand, 15 to 30 percent slopes-----	Menominee	85
	Ashwabay	10
	Morganlake	5
1702606: Deerton-Brownstone complex, 0 to 6 percent slopes, very stony-----	Deerton	50
	Brownstone	40
	Redrim	5
	Zeba	3
	Abbaye	2
1702607: Deerton-Brownstone complex, 6 to 15 percent slopes, very stony-----	Deerton	50
	Brownstone	40
	Redrim	5
	Abbaye	3
	Zeba	2
1702608: Abbaye loamy sand, 6 to 15 percent slopes-----	Abbaye	90
	Deerton	5
	Zeba	5
1711685: Cublake-Keweenaw, stony complex, 0 to 6 percent slopes-----	Cublake	50
	Keweenaw	30
	Annalake	10
	Flink	5
	Gogebic	5

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 2.—Land Capability Classification

(Land capability classification is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. Only the soils suitable for cultivation are listed. Capability is given for nonirrigated areas)

Map unit symbol and component name	Land capability
433292:	
Lerch-----	6w
Herbster-----	3w
433296:	
Cublake-----	4s
Croswell-----	4s
Ashwabay-----	4s
433299:	
Cublake-----	6s
Croswell-----	6s
Ashwabay-----	6s
433300:	
Kellogg-----	3s
Allendale-----	3w
Ashwabay-----	4s
433301:	
Kellogg-----	4s
Allendale-----	3w
Ashwabay-----	6s
433304:	
Sedgwick-----	3w
Munuscong-----	6w
433305:	
Superior-----	3e
Sedgwick-----	3w
433309:	
Superior-----	4e
Sedgwick-----	3w
433310:	
Sultz-----	7s
Ashwabay-----	7s
Rubicon-----	7s

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
433314: Manistee-----	7s
Kellogg-----	7s
Ashwabay-----	7s
433326: Rubicon-----	4s
433379: Allendale-----	3w
433515: Lupton-----	7w
Cathro-----	7w
Tawas-----	7w
433572: Portwing-----	3e
Herbster-----	3w
433573: Cornucopia-----	4e
433582: Croswell-----	4s
433599: Annalake-----	2e
433600: Annalake-----	3e
433671: Arnheim-----	7w
433676: Redrim-----	7s
433679: Lapoin-----	3e
433686: Zeba-----	4s
433729: Sultz-----	4s
433739: Moquah-----	4w
433802: Udorthents, ravines and escarpments-----	7e
452765: Abbaye-----	3e
Lapoin-----	3e

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1383557: Au Gres-----	4w
1383580: Loxley-----	7w
Beseman-----	7w
Dawson-----	7w
1383581: Rifle-----	7w
1383603: Cornucopia-----	7e
1383658: Deerton-----	6s
Brownstone-----	6s
1383660: Deerton-----	7s
Brownstone-----	7s
1383662: Abbaye-----	4e
1383665: Allendale-----	3w
Wakeley-----	6w
Kinross-----	6w
1383960: Flink-----	3w
1444357: Arnheim-----	7w
1444367: Udorthents, ravines and escarpments-----	7e
1444378: Wakefield-----	2e
1444379: Wakefield-----	3e
1444388: Allendale-----	3w
1444402: Tonkey-----	6w
1444410: Tula-----	2w

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1444414:	
Lupton-----	7w
Cathro-----	7w
Tawas-----	7w
1444425:	
Lerch-----	6w
Herbster-----	3w
1444426:	
Portwing-----	3e
Herbster-----	3w
1444427:	
Cornucopia-----	4e
1444428:	
Cornucopia-----	7e
1444431:	
Croswell-----	4s
1444432:	
Gogebic-----	4s
1444435:	
Iosco-----	3w
1444457:	
Redrim-----	7s
1444459:	
Zeba-----	4s
1444460:	
Abbaye-----	3e
Lapoin-----	3e
1444461:	
Abbaye-----	4s
Zeba-----	4s
1444477:	
Cublake-----	4s
Croswell-----	4s
Ashwabay-----	4s
1444478:	
Cublake-----	6s
Croswell-----	6s
Ashwabay-----	6s

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1444479: Morganlake-----	3s
1444480: Morganlake-----	3e
1444481: Kellogg-----	3s
Allendale-----	3w
Ashwabay-----	4s
1444482: Kellogg-----	4s
Allendale-----	3w
Ashwabay-----	6s
1444486: Sedgwick-----	3w
Munuscong-----	6w
1444487: Superior-----	3e
Sedgwick-----	3w
1444488: Superior-----	4e
Sedgwick-----	3w
1444489: Sultz-----	7s
Ashwabay-----	7s
Rubicon-----	7s
1444492: Manistee-----	7s
Kellogg-----	7s
Ashwabay-----	7s
1444506: Keweenaw-----	3s
Rubicon-----	4s
1444507: Keweenaw-----	4s
Rubicon-----	6s
1444585: Meehan, beaches-----	4w

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 2.-Land Capability Classification-Continued

Map unit symbol and component name	Land capability
1444586: Wurtsmith, beaches-----	4s
1444587: Grayling, beaches-----	6s
1529830: Meehan, beaches-----	4w
1700372: Loxley-----	7w
Beseman-----	7w
Dawson-----	7w
1700373: Rifle-----	7w
1700374: Allendale-----	3w
Wakeley-----	6w
Kinross-----	6w
1702605: Menominee-----	6s
1702606: Deerton-----	6s
Brownstone-----	6s
1702607: Deerton-----	7s
Brownstone-----	7s
1702608: Abbaye-----	4e
1711685: Cublake-----	4s
Keweenaw-----	3s

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 3.—Prime and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are indicated in the column "Farmland classification")

Map unit symbol	Map unit name	Farmland classification
433305	Superior-Sedgwick complex, 0 to 6 percent slopes	Farmland of statewide importance
433572	Portwing-Herbster complex, 0 to 6 percent slopes	Farmland of statewide importance
433599	Annalake fine sandy loam, lake terrace, 2 to 6 percent slopes	All areas are prime farmland
433600	Annalake fine sandy loam, lake terrace, 6 to 15 percent slopes	Farmland of statewide importance
1444378	Wakefield fine sandy loam, 1 to 6 percent slopes, stony	All areas are prime farmland
1444402	Tonkey sandy loam, 0 to 2 percent slopes	Prime farmland if drained
1444410	Tula fine sandy loam, 1 to 6 percent slopes, stony	Prime farmland if drained
1444426	Portwing-Herbster complex, 0 to 6 percent slopes	Farmland of statewide importance
1444432	Gogebic fine sandy loam, 1 to 6 percent slopes, very stony	All areas are prime farmland
1444487	Superior-Sedgwick complex, 0 to 6 percent slopes	Farmland of statewide importance

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 4.-Hydric Soils

(This report lists only those map unit components that are rated as hydric. Definitions of hydric criteria codes are included at the end of the report)

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
433292: Lerch-Herbster complex, 0 to 3 percent slopes	Lerch	50	lake plains, till plains	2B3, 3	Yes	No	Yes
	Munuscong	5	ground moraines, lake plains	2B3, 3	Yes	No	Yes
	Pickford	5	depressions, drainageways	2B3, 3	Yes	No	Yes
	Shag	5	depressions, drainageways	3, 2B3	Yes	No	Yes
433300: Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes	Wakeley	5	drainageways, depressions	3, 2B3	Yes	No	Yes
433301: Kellogg-Allendale-Ashwabay complex, 6 to 15 percent slopes	Wakeley	3	drainageways, depressions	2B3, 3	Yes	No	Yes
433304: Sedgwick-Munuscong complex, 0 to 6 percent slopes	Munuscong	30	lake plains, ground moraines	3, 2B3	Yes	No	Yes
	Pickford	3	depressions, drainageways	3, 2B3	Yes	No	Yes
433305: Superior-Sedgwick complex, 0 to 6 percent slopes	Munuscong	3	drainageways, depressions	3, 2B3	Yes	No	Yes
433309: Superior-Sedgwick complex, 6 to 15 percent slopes	Lerch	2	drainageways, depressions	3, 2B3	Yes	No	Yes
433379: Allendale loamy fine sand, 0 to 3 percent slopes	Wakeley	5	depressions, drainageways	3, 2B3	Yes	No	Yes

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
433515: Lupton, Cathro, and Tawas soils, 0 to 1 percent slopes	Lupton	40	depressions on disintegration moraines	3, 1	No	No	Yes
	Cathro	30	depressions on disintegration moraines	1, 3	No	No	Yes
	Tawas	25	depressions on disintegration moraines	3, 1	No	No	Yes
	Seelyeville	5	depressions on outwash plains, depressions on lake plains	3, 1	No	No	Yes
433572: Portwing-Herbster complex, 0 to 6 percent slopes	Lerch	5	depressions on till plains, drainageways on till plains	2B3, 3	Yes	No	Yes
433671: Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded	Arnheim	85	flood plains	4, 3, 2B3	Yes	Yes	Yes
433739: Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded	Arnheim	5	flood plains	3, 4, 2B3	Yes	Yes	Yes
433771: Beaches, 2 to 12 percent slopes	Psammaquents	3	depressions	2B2, 3	Yes	No	Yes
1383557: Au Gres loamy sand, 0 to 3 percent slopes	Kinross	5	depressions, drainageways	2B3, 3	Yes	No	Yes
1383580: Loxley, Beseman, and Dawson soils, 0 to 1 percent slopes	Loxley	40	depressions on disintegration moraines	3, 1	No	No	Yes
	Beseman	30	depressions on disintegration moraines	3, 1	No	No	Yes
	Dawson	28	depressions on disintegration moraines	3, 1	No	No	Yes
	Uskabwanka	2	depressions on disintegration moraines	1	No	No	No

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1383581: Rifle peat, 0 to 1 percent slopes	Rifle	90	depressions on moraines, depressions on outwash plains, depressions on lake plains	3, 1	No	No	Yes
	Dawson	5	depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, bogs on outwash plains	1, 3	No	No	Yes
	Loxley	5	depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, bogs on outwash plains	3, 1	No	No	Yes
1383665: Allendale-Wakeley-Kinross complex, 0 to 6 percent slopes	Wakeley	30	outwash plains, lake plains	2B3, 3	Yes	No	Yes
	Kinross	20	stream terraces, outwash plains, lake plains	3, 2B3	Yes	No	Yes
	Tawas	5	depressions	1, 3	No	No	Yes
1383960: Flink sand, 0 to 3 percent slopes	Kinross	5	drainageways, depressions	3, 2B3	Yes	No	Yes
1444357: Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded	Arnheim	85	flood plains	3, 2B3, 4	Yes	Yes	Yes

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1444359: Beaches, 2 to 12 percent slopes	Psammaquents	3	depressions	3, 2B2	Yes	No	Yes
1444388: Allendale loamy fine sand, 0 to 3 percent slopes	Wakeley	5	depressions, drainageways	3, 2B3	Yes	No	Yes
1444402: Tonkey sandy loam, 0 to 2 percent slopes	Tonkey	90	depressions on lake plains, depressions on outwash plains, drainageways on lake plains, drainageways on outwash plains	3, 2B3	Yes	No	Yes
	Shag	4	drainageways, depressions	2B3, 3	Yes	No	Yes
1444410: Tula fine sandy loam, 1 to 6 percent slopes, stony	Pleine	5	drainageways, depressions	2B3, 3	Yes	No	Yes
1444414: Lupton, Cathro, and Tawas soils, 0 to 1 percent slopes	Lupton	40	depressions on disintegration moraines	1, 3	No	No	Yes
	Cathro	30	depressions on disintegration moraines	1, 3	No	No	Yes
	Tawas	25	depressions on disintegration moraines	1, 3	No	No	Yes
	Seelyeville	5	depressions on outwash plains, depressions on lake plains	1, 3	No	No	Yes

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1444425: Lerch-Herbster complex, 0 to 3 percent slopes	Lerch	50	lake plains, till plains	2B3, 3	Yes	No	Yes
	Munuscong	5	ground moraines, lake plains	3, 2B3	Yes	No	Yes
	Pickford	5	depressions, drainageways	2B3, 3	Yes	No	Yes
	Shag	5	depressions, drainageways	2B3, 3	Yes	No	Yes
1444426: Portwing-Herbster complex, 0 to 6 percent slopes	Lerch	5	depressions on till plains, drainageways on till plains	2B3, 3	Yes	No	Yes
1444435: Iosco loamy sand, 0 to 4 percent slopes	Tonkey	5	drainageways, depressions	3, 2B3	Yes	No	Yes
1444481: Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes	Wakeley	5	drainageways, depressions	3, 2B3	Yes	No	Yes
1444482: Kellogg-Allendale-Ashwabay complex, 0 to 15 percent slopes	Wakeley	3	drainageways, depressions	3, 2B3	Yes	No	Yes
1444486: Sedgwick-Munuscong complex, 0 to 6 percent slopes	Munuscong	30	lake plains, ground moraines	3, 2B3	Yes	No	Yes
	Pickford	3	depressions, drainageways	3, 2B3	Yes	No	Yes
1444487: Superior-Sedgwick complex, 0 to 6 percent slopes	Munuscong	3	drainageways, depressions	3, 2B3	Yes	No	Yes
1444488: Superior-Sedgwick complex, 6 to 15 percent slopes	Lerch	2	drainageways, depressions	2B3, 3	Yes	No	Yes
1444585: Meehan sand, beaches, 0 to 2 percent slopes	Newson, beaches	5	depressions	2B2	Yes	No	No
1529830: Meehan sand, beaches, 0 to 2 percent slopes	Newson, beaches	5	depressions	2B2	Yes	No	No

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 4.—Hydric Soils—Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1700372: Loxley, Beseman, and Dawson soils, 0 to 1 percent slopes	Loxley	40	depressions on disintegration moraines	1, 3	No	No	Yes
	Beseman	30	depressions on disintegration moraines	1, 3	No	No	Yes
	Dawson	28	depressions on disintegration moraines	3, 1	No	No	Yes
	Uskabwanka	2	depressions on disintegration moraines	1	No	No	No
1700373: Rifle peat, 0 to 1 percent slopes	Rifle	90	depressions on moraines, depressions on outwash plains, depressions on lake plains	3, 1	No	No	Yes
	Dawson	5	depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, bogs on outwash plains	1, 3	No	No	Yes
	Loxley	5	depressions on lake plains, depressions on moraines, bogs on lake plains, bogs on moraines, depressions on outwash plains, bogs on outwash plains	3, 1	No	No	Yes

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 4.-Hydric Soils--Continued

Map unit symbol and map unit name	Component	Percent of map unit	Landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
1700374: Allendale-Wakeley-Kinross complex, 0 to 6 percent slopes	Wakeley	30	outwash plains, lake plains	3, 2B3	Yes	No	Yes
	Kinross	20	stream terraces, outwash plains, lake plains	3, 2B3	Yes	No	Yes
	Tawas	5	depressions	3, 1	No	No	Yes

Explanation of hydric criteria codes

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

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material

(Only major components are displayed in this report. Miscellaneous nonsoil components may not be included. Component percents may not add up to 100. MAP is the mean annual precipitation)

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
433292: Lerch-----	50	0-2	600-1099	28-33	Lake plain and till plain	Clayey till and/or clayey lacustrine deposits modified by wave action over loamy and/or sandy stratified lacustrine deposits
Herbster-----	35	0-3	600-1099	28-33	Till plain	Clayey till and underlying loamy and sandy stratified lacustrine deposits
433296: Cublake-----	35	0-6	600-1099	28-33	---	Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Ashwabay-----	20	0-6	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Croswell-----	20	0-6	600-1099	27-34	Lake plain, lake terrace, outwash plain, and stream terrace	Sandy glacial drift
433299: Cublake-----	35	6-15	600-1099	28-33	---	Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Ashwabay-----	20	6-15	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Croswell-----	20	6-12	600-1099	27-34	Lake plain, lake terrace, outwash plain, and stream terrace	Sandy glacial drift

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
433300: Kellogg-----	35	2-6	600-1401	27-32	Lake plain	Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Allendale-----	25	2-6	600-1699	27-34	Ground moraine, lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits
Ashwabay-----	20	2-6	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
433301: Kellogg-----	40	6-15	600-1401	27-32	Lake plain	Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Allendale-----	25	6-12	600-1699	27-34	Ground moraine, lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits
Ashwabay-----	20	6-15	850-1152	28-32	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
433304: Sedgwick-----	50	0-6	600-1001	28-33	Till plain	Loamy alluvium and underlying clayey till
Munuscong-----	30	0-2	600-1099	28-33	Ground moraine and lake plain	Loamy glaciofluvial deposits over calcareous clayey materials
433305: Superior-----	50	2-6	600-1099	28-33	Lake plain	Loamy water-laid deposits and underlying clayey lacustrine deposits
Sedgwick-----	30	0-3	600-1001	28-33	Till plain	Loamy alluvium and underlying clayey till

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
433309: Superior-----	50	6-15	600-1099	28-33	Lake plain	Loamy water-laid deposits and underlying clayey lacustrine deposits
Sedgwick-----	30	0-15	600-1001	28-33	Till plain	Loamy alluvium and underlying clayey till
433310: Sultz-----	35	15-45	699-1952	28-33	Lake plain, lake terrace, outwash plain, and outwash terrace	Sandy outwash underlain by stratified loamy or loamy and sandy alluvium or lacustrine deposits
Ashwabay-----	25	15-30	850-1152	28-32	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Rubicon-----	20	15-45	600-1401	27-34	Outwash plain	Sandy deposits
433314: Manistee-----	40	15-45	600-1401	27-34	Lake plain	Sandy lacustrine and outwash sediments underlain by clayey lacustrine deposits
Kellogg-----	30	15-30	600-1401	27-32	Lake terrace	Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Ashwabay-----	20	15-45	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
433326: Rubicon-----	85	0-6	600-1801	27-34	Outwash plain	Outwash sands
433379: Allendale-----	80	0-3	600-1699	27-34	Ground moraine, lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
433515: Lupton-----	40	0-1	669-1601	27-34	Depression on disintegration moraine	Herbaceous and woody organic material more than 51 inches thick
Cathro-----	30	0-1	600-1601	27-43	Depression on disintegration moraine	Herbaceous organic material 16 to 51 inches thick underlain by loamy deposits
Tawas-----	25	0-1	600-1601	27-35	Depression on disintegration moraine	Herbaceous organic material 16 to 51 inches thick over sandy deposits
433572: Portwing-----	50	2-6	600-1099	28-33	Till plain	Clayey till over underlying stratified loamy and sandy lacustrine deposits
Herbster-----	30	0-3	699-1099	28-33	Till plain	Clayey till and underlying loamy and sandy stratified lacustrine deposits
433573: Cornucopia-----	80	6-15	600-1099	28-33	Till plain	Clayey till and underlying stratified loamy and sandy lacustrine deposits
433582: Crowell-----	82	0-6	600-1470	27-34	Lake plain, lake terrace, outwash plain, and stream terrace	Sandy glacial drift
433599: Annalake-----	85	2-6	600-1949	28-33	Lake terrace	Stratified sandy and loamy glaciofluvial and glaciolacustrine deposits
433600: Annalake-----	80	6-15	600-1949	28-33	Lake terrace	Stratified sandy and loamy glaciofluvial and glaciolacustrine deposits

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
433671: Arnheim-----	85	0-1	600-1099	28-35	Flood plain	Loamy alluvium
433676: Redrim-----	85	0-6	600-1001	28-33	Hill	Sandy-skeletal beach deposits or residuum from sandstone, or both
433679: Lapoin-----	85	0-6	600-1001	28-33	Hill	Loamy alluvium and clayey till and underlying loamy till
433686: Zeba-----	90	0-6	600-1099	26-33	Hill	Loamy glacial drift underlain by sandstone bedrock
433729: Sultz-----	85	0-6	699-1952	28-33	Lake terrace	Sandy outwash underlain by stratified loamy or loamy and sandy alluvium or lacustrine deposits
433739: Moquah-----	85	0-3	699-1099	28-35	Flood plain	Loamy alluvium
433771: Beaches-----	97	2-12	---	---	---	---
433802: Udorthents, ravines and escarpments-----	85	35-60	---	---	---	---
452739. Water						
452765: Abbaye-----	55	0-6	600-1099	26-33	Hill	Till underlain by sandstone bedrock
Lapoin-----	40	0-6	600-1001	28-33	Hill	Loamy alluvium and clayey till and underlying loamy till
1383557: Au Gres-----	85	0-3	600-1801	27-34	Outwash plain	Sandy outwash
1383580: Loxley-----	40	0-1	600-1401	27-34	Depression on disintegration moraine	Herbaceous organic material more than 51 inches thick

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1383580: Beseman-----	30	0-1	600-1401	24-45	Depression on disintegration moraine	Herbaceous organic material 16 to 51 inches thick over loamy till
Dawson-----	28	0-1	600-1401	27-35	Depression on disintegration moraine	Sphagnum moss and herbaceous organic material 16 to 51 inches thick over sandy or sandy and gravelly deposits
1383581: Rifle-----	90	0-1	600-1099	28-33	Depression on moraine, depression on lake plain, and depression on outwash plain	Organic deposits more than 51 inches thick
1383603: Cornucopia-----	80	15-45	600-1099	28-33	Till plain	Clayey till and underlying stratified loamy and sandy lacustrine deposits
1383658: Deerton-----	50	0-6	600-1001	26-33	Hill	Sandy outwash beach deposits or sandy residuum from sandstone
Brownstone-----	40	0-6	600-1001	28-33	Hill	Sandy-skeletal beach deposits or residuum from sandstone, or both
1383660: Deerton-----	50	6-15	600-1001	26-33	Hill	Sandy outwash beach deposits or sandy residuum from sandstone
Brownstone-----	40	6-15	600-1001	28-33	Hill	Sandy-skeletal beach deposits or residuum from sandstone, or both
1383662: Abbaye-----	90	6-15	600-1099	26-33	Hill	Till underlain by sandstone bedrock
1383665: Allendale-----	35	0-6	600-1699	27-34	Ground moraine, lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1383665: Wakeley-----	30	0-2	600-1099	28-32	Lake plain and outwash plain	Sandy outwash and lacustrine material underlain by clayey lacustrine deposits
Kinross-----	20	0-2	600-1099	27-34	Lake plain, outwash plain, and stream terrace	Glaciofluvial material
1383960: Flink-----	75	0-3	600-1900	28-33	Lake plain, lake terrace, outwash plain, and outwash terrace	Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
1444357: Arnheim-----	85	0-1	600-1099	28-35	Flood plain	Loamy alluvium
1444359: Beaches-----	97	2-12	---	---	---	---
1444367: Udorthents, ravines and escarpments-----	85	35-60	---	---	---	---
1444378: Wakefield-----	85	1-6	1299-1601	26-33	Till plain	Modified loamy eolian deposits and underlying loamy till
1444379: Wakefield-----	85	6-18	1299-1601	26-33	Till plain	Modified loamy eolian deposits and underlying loamy till
1444388: Allendale-----	80	0-3	600-1699	27-34	Ground moraine, lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits
1444402: Tonkey-----	90	0-2	600-1099	28-30	Depression on lake plain and drainageway on lake plain	Stratified loamy and sandy glaciofluvial deposits
1444410: Tula-----	80	0-4	1299-1598	30-34	End moraine and ground moraine	Modified loamy eolian material and underlying loamy till

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1444414: Lupton-----	40	0-1	669-1601	27-34	Depression on disintegration moraine	Herbaceous and woody organic material more than 51 inches thick
Cathro-----	30	0-1	600-1601	27-43	Depression on disintegration moraine	Herbaceous organic material 16 to 51 inches thick underlain by loamy deposits
Tawas-----	25	0-1	600-1601	27-35	Depression on disintegration moraine	Herbaceous organic material 16 to 51 inches thick over sandy deposits
1444425: Lerch-----	50	0-2	600-1099	28-33	Lake plain and till plain	Clayey till and/or clayey lacustrine deposits modified by wave action over loamy and/or sandy stratified lacustrine deposits
Herbster-----	35	0-3	600-1099	28-33	Till plain	Clayey till and underlying loamy and sandy stratified lacustrine deposits
1444426: Portwing-----	50	2-6	600-1099	28-33	Till plain	Clayey till over underlying stratified loamy and sandy lacustrine deposits
Herbster-----	30	0-3	699-1099	28-33	Till plain	Clayey till and underlying loamy and sandy stratified lacustrine deposits
1444427: Cornucopia-----	80	6-15	600-1099	28-33	Till plain	Clayey till and underlying stratified loamy and sandy lacustrine deposits
1444428: Cornucopia-----	80	15-45	600-1099	28-33	Till plain	Clayey till and underlying stratified loamy and sandy lacustrine deposits

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1444431: Croswell-----	82	0-6	600-1470	27-34	Lake plain, lake terrace, outwash plain, and stream terrace	Sandy glacial drift
1444432: Gogebic-----	85	1-6	1299-1598	30-34	End moraine	Modified loamy eolian deposits and underlying loamy till
1444435: Iosco-----	85	0-4	600-1099	28-32	Ground moraine, lake plain, and outwash plain	Sandy lacustrine or outwash deposits overlying loamy lacustrine or till deposits
1444457: Redrim-----	85	0-6	600-1001	28-33	Hill	Sandy-skeletal beach deposits or residuum from sandstone, or both
1444459: Zeba-----	90	0-6	600-1099	26-33	Hill	Loamy glacial drift underlain by sandstone bedrock
1444460: Abbaye-----	55	0-6	600-1099	26-33	Hill	Till underlain by sandstone bedrock
Lapoin-----	40	0-6	600-1001	28-33	Hill	Loamy alluvium and clayey till and underlying loamy till
1444461: Abbaye-----	55	0-6	600-1099	26-33	Hill	Till underlain by sandstone bedrock
Zeba-----	40	0-6	600-1099	26-33	Hill	Loamy glacial drift underlain by sandstone bedrock
1444477: Cublake-----	35	0-6	600-1099	28-33	---	Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Ashwabay-----	20	0-6	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1444477: Crowell-----	20	0-6	600-1099	27-34	Lake plain, lake terrace, outwash plain, and stream terrace	Sandy glacial drift
1444478: Cublake-----	35	6-15	600-1099	28-33	---	Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Ashwabay-----	20	6-15	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Crowell-----	20	6-12	600-1099	27-34	Lake plain, lake terrace, outwash plain, and stream terrace	Sandy glacial drift
1444479: Morganlake-----	85	0-6	699-1099	28-33	Moraine	Sandy outwash and underlying loamy till
1444480: Morganlake-----	85	6-15	699-1099	28-33	Moraine	Sandy outwash and underlying loamy till
1444481: Kellogg-----	35	2-6	600-1401	27-32	Lake plain	Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Allendale-----	25	2-6	600-1699	27-34	Ground moraine lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits
Ashwabay-----	20	2-6	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1444482: Kellogg-----	40	6-15	600-1401	27-32	Lake plain	Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Allendale-----	25	6-12	600-1699	27-34	Ground moraine, lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits
Ashwabay-----	20	6-15	850-1152	28-32	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
1444486: Sedgwick-----	50	0-6	600-1001	28-33	Till plain	Loamy alluvium and underlying clayey till
Munuscong-----	30	0-2	600-1099	28-33	Ground moraine and lake plain	Loamy glaciofluvial deposits over calcareous clayey materials
1444487: Superior-----	50	2-6	600-1099	28-33	Lake plain	Loamy water-laid deposits and underlying clayey lacustrine deposits
Sedgwick-----	30	0-3	600-1001	28-33	Till plain	Loamy alluvium and underlying clayey till
1444488: Superior-----	50	6-15	600-1099	28-33	Lake plain	Loamy water-laid deposits and underlying clayey lacustrine deposits
Sedgwick-----	30	0-15	600-1001	28-33	Till plain	Loamy alluvium and underlying clayey till
1444489: Sultz-----	35	15-45	699-1952	28-33	Lake plain, lake terrace, outwash plain, and outwash terrace	Sandy outwash underlain by stratified loamy or loamy and sandy alluvium or lacustrine deposits

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1444489: Ashwabay-----	25	15-30	850-1152	28-32	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
Rubicon-----	20	15-45	600-1401	27-34	Outwash plain	Sandy deposits
1444492: Manistee-----	40	15-45	600-1401	27-34	Lake plain	Sandy lacustrine and outwash sediments underlain by clayey lacustrine deposits
Kellogg-----	30	15-30	600-1401	27-32	Lake terrace	Sandy lacustrine or outwash sediments and underlying clayey lacustrine deposits
Ashwabay-----	20	15-45	850-1152	28-33	Ground moraine, lake plain, and outwash plain	Sandy outwash or beach deposits underlain by clayey till or lacustrine deposits
1444506: Keweenaw-----	60	2-6	---	26-33	Disintegration moraine	Sandy till
Rubicon-----	30	0-6	600-1801	27-34	Disintegration moraine	Outwash sands
1444507: Keweenaw-----	60	6-15	---	26-33	Disintegration moraine	Sandy till
Rubicon-----	30	6-15	600-1801	27-34	Disintegration moraine	Outwash sands
1444585: Meehan, beaches----	90	0-2	669-1952	25-35	Beach ridge	Sandy alluvium
1444586: Wurtsmith, beaches-	90	0-3	600-1401	24-30	Beach ridge and dune	Sandy outwash and lacustrine deposits
1444587: Grayling, beaches--	95	2-12	600-1401	27-34	Beach ridge	Sandy deposits
1529830: Meehan, beaches----	90	0-2	669-1952	25-35	Beach ridge	Sandy alluvium

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1700372: Loxley-----	40	0-1	600-1401	27-34	Depression on disintegration moraine	Herbaceous organic material more than 51 inches thick
Beseman-----	30	0-1	600-1401	24-45	Depression on disintegration moraine	Herbaceous organic material 16 to 51 inches thick over loamy till
Dawson-----	28	0-1	600-1401	27-35	Depression on disintegration moraine	Sphagnum moss and herbaceous organic material 16 to 51 inches thick over sandy or sandy and gravelly deposits
1700373: Rifle-----	90	0-1	600-1099	28-33	Depression on moraine, depression on lake plain, and depression on outwash plain	Organic deposits more than 51 inches thick
1700374: Allendale-----	35	0-6	600-1699	27-34	Ground moraine, lake plain, lake terrace, and outwash plain	Sandy sediments and underlying clayey lacustrine or till deposits
Wakeley-----	30	0-2	600-1099	28-32	Lake plain and outwash plain	Sandy outwash and lacustrine material underlain by clayey lacustrine deposits
Kinross-----	20	0-2	600-1099	27-34	Lake plain, outwash plain, and stream terrace	Glaciofluvial material
1702605: Menominee-----	85	15-30	600-1099	28-32	End moraine, ground moraine, lake plain, and outwash plain	Sandy glaciofluvial material over loamy till or lacustrine sediments
1702606: Deerton-----	50	0-6	600-1001	26-33	Hill	Sandy outwash beach deposits or sandy residuum from sandstone

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 5.-Landform and Parent Material-Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landform	Parent material
	Pct	Pct	Ft	In		
1702606: Brownstone-----	40	0-6	600-1001	28-33	Hill	Sandy-skeletal beach deposits or residuum from sandstone, or both
1702607: Deerton-----	50	6-15	600-1001	26-33	Hill	Sandy outwash beach deposits or sandy residuum from sandstone
Brownstone-----	40	6-15	600-1001	28-33	Hill	Sandy-skeletal beach deposits or residuum from sandstone, or both
1702608: Abbaye-----	90	6-15	600-1099	26-33	Hill	Till underlain by sandstone bedrock
1711685: Cublake-----	50	0-6	600-1099	28-33	---	Sandy outwash underlain by stratified silty, loamy, and sandy glaciofluvial deposits
Keweenaw-----	30	2-6	600-1949	26-33	Disintegration moraine	Sandy till

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.75	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.75	Severe Low strength	1.00
Herbster-----	35	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Severe Low strength	1.00
433296: Cublake-----	35	Well suited		Well suited		Moderate Low strength	0.50
Croswell-----	20	Well suited		Well suited		Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Well suited		Moderate Low strength	0.50
433299: Cublake-----	35	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Croswell-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
433300: Kellogg-----	35	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Allendale-----	25	Well suited		Well suited		Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Well suited		Moderate Low strength	0.50
433301: Kellogg-----	40	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Allendale-----	25	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433304: Sedgwick-----	50	Well suited		Well suited		Moderate Low strength	0.50
Munuscong-----	30	Well suited		Well suited		Moderate Low strength	0.50
433305: Superior-----	50	Well suited		Well suited		Moderate Low strength	0.50
Sedgwick-----	30	Well suited		Well suited		Moderate Low strength	0.50
433309: Superior-----	50	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Sedgwick-----	30	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
433310: Sultz-----	35	Well suited		Unsuited Slope	1.00	Moderate Low strength	0.50
Ashwabay-----	25	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
Rubicon-----	20	Moderately suited Sandiness	0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
433314: Manistee-----	40	Well suited		Unsuited Slope	1.00	Moderate Low strength	0.50
Kellogg-----	30	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Unsuited Slope	1.00	Moderate Low strength	0.50
433326: Rubicon-----	85	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
433379: Allendale-----	80	Well suited		Well suited		Moderate Low strength	0.50
433515: Lupton-----	40	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
Cathro-----	30	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433515: Tawas-----	25	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
433572: Portwing-----	50	Poorly suited Stickiness; high plasticity index	0.75	Poorly suited Stickiness; high plasticity index	0.75	Severe Low strength	1.00
Herbster-----	30	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Severe Low strength	1.00
433573: Cornucopia-----	80	Poorly suited Stickiness; high plasticity index	0.75	Poorly suited Stickiness; high plasticity index Slope	0.75 0.50	Severe Low strength	1.00
433582: Croswell-----	82	Well suited		Well suited		Moderate Low strength	0.50
433599: Annalake-----	85	Well suited		Well suited		Moderate Low strength	0.50
433600: Annalake-----	80	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
433671: Arnheim-----	85	Well suited		Well suited		Severe Low strength	1.00
433676: Redrim-----	85	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
433679: Lapoin-----	85	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Severe Low strength	1.00
433686: Zeba-----	90	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
433729: Sultz-----	85	Well suited		Well suited		Moderate Low strength	0.50
433739: Moquah-----	85	Well suited		Well suited		Moderate Low strength	0.50
433771: Beaches-----	97	Not rated		Not rated		Not rated	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433802: Udorthents, ravines and escarpments-----	85	Not rated		Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated		Not rated	
452765: Abbaye-----	55	Well suited		Well suited		Severe Low strength	1.00
Lapoin-----	40	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Severe Low strength	1.00
1383557: Au Gres-----	85	Well suited		Well suited		Moderate Low strength	0.50
1383580: Loxley-----	40	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Beseman-----	30	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Dawson-----	28	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
1383581: Rifle-----	90	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
1383603: Cornucopia-----	80	Poorly suited Stickiness; high plasticity index	0.75	Unsuited Slope Stickiness; high plasticity index	1.00 0.75	Severe Low strength	1.00
1383658: Deerton-----	50	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
Brownstone-----	40	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Slight Strength	0.10
1383660: Deerton-----	50	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Slope Sandiness	0.50 0.50 0.50	Moderate Low strength	0.50
Brownstone-----	40	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Slight Strength	0.10

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383662: Abbaye-----	90	Well suited		Moderately suited Slope	0.50	Severe Low strength	1.00
1383665: Allendale-----	35	Well suited		Well suited		Moderate Low strength	0.50
Wakeley-----	30	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
Kinross-----	20	Well suited		Well suited		Severe Low strength	1.00
1383960: Flink-----	75	Well suited		Well suited		Moderate Low strength	0.50
1444357: Arnheim-----	85	Well suited		Well suited		Severe Low strength	1.00
1444359: Beaches-----	97	Not rated		Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
1444378: Wakefield-----	85	Well suited		Well suited		Severe Low strength	1.00
1444379: Wakefield-----	85	Well suited		Moderately suited Slope	0.50	Severe Low strength	1.00
1444388: Allendale-----	80	Well suited		Well suited		Moderate Low strength	0.50
1444402: Tonkey-----	90	Well suited		Well suited		Moderate Low strength	0.50
1444410: Tula-----	80	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
1444414: Lupton-----	40	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
Cathro-----	30	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
Tawas-----	25	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444425: Lerch-----	50	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.75	Poorly suited Stickiness; high plasticity index Wetness	0.75 0.75	Severe Low strength	1.00
Herbster-----	35	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Severe Low strength	1.00
1444426: Portwing-----	50	Poorly suited Stickiness; high plasticity index	0.75	Poorly suited Stickiness; high plasticity index	0.75	Severe Low strength	1.00
Herbster-----	30	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Severe Low strength	1.00
1444427: Cornucopia-----	80	Poorly suited Stickiness; high plasticity index	0.75	Poorly suited Stickiness; high plasticity index Slope	0.75 0.50	Severe Low strength	1.00
1444428: Cornucopia-----	80	Poorly suited Stickiness; high plasticity index	0.75	Unsuited Slope Stickiness; high plasticity index	1.00 0.75	Severe Low strength	1.00
1444431: Crowell-----	82	Well suited		Well suited		Moderate Low strength	0.50
1444432: Gogebic-----	85	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
1444435: Iosco-----	85	Well suited		Well suited		Moderate Low strength	0.50
1444457: Redrim-----	85	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
1444459: Zeba-----	90	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
1444460: Abbaye-----	55	Well suited		Well suited		Severe Low strength	1.00
Lapoin-----	40	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Severe Low strength	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444461: Abbaye-----	55	Well suited		Moderately suited Rock fragments	0.50	Severe Low strength	1.00
Zeba-----	40	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
1444477: Cublake-----	35	Well suited		Well suited		Moderate Low strength	0.50
Croswell-----	20	Well suited		Well suited		Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Well suited		Moderate Low strength	0.50
1444478: Cublake-----	35	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Croswell-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1444479: Morganlake-----	85	Well suited		Well suited		Moderate Low strength	0.50
1444480: Morganlake-----	85	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1444481: Kellogg-----	35	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Allendale-----	25	Well suited		Well suited		Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Well suited		Moderate Low strength	0.50
1444482: Kellogg-----	40	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Allendale-----	25	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1444486: Sedgwick-----	50	Well suited		Well suited		Moderate Low strength	0.50
Munuscong-----	30	Well suited		Well suited		Moderate Low strength	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444487: Superior-----	50	Well suited		Well suited		Moderate Low strength	0.50
Sedgwick-----	30	Well suited		Well suited		Moderate Low strength	0.50
1444488: Superior-----	50	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Sedgwick-----	30	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
1444489: Sultz-----	35	Well suited		Unsuited Slope	1.00	Moderate Low strength	0.50
Ashwabay-----	25	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
Rubicon-----	20	Moderately suited Sandiness	0.50	Unsuited Slope Sandiness	1.00 0.50	Moderate Low strength	0.50
1444492: Manistee-----	40	Well suited		Unsuited Slope	1.00	Moderate Low strength	0.50
Kellogg-----	30	Moderately suited Sandiness	0.50	Poorly suited Slope Sandiness	0.75 0.50	Moderate Low strength	0.50
Ashwabay-----	20	Well suited		Unsuited Slope	1.00	Moderate Low strength	0.50
1444506: Keweenaw-----	60	Well suited		Well suited		Moderate Low strength	0.50
Rubicon-----	30	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1444507: Keweenaw-----	60	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Rubicon-----	30	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
1444585: Meehan, beaches----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1444586: Wurtsmith, beaches--	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444587: Grayling, beaches---	95	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
1529830: Meehan, beaches-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1700372: Loxley-----	40	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Beseman-----	30	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
Dawson-----	28	Moderately suited Wetness	0.50	Moderately suited Wetness	0.50	Severe Low strength Wetness	1.00 0.50
1700373: Rifle-----	90	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
1700374: Allendale-----	35	Well suited		Well suited		Moderate Low strength	0.50
Wakeley-----	30	Moderately suited Wetness	0.50	Poorly suited Wetness	0.75	Severe Low strength Wetness	1.00 0.50
Kinross-----	20	Well suited		Well suited		Severe Low strength	1.00
1702605: Menominee-----	85	Well suited		Poorly suited Slope	0.75	Moderate Low strength	0.50
1702606: Deerton-----	50	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
Brownstone-----	40	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Slight Strength	0.10
1702607: Deerton-----	50	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Slope Sandiness	0.50 0.50 0.50	Moderate Low strength	0.50
Brownstone-----	40	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Slight Strength	0.10

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1702608: Abbaye-----	90	Well suited		Moderately suited Slope	0.50	Severe Low strength	1.00
1711685: Cublake-----	50	Well suited		Well suited		Moderate Low strength	0.50
Keweenaw-----	30	Well suited		Well suited		Moderate Low strength	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Slight		Slight		Poorly suited	
						Ponding	1.00
						Wetness	1.00
						Stickiness; high plasticity index	0.50
						Low strength	0.50
Herbster-----	35	Slight		Slight		Moderately suited	
						Low strength	0.50
						Wetness	0.50
433296: Cublake-----	35	Slight		Slight		Well suited	
Croswell-----	20	Slight		Slight		Well suited	
Ashwabay-----	20	Slight		Slight		Well suited	
433299: Cublake-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Croswell-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Ashwabay-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
433300: Kellogg-----	35	Slight		Slight		Moderately suited Sandiness Wetness	0.50 0.50
Allendale-----	25	Slight		Slight		Moderately suited Wetness	0.50
Ashwabay-----	20	Slight		Slight		Well suited	
433301: Kellogg-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness Wetness	0.50 0.50 0.50
Allendale-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Wetness	0.50 0.50
Ashwabay-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433304: Sedgwick-----	50	Slight		Moderate Slope/erodibility	0.50	Poorly suited Wetness Dusty	1.00 0.01
Munuscong-----	30	Slight		Slight		Poorly suited Wetness Ponding Dusty	1.00 0.50 0.01
433305: Superior-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Wetness Dusty	0.50 0.01
Sedgwick-----	30	Slight		Slight		Poorly suited Wetness Dusty	1.00 0.01
433309: Superior-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Moderately suited Slope Wetness Dusty	0.50 0.50 0.01
Sedgwick-----	30	Slight		Moderate Slope/erodibility	0.50	Poorly suited Wetness Slope Dusty	1.00 0.50 0.01
433310: Sultz-----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Ashwabay-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Rubicon-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
433314: Manistee-----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Kellogg-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Wetness	1.00 0.50 0.50
Ashwabay-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
433326: Rubicon-----	85	Slight		Slight		Moderately suited Sandiness	0.50
433379: Allendale-----	80	Slight		Slight		Moderately suited Wetness	0.50

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Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433515: Lupton-----	40	Slight		Slight		Poorly suited	
						Low strength	1.00
						Wetness	1.00
						Ponding	0.50
						Dusty	0.01
Cathro-----	30	Slight		Slight		Poorly suited	
						Low strength	1.00
						Wetness	1.00
						Ponding	0.50
						Dusty	0.01
Tawas-----	25	Slight		Slight		Poorly suited	
						Low strength	1.00
						Wetness	1.00
						Ponding	0.50
						Dusty	0.01
433572: Portwing-----	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
Herbster-----	30	Slight		Slight		Moderately suited	
						Low strength	0.50
						Wetness	0.50
433573: Cornucopia-----	80	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
433582: Croswell-----	82	Slight		Slight		Well suited	
433599: Annalake-----	85	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
433600: Annalake-----	80	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
433671: Arnheim-----	85	Slight		Slight		Moderately suited	
						Low strength	0.50
						Ponding	0.50
						Flooding	0.50
						Wetness	0.50
						Dusty	0.01
433676: Redrim-----	85	Slight		Slight		Moderately suited	
						Sandiness	0.50
433679: Lapoin-----	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
						Wetness	0.50

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Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433686: Zeba-----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Wetness	0.50
433729: Sultz-----	85	Slight		Slight		Well suited	
433739: Moquah-----	85	Slight		Slight		Moderately suited Flooding Dusty	0.50 0.01
433771: Beaches-----	97	Not rated		Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated		Not rated	
452765: Abbaye-----	55	Slight		Slight		Moderately suited Wetness	0.50
Lapoin-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Low strength Wetness	0.50 0.50
1383557: Au Gres-----	85	Slight		Slight		Well suited	
1383580: Loxley-----	40	Slight		Slight		Poorly suited Low strength Wetness Dusty	1.00 1.00 0.01
Beseman-----	30	Slight		Slight		Poorly suited Low strength Wetness	1.00 1.00
Dawson-----	28	Slight		Slight		Poorly suited Low strength Wetness Dusty	1.00 1.00 0.01
1383581: Rifle-----	90	Slight		Slight		Poorly suited Low strength Wetness Ponding Dusty	1.00 1.00 0.50 0.01
1383603: Cornucopia-----	80	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Low strength	1.00 0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383658: Deerton-----	50	Slight		Slight		Moderately suited Sandiness	0.50
Brownstone-----	40	Slight		Slight		Well suited	
1383660: Deerton-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Brownstone-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1383662: Abbaye-----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Wetness	0.50 0.50
1383665: Allendale-----	35	Slight		Slight		Moderately suited Wetness	0.50
Wakeley-----	30	Slight		Slight		Poorly suited Ponding Wetness	1.00 1.00
Kinross-----	20	Slight		Slight		Poorly suited Low strength Wetness Ponding	1.00 1.00 0.50
1383960: Flink-----	75	Slight		Slight		Well suited	
1444357: Arnheim-----	85	Slight		Slight		Moderately suited Low strength Ponding Flooding Wetness Dusty	0.50 0.50 0.50 0.50 0.01
1444359: Beaches-----	97	Not rated		Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
1444378: Wakefield-----	85	Slight		Moderate Slope/erodibility	0.50	Moderately suited Low strength Wetness	0.50 0.50
1444379: Wakefield-----	85	Slight		Severe Slope/erodibility	0.95	Moderately suited Slope Low strength Wetness	0.50 0.50 0.50

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Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444388: Allendale-----	80	Slight		Slight		Moderately suited Wetness	0.50
1444402: Tonkey-----	90	Slight		Slight		Poorly suited Wetness Ponding Dusty	1.00 0.50 0.01
1444410: Tula-----	80	Slight		Slight		Well suited Dusty	0.01
1444414: Lupton-----	40	Slight		Slight		Poorly suited Low strength Wetness Ponding Dusty	1.00 1.00 0.50 0.01
Cathro-----	30	Slight		Slight		Poorly suited Low strength Wetness Ponding Dusty	1.00 1.00 0.50 0.01
Tawas-----	25	Slight		Slight		Poorly suited Low strength Wetness Ponding Dusty	1.00 1.00 0.50 0.01
1444425: Lerch-----	50	Slight		Slight		Poorly suited Ponding Wetness Stickiness; high plasticity index Low strength	1.00 1.00 0.50 0.50
Herbster-----	35	Slight		Slight		Moderately suited Low strength Wetness	0.50 0.50
1444426: Portwing-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Low strength	0.50
Herbster-----	30	Slight		Slight		Moderately suited Low strength Wetness	0.50 0.50
1444427: Cornucopia-----	80	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Moderately suited Slope Low strength	0.50 0.50
1444428: Cornucopia-----	80	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Low strength	1.00 0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444431: Croswell-----	82	Slight		Slight		Well suited	
1444432: Gogebic-----	85	Slight		Moderate Slope/erodibility	0.50	Moderately suited Wetness	0.50
1444435: Iosco-----	85	Slight		Slight		Moderately suited Wetness	0.50
1444457: Redrim-----	85	Slight		Slight		Moderately suited Sandiness	0.50
1444459: Zeba-----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Wetness	0.50
1444460: Abbaye-----	55	Slight		Slight		Moderately suited Wetness	0.50
Lapoin-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Low strength Wetness	0.50 0.50
1444461: Abbaye-----	55	Slight		Slight		Moderately suited Wetness	0.50
Zeba-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Wetness	0.50
1444477: Cublake-----	35	Slight		Slight		Well suited	
Croswell-----	20	Slight		Slight		Well suited	
Ashwabay-----	20	Slight		Slight		Well suited	
1444478: Cublake-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Croswell-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Ashwabay-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1444479: Morganlake-----	85	Slight		Slight		Moderately suited Wetness	0.50
1444480: Morganlake-----	85	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Wetness	0.50 0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444481: Kellogg-----	35	Slight		Slight		Moderately suited Sandiness Wetness	0.50 0.50
Allendale-----	25	Slight		Slight		Moderately suited Wetness	0.50
Ashwabay-----	20	Slight		Slight		Well suited	
1444482: Kellogg-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness Wetness	0.50 0.50 0.50
Allendale-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Wetness	0.50 0.50
Ashwabay-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1444486: Sedgwick-----	50	Slight		Moderate Slope/erodibility	0.50	Poorly suited Wetness Dusty	1.00 0.01
Munuscong-----	30	Slight		Slight		Poorly suited Wetness Ponding Dusty	1.00 0.50 0.01
1444487: Superior-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Wetness Dusty	0.50 0.01
Sedgwick-----	30	Slight		Slight		Poorly suited Wetness Dusty	1.00 0.01
1444488: Superior-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Moderately suited Slope Wetness Dusty	0.50 0.50 0.01
Sedgwick-----	30	Slight		Moderate Slope/erodibility	0.50	Poorly suited Wetness Slope Dusty	1.00 0.50 0.01
1444489: Sultz-----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Ashwabay-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00

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Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444489: Rubicon-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1444492: Manistee-----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Kellogg-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Wetness	1.00 0.50 0.50
Ashwabay-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1444506: Keweenaw-----	60	Slight		Slight		Well suited	
Rubicon-----	30	Slight		Slight		Moderately suited Sandiness	0.50
1444507: Keweenaw-----	60	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Rubicon-----	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
1444585: Meehan, beaches-----	90	Slight		Slight		Moderately suited Sandiness	0.50
1444586: Wurtsmith, beaches--	90	Slight		Slight		Moderately suited Sandiness	0.50
1444587: Grayling, beaches---	95	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
1529830: Meehan, beaches-----	90	Slight		Slight		Moderately suited Sandiness	0.50
1700372: Loxley-----	40	Slight		Slight		Poorly suited Low strength Wetness Dusty	1.00 1.00 0.01
Beseman-----	30	Slight		Slight		Poorly suited Low strength Wetness	1.00 1.00
Dawson-----	28	Slight		Slight		Poorly suited Low strength Wetness Dusty	1.00 1.00 0.01

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Table 6.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1700373: Rifle-----	90	Slight		Slight		Poorly suited	
						Low strength	1.00
						Wetness	1.00
						Ponding	0.50
						Dusty	0.01
1700374: Allendale-----	35	Slight		Slight		Moderately suited	
						Wetness	0.50
Wakeley-----	30	Slight		Slight		Poorly suited	
						Ponding	1.00
						Wetness	1.00
Kinross-----	20	Slight		Slight		Poorly suited	
						Low strength	1.00
						Wetness	1.00
						Ponding	0.50
1702605: Menominee-----	85	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
1702606: Deerton-----	50	Slight		Slight		Moderately suited Sandiness	0.50
Brownstone-----	40	Slight		Slight		Well suited	
1702607: Deerton-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Brownstone-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
1702608: Abbaye-----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Wetness	0.50 0.50
1711685: Cublake-----	50	Slight		Slight		Well suited	
Keweenaw-----	30	Slight		Slight		Well suited	

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Table 6.—Land Management, Part III (Site Preparation)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433292:					
Lerch-----	50	Unsuited Wetness	1.00	Poorly suited Wetness Stickiness; high plasticity index	0.75 0.50
Herbster-----	35	Unsuited Wetness	1.00	Poorly suited Stickiness; high plasticity index	0.50
433296:					
Cublake-----	35	Well suited		Well suited	
Croswell-----	20	Well suited		Well suited	
Ashwabay-----	20	Well suited		Well suited	
433299:					
Cublake-----	35	Well suited		Well suited	
Croswell-----	20	Well suited		Well suited	
Ashwabay-----	20	Well suited		Well suited	
433300:					
Kellogg-----	35	Well suited		Well suited	
Allendale-----	25	Unsuited Wetness	1.00	Well suited	
Ashwabay-----	20	Well suited		Well suited	
433301:					
Kellogg-----	40	Well suited		Well suited	
Allendale-----	25	Unsuited Wetness	1.00	Well suited	
Ashwabay-----	20	Well suited		Well suited	
433304:					
Sedgwick-----	50	Well suited		Well suited	
Munuscong-----	30	Unsuited Wetness	1.00	Well suited	
433305:					
Superior-----	50	Well suited		Well suited	
Sedgwick-----	30	Well suited		Well suited	

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Table 6.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433309: Superior-----	50	Well suited		Well suited	
Sedgwick-----	30	Well suited		Well suited	
433310: Sultz-----	35	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Ashwabay-----	25	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Rubicon-----	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
433314: Manistee-----	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Kellogg-----	30	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Ashwabay-----	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
433326: Rubicon-----	85	Well suited		Well suited	
433379: Allendale-----	80	Unsuited Wetness	1.00	Well suited	
433515: Lupton-----	40	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Cathro-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Tawas-----	25	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
433572: Portwing-----	50	Unsuited Wetness	1.00	Poorly suited Stickiness; high plasticity index	0.50
Herbster-----	30	Unsuited Wetness	1.00	Poorly suited Stickiness; high plasticity index	0.50
433573: Cornucopia-----	80	Well suited		Poorly suited Stickiness; high plasticity index	0.50
433582: Crowell-----	82	Well suited		Well suited	
433599: Annalake-----	85	Well suited		Well suited	

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Table 6.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433600: Annalake-----	80	Well suited		Well suited	
433671: Arnheim-----	85	Unsuited Wetness	1.00	Well suited	
433676: Redrim-----	85	Well suited		Poorly suited Rock fragments	0.50
433679: Lapoin-----	85	Well suited		Well suited	
433686: Zeba-----	90	Well suited		Well suited	
433729: Sultz-----	85	Well suited		Well suited	
433739: Moquah-----	85	Well suited		Well suited	
433771: Beaches-----	97	Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated	
452765: Abbaye-----	55	Well suited		Well suited	
Lapoin-----	40	Well suited		Well suited	
1383557: Au Gres-----	85	Unsuited Wetness	1.00	Well suited	
1383580: Loxley-----	40	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Beseman-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Dawson-----	28	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
1383581: Rifle-----	90	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
1383603: Cornucopia-----	80	Poorly suited Slope	0.50	Poorly suited Slope Stickiness; high plasticity index	0.50 0.50

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Table 6.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383658: Deerton-----	50	Well suited		Well suited	
Brownstone-----	40	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
1383660: Deerton-----	50	Well suited		Well suited	
Brownstone-----	40	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
1383662: Abbaye-----	90	Well suited		Well suited	
1383665: Allendale-----	35	Unsuited Wetness	1.00	Well suited	
Wakeley-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Kinross-----	20	Unsuited Wetness	1.00	Well suited	
1383960: Flink-----	75	Unsuited Wetness	1.00	Well suited	
1444357: Arnheim-----	85	Unsuited Wetness	1.00	Well suited	
1444359: Beaches-----	97	Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
1444378: Wakefield-----	85	Well suited		Well suited	
1444379: Wakefield-----	85	Well suited		Well suited	
1444388: Allendale-----	80	Unsuited Wetness	1.00	Well suited	
1444402: Tonkey-----	90	Unsuited Wetness	1.00	Well suited	
1444410: Tula-----	80	Well suited		Poorly suited Rock fragments	0.50

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Table 6.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444414: Lupton-----	40	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Cathro-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Tawas-----	25	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
1444425: Lerch-----	50	Unsuited Wetness	1.00	Poorly suited Wetness Stickiness; high plasticity index	0.75 0.50
Herbster-----	35	Unsuited Wetness	1.00	Poorly suited Stickiness; high plasticity index	0.50
1444426: Portwing-----	50	Unsuited Wetness	1.00	Poorly suited Stickiness; high plasticity index	0.50
Herbster-----	30	Unsuited Wetness	1.00	Poorly suited Stickiness; high plasticity index	0.50
1444427: Cornucopia-----	80	Well suited		Poorly suited Stickiness; high plasticity index	0.50
1444428: Cornucopia-----	80	Poorly suited Slope	0.50	Poorly suited Slope Stickiness; high plasticity index	0.50 0.50
1444431: Crowell-----	82	Well suited		Well suited	
1444432: Gogebic-----	85	Well suited		Well suited	
1444435: Iosco-----	85	Unsuited Wetness	1.00	Well suited	
1444457: Redrim-----	85	Well suited		Poorly suited Rock fragments	0.50
1444459: Zeba-----	90	Well suited		Well suited	
1444460: Abbaye-----	55	Well suited		Well suited	
Lapoin-----	40	Well suited		Well suited	

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Table 6.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444461: Abbaye-----	55	Well suited		Well suited	
Zeba-----	40	Well suited		Well suited	
1444477: Cublake-----	35	Well suited		Well suited	
Croswell-----	20	Well suited		Well suited	
Ashwabay-----	20	Well suited		Well suited	
1444478: Cublake-----	35	Well suited		Well suited	
Croswell-----	20	Well suited		Well suited	
Ashwabay-----	20	Well suited		Well suited	
1444479: Morganlake-----	85	Well suited		Well suited	
1444480: Morganlake-----	85	Well suited		Well suited	
1444481: Kellogg-----	35	Well suited		Well suited	
Allendale-----	25	Unsuited Wetness	1.00	Well suited	
Ashwabay-----	20	Well suited		Well suited	
1444482: Kellogg-----	40	Well suited		Well suited	
Allendale-----	25	Unsuited Wetness	1.00	Well suited	
Ashwabay-----	20	Well suited		Well suited	
1444486: Sedgwick-----	50	Well suited		Well suited	
Munuscong-----	30	Unsuited Wetness	1.00	Well suited	
1444487: Superior-----	50	Well suited		Well suited	
Sedgwick-----	30	Well suited		Well suited	
1444488: Superior-----	50	Well suited		Well suited	
Sedgwick-----	30	Well suited		Well suited	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444489: Sultz-----	35	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Ashwabay-----	25	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Rubicon-----	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1444492: Manistee-----	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Kellogg-----	30	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Ashwabay-----	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1444506: Keweenaw-----	60	Well suited		Well suited	
Rubicon-----	30	Well suited		Well suited	
1444507: Keweenaw-----	60	Well suited		Well suited	
Rubicon-----	30	Well suited		Well suited	
1444585: Meehan, beaches----	90	Unsuited Wetness	1.00	Well suited	
1444586: Wurtsmith, beaches--	90	Unsuited Wetness	1.00	Well suited	
1444587: Grayling, beaches---	95	Well suited		Well suited	
1529830: Meehan, beaches----	90	Unsuited Wetness	1.00	Well suited	
1700372: Loxley-----	40	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Beseman-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Dawson-----	28	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
1700373: Rifle-----	90	Unsuited Wetness	1.00	Poorly suited Wetness	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1700374: Allendale-----	35	Unsuited Wetness	1.00	Well suited	
Wakeley-----	30	Unsuited Wetness	1.00	Poorly suited Wetness	0.50
Kinross-----	20	Unsuited Wetness	1.00	Well suited	
1702605: Menominee-----	85	Poorly suited Slope	0.50	Poorly suited Slope	0.50
1702606: Deerton-----	50	Well suited		Well suited	
Brownstone-----	40	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
1702607: Deerton-----	50	Well suited		Well suited	
Brownstone-----	40	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
1702608: Abbaye-----	90	Well suited		Well suited	
1711685: Cublake-----	50	Well suited		Well suited	
Keweenaw-----	30	Well suited		Well suited	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Low		High Wetness	1.00
Herbster-----	35	Low		High Wetness	1.00
433296: Cublake-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
Croswell-----	20	Low		Low	
Ashwabay-----	20	Low		Low	
433299: Cublake-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
Croswell-----	20	Low		Low	
Ashwabay-----	20	Low		Low	
433300: Kellogg-----	35	High Texture/surface layer thickness/rock fragments	1.00	Moderate Wetness	0.50
Allendale-----	25	Low		High Wetness	1.00
Ashwabay-----	20	Low		Low	
433301: Kellogg-----	40	High Texture/surface layer thickness/rock fragments	1.00	Moderate Wetness	0.50
Allendale-----	25	Low		High Wetness	1.00
Ashwabay-----	20	Low		Low	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features
433304: Sedgwick-----	50	Low	High Wetness	1.00
Munuscong-----	30	Low	High Wetness	1.00
433305: Superior-----	50	Low	High Wetness	1.00
Sedgwick-----	30	Moderate Texture/rock fragments	High Wetness	1.00
433309: Superior-----	50	Low	High Wetness	1.00
Sedgwick-----	30	Moderate Texture/rock fragments	High Wetness	1.00
433310: Sultz-----	35	High Texture/slope/ surface layer thickness	Low	1.00
Ashwabay-----	25	Low	Low	
Rubicon-----	20	High Texture/slope/ surface layer thickness	Low	1.00
433314: Manistee-----	40	High Texture/slope/ surface layer thickness	Low	1.00
Kellogg-----	30	High Texture/surface layer thickness/rock fragments	Moderate Wetness	1.00
Ashwabay-----	20	High Texture/slope/ surface layer thickness	Low	1.00
433326: Rubicon-----	85	High Texture/surface layer thickness/rock fragments	Low	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433379: Allendale-----	80	Low		High Wetness	1.00
433515: Lupton-----	40	Low		High Wetness	1.00
Cathro-----	30	Low		High Wetness	1.00
Tawas-----	25	Low		High Wetness	1.00
433572: Portwing-----	50	Low		Moderate Wetness	0.50
Herbster-----	30	Low		High Wetness	1.00
433573: Cornucopia-----	80	Low		Low	
433582: Crowell-----	82	Low		Low	
433599: Annalake-----	85	Low		Low	
433600: Annalake-----	80	Low		Low	
433671: Arnheim-----	85	Low		High Wetness	1.00
433676: Redrim-----	85	High Texture/rock fragments	1.00	Low	
433679: Lapoin-----	85	Low		Moderate Wetness	0.50
433686: Zeba-----	90	Low		High Wetness	1.00
433729: Sultz-----	85	High Texture/surface layer thickness/rock fragments	1.00	Low	
433739: Moquah-----	85	Low		Low	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to	Potential for seedling
		soil by fire	mortality
		Rating class and limiting features	Rating class and limiting features
		Value	Value
433771: Beaches-----	97	Not rated	Not rated
433802: Udorthents, ravines and escarpments----	85	Not rated	Not rated
452739: Water-----	100	Not rated	Not rated
452765: Abbaye-----	55	Low	Moderate Wetness
			0.50
Lapoin-----	40	Low	Moderate Wetness
			0.50
1383557: Au Gres-----	85	High Texture/surface layer thickness/rock fragments	High Wetness
			1.00
1383580: Loxley-----	40	Low	High Wetness Soil reaction
			1.00 0.50
Beseman-----	30	Low	High Wetness Soil reaction
			1.00 0.50
Dawson-----	28	Low	High Wetness Soil reaction
			1.00 0.50
1383581: Rifle-----	90	Low	High Wetness
			1.00
1383603: Cornucopia-----	80	Low	Low
1383658: Deerton-----	50	High Texture/rock fragments	Low
			1.00
Brownstone-----	40	High Texture/rock fragments	Low
			1.00
1383660: Deerton-----	50	High Texture/rock fragments	Low
			1.00
Brownstone-----	40	High Texture/rock fragments	Low
			1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383662: Abbaye-----	90	Low		Moderate Wetness	0.50
1383665: Allendale-----	35	Low		High Wetness	1.00
Wakeley-----	30	High Texture/rock fragments	1.00	High Wetness Soil reaction	1.00 0.50
Kinross-----	20	High Texture/surface layer thickness/rock fragments	1.00	High Wetness Soil reaction	1.00 0.50
1383960: Flink-----	75	Low		Moderate Wetness	0.50
1444357: Arnheim-----	85	Low		High Wetness	1.00
1444359: Beaches-----	97	Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
1444378: Wakefield-----	85	Low		High Wetness	1.00
1444379: Wakefield-----	85	Low		High Wetness	1.00
1444388: Allendale-----	80	Low		High Wetness	1.00
1444402: Tonkey-----	90	Low		High Wetness	1.00
1444410: Tula-----	80	Low		High Wetness	1.00
1444414: Lupton-----	40	Low		High Wetness	1.00
Cathro-----	30	Low		High Wetness	1.00
Tawas-----	25	Low		High Wetness	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444425: Lerch-----	50	Low		High Wetness	1.00
Herbster-----	35	Low		High Wetness	1.00
1444426: Portwing-----	50	Low		Moderate Wetness	0.50
Herbster-----	30	Low		High Wetness	1.00
1444427: Cornucopia-----	80	Low		Low	
1444428: Cornucopia-----	80	Low		Low	
1444431: Crowell-----	82	Low		Low	
1444432: Gogebic-----	85	Low		High Wetness	1.00
1444435: Iosco-----	85	Moderate Texture/rock fragments	0.50	High Wetness	1.00
1444457: Redrim-----	85	High Texture/rock fragments	1.00	Low	
1444459: Zeba-----	90	Low		High Wetness	1.00
1444460: Abbaye-----	55	Low		Moderate Wetness	0.50
Lapoin-----	40	Low		Moderate Wetness	0.50
1444461: Abbaye-----	55	Low		Moderate Wetness	0.50
Zeba-----	40	Low		High Wetness	1.00
1444477: Cublake-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444477: Croswell-----	20	Low		Low	
Ashwabay-----	20	Low		Low	
1444478: Cublake-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
Croswell-----	20	Low		Low	
Ashwabay-----	20	Low		Low	
1444479: Morganlake-----	85	High Texture/surface layer thickness/rock fragments	1.00	Low	
1444480: Morganlake-----	85	High Texture/surface layer thickness/rock fragments	1.00	Low	
1444481: Kellogg-----	35	High Texture/surface layer thickness/rock fragments	1.00	Moderate Wetness	0.50
Allendale-----	25	Low		High Wetness	1.00
Ashwabay-----	20	Low		Low	
1444482: Kellogg-----	40	High Texture/surface layer thickness/rock fragments	1.00	Moderate Wetness	0.50
Allendale-----	25	Low		High Wetness	1.00
Ashwabay-----	20	Low		Low	
1444486: Sedgwick-----	50	Low		High Wetness	1.00
Munuscong-----	30	Low		High Wetness	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444487: Superior-----	50	Low		High Wetness	1.00
Sedgwick-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
1444488: Superior-----	50	Low		High Wetness	1.00
Sedgwick-----	30	Moderate Texture/rock fragments	0.50	High Wetness	1.00
1444489: Sultz-----	35	High Texture/slope/ surface layer thickness	1.00	Low	
Ashwabay-----	25	Low		Low	
Rubicon-----	20	High Texture/slope/ surface layer thickness	1.00	Low	
1444492: Manistee-----	40	High Texture/slope/ surface layer thickness	1.00	Low	
Kellogg-----	30	High Texture/surface layer thickness/rock fragments	1.00	Moderate Wetness	0.50
Ashwabay-----	20	High Texture/slope/ surface layer thickness	1.00	Low	
1444506: Keweenaw-----	60	High Texture/surface layer thickness/rock fragments	1.00	Low	
Rubicon-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444507: Keweenaw-----	60	High Texture/surface layer thickness/rock fragments	1.00	Low	
Rubicon-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	
1444585: Meehan, beaches-----	90	High Texture/surface layer thickness/rock fragments	1.00	High Wetness	1.00
1444586: Wurtsmith, beaches--	90	High Texture/surface layer thickness/rock fragments	1.00	Low	
1444587: Grayling, beaches---	95	Low		Low	
1529830: Meehan, beaches-----	90	High Texture/surface layer thickness/rock fragments	1.00	High Wetness	1.00
1700372: Loxley-----	40	Low		High Wetness Soil reaction	1.00 0.50
Beseman-----	30	Low		High Wetness Soil reaction	1.00 0.50
Dawson-----	28	Low		High Wetness Soil reaction	1.00 0.50
1700373: Rifle-----	90	Low		High Wetness	1.00
1700374: Allendale-----	35	Low		High Wetness	1.00
Wakeley-----	30	High Texture/rock fragments	1.00	High Wetness Soil reaction	1.00 0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 6.-Land Management, Part IV (Site Restoration)-Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1700374: Kinross-----	20	High Texture/surface layer thickness/rock fragments	1.00	High Wetness Soil reaction	1.00 0.50
1702605: Menominee-----	85	High Texture/surface layer thickness/rock fragments	1.00	Low	
1702606: Deerton-----	50	High Texture/rock fragments	1.00	Low	
Brownstone-----	40	High Texture/rock fragments	1.00	Low	
1702607: Deerton-----	50	High Texture/rock fragments	1.00	Low	
Brownstone-----	40	High Texture/rock fragments	1.00	Low	
1702608: Abbaye-----	90	Low		Moderate Wetness	0.50
1711685: Cublake-----	50	High Texture/surface layer thickness/rock fragments	1.00	Low	
Keweenaw-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.-Recreation, Part I (Camp and Picnic Areas)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Very limited Depth to saturated zone Ponding Too clayey Slow water movement	1.00 1.00 1.00 1.00	Very limited Too clayey Ponding Depth to saturated zone Slow water movement	1.00 1.00 1.00 1.00
Herbster-----	35	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00
433296: Cublake-----	35	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
Croswell-----	20	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
Ashwabay-----	20	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87
433299: Cublake-----	35	Very limited Too sandy Depth to saturated zone Slope	1.00 0.39 0.37	Very limited Too sandy Slope Depth to saturated zone	1.00 0.37 0.19
Croswell-----	20	Very limited Too sandy Depth to saturated zone Slope	1.00 0.39 0.04	Very limited Too sandy Depth to saturated zone Slope	1.00 0.19 0.04
Ashwabay-----	20	Somewhat limited Too sandy Depth to saturated zone Slope	0.87 0.39 0.37	Somewhat limited Too sandy Slope Depth to saturated zone	0.87 0.37 0.19
433300: Kellogg-----	35	Very limited Too sandy Slow water movement Depth to saturated zone	1.00 0.99 0.98	Very limited Too sandy Slow water movement Depth to saturated zone	1.00 0.99 0.75

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433300: Allendale-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.37	Too sandy	0.37
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87
433301: Kellogg-----	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slow water movement	0.99	Slow water movement	0.99
		Depth to saturated zone	0.98	Depth to saturated zone	0.75
		Slope	0.37	Slope	0.37
Allendale-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.37	Too sandy	0.37
		Slope	0.04	Slope	0.04
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87
		Slope	0.37	Slope	0.37
433304: Sedgwick-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.99	Slow water movement	0.99
		Dusty	0.01	Dusty	0.01
Munuscong-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96
		Dusty	0.01	Dusty	0.01
433305: Superior-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Dusty	0.01	Dusty	0.01

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433305: Sedgwick-----	30	Very limited Depth to saturated zone Slow water movement Too sandy Dusty	1.00 0.99 0.70 0.01	Very limited Depth to saturated zone Slow water movement Too sandy Dusty	1.00 0.99 0.70 0.01
433309: Superior-----	50	Very limited Depth to saturated zone Slow water movement Slope Dusty	1.00 1.00 0.37 0.01	Very limited Depth to saturated zone Slow water movement Slope Dusty	1.00 1.00 0.37 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Slow water movement Too sandy Dusty	1.00 0.99 0.70 0.01	Very limited Depth to saturated zone Slow water movement Too sandy Dusty	1.00 0.99 0.70 0.01
433310: Sultz-----	35	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Ashwabay-----	25	Very limited Slope Too sandy	1.00 0.87	Very limited Slope Too sandy	1.00 0.87
Rubicon-----	20	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
433314: Manistee-----	40	Very limited Slope Slow water movement Too sandy	1.00 1.00 1.00	Very limited Too sandy Slope Slow water movement	1.00 1.00 1.00
Kellogg-----	30	Very limited Slope Too sandy Slow water movement Depth to saturated zone	1.00 1.00 0.99 0.98	Very limited Too sandy Slope Slow water movement Depth to saturated zone	1.00 1.00 0.99 0.75
Ashwabay-----	20	Very limited Slope Too sandy	1.00 0.87	Very limited Slope Too sandy	1.00 0.87
433326: Rubicon-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433379: Allendale-----	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.37	Too sandy	0.37
433515: Lupton-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01
Cathro-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01
Tawas-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01
433572: Portwing-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96
Herbster-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
433573: Cornucopia-----	80	Somewhat limited		Somewhat limited	
		Slow water movement	0.96	Slow water movement	0.96
		Slope	0.37	Slope	0.37
433582: Crowell-----	82	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19
433599: Annalake-----	85	Not limited		Not limited	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433600: Annalake-----	80	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37
433671: Arnheim-----	85	Very limited Depth to saturated zone Flooding Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Flooding Dusty	1.00 1.00 0.40 0.01
433676: Redrim-----	85	Very limited Too sandy Depth to bedrock Large stones content	1.00 1.00 0.50	Very limited Too sandy Depth to bedrock Large stones content	1.00 1.00 0.50
433679: Lapoin-----	85	Somewhat limited Depth to saturated zone Slow water movement	0.98 0.96	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.75
433686: Zeba-----	90	Very limited Depth to saturated zone Large stones content Too sandy	1.00 0.50 0.31	Very limited Depth to saturated zone Large stones content Too sandy	1.00 0.50 0.31
433729: Sultz-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00
433739: Moquah-----	85	Very limited Flooding Dusty Too sandy	1.00 0.01 0.01	Somewhat limited Flooding Dusty Too sandy	0.40 0.01 0.01
433771: Beaches-----	97	Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated	
452765: Abbaye-----	55	Somewhat limited Depth to saturated zone Too sandy	0.98 0.70	Somewhat limited Depth to saturated zone Too sandy	0.75 0.70

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
452765: Lapoin-----	40	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Slow water movement	0.96
		Slow water movement	0.96	Depth to saturated zone	0.75
1383557: Au Gres-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.50	Too sandy	0.50
1383580: Loxley-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01
Beseman-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Slow water movement	0.22	Slow water movement	0.22
Dawson-----	28	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Dusty	0.01	Dusty	0.01
1383581: Rifle-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Dusty	0.01	Dusty	0.01
1383603: Cornucopia-----	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96
1383658: Deerton-----	50	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Large stones content	0.50	Large stones content	0.50
Brownstone-----	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Large stones content	0.50	Large stones content	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383660: Deerton-----	50	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37
Brownstone-----	40	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37
1383662: Abbeye-----	90	Somewhat limited Depth to saturated zone Too sandy Slope	0.98 0.70 0.37	Somewhat limited Depth to saturated zone Too sandy Slope	0.75 0.70 0.37
1383665: Allendale-----	35	Very limited Depth to saturated zone Slow water movement Too sandy	1.00 1.00 0.37	Very limited Depth to saturated zone Slow water movement Too sandy	1.00 1.00 0.37
Wakeley-----	30	Very limited Depth to saturated zone Ponding Slow water movement Too sandy	1.00 1.00 0.98 0.30	Very limited Ponding Depth to saturated zone Slow water movement Too sandy	1.00 1.00 0.98 0.30
Kinross-----	20	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 1.00	Very limited Too sandy Ponding Depth to saturated zone	1.00 1.00 1.00
1383960: Flink-----	75	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy Depth to saturated zone	1.00 1.00
1444357: Arnheim-----	85	Very limited Depth to saturated zone Flooding Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Flooding Dusty	1.00 1.00 0.40 0.01
1444359: Beaches-----	97	Not rated		Not rated	

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Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
1444378: Wakefield-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99
		Too sandy	0.01	Too sandy	0.01
1444379: Wakefield-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Depth to cemented pan	0.99	Depth to cemented pan	0.99
		Slope	0.63	Slope	0.63
		Too sandy	0.01	Too sandy	0.01
1444388: Allendale-----	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.37	Too sandy	0.37
1444402: Tonkey-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Dusty	0.01	Dusty	0.01
1444410: Tula-----	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.97	Depth to cemented pan	0.97
		Dusty	0.01	Dusty	0.01
1444414: Lupton-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444414: Cathro-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01
Tawas-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00
		Dusty	0.01	Dusty	0.01
1444425: Lerch-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Too clayey	1.00
		Ponding	1.00	Ponding	1.00
		Too clayey	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
Herbster-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
1444426: Portwing-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96
Herbster-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
1444427: Cornucopia-----	80	Somewhat limited		Somewhat limited	
		Slow water movement	0.96	Slow water movement	0.96
		Slope	0.37	Slope	0.37
1444428: Cornucopia-----	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96
1444431: Crowell-----	82	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444432: Gogebic-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Depth to cemented pan	0.71	Depth to cemented pan	0.71
		Large stones content	0.50	Large stones content	0.50
1444435: Iosco-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.60	Too sandy	0.60
		Slow water movement	0.22	Slow water movement	0.22
1444457: Redrim-----	85	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.50	Large stones content	0.50
1444459: Zeba-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Large stones content	0.50	Large stones content	0.50
		Too sandy	0.31	Too sandy	0.31
1444460: Abbaye-----	55	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75
		Too sandy	0.70	Too sandy	0.70
Lapoin-----	40	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Slow water movement	0.96
		Slow water movement	0.96	Depth to saturated zone	0.75
1444461: Abbaye-----	55	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75
		Too sandy	0.70	Too sandy	0.70
		Large stones content	0.50	Large stones content	0.50
Zeba-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Large stones content	0.50	Large stones content	0.50
		Too sandy	0.31	Too sandy	0.31

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444477: Cublake-----	35	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
Croswell-----	20	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
Ashwabay-----	20	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87
1444478: Cublake-----	35	Very limited Too sandy Depth to saturated zone Slope	1.00 0.39 0.37	Very limited Too sandy Slope Depth to saturated zone	1.00 0.37 0.19
Croswell-----	20	Very limited Too sandy Depth to saturated zone Slope	1.00 0.39 0.04	Very limited Too sandy Depth to saturated zone Slope	1.00 0.19 0.04
Ashwabay-----	20	Somewhat limited Too sandy Depth to saturated zone Slope	0.87 0.39 0.37	Somewhat limited Too sandy Slope Depth to saturated zone	0.87 0.37 0.19
1444479: Morganlake-----	85	Somewhat limited Depth to saturated zone Too sandy Slow water movement	0.98 0.72 0.22	Somewhat limited Depth to saturated zone Too sandy Slow water movement	0.75 0.72 0.22
1444480: Morganlake-----	85	Somewhat limited Depth to saturated zone Too sandy Slope Slow water movement	0.98 0.72 0.37 0.22	Somewhat limited Depth to saturated zone Too sandy Slope Slow water movement	0.75 0.72 0.37 0.22
1444481: Kellogg-----	35	Very limited Too sandy Slow water movement Depth to saturated zone	1.00 0.99 0.98	Very limited Too sandy Slow water movement Depth to saturated zone	1.00 0.99 0.75

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444481: Allendale-----	25	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.37	Too sandy	0.37
Ashwabay-----	20	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87
1444482: Kellogg-----	40	Very limited Too sandy	1.00	Very limited Too sandy	1.00
		Slow water movement	0.99	Slow water movement	0.99
		Depth to saturated zone	0.98	Depth to saturated zone	0.75
		Slope	0.37	Slope	0.37
Allendale-----	25	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.37	Too sandy	0.37
		Slope	0.04	Slope	0.04
Ashwabay-----	20	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87
		Slope	0.37	Slope	0.37
1444486: Sedgwick-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Slow water movement	0.99	Slow water movement	0.99
		Dusty	0.01	Dusty	0.01
Munuscong-----	30	Very limited Depth to saturated zone	1.00	Very limited Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96
		Dusty	0.01	Dusty	0.01
1444487: Superior-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Dusty	0.01	Dusty	0.01

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444487: Sedgwick-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.99	Slow water movement	0.99
		Too sandy	0.70	Too sandy	0.70
		Dusty	0.01	Dusty	0.01
1444488: Superior-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Slope	0.37	Slope	0.37
		Dusty	0.01	Dusty	0.01
Sedgwick-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.99	Slow water movement	0.99
		Too sandy	0.70	Too sandy	0.70
		Dusty	0.01	Dusty	0.01
1444489: Sultz-----	35	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
Ashwabay-----	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.87	Too sandy	0.87
Rubicon-----	20	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
1444492: Manistee-----	40	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Slow water movement	1.00	Slope	1.00
		Too sandy	1.00	Slow water movement	1.00
Kellogg-----	30	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
		Slow water movement	0.99	Slow water movement	0.99
		Depth to saturated zone	0.98	Depth to saturated zone	0.75
Ashwabay-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.87	Too sandy	0.87

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444506: Keweenaw-----	60	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76
Rubicon-----	30	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1444507: Keweenaw-----	60	Somewhat limited Too sandy Slope	0.76 0.16	Somewhat limited Too sandy Slope	0.76 0.16
Rubicon-----	30	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37
1444585: Meehan, beaches----	90	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy Depth to saturated zone	1.00 1.00
1444586: Wurtsmith, beaches--	90	Very limited Too sandy Depth to saturated zone	1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19
1444587: Grayling, beaches---	95	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1529830: Meehan, beaches----	90	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy Depth to saturated zone	1.00 1.00
1700372: Loxley-----	40	Very limited Depth to saturated zone Ponding Organic matter content Dusty	1.00 1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Organic matter content Dusty	1.00 1.00 1.00 0.01
Beseman-----	30	Very limited Depth to saturated zone Ponding Organic matter content Slow water movement	1.00 1.00 1.00 0.22	Very limited Ponding Depth to saturated zone Organic matter content Slow water movement	1.00 1.00 1.00 0.22
Dawson-----	28	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1700373: Rifle-----	90	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
1700374: Allendale-----	35	Very limited Depth to saturated zone Slow water movement Too sandy	1.00 1.00 0.37	Very limited Depth to saturated zone Slow water movement Too sandy	1.00 1.00 0.37
Wakeley-----	30	Very limited Depth to saturated zone Ponding Slow water movement Too sandy	1.00 1.00 0.98 0.30	Very limited Ponding Depth to saturated zone Slow water movement Too sandy	1.00 1.00 0.98 0.30
Kinross-----	20	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 1.00	Very limited Too sandy Ponding Depth to saturated zone	1.00 1.00 1.00
1702605: Menominee-----	85	Very limited Slope Too sandy Slow water movement	1.00 0.72 0.22	Very limited Slope Too sandy Slow water movement	1.00 0.72 0.22
1702606: Deerton-----	50	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
Brownstone-----	40	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
1702607: Deerton-----	50	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37
Brownstone-----	40	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37	Very limited Too sandy Large stones content Slope	1.00 0.50 0.37

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.-Recreation, Part I (Camp and Picnic Areas)-Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1702608: Abbaye-----	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75
		Too sandy	0.70	Too sandy	0.70
		Slope	0.37	Slope	0.37
1711685: Cublake-----	50	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19
Keweenaw-----	30	Somewhat limited		Somewhat limited	
		Too sandy	0.76	Too sandy	0.76

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.-Recreation, Part II (Trail Management)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433292:					
Lerch-----	50	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
		Too clayey	1.00	Too clayey	1.00
		Ponding	1.00	Ponding	1.00
Herbster-----	35	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
433296:					
Cublake-----	35	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Croswell-----	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87
433299:					
Cublake-----	35	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Croswell-----	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87
433300:					
Kellogg-----	35	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Depth to	0.44	Depth to	0.44
		saturated zone		saturated zone	
Allendale-----	25	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
		Too sandy	0.37	Too sandy	0.37
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87
433301:					
Kellogg-----	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Depth to	0.44	Depth to	0.44
		saturated zone		saturated zone	

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433301: Allendale-----	25	Very limited Depth to saturated zone Too sandy	1.00 0.37	Very limited Depth to saturated zone Too sandy	1.00 0.37
Ashwabay-----	20	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87
433304: Sedgwick-----	50	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
Munuscong-----	30	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
433305: Superior-----	50	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01
433309: Superior-----	50	Very limited Depth to saturated zone Water erosion Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Water erosion Dusty	1.00 1.00 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01
433310: Sultz-----	35	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.22
Ashwabay-----	25	Somewhat limited Slope Too sandy	0.92 0.87	Somewhat limited Too sandy	0.87
Rubicon-----	20	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.22

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433314: Manistee-----	40	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.22
Kellogg-----	30	Very limited Too sandy Slope Depth to saturated zone	1.00 0.82 0.44	Very limited Too sandy Depth to saturated zone	1.00 0.44
Ashwabay-----	20	Very limited Slope Too sandy	1.00 0.87	Somewhat limited Too sandy Slope	0.87 0.22
433326: Rubicon-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00
433379: Allendale-----	80	Very limited Depth to saturated zone Too sandy	1.00 0.37	Very limited Depth to saturated zone Too sandy	1.00 0.37
433515: Lupton-----	40	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
Cathro-----	30	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
Tawas-----	25	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
433572: Portwing-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Herbster-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433573: Cornucopia-----	80	Very limited Water erosion	1.00	Very limited Water erosion	1.00
433582: Crowell-----	82	Very limited Too sandy	1.00	Very limited Too sandy	1.00
433599: Annalake-----	85	Not limited		Not limited	
433600: Annalake-----	80	Not limited		Not limited	
433671: Arnheim-----	85	Very limited Depth to saturated zone Ponding Flooding Dusty	1.00 1.00 0.40 0.01	Very limited Depth to saturated zone Ponding Flooding Dusty	1.00 1.00 0.40 0.01
433676: Redrim-----	85	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
433679: Lapoin-----	85	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44
433686: Zeba-----	90	Very limited Depth to saturated zone Large stones content Too sandy	1.00 0.50 0.31	Very limited Depth to saturated zone Large stones content Too sandy	1.00 0.50 0.31
433729: Sultz-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00
433739: Moquah-----	85	Somewhat limited Flooding Dusty Too sandy	0.40 0.01 0.01	Somewhat limited Flooding Dusty Too sandy	0.40 0.01 0.01
433771: Beaches-----	97	Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
452765: Abbaye-----	55	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44
Lapoin-----	40	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44
1383557: Au Gres-----	85	Very limited Depth to saturated zone Too sandy	1.00 0.50	Very limited Depth to saturated zone Too sandy	1.00 0.50
1383580: Loxley-----	40	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
Beseman-----	30	Very limited Depth to saturated zone Organic matter content Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Organic matter content Ponding	1.00 1.00 1.00
Dawson-----	28	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1383581: Rifle-----	90	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1383603: Cornucopia-----	80	Very limited Water erosion Slope	1.00 1.00	Very limited Water erosion Slope	1.00 0.22
1383658: Deerton-----	50	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
Brownstone-----	40	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383660: Deerton-----	50	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
Brownstone-----	40	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
1383662: Abbaye-----	90	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44
1383665: Allendale-----	35	Very limited Depth to saturated zone Too sandy	1.00 0.37	Very limited Depth to saturated zone Too sandy	1.00 0.37
Wakeley-----	30	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.30	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.30
Kinross-----	20	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
1383960: Flink-----	75	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
1444357: Arnheim-----	85	Very limited Depth to saturated zone Ponding Flooding Dusty	1.00 1.00 0.40 0.01	Very limited Depth to saturated zone Ponding Flooding Dusty	1.00 1.00 0.40 0.01
1444359: Beaches-----	97	Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
1444378: Wakefield-----	85	Very limited Depth to saturated zone Too sandy	1.00 0.01	Very limited Depth to saturated zone Too sandy	1.00 0.01

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444379: Wakefield-----	85	Very limited Depth to saturated zone Too sandy	1.00 0.01	Very limited Depth to saturated zone Too sandy	1.00 0.01
1444388: Allendale-----	80	Very limited Depth to saturated zone Too sandy	1.00 0.37	Very limited Depth to saturated zone Too sandy	1.00 0.37
1444402: Tonkey-----	90	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1444410: Tula-----	80	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
1444414: Lupton-----	40	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
Cathro-----	30	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
Tawas-----	25	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Organic matter content Ponding Dusty	1.00 1.00 1.00 0.01
1444425: Lerch-----	50	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00
Herbster-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444426: Portwing-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Herbster-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1444427: Cornucopia-----	80	Very limited Water erosion	1.00	Very limited Water erosion	1.00
1444428: Cornucopia-----	80	Very limited Water erosion Slope	1.00 1.00	Very limited Water erosion Slope	1.00 0.22
1444431: Crowell-----	82	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1444432: Gogebic-----	85	Very limited Depth to saturated zone Large stones content	1.00 0.50	Very limited Depth to saturated zone Large stones content	1.00 0.50
1444435: Iosco-----	85	Very limited Depth to saturated zone Too sandy	1.00 0.60	Very limited Depth to saturated zone Too sandy	1.00 0.60
1444457: Redrim-----	85	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
1444459: Zeba-----	90	Very limited Depth to saturated zone Large stones content Too sandy	1.00 0.50 0.31	Very limited Depth to saturated zone Large stones content Too sandy	1.00 0.50 0.31
1444460: Abbaye-----	55	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44
Lapoin-----	40	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444461: Abbaye-----	55	Somewhat limited		Somewhat limited	
		Too sandy	0.70	Too sandy	0.70
		Large stones content	0.50	Large stones content	0.50
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
Zeba-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Large stones content	0.50	Large stones content	0.50
		Too sandy	0.31	Too sandy	0.31
1444477: Cublake-----	35	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Croswell-----	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87
1444478: Cublake-----	35	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Croswell-----	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87
1444479: Morganlake-----	85	Somewhat limited		Somewhat limited	
		Too sandy	0.72	Too sandy	0.72
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
1444480: Morganlake-----	85	Somewhat limited		Somewhat limited	
		Too sandy	0.72	Too sandy	0.72
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
1444481: Kellogg-----	35	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
Allendale-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.37	Too sandy	0.37
Ashwabay-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Too sandy	0.87

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444482: Kellogg-----	40	Very limited Too sandy Depth to saturated zone	1.00 0.44	Very limited Too sandy Depth to saturated zone	1.00 0.44
Allendale-----	25	Very limited Depth to saturated zone Too sandy	1.00 0.37	Very limited Depth to saturated zone Too sandy	1.00 0.37
Ashwabay-----	20	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87
1444486: Sedgwick-----	50	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
Munuscong-----	30	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1444487: Superior-----	50	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Depth to saturated zone Dusty	1.00 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01
1444488: Superior-----	50	Very limited Depth to saturated zone Water erosion Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Water erosion Dusty	1.00 1.00 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01	Very limited Depth to saturated zone Too sandy Dusty	1.00 0.70 0.01
1444489: Sultz-----	35	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.22
Ashwabay-----	25	Somewhat limited Slope Too sandy	0.92 0.87	Somewhat limited Too sandy	0.87

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444489: Rubicon-----	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	0.22
1444492: Manistee-----	40	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	0.22
Kellogg-----	30	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.82	Depth to	0.44
		Depth to saturated zone	0.44	saturated zone	
Ashwabay-----	20	Very limited		Somewhat limited	
		Slope	1.00	Too sandy	0.87
		Too sandy	0.87	Slope	0.22
1444506: Keweenaw-----	60	Somewhat limited		Somewhat limited	
		Too sandy	0.76	Too sandy	0.76
Rubicon-----	30	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
1444507: Keweenaw-----	60	Somewhat limited		Somewhat limited	
		Too sandy	0.76	Too sandy	0.76
Rubicon-----	30	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
1444585: Meehan, beaches----	90	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
		Too sandy	1.00	Too sandy	1.00
1444586: Wurtsmith, beaches--	90	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
1444587: Grayling, beaches---	95	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
1529830: Meehan, beaches----	90	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
		Too sandy	1.00	Too sandy	1.00
1700372: Loxley-----	40	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
		Organic matter	1.00	Organic matter	1.00
		content		content	
		Ponding	1.00	Ponding	1.00
		Dusty	0.01	Dusty	0.01

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1700372: Beseman-----	30	Very limited Depth to saturated zone Organic matter content Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Organic matter content Ponding	1.00 1.00 1.00
Dawson-----	28	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1700373: Rifle-----	90	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Dusty	1.00 1.00 0.01
1700374: Allendale-----	35	Very limited Depth to saturated zone Too sandy	1.00 0.37	Very limited Depth to saturated zone Too sandy	1.00 0.37
Wakeley-----	30	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.30	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.30
Kinross-----	20	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
1702605: Menominee-----	85	Somewhat limited Slope Too sandy	0.92 0.72	Somewhat limited Too sandy	0.72
1702606: Deerton-----	50	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
Brownstone-----	40	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
1702607: Deerton-----	50	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50

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Table 7.-Recreation, Part II (Trail Management)-Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1702607: Brownstone-----	40	Very limited Too sandy Large stones content	1.00 0.50	Very limited Too sandy Large stones content	1.00 0.50
1702608: Abbaye-----	90	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44	Somewhat limited Too sandy Depth to saturated zone	0.70 0.44
1711685: Cublake-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Keweenaw-----	30	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76

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Table 8.—Dwellings and Small Commercial Buildings

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Herbster-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
433296: Cublake-----	35	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Croswell-----	20	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Ashwabay-----	20	Not limited		Very limited Depth to saturated zone Shrink-swell	1.00 0.01	Not limited	
433299: Cublake-----	35	Somewhat limited Depth to saturated zone Slope	0.39 0.37	Very limited Depth to saturated zone Slope	1.00 0.37	Very limited Slope Depth to saturated zone	1.00 0.39
Croswell-----	20	Somewhat limited Depth to saturated zone Slope	0.39 0.04	Very limited Depth to saturated zone Slope	1.00 0.04	Very limited Slope Depth to saturated zone	1.00 0.39
Ashwabay-----	20	Somewhat limited Depth to saturated zone Slope	0.39 0.37	Very limited Depth to saturated zone Shrink-swell	1.00 0.37 0.01	Very limited Slope Depth to saturated zone	1.00 0.39
433300: Kellogg-----	35	Somewhat limited Depth to saturated zone Shrink-swell	0.98 0.57	Very limited Depth to saturated zone Shrink-swell	1.00 0.99	Somewhat limited Depth to saturated zone Shrink-swell	0.98 0.57
Allendale-----	25	Very limited Depth to saturated zone Shrink-swell	1.00 0.15	Very limited Depth to saturated zone Shrink-swell	1.00 0.89	Very limited Depth to saturated zone Shrink-swell	1.00 0.15

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433300: Ashwabay-----	20	Not limited		Very limited Depth to saturated zone Shrink-swell	1.00 0.01	Not limited	
433301: Kellogg-----	40	Somewhat limited Depth to saturated zone Shrink-swell Slope	0.98 0.57 0.37	Very limited Depth to saturated zone Shrink-swell Slope	1.00 0.99 0.37	Very limited Slope Depth to saturated zone Shrink-swell	1.00 0.98 0.57
Allendale-----	25	Very limited Depth to saturated zone Shrink-swell Slope	1.00 0.15 0.04	Very limited Depth to saturated zone Shrink-swell Slope	1.00 0.89 0.04	Very limited Depth to saturated zone Slope Shrink-swell	1.00 1.00 0.15
Ashwabay-----	20	Somewhat limited Slope	0.37	Very limited Depth to saturated zone Slope Shrink-swell	1.00 0.37 0.01	Very limited Slope	1.00
433304: Sedgwick-----	50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
Munuscong-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.04	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.80	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.04
433305: Superior-----	50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
433309: Superior-----	50	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.37	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.37	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00
Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.88

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433310: Sultz-----	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Ashwabay-----	25	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.01	Very limited Slope	1.00
Rubicon-----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
433314: Manistee-----	40	Very limited Slope Shrink-swell	1.00 0.04	Very limited Slope Shrink-swell	1.00 0.80	Very limited Slope Shrink-swell	1.00 0.04
Kellogg-----	30	Very limited Slope Depth to saturated zone Shrink-swell	1.00 0.98 0.57	Very limited Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.99	Very limited Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.57
Ashwabay-----	20	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.01	Very limited Slope	1.00
433326: Rubicon-----	85	Not limited		Not limited		Not limited	
433379: Allendale-----	80	Very limited Depth to saturated zone Shrink-swell	1.00 0.15	Very limited Depth to saturated zone Shrink-swell	1.00 0.89	Very limited Depth to saturated zone Shrink-swell	1.00 0.15
433515: Lupton-----	40	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Cathro-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433515: Tawas-----	25	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
433572: Portwing-----	50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
Herbster-----	30	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
433573: Cornucopia-----	80	Very limited Shrink-swell Slope	1.00 0.37	Somewhat limited Shrink-swell Slope	0.99 0.37	Very limited Shrink-swell Slope	1.00 1.00
433582: Croswell-----	82	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
433599: Annalake-----	85	Not limited		Very limited Depth to saturated zone	1.00	Not limited	
433600: Annalake-----	80	Somewhat limited Slope	0.37	Very limited Depth to saturated zone Slope	1.00 0.37	Very limited Slope	1.00
433671: Arnheim-----	85	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
433676: Redrim-----	85	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
433679: Lapoin-----	85	Very limited Shrink-swell Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.01	Very limited Depth to saturated zone Shrink-swell Depth to hard bedrock	1.00 1.00 1.00	Very limited Shrink-swell Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.01

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433686: Zeba-----	90	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20
433729: Sultz-----	85	Not limited		Not limited		Not limited	
433739: Moquah-----	85	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding	1.00
433771: Beaches-----	97	Not rated		Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated		Not rated	
452765: Abbaye-----	55	Somewhat limited Depth to saturated zone Depth to hard bedrock	0.98 0.61	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Somewhat limited Depth to saturated zone Depth to hard bedrock	0.98 0.61
Lapoin-----	40	Very limited Shrink-swell Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.01	Very limited Depth to saturated zone Shrink-swell Depth to hard bedrock	1.00 1.00 1.00 1.00	Very limited Shrink-swell Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.01
1383557: Au Gres-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1383580: Loxley-----	40	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Beseman-----	30	Very limited Ponding Depth to saturated zone Organic matter content Subsidence	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Subsidence	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Subsidence	1.00 1.00 1.00 1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383580: Dawson-----	28	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
1383581: Rifle-----	90	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00
1383603: Cornucopia-----	80	Very limited Slope Shrink-swell	1.00 1.00	Very limited Slope Shrink-swell	1.00 0.99	Very limited Slope Shrink-swell	1.00 1.00
1383658: Deerton-----	50	Somewhat limited Depth to hard bedrock	0.01	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.01
Brownstone-----	40	Somewhat limited Large stones Depth to hard bedrock	0.39 0.35	Very limited Depth to hard bedrock Large stones	1.00 0.39	Somewhat limited Large stones Depth to hard bedrock	0.39 0.35
1383660: Deerton-----	50	Somewhat limited Slope Depth to hard bedrock	0.37 0.01	Very limited Depth to hard bedrock Slope	1.00 0.37	Very limited Slope Depth to hard bedrock	1.00 0.01
Brownstone-----	40	Somewhat limited Large stones Slope Depth to hard bedrock	0.39 0.37 0.35	Very limited Depth to hard bedrock Large stones Slope	1.00 0.39 0.37	Very limited Slope Large stones Depth to hard bedrock	1.00 0.39 0.35
1383662: Abbaye-----	90	Somewhat limited Depth to saturated zone Depth to hard bedrock Slope	0.98 0.46 0.37	Very limited Depth to saturated zone Depth to hard bedrock Slope	1.00 1.00 0.37	Very limited Slope Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.46
1383665: Allendale-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 0.15	Very limited Depth to saturated zone Shrink-swell	1.00 0.89	Very limited Depth to saturated zone Shrink-swell	1.00 0.15

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383665: Wakeley-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.57	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.99	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.57
Kinross-----	20	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1383960: Flink-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1444357: Arnheim-----	85	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
1444359: Beaches-----	97	Not rated		Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
1444378: Wakefield-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1444379: Wakefield-----	85	Very limited Depth to saturated zone Slope	1.00 0.63	Very limited Depth to saturated zone Slope	1.00 0.63	Very limited Depth to saturated zone Slope	1.00 1.00
1444388: Allendale-----	80	Very limited Depth to saturated zone Shrink-swell	1.00 0.15	Very limited Depth to saturated zone Shrink-swell	1.00 0.89	Very limited Depth to saturated zone Shrink-swell	1.00 0.15
1444402: Tonkey-----	90	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1444410: Tula-----	80	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444414: Lupton-----	40	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Cathro-----	30	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Tawas-----	25	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
1444425: Lerch-----	50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Herbster-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
1444426: Portwing-----	50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
Herbster-----	30	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
1444427: Cornucopia-----	80	Very limited Shrink-swell Slope	1.00 0.37	Somewhat limited Shrink-swell Slope	0.99 0.37	Very limited Shrink-swell Slope	1.00 1.00
1444428: Cornucopia-----	80	Very limited Slope Shrink-swell	1.00 1.00	Very limited Slope Shrink-swell	1.00 0.99	Very limited Slope Shrink-swell	1.00 1.00
1444431: Croswell-----	82	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444432: Gogebic-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1444435: Iosco-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1444457: Redrim-----	85	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
1444459: Zeba-----	90	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20
1444460: Abbaye-----	55	Somewhat limited Depth to saturated zone Depth to hard bedrock	0.98 0.61	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Somewhat limited Depth to saturated zone Depth to hard bedrock	0.98 0.61
Lapoin-----	40	Very limited Shrink-swell Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.01	Very limited Depth to saturated zone Shrink-swell Depth to hard bedrock	1.00 1.00 1.00	Very limited Shrink-swell Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.01
1444461: Abbaye-----	55	Somewhat limited Depth to saturated zone Depth to hard bedrock	0.98 0.61	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Somewhat limited Depth to saturated zone Depth to hard bedrock	0.98 0.61
Zeba-----	40	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20	Very limited Depth to saturated zone Depth to hard bedrock	1.00 1.00	Very limited Depth to saturated zone Depth to hard bedrock	1.00 0.20
1444477: Cublake-----	35	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Croswell-----	20	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Ashwabay-----	20	Not limited		Very limited Depth to saturated zone Shrink-swell	1.00 0.01	Not limited	

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444478: Cublake-----	35	Somewhat limited Depth to saturated zone Slope	0.39 0.37	Very limited Depth to saturated zone Slope	1.00 0.37	Very limited Slope Depth to saturated zone	1.00 0.39
Croswell-----	20	Somewhat limited Depth to saturated zone Slope	0.39 0.04	Very limited Depth to saturated zone Slope	1.00 0.04	Very limited Slope Depth to saturated zone	1.00 0.39
Ashwabay-----	20	Somewhat limited Depth to saturated zone Slope	0.39 0.37	Very limited Depth to saturated zone Shrink-swell	1.00 0.37 0.01	Very limited Slope Depth to saturated zone	1.00 0.39
1444479: Morganlake-----	85	Somewhat limited Depth to saturated zone	0.98	Very limited Depth to saturated zone Shrink-swell	1.00 0.01	Somewhat limited Depth to saturated zone	0.98
1444480: Morganlake-----	85	Somewhat limited Depth to saturated zone Slope	0.98 0.37	Very limited Depth to saturated zone Shrink-swell	1.00 0.37 0.01	Very limited Slope Depth to saturated zone	1.00 0.98
1444481: Kellogg-----	35	Somewhat limited Depth to saturated zone Shrink-swell	0.98 0.57	Very limited Depth to saturated zone Shrink-swell	1.00 0.99	Somewhat limited Depth to saturated zone Shrink-swell	0.98 0.57
Allendale-----	25	Very limited Depth to saturated zone Shrink-swell	1.00 0.15	Very limited Depth to saturated zone Shrink-swell	1.00 0.89	Very limited Depth to saturated zone Shrink-swell	1.00 0.15
Ashwabay-----	20	Not limited		Very limited Depth to saturated zone Shrink-swell	1.00 0.01	Not limited	
1444482: Kellogg-----	40	Somewhat limited Depth to saturated zone Shrink-swell Slope	0.98 0.57 0.37	Very limited Depth to saturated zone Shrink-swell Slope	1.00 0.99 0.37	Very limited Slope Depth to saturated zone Shrink-swell	1.00 0.98 0.57
Allendale-----	25	Very limited Depth to saturated zone Shrink-swell Slope	1.00 0.15 0.04	Very limited Depth to saturated zone Shrink-swell Slope	1.00 0.89 0.04	Very limited Depth to saturated zone Slope Shrink-swell	1.00 1.00 1.00 0.15

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444482: Ashwabay-----	20	Somewhat limited Slope	0.37	Very limited Depth to saturated zone Slope Shrink-swell	1.00 0.37 0.01	Very limited Slope	1.00
1444486: Sedgwick-----	50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Munuscong-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.04	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.80	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.04
1444487: Superior-----	50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00
1444488: Superior-----	50	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.37	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.37	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00 1.00
Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00 0.88
1444489: Sultz-----	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Ashwabay-----	25	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.01	Very limited Slope	1.00
Rubicon-----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1444492: Manistee-----	40	Very limited Slope Shrink-swell	1.00 0.04	Very limited Slope Shrink-swell	1.00 0.80	Very limited Slope Shrink-swell	1.00 0.04

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444492: Kellogg-----	30	Very limited Slope Depth to saturated zone Shrink-swell	1.00 0.98 0.57	Very limited Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.99	Very limited Slope Depth to saturated zone Shrink-swell	1.00 0.98 0.57
Ashwabay-----	20	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.01	Very limited Slope	1.00
1444506: Keweenaw-----	60	Not limited		Not limited		Not limited	
Rubicon-----	30	Not limited		Not limited		Not limited	
1444507: Keweenaw-----	60	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Rubicon-----	30	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1444585: Meehan, beaches----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1444586: Wurtsmith, beaches--	90	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
1444587: Grayling, beaches---	95	Not limited		Not limited		Somewhat limited Slope	0.88
1529830: Meehan, beaches----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1700372: Loxley-----	40	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
Beseman-----	30	Very limited Ponding Depth to saturated zone Organic matter content Subsidence	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Subsidence	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Subsidence	1.00 1.00 1.00 1.00

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1700372: Dawson-----	28	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00 1.00
1700373: Rifle-----	90	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content	1.00 1.00 1.00 1.00
1700374: Allendale-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 0.15	Very limited Depth to saturated zone Shrink-swell	1.00 0.89	Very limited Depth to saturated zone Shrink-swell	1.00 0.15
Wakeley-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.57	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.99	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.57
Kinross-----	20	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
1702605: Menominee-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1702606: Deerton-----	50	Somewhat limited Depth to hard bedrock	0.01	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.01
Brownstone-----	40	Somewhat limited Large stones Depth to hard bedrock	0.39 0.35	Very limited Depth to hard bedrock Large stones	1.00 0.39	Somewhat limited Large stones Depth to hard bedrock	0.39 0.35
1702607: Deerton-----	50	Somewhat limited Slope Depth to hard bedrock	0.37 0.01	Very limited Depth to hard bedrock Slope	1.00 0.37	Very limited Slope Depth to hard bedrock	1.00 0.01
Brownstone-----	40	Somewhat limited Large stones Slope Depth to hard bedrock	0.39 0.37 0.35	Very limited Depth to hard bedrock Large stones Slope	1.00 0.39 0.37	Very limited Slope Large stones Depth to hard bedrock	1.00 0.39 0.35

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Table 8.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1702608: Abbaye-----	90	Somewhat limited Depth to saturated zone Depth to hard bedrock Slope	0.98 0.46 0.37	Very limited Depth to saturated zone Depth to hard bedrock Slope	1.00 1.00 0.37	Very limited Slope Depth to saturated zone Depth to hard bedrock	1.00 0.98 0.46
1711685: Cublake-----	50	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Keweenaw-----	30	Not limited		Not limited		Not limited	

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Very limited Ponding Depth to saturated zone Shrink-swell Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 1.00 1.00 0.46	Very limited Ponding Too clayey Depth to saturated zone	1.00 1.00 1.00
Herbster-----	35	Very limited Depth to saturated zone Shrink-swell Low strength Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.28 0.01	Very limited Depth to saturated zone	1.00
433296: Cublake-----	35	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00 0.15	Somewhat limited Droughty Too sandy Depth to saturated zone	0.53 0.50 0.19
Croswell-----	20	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Somewhat limited Droughty Too sandy Depth to saturated zone	0.56 0.50 0.19
Ashwabay-----	20	Not limited		Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.50 0.01	Somewhat limited Droughty	0.34
433299: Cublake-----	35	Somewhat limited Slope Depth to saturated zone	0.37 0.19	Very limited Depth to saturated zone Slope Unstable excavation walls	1.00 1.00 0.37 0.15	Somewhat limited Droughty Too sandy Slope Depth to saturated zone	0.53 0.50 0.37 0.19
Croswell-----	20	Somewhat limited Depth to saturated zone Slope	0.19 0.04	Very limited Depth to saturated zone Unstable excavation walls Slope	1.00 1.00 1.00 0.04	Somewhat limited Droughty Too sandy Depth to saturated zone Slope	0.56 0.50 0.19 0.04

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433299: Ashwabay-----	20	Somewhat limited Slope Depth to saturated zone	0.37 0.19	Very limited Depth to saturated zone Too clayey Slope Unstable excavation walls	1.00 0.50 0.37 0.01	Somewhat limited Slope Droughty Depth to saturated zone	0.37 0.34 0.19
433300: Kellogg-----	35	Somewhat limited Depth to saturated zone Shrink-swell	0.75 0.57	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 0.32 0.02	Somewhat limited Depth to saturated zone	0.75
Allendale-----	25	Very limited Depth to saturated zone Frost action Shrink-swell	1.00 0.50 0.15	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Droughty	1.00 0.13
Ashwabay-----	20	Not limited		Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 0.50 0.01	Somewhat limited Droughty	0.34
433301: Kellogg-----	40	Somewhat limited Depth to saturated zone Shrink-swell Slope	0.75 0.57 0.37	Very limited Depth to saturated zone Slope Too clayey Unstable excavation walls	1.00 0.37 0.32 0.02	Somewhat limited Depth to saturated zone Slope	0.75 0.37
Allendale-----	25	Very limited Depth to saturated zone Frost action Shrink-swell Slope	1.00 0.50 0.15 0.04	Very limited Depth to saturated zone Too clayey Slope Unstable excavation walls	1.00 0.50 0.04 0.01	Very limited Depth to saturated zone Droughty Slope	1.00 0.13 0.04
Ashwabay-----	20	Somewhat limited Slope	0.37	Very limited Depth to saturated zone Too clayey Slope Unstable excavation walls	1.00 0.50 0.37 0.01	Somewhat limited Slope Droughty	0.37 0.34

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433304: Sedgwick-----	50	Very limited Depth to saturated zone Shrink-swell Frost action Low strength	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Unstable excavation walls Dusty	1.00 1.00 0.50 0.29 0.01	Very limited Depth to saturated zone Dusty	1.00 1.00 0.01
Munuscong-----	30	Very limited Ponding Depth to saturated zone Frost action Shrink-swell	1.00 1.00 1.00 0.04	Very limited Ponding Depth to saturated zone Too clayey Unstable excavation walls Dusty	1.00 1.00 0.97 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
433305: Superior-----	50	Very limited Depth to saturated zone Shrink-swell Low strength Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Unstable excavation walls Dusty	1.00 1.00 1.00 0.33 0.01	Very limited Depth to saturated zone Dusty	1.00 1.00 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell Frost action Low strength	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Unstable excavation walls Dusty	1.00 1.00 0.50 0.29 0.01	Very limited Depth to saturated zone Dusty	1.00 1.00 0.01
433309: Superior-----	50	Very limited Depth to saturated zone Shrink-swell Low strength Frost action Slope	1.00 1.00 1.00 1.00 0.50 0.37	Very limited Depth to saturated zone Too clayey Slope Unstable excavation walls Dusty	1.00 1.00 1.00 0.37 0.33 0.01	Very limited Depth to saturated zone Slope Dusty	1.00 1.00 0.37 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell Frost action Low strength	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Unstable excavation walls Dusty	1.00 1.00 0.50 0.29 0.01	Very limited Depth to saturated zone Dusty	1.00 1.00 0.01
433310: Sultz-----	35	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.73	Very limited Slope Droughty	1.00 0.01

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433310: Ashwabay-----	25	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Slope Droughty	1.00 0.34
Rubicon-----	20	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.93 0.50
433314: Manistee-----	40	Very limited Slope Shrink-swell	1.00 0.04	Very limited Slope Too clayey Unstable excavation walls	1.00 1.00 0.28 0.01	Very limited Slope Too sandy Droughty	1.00 0.50 0.13
Kellogg-----	30	Very limited Slope Depth to saturated zone Shrink-swell	1.00 0.75 0.57	Very limited Slope Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.32 0.02	Very limited Slope Depth to saturated zone	1.00 0.75
Ashwabay-----	20	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Slope Droughty	1.00 0.34
433326: Rubicon-----	85	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.67 0.50
433379: Allendale-----	80	Very limited Depth to saturated zone Frost action Shrink-swell	1.00 0.50 0.15	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Depth to saturated zone Droughty	1.00 0.13
433515: Lupton-----	40	Very limited Ponding Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 0.01

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433515: Cathro-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 1.00 0.01
Tawas-----	25	Very limited Ponding Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 1.00 0.01
433572: Portwing-----	50	Very limited Depth to saturated zone Shrink-swell Low strength Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 0.28 0.01	Very limited Depth to saturated zone	1.00
Herbster-----	30	Very limited Depth to saturated zone Shrink-swell Low strength Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 0.28 0.01	Very limited Depth to saturated zone	1.00
433573: Cornucopia-----	80	Very limited Shrink-swell Low strength Frost action Slope	1.00 1.00 0.50 0.37	Somewhat limited Too clayey Slope Unstable excavation walls	0.50 0.37 0.01	Somewhat limited Slope	0.37
433582: Croswell-----	82	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Droughty Too sandy Depth to saturated zone	0.64 0.50 0.19
433599: Annalake-----	85	Somewhat limited Frost action	0.50	Very limited Depth to saturated zone Unstable excavation walls	1.00 0.01	Not limited	
433600: Annalake-----	80	Somewhat limited Frost action Slope	0.50 0.37	Very limited Depth to saturated zone Slope Unstable excavation walls	1.00 0.37 0.01	Somewhat limited Slope	0.37

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433671: Arnheim-----	85	Very limited Ponding Depth to saturated zone Frost action Flooding	 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Flooding Unstable excavation walls Dusty	 1.00 1.00 0.80 0.01 0.01	Very limited Ponding Flooding Depth to saturated zone Dusty	 1.00 1.00 1.00 0.01
433676: Redrim-----	85	Very limited Depth to hard bedrock Low strength	 1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	 1.00 0.35	Very limited Depth to bedrock Large stones content Droughty	 1.00 0.99 0.67
433679: Lapoin-----	85	Very limited Shrink-swell Low strength Depth to saturated zone Frost action Depth to hard bedrock	 1.00 1.00 0.75 0.50 0.01	Very limited Depth to hard bedrock Depth to saturated zone Too clayey Unstable excavation walls	 1.00 1.00 0.28 0.04	Somewhat limited Depth to saturated zone Depth to bedrock	 0.75 0.01
433686: Zeba-----	90	Very limited Depth to saturated zone Frost action Depth to hard bedrock	 1.00 1.00 0.20	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	 1.00 1.00 0.01	Very limited Depth to saturated zone Depth to bedrock Large stones content	 1.00 0.21 0.03
433729: Sultz-----	85	Not limited		Somewhat limited Unstable excavation walls	 0.73	Somewhat limited Droughty	 0.01
433739: Moquah-----	85	Very limited Flooding Frost action	 1.00 0.50	Very limited Depth to saturated zone Flooding Unstable excavation walls Dusty	 1.00 0.80 0.01 0.01	Very limited Flooding Dusty	 1.00 0.01
433771: Beaches-----	97	Not rated		Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated		Not rated	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
452765: Abbaye-----	55	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to hard bedrock	1.00	Depth to saturated zone	0.75
		Depth to hard bedrock	0.61	Depth to saturated zone	1.00	Depth to bedrock	0.42
		Frost action	0.50	Unstable excavation walls	0.01		
Lapoin-----	40	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	0.75
		Low strength	1.00	Depth to saturated zone	1.00	Depth to bedrock	0.01
		Depth to saturated zone	0.75	Too clayey	0.28		
		Frost action	0.50	Unstable excavation walls	0.04		
		Depth to hard bedrock	0.01				
1383557: Au Gres-----	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Unstable excavation walls	1.00	Droughty	0.09
1383580: Loxley-----	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Organic matter content	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.01	Dusty	0.01
		Low strength	1.00	Dusty	0.01		
Beseman-----	30	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Organic matter content	1.00
		Frost action	1.00	Unstable excavation walls	0.01	Depth to saturated zone	1.00
		Low strength	1.00				
		Subsidence	1.00				
Dawson-----	28	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Subsidence	1.00	Unstable excavation walls	0.01	Dusty	0.01
		Frost action	1.00	Dusty	0.01		
		Low strength	1.00				
1383581: Rifle-----	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Organic matter content	1.00	Dusty	0.01
				Dusty	0.01		
				Unstable excavation walls	0.01		

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383603: Cornucopia-----	80	Very limited Slope Shrink-swell Low strength Frost action	 1.00 1.00 1.00 0.50	Very limited Slope Too clayey Unstable excavation walls	 1.00 0.50 0.01	Very limited Slope	 1.00
1383658: Deerton-----	50	Somewhat limited Depth to hard bedrock	 0.01	Very limited Depth to hard bedrock Unstable excavation walls	 1.00 0.98	Somewhat limited Droughty Depth to bedrock	 0.78 0.01
Brownstone-----	40	Somewhat limited Large stones Depth to hard bedrock	 0.39 0.35	Very limited Depth to hard bedrock Unstable excavation walls Large stones	 1.00 1.00 0.39	Somewhat limited Large stones content Droughty Depth to bedrock	 0.99 0.43 0.21
1383660: Deerton-----	50	Somewhat limited Slope Depth to hard bedrock	 0.37 0.01	Very limited Depth to hard bedrock Unstable excavation walls Slope	 1.00 0.98 0.37	Somewhat limited Droughty Slope Depth to bedrock	 0.78 0.37 0.01
Brownstone-----	40	Somewhat limited Large stones Slope Depth to hard bedrock	 0.39 0.37 0.35	Very limited Depth to hard bedrock Unstable excavation walls Large stones Slope	 1.00 1.00 0.39 0.37	Somewhat limited Large stones content Droughty Slope Depth to bedrock	 0.99 0.43 0.37 0.21
1383662: Abbaye-----	90	Somewhat limited Depth to saturated zone Frost action Depth to hard bedrock Slope	 0.75 0.50 0.46 0.37	Very limited Depth to hard bedrock Depth to saturated zone Slope Unstable excavation walls	 1.00 1.00 0.37 0.01	Somewhat limited Depth to saturated zone Slope Depth to bedrock	 0.75 0.37 0.29
1383665: Allendale-----	35	Very limited Depth to saturated zone Frost action Shrink-swell	 1.00 0.50 0.15	Very limited Depth to saturated zone Too clayey Unstable excavation walls	 1.00 0.50 0.01	Very limited Depth to saturated zone Droughty	 1.00 0.13
Wakeley-----	30	Very limited Ponding Depth to saturated zone Shrink-swell Frost action	 1.00 1.00 0.57 0.50	Very limited Ponding Depth to saturated zone Too clayey Unstable excavation walls	 1.00 1.00 0.50 0.01	Very limited Ponding Depth to saturated zone	 1.00 1.00

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383665: Kinross-----	20	Very limited Ponding Depth to saturated zone Frost action	 1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	 1.00 1.00
1383960: Flink-----	75	Very limited Depth to saturated zone Frost action	 1.00 0.50	Very limited Depth to saturated zone Unstable excavation walls	 1.00 0.01	Very limited Depth to saturated zone	 1.00
1444357: Arnheim-----	85	Very limited Ponding Depth to saturated zone Frost action Flooding	 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Flooding Unstable excavation walls Dusty	 1.00 1.00 0.80 0.01 0.01	Very limited Ponding Flooding Depth to saturated zone Dusty	 1.00 1.00 1.00 0.01
1444359: Beaches-----	97	Not rated		Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
1444378: Wakefield-----	85	Very limited Depth to saturated zone Frost action	 1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	 1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Large stones content	 1.00 0.99 0.01
1444379: Wakefield-----	85	Very limited Depth to saturated zone Slope Frost action	 1.00 0.63 0.50	Very limited Depth to saturated zone Slope Dense layer Unstable excavation walls	 1.00 0.63 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan Slope Large stones content	 1.00 0.99 0.63 0.01
1444388: Allendale-----	80	Very limited Depth to saturated zone Frost action Shrink-swell	 1.00 0.50 0.15	Very limited Depth to saturated zone Too clayey Unstable excavation walls	 1.00 0.50 0.01	Very limited Depth to saturated zone Droughty	 1.00 0.13

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444402: Tonkey-----	90	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
1444410: Tula-----	80	Very limited Depth to saturated zone Frost action	1.00 1.00	Very limited Depth to saturated zone Dense layer Unstable excavation walls Dusty	1.00 0.50 0.01 0.01	Very limited Depth to saturated zone Depth to cemented pan Large stones content Dusty	1.00 0.97 0.01 0.01
1444414: Lupton-----	40	Very limited Ponding Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
Cathro-----	30	Very limited Ponding Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
Tawas-----	25	Very limited Ponding Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
1444425: Lerch-----	50	Very limited Ponding Depth to saturated zone Shrink-swell Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 1.00 0.46	Very limited Ponding Too clayey Depth to saturated zone	1.00 1.00 1.00
Herbster-----	35	Very limited Depth to saturated zone Shrink-swell Low strength Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.28 0.01	Very limited Depth to saturated zone	1.00

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444426: Portwing-----	50	Very limited Depth to saturated zone Shrink-swell Low strength Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.28 0.01	Very limited Depth to saturated zone	1.00
Herbster-----	30	Very limited Depth to saturated zone Shrink-swell Low strength Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.28 0.01	Very limited Depth to saturated zone	1.00
1444427: Cornucopia-----	80	Very limited Shrink-swell Low strength Frost action Slope	1.00 1.00 0.50 0.37	Somewhat limited Too clayey Slope Unstable excavation walls	0.50 0.37 0.01	Somewhat limited Slope	0.37
1444428: Cornucopia-----	80	Very limited Slope Shrink-swell Low strength Frost action	1.00 1.00 1.00 0.50	Very limited Slope Too clayey Unstable excavation walls	1.00 0.50 0.01	Very limited Slope	1.00
1444431: Crowell-----	82	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Droughty Too sandy Depth to saturated zone	0.64 0.50 0.19
1444432: Gogebic-----	85	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Dense layer Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Depth to cemented pan	1.00 0.71
1444435: Iosco-----	85	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Unstable excavation walls	1.00 0.01	Very limited Depth to saturated zone	1.00
1444457: Redrim-----	85	Very limited Depth to hard bedrock Low strength	1.00 1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.35	Very limited Depth to bedrock Large stones content Droughty	1.00 0.99 0.67

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444459: Zeba-----	90	Very limited Depth to saturated zone Frost action Depth to hard bedrock	1.00 1.00 0.20	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 0.01	Very limited Depth to saturated zone Depth to bedrock Large stones content	1.00 0.21 0.03
1444460: Abbaye-----	55	Somewhat limited Depth to saturated zone Depth to hard bedrock Frost action	0.75 0.61 0.50	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 0.01	Somewhat limited Depth to saturated zone Depth to bedrock	0.75 0.42
Lapoin-----	40	Very limited Shrink-swell Low strength Depth to saturated zone Frost action Depth to hard bedrock	1.00 1.00 0.75 0.50 0.01	Very limited Depth to hard bedrock Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.28 0.04	Somewhat limited Depth to saturated zone Depth to bedrock	0.75 0.01
1444461: Abbaye-----	55	Somewhat limited Depth to saturated zone Depth to hard bedrock Frost action	0.75 0.61 0.50	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 0.01	Somewhat limited Depth to saturated zone Depth to bedrock	0.75 0.42
Zeba-----	40	Very limited Depth to saturated zone Frost action Depth to hard bedrock	1.00 1.00 0.20	Very limited Depth to hard bedrock Depth to saturated zone Unstable excavation walls	1.00 1.00 0.01	Very limited Depth to saturated zone Depth to bedrock Large stones content	1.00 0.21 0.03
1444477: Cublake-----	35	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 0.15	Somewhat limited Droughty Too sandy Depth to saturated zone	0.53 0.50 0.19
Croswell-----	20	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00	Somewhat limited Droughty Too sandy Depth to saturated zone	0.56 0.50 0.19

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444477: Ashwabay-----	20	Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	1.00	Droughty	0.34
				Too clayey	0.50		
				Unstable excavation walls	0.01		
1444478: Cublake-----	35	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Depth to saturated zone	1.00	Droughty	0.53
		Depth to saturated zone	0.19	Slope	0.37	Too sandy	0.50
				Unstable excavation walls	0.15	Slope	0.37
						Depth to saturated zone	0.19
Croswell-----	20	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.19	Depth to saturated zone	1.00	Droughty	0.56
		Slope	0.04	Unstable excavation walls	1.00	Too sandy	0.50
				Slope	0.04	Depth to saturated zone	0.19
						Slope	0.04
Ashwabay-----	20	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Depth to saturated zone	1.00	Slope	0.37
		Depth to saturated zone	0.19	Too clayey	0.50	Droughty	0.34
				Slope	0.37	Depth to saturated zone	0.19
				Unstable excavation walls	0.01		
1444479: Morganlake-----	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	1.00	Depth to saturated zone	0.75
				Unstable excavation walls	0.01		
1444480: Morganlake-----	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Slope	0.37	Slope	0.37	Slope	0.37
				Unstable excavation walls	0.01		
1444481: Kellogg-----	35	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Shrink-swell	0.57	Too clayey	0.32		
				Unstable excavation walls	0.02		
Allendale-----	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	0.50	Too clayey	0.50	Droughty	0.13
		Shrink-swell	0.15	Unstable excavation walls	0.01		

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444481: Ashwabay-----	20	Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	1.00	Droughty	0.34
				Too clayey	0.50		
				Unstable excavation walls	0.01		
1444482: Kellogg-----	40	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Shrink-swell	0.57	Slope	0.37	Slope	0.37
		Slope	0.37	Too clayey	0.32		
				Unstable excavation walls	0.02		
Allendale-----	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	0.50	Too clayey	0.50	Droughty	0.13
		Shrink-swell	0.15	Slope	0.04	Slope	0.04
		Slope	0.04	Unstable excavation walls	0.01		
Ashwabay-----	20	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Depth to saturated zone	1.00	Slope	0.37
				Too clayey	0.50	Droughty	0.34
				Slope	0.37		
				Unstable excavation walls	0.01		
1444486: Sedgwick-----	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Dusty	0.01
		Frost action	1.00	Unstable excavation walls	0.29		
		Low strength	1.00	Dusty	0.01		
Munuscong-----	30	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.97	Dusty	0.01
		Shrink-swell	0.04	Unstable excavation walls	0.01		
				Dusty	0.01		
1444487: Superior-----	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	1.00	Dusty	0.01
		Low strength	1.00	Unstable excavation walls	0.33		
		Frost action	0.50	Dusty	0.01		

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444487: Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell Frost action Low strength	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Unstable excavation walls Dusty	1.00 1.00 0.50 0.29 0.01	Very limited Depth to saturated zone Dusty	1.00 1.00 0.01
1444488: Superior-----	50	Very limited Depth to saturated zone Shrink-swell Low strength Frost action Slope	1.00 1.00 1.00 0.50 0.37	Very limited Depth to saturated zone Too clayey Slope Unstable excavation walls Dusty	1.00 1.00 0.37 0.33 0.01	Very limited Depth to saturated zone Slope Dusty	1.00 1.00 0.37 0.01
Sedgwick-----	30	Very limited Depth to saturated zone Shrink-swell Frost action Low strength	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Unstable excavation walls Dusty	1.00 1.00 0.50 0.29 0.01	Very limited Depth to saturated zone Dusty	1.00 1.00 0.01
1444489: Sultz-----	35	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00 0.73	Very limited Slope Droughty	1.00 1.00
Ashwabay-----	25	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 1.00 0.50 0.01	Very limited Slope Droughty	1.00 0.34
Rubicon-----	20	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.93 0.50
1444492: Manistee-----	40	Very limited Slope Shrink-swell	1.00 0.04	Very limited Slope Too clayey Unstable excavation walls	1.00 1.00 0.28 0.01	Very limited Slope Too sandy Droughty	1.00 0.50 0.13
Kellogg-----	30	Very limited Slope Depth to saturated zone Shrink-swell	1.00 0.75 0.57	Very limited Slope Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 1.00 0.32 0.02	Very limited Slope Depth to saturated zone	1.00 0.75

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444492: Ashwabay-----	20	Very limited Slope	1.00	Very limited Slope Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Slope Droughty	1.00 0.34
1444506: Keweenaw-----	60	Not limited		Somewhat limited Unstable excavation walls	0.27	Somewhat limited Droughty Large stones content	0.06 0.01
Rubicon-----	30	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.67 0.50
1444507: Keweenaw-----	60	Somewhat limited Slope	0.16	Somewhat limited Unstable excavation walls Slope	0.27 0.16	Somewhat limited Slope Droughty Large stones content	0.16 0.06 0.01
Rubicon-----	30	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Too sandy Slope	0.67 0.50 0.37
1444585: Meehan, beaches----	90	Very limited Depth to saturated zone Low strength Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Droughty	1.00 0.50 0.29
1444586: Wurtsmith, beaches--	90	Very limited Low strength Depth to saturated zone	1.00 0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Somewhat limited Droughty Depth to saturated zone	0.26 0.19
1444587: Grayling, beaches---	95	Very limited Low strength	1.00	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.88 0.50
1529830: Meehan, beaches----	90	Very limited Depth to saturated zone Low strength Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Droughty	1.00 0.50 0.29

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1700372: Loxley-----	40	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Unstable excavation walls Dusty	1.00 1.00 1.00 1.00 0.01 0.01	Very limited Ponding Organic matter content Depth to saturated zone Dusty	1.00 1.00 1.00 1.00 0.01
Beseman-----	30	Very limited Ponding Depth to saturated zone Frost action Low strength Subsidence	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 0.01	Very limited Ponding Organic matter content Depth to saturated zone	1.00 1.00 1.00
Dawson-----	28	Very limited Ponding Depth to saturated zone Subsidence Frost action Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Unstable excavation walls Dusty	1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01
1700373: Rifle-----	90	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Organic matter content Dusty Unstable excavation walls	1.00 1.00 1.00 0.01 0.01	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 1.00 0.01
1700374: Allendale-----	35	Very limited Depth to saturated zone Frost action Shrink-swell	1.00 0.50 0.15	Very limited Depth to saturated zone Too clayey Unstable excavation walls	1.00 0.50 0.01	Very limited Depth to saturated zone Droughty	1.00 0.13
Wakeley-----	30	Very limited Ponding Depth to saturated zone Shrink-swell Frost action	1.00 1.00 0.57 0.50	Very limited Ponding Depth to saturated zone Too clayey Unstable excavation walls	1.00 1.00 0.50 0.01	Very limited Ponding Depth to saturated zone	1.00 1.00
Kinross-----	20	Very limited Ponding Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Unstable excavation walls	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00

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Table 9.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1702605: Menominee-----	85	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.01	Very limited Slope	1.00
1702606: Deerton-----	50	Somewhat limited Depth to hard bedrock	0.01	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.98	Somewhat limited Droughty Depth to bedrock	0.78 0.01
Brownstone-----	40	Somewhat limited Large stones Depth to hard bedrock	0.39 0.35	Very limited Depth to hard bedrock Unstable excavation walls Large stones	1.00 1.00 0.39	Somewhat limited Large stones content Droughty Depth to bedrock	0.99 0.43 0.21
1702607: Deerton-----	50	Somewhat limited Slope Depth to hard bedrock	0.37 0.01	Very limited Depth to hard bedrock Unstable excavation walls Slope	1.00 0.98 0.37	Somewhat limited Droughty Slope Depth to bedrock	0.78 0.37 0.01
Brownstone-----	40	Somewhat limited Large stones Slope Depth to hard bedrock	0.39 0.37 0.35	Very limited Depth to hard bedrock Unstable excavation walls Large stones Slope	1.00 1.00 1.00 0.39 0.37	Somewhat limited Large stones content Droughty Slope Depth to bedrock	0.99 0.43 0.37 0.21
1702608: Abbaye-----	90	Somewhat limited Depth to saturated zone Frost action Depth to hard berock Slope	0.75 0.50 0.46 0.37	Very limited Depth to hard bedrock Depth to saturated zone Slope Unstable excavation walls	1.00 1.00 0.37 0.01	Somewhat limited Depth to saturated zone Slope Depth to bedrock	0.75 0.37 0.29
1711685: Cublake-----	50	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Unstable excavation walls	1.00 0.15	Somewhat limited Droughty Too sandy Depth to saturated zone	0.53 0.50 0.19
Keweenaw-----	30	Not limited		Somewhat limited Unstable excavation walls	0.27	Somewhat limited Droughty Large stones content	0.06 0.01

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Table 10.—Sewage Disposal

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Very limited Ponding	1.00	Very limited Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Herbster-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
433296: Cublake-----	35	Very limited Depth to saturated zone	1.00	Very limited Seepage	1.00
		Slow water movement	0.72	Depth to saturated zone	0.75
				Slope	0.08
Croswell-----	20	Very limited Depth to saturated zone	1.00	Very limited Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Slope	0.08
Ashwabay-----	20	Very limited Depth to saturated zone	1.00	Very limited Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	0.19
				Slope	0.08
433299: Cublake-----	35	Very limited Depth to saturated zone	1.00	Very limited Seepage	1.00
		Slow water movement	0.72	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.75
Croswell-----	20	Very limited Depth to saturated zone	1.00	Very limited Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.04		

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433299: Ashwabay-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.75
433300: Kellogg-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	0.99
		Slope		Slope	0.32
Allendale-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope		Slope	0.32
Ashwabay-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	0.32
		Slope		Depth to saturated zone	0.19
433301: Kellogg-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.99
Allendale-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.04	Slope	1.00
Ashwabay-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.19
433304: Sedgwick-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
		Slope		Slope	0.08
Munuscong-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433305: Superior-----	50	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.53 0.32
Sedgwick-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.53 0.08
433309: Superior-----	50	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 0.37	Very limited Depth to saturated zone Slope Seepage	1.00 1.00 0.53
Sedgwick-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slope Seepage	1.00 1.00 0.53
433310: Sultz-----	35	Very limited Slope Slow water movement	1.00 0.47	Very limited Slope Seepage	1.00 1.00
Ashwabay-----	25	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 1.00	Very limited Slope Seepage Depth to saturated zone	1.00 1.00 0.19
Rubicon-----	20	Very limited Filtering capacity Slope Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
433314: Manistee-----	40	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
Kellogg-----	30	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 1.00	Very limited Slope Seepage Depth to saturated zone	1.00 1.00 0.99

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433314: Ashwabay-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	1.00
		Slope	1.00	Depth to saturated zone	0.19
433326: Rubicon-----	85	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.08
433379: Allendale-----	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
433515: Lupton-----	40	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Cathro-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	0.72	Depth to saturated zone	1.00
				Seepage	1.00
Tawas-----	25	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
433572: Portwing-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
				Slope	0.32
Herbster-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433573: Cornucopia-----	80	Very limited Slow water movement Slope	1.00 0.37	Very limited Slope Seepage	1.00 0.53
433582: Crowell-----	82	Very limited Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.08
433599: Annalake-----	85	Very limited Depth to saturated zone Slow water movement	1.00 0.47	Very limited Depth to saturated zone Seepage Slope	1.00 0.53 0.32
433600: Annalake-----	80	Very limited Depth to saturated zone Slow water movement Slope	1.00 0.47 0.37	Very limited Depth to saturated zone Slope Seepage	1.00 1.00 0.53
433671: Arnheim-----	85	Very limited Flooding Ponding Depth to saturated zone Slow water movement	1.00 1.00 1.00 0.47	Very limited Ponding Flooding Depth to saturated zone Seepage	1.00 1.00 1.00 0.53
433676: Redrim-----	85	Very limited Depth to bedrock Seepage, bottom layer Slow water movement	1.00 1.00 0.72	Very limited Depth to hard bedrock Seepage Slope Large stones	1.00 1.00 0.08 0.02
433679: Lapoin-----	85	Very limited Depth to saturated zone Slow water movement Depth to bedrock	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to saturated zone Seepage Slope	1.00 1.00 0.53 0.08

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433686: Zeba-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Seepage	0.53
				Slope	0.08
433729: Sultz-----	85	Somewhat limited		Very limited	
		Slow water movement	0.47	Seepage	1.00
				Slope	0.08
433739: Moquah-----	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Seepage	0.53
433771: Beaches-----	97	Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated	
452765: Abbaye-----	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Seepage	0.53
				Slope	0.08
Lapoin-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Seepage	0.53
				Slope	0.08
1383557: Au Gres-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383580: Loxley-----	40	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
Beseman-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Subsidence	1.00	Seepage	1.00
Dawson-----	28	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.47		
1383581: Rifle-----	90	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Depth to saturated zone	1.00
1383603: Cornucopia-----	80	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
1383658: Deerton-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	0.72	Seepage	1.00
				Slope	0.08
Brownstone-----	40	Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Slow water movement	0.72	Large stones	0.87
		Large stones	0.39	Slope	0.08

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383660: Deerton-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	0.72	Seepage	1.00
		Slope	0.37	Slope	1.00
Brownstone-----	40	Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Slow water movement	0.72	Slope	1.00
		Large stones	0.39	Large stones	0.87
		Slope	0.37		
1383662: Abbaye-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to	1.00
		Slow water movement	0.72	saturated zone	
		Slope	0.37	Slope	1.00
				Seepage	0.53
1383665: Allendale-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to	1.00
				saturated zone	
				Slope	0.08
Wakeley-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	1.00	Seepage	1.00
				Depth to	1.00
				saturated zone	
Kinross-----	20	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to	1.00
				saturated zone	
1383960: Flink-----	75	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	0.72	Depth to	1.00
				saturated zone	

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444357: Arnheim-----	85	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.47	Seepage	0.53
1444359: Beaches-----	97	Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
1444378: Wakefield-----	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
				Slope	0.32
1444379: Wakefield-----	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.63	Seepage	0.53
1444388: Allendale-----	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
1444402: Tonkey-----	90	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.47	Seepage	0.53
1444410: Tula-----	80	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444414: Lupton-----	40	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Cathro-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	0.72	Depth to saturated zone	1.00
				Seepage	1.00
Tawas-----	25	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
1444425: Lerch-----	50	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Herbster-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
1444426: Portwing-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
				Slope	0.32
Herbster-----	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
1444427: Cornucopia-----	80	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.37	Seepage	0.53

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444428: Cornucopia-----	80	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Seepage	1.00 0.53
1444431: Crowell-----	82	Very limited Depth to saturated zone Filtering capacity Seepage, bottom layer	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.08
1444432: Gogebic-----	85	Very limited Depth to cemented pan Depth to saturated zone Slow water movement	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage Slope	1.00 1.00 0.53 0.32
1444435: Iosco-----	85	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
1444457: Redrim-----	85	Very limited Depth to bedrock Seepage, bottom layer Slow water movement	1.00 1.00 0.72	Very limited Depth to hard bedrock Seepage Slope Large stones	1.00 1.00 1.00 0.08 0.02
1444459: Zeba-----	90	Very limited Depth to saturated zone Depth to bedrock Slow water movement	1.00 1.00 0.72	Very limited Depth to hard bedrock Depth to saturated zone Seepage Slope	1.00 1.00 0.53 0.08
1444460: Abbaye-----	55	Very limited Depth to saturated zone Depth to bedrock Slow water movement	1.00 1.00 0.72	Very limited Depth to hard bedrock Depth to saturated zone Seepage Slope	1.00 1.00 0.53 0.08

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444460: Lapoin-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Seepage	0.53
				Slope	0.08
1444461: Abbaye-----	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Seepage	0.53
				Slope	0.08
Zeba-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Seepage	0.53
				Slope	0.08
1444477: Cublake-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	0.72	Depth to saturated zone	0.75
				Slope	0.08
Croswell-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Slope	0.08
Ashwabay-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	0.19
				Slope	0.08
1444478: Cublake-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	0.72	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.75

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444478: Crowell-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.04		
Ashwabay-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.75
1444479: Morganlake-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	0.99
				Slope	0.08
1444480: Morganlake-----	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.99
1444481: Kellogg-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	0.99
				Slope	0.32
Allendale-----	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
				Slope	0.32
Ashwabay-----	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	0.32
				Depth to saturated zone	0.19
1444482: Kellogg-----	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.99

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444482: Allendale-----	25	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 1.00 0.04	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 1.00
Ashwabay-----	20	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 1.00 0.37	Very limited Seepage Slope Depth to saturated zone	1.00 1.00 0.19
1444486: Sedgwick-----	50	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.53 0.08
Munuscong-----	30	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 1.00	Very limited Ponding Seepage Depth to saturated zone	1.00 1.00 1.00
1444487: Superior-----	50	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.53 0.32
Sedgwick-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.53 0.08
1444488: Superior-----	50	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 0.37	Very limited Depth to saturated zone Slope Seepage	1.00 1.00 0.53
Sedgwick-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slope Seepage	1.00 1.00 0.53
1444489: Sultz-----	35	Very limited Slope Slow water movement	1.00 0.47	Very limited Slope Seepage	1.00 1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444489: Ashwabay-----	25	Very limited Depth to saturated zone	1.00	Very limited Slope	1.00
		Slow water movement	1.00	Seepage	1.00
		Slope	1.00	Depth to saturated zone	0.19
Rubicon-----	20	Very limited Filtering capacity	1.00	Very limited Slope	1.00
		Slope	1.00	Seepage	1.00
		Seepage, bottom layer	1.00		
1444492: Manistee-----	40	Very limited Slow water movement	1.00	Very limited Slope	1.00
		Slope	1.00	Seepage	1.00
Kellogg-----	30	Very limited Depth to saturated zone	1.00	Very limited Slope	1.00
		Slow water movement	1.00	Seepage	1.00
		Slope	1.00	Depth to saturated zone	0.99
Ashwabay-----	20	Very limited Depth to saturated zone	1.00	Very limited Slope	1.00
		Slow water movement	1.00	Seepage	1.00
		Slope	1.00	Depth to saturated zone	0.19
1444506: Keweenaw-----	60	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
				Slope	0.32
Rubicon-----	30	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.08
1444507: Keweenaw-----	60	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
		Slope	0.16	Slope	1.00
Rubicon-----	30	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.37		

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444585: Meehan, beaches-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		
1444586: Wurtsmith, beaches--	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		
1444587: Grayling, beaches---	95	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	1.00
1529830: Meehan, beaches-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00		
1700372: Loxley-----	40	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
Beseman-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Subsidence	1.00	Seepage	1.00
Dawson-----	28	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Subsidence	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.47		

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1700373: Rifle-----	90	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Depth to saturated zone	1.00
1700374: Allendale-----	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
				Slope	0.08
Wakeley-----	30	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Slow water movement	1.00	Seepage	1.00
				Depth to saturated zone	1.00
Kinross-----	20	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
1702605: Menominee-----	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	1.00
1702606: Deerton-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	0.72	Seepage	1.00
				Slope	0.08
Brownstone-----	40	Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Slow water movement	0.72	Large stones	0.87
		Large stones	0.39	Slope	0.08
1702607: Deerton-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	0.72	Seepage	1.00
		Slope	0.37	Slope	1.00

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Table 10.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1702607: Brownstone-----	40	Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Slow water movement	0.72	Slope	1.00
		Large stones	0.39	Large stones	0.87
		Slope	0.37		
1702608: Abbaye-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Slope	1.00
		Slope	0.37	Seepage	0.53
1711685: Cublake-----	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	0.72	Depth to saturated zone	0.75
				Slope	0.08
Keweenaw-----	30	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.32

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Table 11.—Source of Gravel and Sand

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433292:					
Lerch-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Herbster-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
433296:					
Cublake-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.38
Croswell-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00		
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
433299:					
Cublake-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.38
Croswell-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00		
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
433300:					
Kellogg-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Allendale-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433301: Kellogg-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Allendale-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.02
Ashwabay-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.10
433304: Sedgwick-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Munuscong-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
433305: Superior-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sedgwick-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
433309: Superior-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sedgwick-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
433310: Sultz-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.05 0.66
Ashwabay-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.10
Rubicon-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Good Bottom layer	0.82
433314: Manistee-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.04

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433314: Kellogg-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ashwabay-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.10
433326: Rubicon-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Good Bottom layer	0.82
433379: Allendale-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.02
433515: Lupton-----	40	Poor Bottom layer Thickest layer Organic matter content	0.00 0.00 0.00	Poor Bottom layer Thickest layer Organic matter content	0.00 0.00 0.00
Cathro-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.03
Tawas-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.20
433572: Portwing-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Herbster-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
433573: Cornucopia-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
433582: Crowell-----	82	Poor Bottom layer Thickest layer	0.00 0.00	Good Bottom layer	0.86
433599: Annalake-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.10

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
433600: Annalake-----	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
433671: Arnheim-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
433676: Redrim-----	85	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.08
		Bottom layer	0.00	Thickest layer	0.29
433679: Lapoin-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
433686: Zeba-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.10
433729: Sultz-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.05
		Thickest layer	0.00	Thickest layer	0.66
433739: Moquah-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.22
433771: Beaches-----	97	Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated	
452765: Abbaye-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.12
Lapoin-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
1383557: Au Gres-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00	Thickest layer	0.98

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383580: Loxley-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Beseman-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dawson-----	28	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.65
1383581: Rifle-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
1383603: Cornucopia-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1383658: Deerton-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.91
Brownstone-----	40	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.09
1383660: Deerton-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.91
Brownstone-----	40	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.09
1383662: Abbaye-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.11
1383665: Allendale-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Wakeley-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kinross-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.65
		Thickest layer	0.00	Thickest layer	0.99

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1383960: Flink-----	75	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.18
1444357: Arnheim-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
1444359: Beaches-----	97	Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated	
1444378: Wakefield-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.07
1444379: Wakefield-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.07
1444388: Allendale-----	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
1444402: Tonkey-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
1444410: Tula-----	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.05
1444414: Lupton-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Cathro-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Tawas-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.20

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444425: Lerch-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Herbster-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1444426: Portwing-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Herbster-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1444427: Cornucopia-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1444428: Cornucopia-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1444431: Crowell-----	82	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00		
1444432: Gogebic-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.10
1444435: Iosco-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.04
1444457: Redrim-----	85	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.08
		Bottom layer	0.00	Thickest layer	0.29
1444459: Zeba-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.10
1444460: Abbaye-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.12
Lapoin-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444461: Abbaye-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.12
Zeba-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.10
1444477: Cublake-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.38
Croswell-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00		
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
1444478: Cublake-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.38
Croswell-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.86
		Thickest layer	0.00		
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
1444479: Morganlake-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
1444480: Morganlake-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
1444481: Kellogg-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Allendale-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444482: Kellogg-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Allendale-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
1444486: Sedgwick-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Munuscong-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1444487: Superior-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sedgwick-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1444488: Superior-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sedgwick-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1444489: Sultz-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.05
		Thickest layer	0.00	Thickest layer	0.66
Ashwabay-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
Rubicon-----	20	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.82
		Thickest layer	0.00		
1444492: Manistee-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.04

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1444492: Kellogg-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ashwabay-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.10
1444506: Keweenaw-----	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.49
Rubicon-----	30	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.82
		Thickest layer	0.00		
1444507: Keweenaw-----	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.49
Rubicon-----	30	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.82
		Thickest layer	0.00		
1444585: Meehan, beaches-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.82
		Thickest layer	0.00	Thickest layer	0.99
1444586: Wurtsmith, beaches--	90	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.82
		Thickest layer	0.00		
1444587: Grayling, beaches---	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.64
		Thickest layer	0.00	Thickest layer	0.99
1529830: Meehan, beaches-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.82
		Thickest layer	0.00	Thickest layer	0.99
1700372: Loxley-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
Beseman-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dawson-----	28	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.65

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Table 11.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1700373: Rifle-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
1700374: Allendale-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Wakeley-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kinross-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.65
		Thickest layer	0.00	Thickest layer	0.99
1702605: Menominee-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.03
1702606: Deerton-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.91
Brownstone-----	40	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.09
1702607: Deerton-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.91
Brownstone-----	40	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.09
1702608: Abbaye-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.11
1711685: Cublake-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.38
Keweenaw-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.49

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Poor Too clayey Low content of organic matter Too acid	0.00 0.13 0.84	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.00	Poor Too clayey Wetness	0.00 0.00
Herbster-----	35	Poor Too clayey Low content of organic matter Too acid	0.00 0.13 0.84	Poor Wetness Shrink-swell Dusty	0.00 0.22 0.82	Poor Wetness Too clayey	0.00 0.00
433296: Cublake-----	35	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.21	Fair Wetness	0.53	Poor Too sandy Wetness Too acid	0.00 0.53 0.88
Croswell-----	20	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Wetness	0.53	Poor Too sandy Wetness Rock fragments	0.00 0.53 0.97
Ashwabay-----	20	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.46	Fair Wetness Shrink-swell	0.89 0.99	Poor Too sandy Wetness	0.00 0.89
433299: Cublake-----	35	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.21	Fair Wetness	0.53	Poor Too sandy Wetness Slope	0.00 0.53 0.63
Croswell-----	20	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Wetness	0.53	Poor Too sandy Wetness Slope	0.00 0.53 0.96
Ashwabay-----	20	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.46	Fair Wetness Shrink-swell	0.53 0.99	Poor Too sandy Wetness Slope	0.00 0.53 0.63
433300: Kellogg-----	35	Poor Wind erosion Too acid Low content of organic matter	0.00 0.12 0.13	Poor Low strength Wetness Shrink-swell	0.00 0.14 0.64	Fair Wetness	0.14

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433300: Allendale-----	25	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.54	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.71	Poor Wetness	0.00
Ashwabay-----	20	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.46	Fair Wetness Shrink-swell	0.89 0.99	Poor Too sandy Wetness	0.00 0.89
433301: Kellogg-----	40	Poor Wind erosion Too acid Low content of organic matter	0.00 0.12 0.13	Poor Low strength Wetness Shrink-swell	0.00 0.14 0.64	Fair Wetness Slope	0.14 0.63
Allendale-----	25	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.54	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.71	Poor Wetness Slope	0.00 0.96
Ashwabay-----	20	Poor Too sandy Wind erosion Too acid	0.00 0.00 0.46	Fair Wetness Shrink-swell	0.89 0.99	Poor Too sandy Slope Wetness	0.00 0.63 0.89
433304: Sedgwick-----	50	Fair Low content of organic matter Too acid Too clayey	0.13 0.46 0.66	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.29	Poor Wetness Too clayey	0.00 0.50
Munuscong-----	30	Fair Low content of organic matter Carbonate content	0.13 0.92	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.77	Poor Wetness	0.00
433305: Superior-----	50	Fair Too clayey Low content of organic matter Too acid	0.01 0.13 0.54	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.23	Poor Wetness Too clayey	0.00 0.01
Sedgwick-----	30	Fair Low content of organic matter Too acid Too clayey	0.13 0.46 0.74	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.29	Poor Wetness Too clayey	0.00 0.56
433309: Superior-----	50	Fair Too clayey Low content of organic matter Too acid	0.01 0.13 0.54	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.23	Poor Wetness Too clayey Slope	0.00 0.01 0.63

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433309: Sedgwick-----	30	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.46	Low strength	0.00	Too clayey	0.56
		Too clayey	0.74	Shrink-swell	0.29		
433310: Sultz-----	35	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.13			Rock fragments	0.97
Ashwabay-----	25	Poor		Fair		Poor	
		Too sandy	0.00	Slope	0.08	Slope	0.00
		Wind erosion	0.00	Wetness	0.89	Too sandy	0.00
		Too acid	0.46	Shrink-swell	0.99	Wetness	0.89
Rubicon-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.04			Too acid	0.99
433314: Manistee-----	40	Poor		Poor		Poor	
		Wind erosion	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.13	Slope	0.00		
		Too acid	0.89	Shrink-swell	0.77		
Kellogg-----	30	Poor		Poor		Poor	
		Wind erosion	0.00	Low strength	0.00	Slope	0.00
		Too acid	0.12	Wetness	0.14	Wetness	0.14
		Low content of organic matter	0.13	Slope	0.18		
Ashwabay-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00	Wetness	0.89	Too sandy	0.00
		Too acid	0.46	Shrink-swell	0.99	Wetness	0.89
433326: Rubicon-----	85	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.13				
433379: Allendale-----	80	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Low strength	0.00		
		Too acid	0.54	Shrink-swell	0.71		
433515: Lupton-----	40	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Dusty	0.80	Organic matter content high	0.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433515: Cathro-----	30	Fair Too acid	0.99	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high	0.00 0.00
Tawas-----	25	Good		Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high	0.00 0.00
433572: Portwing-----	50	Poor Too alkaline Too clayey Low content of organic matter	0.00 0.00 0.50	Poor Wetness Shrink-swell Dusty	0.00 0.34 0.82	Poor Wetness Too clayey	0.00 0.00
Herbster-----	30	Poor Too clayey Low content of organic matter Too acid	0.00 0.13 0.84	Poor Wetness Shrink-swell Dusty	0.00 0.22 0.82	Poor Wetness Too clayey	0.00 0.00
433573: Cornucopia-----	80	Poor Too clayey Low content of organic matter Too acid	0.00 0.50 0.68	Fair Shrink-swell Dusty	0.57 0.94	Poor Too clayey Slope	0.00 0.63
433582: Croswell-----	82	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Wetness	0.53	Poor Too sandy Wetness	0.00 0.53
433599: Annalake-----	85	Fair Low content of organic matter Too acid	0.13 0.50	Fair Wetness	0.89	Fair Wetness Too acid	0.89 0.93
433600: Annalake-----	80	Fair Low content of organic matter Too acid	0.13 0.50	Fair Wetness	0.89	Fair Slope Wetness Too acid	0.63 0.89 0.93
433671: Arnheim-----	85	Fair Low content of organic matter Too acid Water erosion	0.50 0.97 0.99	Poor Wetness Dusty	0.00 0.97	Poor Wetness	0.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433676: Redrim-----	85	Poor Too sandy Low content of organic matter Depth to bedrock	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Depth to bedrock Rock fragments	0.00 0.00 0.00
433679: Lapoin-----	85	Poor Low content of organic matter Too clayey Too acid	0.00 0.31 0.50	Poor Depth to bedrock Wetness Shrink-swell	0.00 0.14 0.36	Fair Wetness Too clayey Depth to bedrock	0.14 0.22 0.99
433686: Zeba-----	90	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.68	Poor Wetness Depth to bedrock	0.00 0.00	Poor Wetness Depth to bedrock Rock fragments	0.00 0.79 0.97
433729: Sultz-----	85	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Good		Poor Too sandy Rock fragments	0.00 0.97
433739: Moquah-----	85	Fair Low content of organic matter Too acid	0.88 0.97	Fair Wetness	0.89	Fair Wetness	0.89
433771: Beaches-----	97	Not rated		Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated		Not rated	
452765: Abbaye-----	55	Poor Low content of organic matter Too acid Depth to bedrock	0.00 0.50 0.58	Poor Depth to bedrock Wetness	0.00 0.14	Fair Wetness Depth to bedrock Too sandy	0.14 0.58 0.85
Lapoin-----	40	Poor Low content of organic matter Too clayey Too acid	0.00 0.31 0.50	Poor Depth to bedrock Wetness Shrink-swell	0.00 0.14 0.36	Fair Wetness Too clayey Depth to bedrock	0.14 0.22 0.99

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383557: Au Gres-----	85	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Wetness	0.00	Poor Wetness Too sandy	0.00 0.00
1383580: Loxley-----	40	Fair Too acid	0.50	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high Too acid	0.00 0.00 0.13
Beseman-----	30	Fair Too acid Water erosion	0.61 0.90	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high Too acid	0.00 0.00 0.20
Dawson-----	28	Poor Too acid	0.00	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high Too acid	0.00 0.00 0.13
1383581: Rifle-----	90	Good		Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high	0.00 0.00
1383603: Cornucopia-----	80	Poor Too clayey Low content of organic matter Too acid	0.00 0.50 0.68	Poor Slope Shrink-swell Dusty	0.00 0.57 0.94	Poor Slope Too clayey	0.00 0.00
1383658: Deerton-----	50	Poor Low content of organic matter Droughty Too sandy	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Too acid Rock fragments	0.00 0.76 0.88
Brownstone-----	40	Poor Too sandy Low content of organic matter Droughty	0.00 0.00 0.01	Poor Depth to bedrock Cobble content Stones	0.00 0.13 0.98	Poor Too sandy Rock fragments Depth to bedrock	0.00 0.00 0.79
1383660: Deerton-----	50	Poor Low content of organic matter Droughty Too sandy	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Slope Too acid	0.00 0.63 0.76

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383660: Brownstone-----	40	Poor Too sandy Low content of organic matter Droughty	0.00 0.00 0.01	Poor Depth to bedrock Cobble content Stones	0.00 0.13 0.98	Poor Too sandy Rock fragments Slope	0.00 0.00 0.63
1383662: Abbaye-----	90	Poor Wind erosion Low content of organic matter Too acid	0.00 0.00 0.50	Poor Depth to bedrock Wetness	0.00 0.14	Fair Wetness Slope Depth to bedrock	0.14 0.63 0.71
1383665: Allendale-----	35	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.54	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.71	Poor Wetness	0.00
Wakeley-----	30	Fair Low content of organic matter Too acid Carbonate content	0.13 0.50 0.95	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.71	Poor Wetness	0.00
Kinross-----	20	Poor Too sandy Too acid Droughty	0.00 0.03 0.99	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	0.00 0.00 0.93
1383960: Flink-----	75	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	0.00 0.00 0.99
1444357: Arnheim-----	85	Fair Low content of organic matter Too acid Water erosion	0.50 0.97 0.99	Poor Wetness Dusty	0.00 0.97	Poor Wetness	0.00
1444359: Beaches-----	97	Not rated		Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
1444378: Wakefield-----	85	Fair Low content of organic matter Too acid Water erosion	0.13 0.68 0.99	Poor Wetness	0.00	Poor Wetness Rock fragments	0.00 0.88

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444379: Wakefield-----	85	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.68			Slope	0.37
		Water erosion	0.99			Rock fragments	0.88
1444388: Allendale-----	80	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Low strength	0.00		
		Too acid	0.54	Shrink-swell	0.71		
1444402: Tonkey-----	90	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
1444410: Tula-----	80	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.54			Rock fragments	0.47
		Droughty	0.86			Hard to reclaim (rock fragments)	0.88
1444414: Lupton-----	40	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Dusty	0.80	Organic matter content high	0.00
Cathro-----	30	Fair		Poor		Poor	
		Too acid	0.99	Wetness	0.00	Wetness	0.00
				Dusty	0.80	Organic matter content high	0.00
Tawas-----	25	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Dusty	0.80	Organic matter content high	0.00
1444425: Lerch-----	50	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Low content of organic matter	0.13	Low strength	0.00	Wetness	0.00
		Too acid	0.84	Shrink-swell	0.00		
Herbster-----	35	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Shrink-swell	0.22	Too clayey	0.00
		Too acid	0.84	Dusty	0.82		
1444426: Portwing-----	50	Poor		Poor		Poor	
		Too alkaline	0.00	Wetness	0.00	Wetness	0.00
		Too clayey	0.00	Shrink-swell	0.34	Too clayey	0.00
		Low content of organic matter	0.50	Dusty	0.82		

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444426: Herbster-----	30	Poor Too clayey Low content of organic matter Too acid	0.00 0.13 0.84	Poor Wetness Shrink-swell Dusty	0.00 0.22 0.82	Poor Wetness Too clayey	0.00 0.00
1444427: Cornucopia-----	80	Poor Too clayey Low content of organic matter Too acid	0.00 0.50 0.68	Fair Shrink-swell Dusty	0.57 0.94	Poor Too clayey Slope	0.00 0.63
1444428: Cornucopia-----	80	Poor Too clayey Low content of organic matter Too acid	0.00 0.50 0.68	Poor Slope Shrink-swell Dusty	0.00 0.57 0.94	Poor Slope Too clayey	0.00 0.00
1444431: Croswell-----	82	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.13	Fair Wetness	0.53	Poor Too sandy Wetness	0.00 0.53
1444432: Gogebic-----	85	Fair Too acid Low content of organic matter	0.12 0.13	Poor Wetness	0.00	Poor Wetness Too acid	0.00 0.87
1444435: Iosco-----	85	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.13 0.43	Poor Wetness	0.00	Poor Wetness Too sandy Rock fragments	0.00 0.43 0.99
1444457: Redrim-----	85	Poor Too sandy Low content of organic matter Depth to bedrock	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Depth to bedrock Rock fragments	0.00 0.00 0.00
1444459: Zeba-----	90	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.68	Poor Wetness Depth to bedrock	0.00 0.00	Poor Wetness Depth to bedrock Rock fragments	0.00 0.79 0.97
1444460: Abbaye-----	55	Poor Low content of organic matter Too acid Depth to bedrock	0.00 0.50 0.58	Poor Depth to bedrock Wetness	0.00 0.14	Fair Wetness Depth to bedrock Too sandy	0.14 0.58 0.85

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444460: Lapoin-----	40	Poor		Poor		Fair	
		Low content of organic matter	0.00	Depth to bedrock	0.00	Wetness	0.14
		Too clayey	0.31	Wetness	0.14	Too clayey	0.22
		Too acid	0.50	Shrink-swell	0.36	Depth to bedrock	0.99
1444461: Abbaye-----	55	Poor		Poor		Fair	
		Low content of organic matter	0.00	Depth to bedrock	0.00	Wetness	0.14
		Too acid	0.50	Wetness	0.14	Depth to bedrock	0.58
		Depth to bedrock	0.58			Too sandy	0.85
Zeba-----	40	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Depth to bedrock	0.00	Depth to bedrock	0.79
		Too acid	0.68			Rock fragments	0.97
1444477: Cublake-----	35	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.53	Too sandy	0.00
		Wind erosion	0.00			Wetness	0.53
		Too acid	0.21			Too acid	0.88
Croswell-----	20	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.53	Too sandy	0.00
		Wind erosion	0.00			Wetness	0.53
		Low content of organic matter	0.13			Rock fragments	0.97
Ashwabay-----	20	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.89	Too sandy	0.00
		Wind erosion	0.00	Shrink-swell	0.99	Wetness	0.89
		Too acid	0.46				
1444478: Cublake-----	35	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.53	Too sandy	0.00
		Wind erosion	0.00			Wetness	0.53
		Too acid	0.21			Slope	0.63
Croswell-----	20	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.53	Too sandy	0.00
		Wind erosion	0.00			Wetness	0.53
		Low content of organic matter	0.13			Slope	0.96
Ashwabay-----	20	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.53	Too sandy	0.00
		Wind erosion	0.00	Shrink-swell	0.99	Wetness	0.53
		Too acid	0.46			Slope	0.63
1444479: Morganlake-----	85	Poor		Fair		Fair	
		Wind erosion	0.00	Wetness	0.14	Wetness	0.14
		Low content of organic matter	0.13	Shrink-swell	0.99	Too acid	0.96
		Too acid	0.16				

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Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444480: Morganlake-----	85	Poor		Fair		Fair	
		Wind erosion	0.00	Wetness	0.14	Wetness	0.14
		Low content of organic matter	0.13	Shrink-swell	0.99	Slope	0.63
		Too acid	0.16			Too acid	0.96
1444481: Kellogg-----	35	Poor		Poor		Fair	
		Wind erosion	0.00	Low strength	0.00	Wetness	0.14
		Too acid	0.12	Wetness	0.14		
		Low content of organic matter	0.13	Shrink-swell	0.64		
Allendale-----	25	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Low strength	0.00		
		Too acid	0.54	Shrink-swell	0.71		
Ashwabay-----	20	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.89	Too sandy	0.00
		Wind erosion	0.00	Shrink-swell	0.99	Wetness	0.89
		Too acid	0.46				
1444482: Kellogg-----	40	Poor		Poor		Fair	
		Wind erosion	0.00	Low strength	0.00	Wetness	0.14
		Too acid	0.12	Wetness	0.14	Slope	0.63
		Low content of organic matter	0.13	Shrink-swell	0.64		
Allendale-----	25	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Low strength	0.00	Slope	0.96
		Too acid	0.54	Shrink-swell	0.71		
Ashwabay-----	20	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.89	Too sandy	0.00
		Wind erosion	0.00	Shrink-swell	0.99	Slope	0.63
		Too acid	0.46			Wetness	0.89
1444486: Sedgwick-----	50	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.46	Low strength	0.00	Too clayey	0.50
		Too clayey	0.66	Shrink-swell	0.29		
Munuscong-----	30	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Carbonate content	0.92	Low strength	0.00		
				Shrink-swell	0.77		
1444487: Superior-----	50	Fair		Poor		Poor	
		Too clayey	0.01	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Low strength	0.00	Too clayey	0.01
		Too acid	0.54	Shrink-swell	0.23		

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444487: Sedgwick-----	30	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.46	Low strength	0.00	Too clayey	0.56
		Too clayey	0.74	Shrink-swell	0.29		
1444488: Superior-----	50	Fair		Poor		Poor	
		Too clayey	0.01	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.13	Low strength	0.00	Too clayey	0.01
		Too acid	0.54	Shrink-swell	0.23	Slope	0.63
Sedgwick-----	30	Fair		Poor		Poor	
		Low content of organic matter	0.13	Wetness	0.00	Wetness	0.00
		Too acid	0.46	Low strength	0.00	Too clayey	0.56
		Too clayey	0.74	Shrink-swell	0.29		
1444489: Sultz-----	35	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.13			Rock fragments	0.97
Ashwabay-----	25	Poor		Fair		Poor	
		Too sandy	0.00	Slope	0.08	Slope	0.00
		Wind erosion	0.00	Wetness	0.89	Too sandy	0.00
		Too acid	0.46	Shrink-swell	0.99	Wetness	0.89
Rubicon-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.04			Too acid	0.99
1444492: Manistee-----	40	Poor		Poor		Poor	
		Wind erosion	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.13	Slope	0.00		
		Too acid	0.89	Shrink-swell	0.77		
Kellogg-----	30	Poor		Poor		Poor	
		Wind erosion	0.00	Low strength	0.00	Slope	0.00
		Too acid	0.12	Wetness	0.14	Wetness	0.14
		Low content of organic matter	0.13	Slope	0.18		
Ashwabay-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Wind erosion	0.00	Wetness	0.89	Too sandy	0.00
		Too acid	0.46	Shrink-swell	0.99	Wetness	0.89
1444506: Keweenaw-----	60	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Too sandy	0.00			Rock fragments	0.82
		Low content of organic matter	0.13				

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444506: Rubicon-----	30	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Good		Poor Too sandy	 0.00
1444507: Keweenaw-----	60	Poor Wind erosion Too sandy Low content of organic matter	 0.00 0.00 0.13	Good		Poor Too sandy Rock fragments Slope	 0.00 0.82 0.84
Rubicon-----	30	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Good		Poor Too sandy Slope	 0.00 0.63
1444585: Meehan, beaches----	90	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	 0.00 0.00 0.94
1444586: Wurtsmith, beaches--	90	Poor Too sandy Wind erosion Too acid	 0.00 0.00 0.12	Fair Wetness	0.53	Poor Too sandy Wetness Too acid	 0.00 0.53 0.90
1444587: Grayling, beaches---	95	Poor Too sandy Wind erosion Droughty	 0.00 0.00 0.06	Good		Poor Too sandy Too acid	 0.00 0.93
1529830: Meehan, beaches----	90	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.13	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	 0.00 0.00 0.94
1700372: Loxley-----	40	Fair Too acid	 0.50	Poor Wetness Dusty	 0.00 0.80	Poor Wetness Organic matter content high Too acid	 0.00 0.00 0.13
Beseman-----	30	Fair Too acid Water erosion	 0.61 0.90	Poor Wetness Dusty	 0.00 0.80	Poor Wetness Organic matter content high Too acid	 0.00 0.00 0.20

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1700372: Dawson-----	28	Poor Too acid	0.00	Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high Too acid	0.00 0.00 0.13
1700373: Rifle-----	90	Good		Poor Wetness Dusty	0.00 0.80	Poor Wetness Organic matter content high	0.00 0.00
1700374: Allendale-----	35	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.54	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.71	Poor Wetness	0.00
Wakeley-----	30	Fair Low content of organic matter Too acid Carbonate content	0.13 0.50 0.95	Poor Wetness Low strength Shrink-swell	0.00 0.00 0.71	Poor Wetness	0.00
Kinross-----	20	Poor Too sandy Too acid Droughty	0.00 0.03 0.99	Poor Wetness	0.00	Poor Wetness Too sandy Too acid	0.00 0.00 0.93
1702605: Menominee-----	85	Poor Wind erosion Low content of organic matter Too acid	0.00 0.13 0.16	Fair Slope	0.08	Poor Slope Rock fragments	0.00 0.91
1702606: Deerton-----	50	Poor Low content of organic matter Droughty Too sandy	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Too acid Rock fragments	0.00 0.76 0.88
Brownstone-----	40	Poor Too sandy Low content of organic matter Droughty	0.00 0.00 0.01	Poor Depth to bedrock Cobble content Stones	0.00 0.13 0.98	Poor Too sandy Rock fragments Depth to bedrock	0.00 0.00 0.79
1702607: Deerton-----	50	Poor Low content of organic matter Droughty Too sandy	0.00 0.00 0.00	Poor Depth to bedrock	0.00	Poor Too sandy Slope Too acid	0.00 0.63 0.76

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 12.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material		Roadfill source		Topsoil source	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1702607: Brownstone-----	40	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Too sandy	0.00
		Low content of organic matter	0.00	Cobble content	0.13	Rock fragments	0.00
		Droughty	0.01	Stones	0.98	Slope	0.63
1702608: Abbaye-----	90	Poor		Poor		Fair	
		Wind erosion	0.00	Depth to bedrock	0.00	Wetness	0.14
		Low content of organic matter	0.00	Wetness	0.14	Slope	0.63
		Too acid	0.50			Depth to bedrock	0.71
1711685: Cublake-----	50	Poor		Fair		Poor	
		Too sandy	0.00	Wetness	0.53	Too sandy	0.00
		Wind erosion	0.00			Wetness	0.53
		Too acid	0.21			Too acid	0.88
Keweenaw-----	30	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Too sandy	0.00			Rock fragments	0.82
		Low content of organic matter	0.13				

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433292: Lerch-----	50	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 0.97	Very limited Unstable excavation walls Depth to saturated zone	1.00 0.54
Herbster-----	35	Somewhat limited Seepage	0.72	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls Depth to saturated zone Slow refill	1.00 0.54 0.28
433296: Cublake-----	35	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Depth to water	1.00
Croswell-----	20	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
Ashwabay-----	20	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
433299: Cublake-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Depth to water	1.00
Croswell-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
Ashwabay-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Depth to water	1.00
433300: Kellogg-----	35	Very limited Seepage Slope	1.00 0.08	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Allendale-----	25	Very limited Seepage Slope	1.00 0.08	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433300: Ashwabay-----	20	Very limited Seepage Slope	1.00 0.08	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
433301: Kellogg-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Allendale-----	25	Very limited Seepage Slope	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Ashwabay-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
433304: Sedgwick-----	50	Not limited		Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.77 0.01	Very limited Depth to water	1.00
Munuscong-----	30	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01	Very limited Depth to water	1.00
433305: Superior-----	50	Somewhat limited Slope	0.08	Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.96 0.01	Very limited Depth to water	1.00
Sedgwick-----	30	Not limited		Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.77 0.01	Very limited Depth to water	1.00
433309: Superior-----	50	Very limited Slope	1.00	Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.96 0.01	Very limited Depth to water	1.00
Sedgwick-----	30	Somewhat limited Slope	0.92	Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.77 0.01	Very limited Depth to water	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433310: Sultz-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Ashwabay-----	25	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
Rubicon-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
433314: Manistee-----	40	Very limited Seepage Slope	1.00 1.00	Not limited		Very limited Depth to water	1.00
Kellogg-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Ashwabay-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
433326: Rubicon-----	85	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
433379: Allendale-----	80	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
433515: Lupton-----	40	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Cathro-----	30	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Somewhat limited Unstable excavation walls	0.50

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433515: Tawas-----	25	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00
433572: Portwing-----	50	Somewhat limited Seepage Slope	0.72 0.08	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls Depth to saturated zone Slow refill	1.00 0.54 0.28
Herbster-----	30	Somewhat limited Seepage	0.72	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls Depth to saturated zone Slow refill	1.00 0.54 0.28
433573: Cornucopia-----	80	Very limited Slope Seepage	1.00 0.72	Not limited		Very limited Depth to water	1.00
433582: Croswell-----	82	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
433599: Annalake-----	85	Somewhat limited Seepage Slope	0.72 0.08	Very limited Piping Depth to saturated zone	1.00 0.86	Very limited Unstable excavation walls Slow refill Depth to saturated zone	1.00 0.28 0.06
433600: Annalake-----	80	Very limited Slope Seepage	1.00 0.72	Very limited Piping Depth to saturated zone	1.00 0.86	Very limited Unstable excavation walls Slow refill Depth to saturated zone	1.00 0.28 0.06
433671: Arnheim-----	85	Somewhat limited Seepage	0.72	Very limited Ponding Depth to saturated zone Piping Dusty	1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00

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Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
433676: Redrim-----	85	Very limited Depth to bedrock Seepage	1.00 0.54	Very limited Seepage	1.00	Very limited Depth to water	1.00
433679: Lapoin-----	85	Somewhat limited Seepage Depth to bedrock	0.72 0.52	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
433686: Zeba-----	90	Somewhat limited Depth to bedrock Seepage	0.77 0.72	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
433729: Sultz-----	85	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
433739: Moquah-----	85	Somewhat limited Seepage	0.72	Somewhat limited Depth to saturated zone Dusty	0.86 0.01	Very limited Unstable excavation walls Slow refill Depth to saturated zone	1.00 0.28 0.06
433771: Beaches-----	97	Not rated		Not rated		Not rated	
433802: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	
452739: Water-----	100	Not rated		Not rated		Not rated	
452765: Abbaye-----	55	Somewhat limited Depth to bedrock Seepage	0.85 0.72	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
Lapoin-----	40	Somewhat limited Seepage Depth to bedrock	0.72 0.52	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383557: Au Gres-----	85	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1383580: Loxley-----	40	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Beseman-----	30	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.50
Dawson-----	28	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Unstable excavation walls	1.00
1383581: Rifle-----	90	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
1383603: Cornucopia-----	80	Very limited Slope Seepage	1.00 0.72	Not limited		Very limited Depth to water	1.00
1383658: Deerton-----	50	Very limited Seepage Depth to bedrock	1.00 0.52	Very limited Seepage	1.00	Very limited Depth to water	1.00
Brownstone-----	40	Very limited Seepage Depth to bedrock	1.00 0.77	Very limited Seepage Large stones	1.00 0.39	Very limited Depth to water	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1383660: Deerton-----	50	Very limited Seepage Slope Depth to bedrock	 1.00 1.00 0.52	Very limited Seepage	 1.00	Very limited Depth to water	 1.00
Brownstone-----	40	Very limited Seepage Slope Depth to bedrock	 1.00 1.00 0.77	Very limited Seepage Large stones	 1.00 0.39	Very limited Depth to water	 1.00
1383662: Abbaye-----	90	Very limited Slope Depth to bedrock Seepage	 1.00 0.81 0.72	Very limited Depth to saturated zone	 1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	 1.00 0.50 0.28
1383665: Allendale-----	35	Very limited Seepage	 1.00	Very limited Depth to saturated zone	 1.00	Very limited Depth to water	 1.00
Wakeley-----	30	Very limited Seepage	 1.00	Very limited Ponding Depth to saturated zone Hard to pack	 1.00 1.00 0.40	Very limited Unstable excavation walls Slow refill Depth to saturated zone	 1.00 1.00 0.24
Kinross-----	20	Very limited Seepage	 1.00	Very limited Ponding Depth to saturated zone Seepage	 1.00 1.00 1.00	Very limited Unstable excavation walls Depth to saturated zone	 1.00 0.54
1383960: Flink-----	75	Very limited Seepage	 1.00	Very limited Depth to saturated zone Seepage	 1.00 1.00	Very limited Depth to water	 1.00
1444357: Arnheim-----	85	Somewhat limited Seepage	 0.72	Very limited Ponding Depth to saturated zone Piping Dusty	 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	 1.00
1444359: Beaches-----	97	Not rated		Not rated		Not rated	
1444367: Udorthents, ravines and escarpments----	85	Not rated		Not rated		Not rated	

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Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444378: Wakefield-----	85	Very limited Depth to cemented pan Seepage Slope	1.00 0.72 0.08	Very limited Depth to saturated zone Piping	1.00 0.95	Very limited Depth to water	1.00
1444379: Wakefield-----	85	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 0.72	Very limited Depth to saturated zone Piping	1.00 0.95	Very limited Depth to water	1.00
1444388: Allendale-----	80	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
1444402: Tonkey-----	90	Somewhat limited Seepage	0.72	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01	Very limited Unstable excavation walls Slow refill	1.00 0.28
1444410: Tula-----	80	Somewhat limited Depth to cemented pan Seepage	0.99 0.72	Very limited Depth to saturated zone Dusty	1.00 0.01	Very limited Unstable excavation walls Depth to saturated zone Slow refill	1.00 0.96 0.28
1444414: Lupton-----	40	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Cathro-----	30	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Somewhat limited Unstable excavation walls	0.50
Tawas-----	25	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage Hard to pack Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Unstable excavation walls	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444425: Lerch-----	50	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 0.97	Very limited Unstable excavation walls Depth to saturated zone	1.00 0.54
Herbster-----	35	Somewhat limited Seepage	0.72	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls Depth to saturated zone Slow refill	1.00 0.54 0.28
1444426: Portwing-----	50	Somewhat limited Seepage Slope	0.72 0.08	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls Depth to saturated zone Slow refill	1.00 0.54 0.28
Herbster-----	30	Somewhat limited Seepage	0.72	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls Depth to saturated zone Slow refill	1.00 0.54 0.28
1444427: Cornucopia-----	80	Very limited Slope Seepage	1.00 0.72	Not limited		Very limited Depth to water	1.00
1444428: Cornucopia-----	80	Very limited Slope Seepage	1.00 0.72	Not limited		Very limited Depth to water	1.00
1444431: Croswell-----	82	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
1444432: Gogebic-----	85	Somewhat limited Depth to cemented pan Seepage Slope	0.93 0.72 0.08	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
1444435: Iosco-----	85	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Unstable excavation walls	1.00
1444457: Redrim-----	85	Very limited Depth to bedrock Seepage	1.00 0.54	Very limited Seepage	1.00	Very limited Depth to water	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444459: Zeba-----	90	Somewhat limited Depth to bedrock Seepage	0.77 0.72	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
1444460: Abbaye-----	55	Somewhat limited Depth to bedrock Seepage	0.85 0.72	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
Lapoin-----	40	Somewhat limited Seepage Depth to bedrock	0.72 0.52	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
1444461: Abbaye-----	55	Somewhat limited Depth to bedrock Seepage	0.85 0.72	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
Zeba-----	40	Somewhat limited Depth to bedrock Seepage	0.77 0.72	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28
1444477: Cublake-----	35	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Depth to water	1.00
Croswell-----	20	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
Ashwabay-----	20	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
1444478: Cublake-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Depth to water	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444478: Crowell-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
Ashwabay-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Depth to water	1.00
1444479: Morganlake-----	85	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
1444480: Morganlake-----	85	Very limited Seepage Slope	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
1444481: Kellogg-----	35	Very limited Seepage Slope	1.00 0.08	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Allendale-----	25	Very limited Seepage Slope	1.00 0.08	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Ashwabay-----	20	Very limited Seepage Slope	1.00 0.08	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
1444482: Kellogg-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Allendale-----	25	Very limited Seepage Slope	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Ashwabay-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
1444486: Sedgwick-----	50	Not limited		Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.77 0.01	Very limited Depth to water	1.00
Munuscong-----	30	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Dusty	1.00 1.00 0.01	Very limited Depth to water	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444487: Superior-----	50	Somewhat limited Slope	0.08	Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.96 0.01	Very limited Depth to water	1.00
Sedgwick-----	30	Not limited		Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.77 0.01	Very limited Depth to water	1.00
1444488: Superior-----	50	Very limited Slope	1.00	Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.96 0.01	Very limited Depth to water	1.00
Sedgwick-----	30	Somewhat limited Slope	0.92	Very limited Depth to saturated zone Hard to pack Dusty	1.00 0.77 0.01	Very limited Depth to water	1.00
1444489: Sultz-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Ashwabay-----	25	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
Rubicon-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1444492: Manistee-----	40	Very limited Seepage Slope	1.00 1.00	Not limited		Very limited Depth to water	1.00
Kellogg-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Ashwabay-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.86	Very limited Depth to water	1.00
1444506: Keweenaw-----	60	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.97	Very limited Depth to water	1.00
Rubicon-----	30	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1444507: Keweenaw-----	60	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.97	Very limited Depth to water	1.00
Rubicon-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1444585: Meehan, beaches-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Unstable excavation walls	1.00
1444586: Wurtsmith, beaches--	90	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Unstable excavation walls	1.00
1444587: Grayling, beaches---	95	Very limited Seepage Slope	1.00 0.92	Very limited Seepage	1.00	Very limited Depth to water	1.00
1529830: Meehan, beaches-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Unstable excavation walls	1.00
1700372: Loxley-----	40	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
Beseman-----	30	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.50
Dawson-----	28	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Very limited Unstable excavation walls	1.00

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1700373: Rifle-----	90	Very limited Seepage	1.00	Very limited Organic matter content Ponding Depth to saturated zone Seepage Hard to pack	1.00 1.00 1.00 1.00 1.00	Somewhat limited Unstable excavation walls	0.10
1700374: Allendale-----	35	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
Wakeley-----	30	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 1.00 0.40	Very limited Unstable excavation walls Slow refill Depth to saturated zone	1.00 1.00 1.00 0.24
Kinross-----	20	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Unstable excavation walls Depth to saturated zone	1.00 0.54
1702605: Menominee-----	85	Very limited Seepage Slope	1.00 1.00	Not limited		Very limited Depth to water	1.00
1702606: Deerton-----	50	Very limited Seepage Depth to bedrock	1.00 0.52	Very limited Seepage	1.00	Very limited Depth to water	1.00
Brownstone-----	40	Very limited Seepage Depth to bedrock	1.00 0.77	Very limited Seepage Large stones	1.00 0.39	Very limited Depth to water	1.00
1702607: Deerton-----	50	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.52	Very limited Seepage	1.00	Very limited Depth to water	1.00
Brownstone-----	40	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.77	Very limited Seepage Large stones	1.00 0.39	Very limited Depth to water	1.00
1702608: Abbaye-----	90	Very limited Slope Depth to bedrock Seepage	1.00 0.81 0.72	Very limited Depth to saturated zone	1.00	Very limited Depth to hard bedrock Unstable excavation walls Slow refill	1.00 0.50 0.28

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 13.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1711685: Cublake-----	50	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 0.99	Very limited Depth to water	1.00
Keweenaw-----	30	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.97	Very limited Depth to water	1.00

Table 14.-Engineering Properties

(Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
433292:												
Lerch-----	0-3	Muck	PT	A-8	0	0	100	100	100	100	---	---
	3-7	Clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	70-105	44-70
	7-12	Clay, silty clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	51-102	29-70
	12-29	Clay, silty clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	51-101	29-70
	29-56	Clay, silty clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	51-101	29-70
	56-80	Stratified silt loam to very fine sandy loam to loamy fine sand	SC-SM, SM, CL, ML	A-4, A-2-4, A-6	0	0	98-100	95-100	65-100	35-90	16-36	2-17
Herbster-----	0-5	Silt loam	CL-ML, CL	A-7, A-6, A-4	0	0	90-100	85-100	80-100	65-90	22-41	6-18
	5-10	Silt loam, clay, loam, silty clay loam, clay loam, silty clay	CH, CL	A-7, A-6, A-4	0	0	90-100	85-100	75-100	55-95	26-52	9-32
	10-13	Silty clay loam, clay, silty clay, clay loam	CH, CL	A-7, A-6	0	0	90-100	85-100	80-100	65-95	34-65	17-43
	13-28	Clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	43-65	24-43
	28-33	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	33-55	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	55-80	Stratified very fine sandy loam to silt loam to loamy very fine sand	ML, SC-SM, SC, SM	A-6, A-4	0	0	90-100	85-100	60-95	35-75	16-32	2-13
433296:												
Cublake-----	0-3	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-70	5-15	0-25	NP-4
	3-4	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-24	NP-6
	4-23	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-29	NP-6
	23-32	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-23	NP-6
	32-40	Sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	40-48	Stratified fine sand to very fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	48-60	Stratified very fine sandy loam to silt loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0	95-100	90-100	75-95	45-85	20-32	6-13

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
433296: Croswell-----	0-1	Sand	SP-SM, SM	A-1-b, A-2-4	0	0	80-100	75-100	30-75	10-35	0-29	NP-6
	1-7	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-26	NP-6
	7-16	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-24	NP-6
	16-39	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-23	NP-6
	39-60	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-19	NP-2
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
433299: Cublake-----	0-3	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-70	5-15	0-25	NP-4
	3-4	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-24	NP-6
	4-23	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-29	NP-6
	23-32	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-23	NP-6
	32-40	Sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	40-48	Stratified fine sand to very fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	48-60	Stratified very fine sandy loam to silt loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0	95-100	90-100	75-95	45-85	20-32	6-13

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
433299: Croswell-----	0-1	Sand	SP-SM, SM	A-1-b, A-2-4	0	0	80-100	75-100	30-75	10-35	0-29	NP-6
	1-7	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-26	NP-6
	7-16	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-24	NP-6
	16-39	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-23	NP-6
	39-60	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-19	NP-2
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
433300: Kellogg-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-70	5-15	0-22	NP-4
	6-26	Sand, loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-26	NP-7
	26-29	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44
	29-40	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	45-69	25-44
	40-80	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
433300:												
Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
433301:												
Kellogg-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-70	5-15	0-22	NP-4
	6-26	Sand, loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-26	NP-7
	26-29	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44
	29-40	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	45-69	25-44
	40-80	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
433301:												
Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
433304:												
Sedgwick-----	0-5	Sandy loam	SM, SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-80	20-50	23-37	4-12
	5-8	Loamy sand, fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM, SC	A-4, A-2-4, A-1-b	0	0-3	80-100	75-98	30-90	10-50	0-28	NP-10
	8-16	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	21-33	4-12
	16-19	Clay, silty clay loam, sandy loam, clay loam	CL, CH	A-7, A-6	0	0-3	98-100	95-98	60-95	50-85	31-78	12-51
	19-53	Clay, clay loam, silty clay loam, silty clay	CL, CH	A-7	0	0-3	98-100	95-98	85-95	75-85	41-78	21-51
	53-80	Silty clay, silty clay loam, clay, clay loam	CL, CH	A-7	0	0-3	98-100	95-98	85-95	75-95	41-78	21-51
Munuscong-----	0-8	Fine sandy loam	SM, SC-SM, SC	A-4	0	0	95-100	90-100	65-85	35-55	20-33	2-10
	8-30	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2	0	0	95-100	90-100	55-85	25-55	18-30	4-12
	30-60	Silty clay, silty clay loam, clay	CL, CH	A-7	0	0	95-100	90-100	80-100	70-95	45-86	25-59

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
433305: Superior-----	0-3	Fine sandy loam	SC-SM, SM, SC, CL-ML, ML	A-4, A-2	0	0	85-100	75-100	55-85	30-55	20-33	3-10
	3-6	Sandy loam, fine sandy loam, loam	SC-SM, SM, ML, SC, CL-ML	A-4, A-2	0	0	85-100	75-100	45-95	25-75	17-27	2-8
	6-14	Sandy loam, fine sandy loam, loam	SC, SC-SM, CL-ML, SM, CL	A-4, A-2	0	0	85-100	75-100	45-95	25-75	19-28	3-10
	14-19	Clay loam, sandy loam, clay, silty clay	CH, CL	A-7	0	0	95-100	90-100	55-100	25-95	45-74	25-48
	19-26	Clay, silty clay	CH	A-7	0	0	95-100	90-100	80-100	70-95	54-82	32-55
	26-60	Clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	80-100	70-95	49-78	29-51
Sedgwick-----	0-5	Loamy sand	SM, SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	23-37	4-12
	5-8	Loamy sand, fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM, SC	A-4, A-2-4, A-1-b	0	0-3	80-100	75-98	30-90	10-50	0-28	NP-10
	8-16	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	21-33	4-12
	16-19	Clay, silty clay loam, sandy loam, clay loam	CL, CH	A-7, A-6	0	0-3	98-100	95-98	60-95	50-85	31-78	12-51
	19-53	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-85	41-78	21-51
	53-80	Silty clay, silty clay loam, clay, clay loam	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-95	41-78	21-51
433309: Superior-----	0-3	Fine sandy loam	SC-SM, SM, SC, CL-ML, ML	A-4, A-2	0	0	85-100	75-100	55-85	30-55	20-33	3-10
	3-6	Sandy loam, fine sandy loam, loam	SC-SM, SM, ML, SC, CL-ML	A-4, A-2	0	0	85-100	75-100	45-95	25-75	17-27	2-8
	6-14	Sandy loam, fine sandy loam, loam	SC, SC-SM, CL-ML, SM, CL	A-4, A-2	0	0	85-100	75-100	45-95	25-75	19-28	3-10
	14-19	Sandy loam, clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	90-100	55-100	25-95	45-74	25-48
	19-26	Clay, silty clay	CH	A-7	0	0	95-100	90-100	80-100	70-95	54-82	32-55
	26-60	Clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	80-100	70-95	49-78	29-51

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
433309: Sedgwick-----	In											
	0-5	Loamy sand	SM, SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	23-37	4-12
	5-8	Loamy sand, fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM, SC	A-4, A-2-4, A-1-b	0	0-3	80-100	75-98	30-90	10-50	0-28	NP-10
	8-16	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	21-33	4-12
	16-19	Clay, silty clay loam, sandy loam, clay loam	CL, CH	A-7, A-6	0	0-3	98-100	95-98	60-95	50-85	31-78	12-51
	19-53	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-85	41-78	21-51
	53-80	Silty clay, silty clay loam, clay, clay loam	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-95	41-78	21-51
433310: Sultz-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand, loamy sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	40-75	5-30	0-20	NP-2
	6-18	Sand, loamy sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	40-75	5-30	0-23	NP-3
	18-25	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	35-75	5-35	0-17	NP-1
	25-43	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	35-75	5-35	0-17	NP-1
	43-60	Stratified sand to fine sand to loamy sand to very fine sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-7	90-100	75-100	35-95	5-65	0-32	NP-13
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
Rubicon-----	0-1	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-22	NP-2
	1-6	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-19	NP-2
	6-18	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-24	NP-6
	18-36	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-24	NP-6
	36-60	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-19	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
433314: Manistee-----	0-3	Sand	SM	A-2-4, A-1-b	0	0	95-100	90-100	45-70	5-15	0-32	NP-7
	3-11	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	90-100	45-80	5-45	0-24	NP-7
	11-28	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	90-100	45-80	5-45	0-24	NP-7
	28-30	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	90-100	45-80	5-45	0-24	NP-7
	30-38	Clay, silty clay, clay loam, silty clay loam	CH, CL	A-7	0	0	95-100	90-100	80-100	65-95	45-68	25-44
	38-60	Clay, silty clay, clay loam, silty clay loam	CL, CH	A-7	0	0	95-100	90-100	80-100	65-95	45-68	25-44
Kellogg-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-70	5-15	0-22	NP-4
	6-26	Sand, loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-26	NP-7
	26-29	Silty clay, clay, silty clay loam, loamy sand	SM, CL-ML, SC-SM, CH, CL	A-7	0	0	96-100	96-100	50-100	40-95	19-65	3-40
	29-40	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	45-69	25-44
	40-80	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
433326: Rubicon-----	0-1	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	1-6	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	6-18	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	18-36	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	36-60	Coarse sand, sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
433379: Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
433515: Lupton-----	0-65	Muck	PT	A-8	0	0	100	100	100	100	---	NP
Cathro-----	0-28	Muck	PT	A-8	0	0	100	100	100	100	---	---
	28-49	Loam, silty clay loam, sandy loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0-5	80-100	75-100	60-100	35-90	20-40	4-20
	49-60	Sandy loam, silty clay loam, loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0-5	80-100	75-100	60-100	35-90	20-40	4-20
Tawas-----	0-31	Muck	PT	A-8	0	0	100	100	100	100	---	---
	31-60	Fine sand, loamy fine sand, coarse sand, gravelly sand, loamy sand, sand	SC-SM, SP-SM, SM	A-2-4	0	0	100	75-100	65-90	10-30	0-23	NP-6

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
433572: Portwing-----	In											
	0-4	Silt loam	CL-ML, CL	A-6, A-4	0	0-4	90-100	85-100	80-100	65-90	22-41	6-18
	4-9	Silt loam, clay, silty clay loam, silty clay	CL	A-7, A-6, A-4	0	0	90-100	85-100	80-100	75-95	26-52	9-32
	9-32	Clay, clay loam, silty clay loam	CL, CH	A-7	0	0	90-100	85-100	80-100	65-95	42-65	24-43
	32-51	Clay, clay loam, silty clay loam	CL, CH	A-7	0	0	90-100	85-100	80-100	65-95	42-65	24-43
	51-80	Stratified very fine sand to silt	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	65-95	30-80	16-27	2-10
Herbster-----	0-5	Silt loam	CL-ML, CL	A-7, A-6, A-4	0	0	90-100	85-100	80-100	65-90	22-41	6-18
	5-10	Silt loam, clay, loam, silty clay loam, clay loam, silty clay	CH, CL	A-7, A-6, A-4	0	0	90-100	85-100	75-100	55-95	26-52	9-32
	10-13	Silty clay loam, clay, silty clay, clay loam	CH, CL	A-7, A-6	0	0	90-100	85-100	80-100	65-95	34-65	17-43
	13-28	Clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	43-65	24-43
	28-33	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	33-55	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	55-80	Stratified very fine sandy loam to silt loam to loamy very fine sand	SC-SM, SM, ML, SC	A-6, A-4	0	0	90-100	85-100	60-95	35-75	16-32	2-13
433573: Cornucopia-----	0-3	Silt loam	CL-ML, CL	A-6, A-4	0	0-5	97-100	95-100	80-100	70-90	22-41	6-18
	3-10	Very fine sandy loam, silt loam, silty clay loam, silty clay	SC-SM, CL	A-7, A-6, A-4	0	0-5	97-100	95-100	80-100	55-95	26-52	9-32
	10-32	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	32-45	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	45-50	Stratified very fine sandy loam to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	60-95	20-80	16-32	2-13
	50-72	Stratified very fine sand to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	65-95	30-80	16-27	2-10

Table 14.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
433582: Croswell-----	0-1	Sand	SP-SM, SM	A-3, A-2-4	0	0	80-100	75-100	35-70	5-15	0-29	NP-6
	1-7	Sand, loamy sand	SC-SM, SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-26	NP-6
	7-16	Sand, loamy sand	SC-SM, SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-24	NP-6
	16-39	Sand, loamy sand	SC-SM, SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-14	NP
	39-60	Sand	SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-70	5-15	0-14	NP
433599: Annalake-----	0-3	Fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	90-100	85-100	65-85	30-55	18-33	2-10
	3-6	Fine sandy loam, sandy loam, loam, very fine sandy loam	SM, CL, SC-SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	0-28	NP-10
	6-17	Fine sandy loam, very fine sandy loam, sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	17-28	2-10
	17-31	Fine sandy loam, sandy loam, loam, very fine sandy loam	SM, CL, SC-SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	16-27	2-10
	31-39	Sandy loam, very fine sandy loam, loam	CL-ML, SC-SM, CL, SC	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	18-30	4-12
	39-60	Stratified fine sand to silt loam	SM, CL, SC-SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-80	16-27	2-10
433600: Annalake-----	0-3	Fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	90-100	85-100	65-85	30-55	18-33	2-10
	3-6	Fine sandy loam, sandy loam, loam, very fine sandy loam	SM, CL, SC-SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	0-28	NP-10
	6-17	Fine sandy loam, very fine sandy loam, sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	17-28	2-10
	17-31	Fine sandy loam, sandy loam, loam, very fine sandy loam	SM, CL, SC-SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	16-27	2-10
	31-39	Sandy loam, very fine sandy loam, loam	CL, SC, CL-ML, SC-SM	A-4, A-2-4	0	0	90-100	85-100	50-95	25-75	18-30	4-12
	39-60	Stratified fine sand to silt loam	SC-SM, SM, ML, CL, CL-ML	A-4, A-2-4	0	0	90-100	85-100	50-95	25-80	16-27	2-10

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
433671: Arnheim-----	0-5	Mucky silt loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	85-100	40-90	28-61	7-11
	5-10	Silt loam	SC-SM, CL-ML	A-4	0	0	100	100	80-100	70-90	23-33	7-12
	10-15	Very fine sandy loam, silt loam, fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	75-100	40-90	17-33	2-12
	15-24	Silt loam, very fine sandy loam, fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	75-100	40-90	17-33	2-12
	24-60	Stratified loamy fine sand to fine sandy loam to very fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	75-95	25-65	16-28	2-10
433676: Redrim-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	1-3	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	3-11	Very cobbly sand	SP-SM, GP-GM, SP, GP, SM	A-1-a	0-15	15-55	10-95	5-90	2-65	0-15	0-14	NP
	11-18	Very cobbly loamy sand, very gravelly loamy sand, cobbly sand, extremely cobbly sand	SP, SP-SM, SM, GP, GP-GM	A-1-a	0-15	15-55	10-95	5-90	2-70	0-25	0-19	NP-2
	18-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
433679: Lapoin-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	1-4	Loam	CL-ML, CL	A-4	0-2	0-5	95-100	90-100	75-95	55-75	26-48	7-13
	4-7	Loam, sandy loam, sandy clay loam, fine sandy loam	SC, CL	A-6, A-4	0-2	0-5	95-100	90-100	55-95	25-75	24-43	6-17
	7-19	Clay, loam, clay loam, silty clay loam	CL, CH	A-7, A-6	0-2	0-5	95-100	90-100	75-100	55-95	37-61	18-37
	19-34	Clay, clay loam, silty clay, silty clay loam	CL, CH	A-7	0-2	0-5	95-100	90-100	80-100	65-95	45-69	25-44
	34-39	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2	0-2	0-5	95-100	90-100	55-85	25-55	16-27	2-10
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
433686: Zeba-----	0-2	Sandy loam	SM	A-2-4, A-4	0	0-30	85-100	75-100	40-70	20-40	20-35	2-10
	2-5	Sandy loam, cobbly fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-30	85-100	75-100	35-85	15-55	0-25	NP-7
	5-13	Sandy loam, cobbly fine sandy loam, fine sandy loam, cobbly sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-30	85-100	75-100	40-85	15-55	0-23	NP-6
	13-21	Sandy loam, fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-15	85-100	75-100	40-85	15-55	16-27	2-10
	21-33	Sandy loam, fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-15	85-100	75-100	35-85	15-55	15-25	1-7
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
433729: Sultz-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand, loamy sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	40-75	5-30	0-20	NP-2
	6-18	Sand, loamy sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	40-75	5-30	0-23	NP-3
	18-25	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	35-75	5-35	0-17	NP-1
	25-43	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	35-75	5-35	0-17	NP-1
	43-60	Stratified sand to fine sand to loamy sand to very fine sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-7	90-100	75-100	35-95	5-65	0-32	NP-13
433739: Moquah-----	0-5	Fine sandy loam	SM, SC-SM	A-4	0	0	100	100	70-85	40-55	25-33	6-10
	5-19	Stratified fine sandy loam to silt loam to fine sand	SC, SC-SM, CL, CL-ML	A-4	0	0	100	100	70-85	40-55	20-31	4-12
	19-48	Stratified very fine sandy loam to silt loam to fine sand	SC-SM, CL-ML, CL	A-4	0	0	100	100	70-85	40-55	20-31	4-12
	48-55	Silt loam	SC-SM, CL-ML	A-4	0	0	100	100	90-100	70-90	23-33	7-12
	55-60	Stratified sand to fine sand	SP-SM, SM	A-2, A-1-b	0	0	100	100	50-80	5-35	0-21	NP-3
433802. Udorthents, ravines and excarpments												

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
452765: Abbaye-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-4	Sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	45-70	25-40	0-25	2-7
	4-13	Loamy sand, loamy fine sand, fine sandy loam, sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	0-28	NP-9
	13-25	Sandy loam, fine sandy loam	SM, SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	45-85	25-55	17-28	2-10
	25-32	Sandy loam, loamy sand, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	18-30	4-12
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Lapoin-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	1-4	Loam	CL-ML, CL	A-4	0-2	0-5	95-100	90-100	75-95	55-75	26-48	7-13
	4-7	Loam, sandy loam, sandy clay loam, fine sandy loam	SC, CL	A-6, A-4	0-2	0-5	95-100	90-100	55-95	25-75	24-43	6-17
	7-19	Clay, loam, clay loam, silty clay loam	CL, CH	A-7, A-6	0-2	0-5	95-100	90-100	75-100	55-95	37-61	18-37
	19-34	Clay, clay loam, silty clay, silty clay loam	CL, CH	A-7	0-2	0-5	95-100	90-100	80-100	65-95	45-69	25-44
	34-39	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2	0-2	0-5	95-100	90-100	55-85	25-55	16-27	2-10
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1383557: Au Gres-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	---	---	---	NP
	2-5	Loamy sand	SP-SM, SM, SC-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	25-75	5-30	0-25	NP-7
	5-8	Loamy sand, sand, loamy coarse sand	SP-SM, SM, SC-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	25-75	5-30	0-25	NP-7
	8-16	Loamy sand, sand, loamy coarse sand	SP-SM, SM, SC-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	25-75	5-30	0-25	NP-7
	16-28	Sand, loamy sand, coarse sand	SP-SM, SM, SC-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	25-75	5-30	0-25	NP-7
	28-60	Sand, coarse sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	25-70	5-25	0-14	NP
1383580: Loxley-----	0-13	Mucky peat	PT	A-8	0	0	100	100	100	100	---	NP
	13-60	Muck	PT	A-8	0	0	100	100	100	100	---	NP

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1383580: Beseman-----	0-36	Muck	PT	A-8	0	0	100	100	100	100	---	---
	36-60	Loam, silt loam, sandy loam	SC-SM, CL-ML, CL	A-2-4, A-4	0	0-2	80-100	75-100	45-100	25-90	20-33	4-13
Dawson-----	0-8	Peat	PT	A-8	0	0	100	100	100	100	---	---
	8-38	Muck	PT	A-8	0	0	100	100	100	100	---	---
	38-40	Silt loam, loam, fine sand, mucky sand	ML, SM	A-4, A-2-4	0	0	100	100	50-100	10-90	0-59	NP-9
	40-60	Sand, gravelly sand, very gravelly very fine sand	SP, SP-SM, GP, SM	A-3, A-4, A-1, A-2	0	0	45-100	35-100	15-90	0-45	0-23	NP-6
1383581: Rifle-----	0-4	Peat	PT	A-8	0	0	100	100	100	100	---	NP
	4-60	Mucky peat	PT	A-8	0	0	100	100	100	100	---	NP
1383603: Cornucopia-----	0-3	Silt loam	CL-ML, CL	A-6, A-4	0	0-5	97-100	95-100	80-100	70-90	22-41	6-18
	3-10	Very fine sandy loam, silt loam, silty clay loam, silty clay	SC-SM, CL	A-7, A-6, A-4	0	0-5	97-100	95-100	80-100	55-95	26-52	9-32
	10-32	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	32-45	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	45-50	Stratified very fine sandy loam to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	60-95	20-80	16-32	2-13
	50-72	Stratified very fine sand to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	65-95	30-80	16-27	2-10
1383658: Deerton-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	1-9	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-70	0-15	0-26	NP-6
	9-10	Loamy sand, sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7
	10-25	Sand, loamy sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1383658: Brownstone-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	2-12	Very cobbly sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-65	3-30	0-14	NP
	12-15	Extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-24	NP-2
	15-23	Extremely cobbly sand, extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-22	NP-2
	23-33	Extremely cobbly coarse sand, extremely cobbly sand, extremely gravelly coarse sand, gravelly loamy coarse sand	GP-GM, GP, GM, SM, SP, SP-SM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-19	NP-2
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1383660: Deerton-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	1-9	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-70	0-15	0-26	NP-6
	9-10	Loamy sand, sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7
	10-25	Sand, loamy sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1383660: Brownstone-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	2-12	Very cobbly sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-65	3-30	0-14	NP
	12-15	Extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-24	NP-2
	15-23	Extremely cobbly sand, extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-22	NP-2
	23-33	Extremely cobbly coarse sand, extremely cobbly sand, extremely gravelly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-19	NP-2
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1383662: Abbaye-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-4	Loamy sand	SM, SC-SM	A-2-4	0	0-7	85-100	75-100	40-75	15-30	0-33	NP-10
	4-13	Loamy sand, loamy fine sand, fine sandy loam, sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	0-28	NP-9
	13-25	Sandy loam, fine sandy loam	SM, SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	45-85	25-55	17-28	2-10
	25-32	Sandy loam, loamy sand, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	18-30	4-12
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1383665:												
Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
Wakeley-----	0-4	Muck	PT	A-8	0	0	100	100	100	100	---	---
	4-23	Loamy sand, sand, loamy fine sand, fine sand	SP-SM, SM, SC-SM	A-4, A-3, A-2-4	0	0-5	90-100	80-100	40-90	5-45	0-24	NP-6
	23-28	Loamy sand, sand, loamy fine sand, fine sand	SP-SM, SC-SM, SM	A-4, A-3, A-2-4	0	0-5	90-100	80-100	40-90	5-45	0-24	NP-6
	28-80	Clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	90-100	75-95	49-69	29-44
Kinross-----	0-6	Muck	PT	A-8	0	0	100	100	100	100	---	---
	6-10	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-24	NP-6
	10-12	Sand, fine sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-31	NP-6
	12-24	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-26	NP-6
	24-42	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	100	90-100	50-80	5-30	0-26	NP-6
	42-60	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-23	NP-6

Table 14.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1383960: Flink-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-3	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	3-6	Sand	SP-SM, SM	A-3, A-1-b	0	0	90-100	85-100	40-70	5-15	0-24	NP-2
	6-9	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-1-b	0	0	90-100	85-100	40-80	5-45	0-29	NP-6
	9-26	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-1-b	0	0	90-100	85-100	40-80	5-45	0-29	NP-6
	26-35	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0	90-100	85-100	40-80	5-25	0-17	NP-1
	35-46	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0	90-100	85-100	40-70	5-25	0-17	NP-1
	46-52	Stratified silt to silty clay loam	SC-SM, CL-ML, CL	A-6, A-4	0	0	90-100	85-100	85-95	75-95	20-44	6-25
	52-80	Stratified silt to silty clay loam to loamy very fine sand	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0	90-100	85-100	80-95	35-95	16-44	2-25
1444357: Arnheim-----	0-5	Mucky silt loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	85-100	40-90	28-61	7-11
	5-10	Silt loam	SC-SM, CL-ML	A-4	0	0	100	100	80-100	70-90	23-33	7-12
	10-15	Very fine sandy loam, silt loam, fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	75-100	40-90	17-33	2-12
	15-24	Silt loam, very fine sandy loam, fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	75-100	40-90	17-33	2-12
	24-60	Stratified loamy fine sand to fine sandy loam to very fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	100	100	75-95	25-65	16-28	2-10
1444367. Udorthents, ravines and escarpments												

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444378:												
Wakefield-----	0-4	Fine sandy loam	SC-SM, CL-ML	A-4	0-5	0-7	80-100	75-95	55-85	30-50	21-35	4-12
	4-7	Fine sandy loam, loam, silt loam			0	0-7	80-100	75-95	55-95	30-85	17-28	3-10
	7-18	Fine sandy loam, loam, silt loam	SC-SM, CL-ML	A-4	0	0-7	80-100	75-95	55-95	30-85	18-30	4-12
	18-24	Very fine sandy loam, loam	CL	A-6	0	0-7	80-100	75-95	65-90	40-70	20-32	6-13
	24-36	Fine sandy loam, loam, sandy loam, clay loam	CL	A-6	0	0-7	80-100	75-95	45-95	25-75	22-38	7-19
	36-49	Loam, clay loam	CL	A-6	0	0-7	80-100	75-95	65-95	50-75	27-40	12-21
	49-64	Fine sandy loam, loam, very fine sandy loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0-7	80-100	75-95	55-90	30-70	20-32	6-13
1444379:												
Wakefield-----	0-4	Fine sandy loam	SC-SM, CL-ML	A-4	0-5	0-7	80-100	75-95	55-85	30-50	21-35	4-12
	4-7	Fine sandy loam, loam, silt loam			0	0-7	80-100	75-95	55-95	30-85	17-28	3-10
	7-18	Fine sandy loam, loam, silt loam	SC-SM, CL-ML	A-4	0	0-7	80-100	75-95	55-95	30-85	18-30	4-12
	18-24	Very fine sandy loam, loam	CL	A-6	0	0-7	80-100	75-95	65-90	40-70	20-32	6-13
	24-36	Fine sandy loam, loam, sandy loam, clay loam	CL	A-6	0	0-7	80-100	75-95	45-95	25-75	22-38	7-19
	36-49	Loam, clay loam	CL	A-6	0	0-7	80-100	75-95	65-95	50-75	27-40	12-21
	49-64	Fine sandy loam, loam, very fine sandy loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0-7	80-100	75-95	55-90	30-70	20-32	6-13
1444388:												
Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444402: Tonkey-----	0-8	Sandy loam	SM, SC-SM	A-4, A-2	0	0	100	100	60-70	30-40	27-44	4-12
	8-14	Sandy loam, loam, very fine sandy loam	SM, SC-SM, SC	A-4, A-2	0	0	100	100	60-90	30-70	16-30	2-12
	14-28	Loam, sandy loam, very fine sandy loam	SM, SC-SM, SC	A-4, A-2	0	0	100	100	60-90	30-70	16-30	2-12
	28-60	Stratified sand to loam to silt loam	SM, SP-SM, ML, SC-SM	A-3, A-4, A-1, A-2	0	0	95-100	90-100	40-80	5-65	0-32	NP-13
1444410: Tula-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	1-5	Fine sandy loam	CL-ML, SM, ML	A-4	0-7	2-30	80-95	75-85	50-75	30-50	0-29	NP-6
	5-8	Fine sandy loam, very fine sandy loam, cobble fine sandy loam, cobbly very fine sandy loam	SM, CL-ML, SC-SM, ML	A-4	0-7	2-30	80-95	75-85	50-75	30-50	0-22	NP-4
	8-20	Cobbly very fine sandy loam, cobbly fine sandy loam, very fine sandy loam, fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0-7	2-30	80-95	75-85	50-85	30-55	0-26	NP-7
	20-28	Gravelly sandy loam, sandy loam, fine sandy loam, gravelly fine sandy loam	CL-ML, ML, SC-SM, SM	A-4, A-2-4	0-7	2-30	80-95	75-85	40-75	20-50	0-26	NP-7
	28-37	Gravelly sandy loam, gravelly loamy sand	SM, SC-SM	A-2-4	0-7	2-25	65-95	65-90	30-70	15-35	0-23	NP-6
	37-62	Gravelly loam, gravelly sandy loam	SM, SC-SM, SC	A-2-4	0-7	2-25	65-95	65-90	35-65	15-35	18-36	3-17
	62-80	Gravelly sandy loam, cobble sandy loam, fine sandy loam	CL-ML, ML, SM, SC, SC-SM	A-2-4, A-4	0-7	2-25	65-95	65-90	35-75	15-50	16-26	2-8
1444414: Lupton-----	0-65	Muck	PT	A-8	0	0	100	100	100	100	---	NP
Cathro-----	0-28	Muck	PT	A-8	0	0	100	100	100	100	---	---
	28-49	Loam, silty clay loam, sandy loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0-5	80-100	75-100	60-100	35-90	20-40	4-20
	49-60	Sandy loam, silty clay loam, loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0-5	80-100	75-100	60-100	35-90	20-40	4-20

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth In	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
					Pct	Pct					Pct	
1444414: Tawas-----	0-31	Muck	PT	A-8	0	0	100	100	100	100	---	---
	31-60	Fine sand, loamy fine sand, coarse sand, gravelly sand, loamy sand, sand	SC-SM, SP-SM, SM	A-2-4	0	0	100	75-100	65-90	10-30	0-23	NP-6
1444425: Lerch-----	0-3	Muck	PT	A-8	0	0	100	100	100	100	---	---
	3-7	Clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	70-105	44-70
	7-12	Clay, silty clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	51-102	29-70
	12-29	Clay, silty clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	51-101	29-70
	29-56	Clay, silty clay	CH	A-7	0	0	98-100	95-100	80-100	70-95	51-101	29-70
	56-80	Stratified silt loam to very fine sandy loam to loamy fine sand	SC-SM, SM, CL, ML	A-4, A-2-4, A-6	0	0	98-100	95-100	65-100	35-90	16-36	2-17
Herbster-----	0-5	Silt loam	CL-ML, CL	A-7, A-6, A-4	0	0	90-100	85-100	80-100	65-90	22-41	6-18
	5-10	Silt loam, clay, loam, silty clay loam, clay loam, silty clay	CH, CL	A-7, A-6, A-4	0	0	90-100	85-100	75-100	55-95	26-52	9-32
	10-13	Silty clay loam, clay, silty clay, clay loam	CH, CL	A-7, A-6	0	0	90-100	85-100	80-100	65-95	34-65	17-43
	13-28	Clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	43-65	24-43
	28-33	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	33-55	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	55-80	Stratified very fine sandy loam to silt loam to loamy very fine sand	ML, SC-SM, SC, SM	A-6, A-4	0	0	90-100	85-100	60-95	35-75	16-32	2-13
1444426: Portwing-----	0-4	Silt loam	CL-ML, CL	A-6, A-4	0	0-4	90-100	85-100	80-100	65-90	22-41	6-18
	4-9	Silt loam, clay, silty clay loam, silty clay	CL	A-7, A-6, A-4	0	0	90-100	85-100	80-100	75-95	26-52	9-32
	9-32	Clay, clay loam, silty clay loam	CL, CH	A-7	0	0	90-100	85-100	80-100	65-95	42-65	24-43
	32-51	Clay, clay loam, silty clay loam	CL, CH	A-7	0	0	90-100	85-100	80-100	65-95	42-65	24-43
	51-80	Stratified very fine sand to silt	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0	90-100	85-100	65-95	30-80	16-27	2-10

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
1444426: Herbster-----	In											
	0-5	Silt loam	CL-ML, CL	A-7, A-6, A-4	0	0	90-100	85-100	80-100	65-90	22-41	6-18
	5-10	Silt loam, clay, loam, silty clay loam, clay loam, silty clay	CH, CL	A-7, A-6, A-4	0	0	90-100	85-100	75-100	55-95	26-52	9-32
	10-13	Silty clay loam, clay, silty clay, clay loam	CH, CL	A-7, A-6	0	0	90-100	85-100	80-100	65-95	34-65	17-43
	13-28	Clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	43-65	24-43
	28-33	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	33-55	Stratified silty clay loam to clay to silty clay	CH, CL	A-7	0	0	90-100	85-100	80-100	70-95	45-69	25-44
	55-80	Stratified very fine sandy loam to silt loam to loamy very fine sand	SC-SM, SM, ML, SC	A-6, A-4	0	0	90-100	85-100	60-95	35-75	16-32	2-13
1444427: Cornucopia-----	0-3	Silt loam	CL-ML, CL	A-6, A-4	0	0-5	97-100	95-100	80-100	70-90	22-41	6-18
	3-10	Very fine sandy loam, silt loam, silty clay loam, silty clay	SC-SM, CL	A-7, A-6, A-4	0	0-5	97-100	95-100	80-100	55-95	26-52	9-32
	10-32	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	32-45	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	45-50	Stratified very fine sandy loam to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	60-95	20-80	16-32	2-13
	50-72	Stratified very fine sand to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	65-95	30-80	16-27	2-10
1444428: Cornucopia-----	0-3	Silt loam	CL-ML, CL	A-6, A-4	0	0-5	97-100	95-100	80-100	70-90	22-41	6-18
	3-10	Very fine sandy loam, silt loam, silty clay loam, silty clay	SC-SM, CL	A-7, A-6, A-4	0	0-5	97-100	95-100	80-100	55-95	26-52	9-32
	10-32	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	32-45	Clay	CL, CH	A-7	0	0-5	97-100	95-100	90-100	75-95	46-65	28-43
	45-50	Stratified very fine sandy loam to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	60-95	20-80	16-32	2-13
	50-72	Stratified very fine sand to silt loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-5	97-100	95-100	65-95	30-80	16-27	2-10

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444431: Croswell-----	0-1	Sand	SP-SM, SM	A-3, A-2-4	0	0	80-100	75-100	35-70	5-15	0-29	NP-6
	1-7	Sand, loamy sand	SC-SM, SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-26	NP-6
	7-16	Sand, loamy sand	SC-SM, SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-24	NP-6
	16-39	Sand, loamy sand	SC-SM, SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-14	NP
	39-60	Sand	SP-SM, SM	A-3, A-2-4	0	0	90-100	75-100	35-70	5-15	0-14	NP
1444432: Gogebic-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	1-5	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-4	0-15	2-25	90-100	75-93	50-85	30-55	20-25	3-7
	5-7	Fine sandy loam, gravelly fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0-15	2-25	85-100	75-93	35-85	20-55	20-25	3-7
	7-17	Fine sandy loam, gravelly fine sandy loam, cobbly sandy loam	SC-SM, SM, CL-ML, ML	A-4	0-15	2-25	85-100	75-93	35-85	20-55	20-25	3-7
	17-26	Gravelly fine sandy loam, cobbly fine sandy loam, sandy loam	ML, SC-SM, SM, CL-ML	A-4, A-2-4	0-15	2-25	85-100	75-93	25-85	15-55	20-25	3-7
	26-36	Sandy loam, fine sandy loam, cobbly loamy sand, gravelly sandy loam	CL, SC-SM	A-2-4, A-4	0-15	2-30	90-100	75-93	25-85	15-55	25-40	10-20
	36-53	Gravelly sandy loam, cobbly sandy loam, fine sandy loam	SC-SM, CL	A-2-4, A-4	0-15	2-30	90-100	75-93	25-85	15-55	25-40	10-20
	53-71	Fine sandy loam, cobbly sandy loam, very gravelly sandy loam, gravelly sandy loam	SC, SC-SM	A-2-4, A-4	0-15	2-30	65-100	55-93	25-85	15-55	25-40	10-20
	71-80	Fine sandy loam, gravelly fine sandy loam, very gravelly sandy loam, cobbly sandy loam	SC-SM, SC, CL-ML	A-2-4, A-4	0-15	2-30	65-100	55-93	15-85	15-55	20-30	4-11

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444435:												
Iosco-----	0-7	Loamy sand	SM	A-2-4, A-1-b	0	0-7	90-100	80-100	45-75	15-30	18-35	2-10
	7-9	Loamy sand, sand, loamy fine sand, fine sand	SC-SM, SP-SM, SM	A-3, A-2-4, A-1-b	0	0-7	90-100	80-100	40-80	5-45	0-28	NP-10
	9-11	Loamy sand, sand, loamy fine sand, fine sand	SP-SM, SM, SC-SM	A-1-b, A-3, A-2-4	0	0-7	90-100	80-100	40-95	5-45	0-28	NP-10
	11-28	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM, SC-SM	A-3, A-2-4, A-1-b	0	0-7	90-100	80-100	40-95	5-45	0-28	NP-10
	28-34	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM, SC-SM	A-3, A-2-4, A-1-b	0	0-7	90-100	80-100	40-95	5-45	0-28	NP-10
	34-40	Silty clay loam, clay loam, sandy clay loam, loam, gravelly sandy loam	SC-SM, SC, CL	A-7, A-6, A-2	0	0-11	80-100	60-100	35-95	20-90	29-46	12-25
	40-60	Silty clay loam, clay loam, loam, fine sandy loam, gravelly sandy loam	SC-SM, SC, CL	A-2, A-7, A-6	0	0-11	80-100	60-100	35-95	20-90	26-46	10-25
1444457:												
Redrim-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	1-3	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	3-11	Very cobbly sand	SP-SM, GP-GM, SP, GP, SM	A-1-a	0-15	15-55	10-95	5-90	2-65	0-15	0-14	NP
	11-18	Very cobbly loamy sand, very gravelly loamy sand, cobbly sand, extremely cobbly sand	SP, SP-SM, SM, GP, GP-GM	A-1-a	0-15	15-55	10-95	5-90	2-70	0-25	0-19	NP-2
	18-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1444459:												
Zeba-----	0-2	Sandy loam	SM	A-2-4, A-4	0	0-30	85-100	75-100	40-70	20-40	20-35	2-10
	2-5	Sandy loam, cobbly fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-30	85-100	75-100	35-85	15-55	0-25	NP-7
	5-13	Sandy loam, cobbly fine sandy loam, fine sandy loam, cobbly sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-30	85-100	75-100	40-85	15-55	0-23	NP-6
	13-21	Sandy loam, fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-15	85-100	75-100	40-85	15-55	16-27	2-10
	21-33	Sandy loam, fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-15	85-100	75-100	35-85	15-55	15-25	1-7
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444460: Abbaye-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-4	Sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	45-70	25-40	0-25	2-7
	4-13	Loamy sand, loamy fine sand, fine sandy loam, sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	0-28	NP-9
	13-25	Sandy loam, fine sandy loam	SM, SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	45-85	25-55	17-28	2-10
	25-32	Sandy loam, loamy sand, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	18-30	4-12
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Lapoin-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	1-4	Loam	CL-ML, CL	A-4	0-2	0-5	95-100	90-100	75-95	55-75	26-48	7-13
	4-7	Loam, sandy loam, sandy clay loam, fine sandy loam	SC, CL	A-6, A-4	0-2	0-5	95-100	90-100	55-95	25-75	24-43	6-17
	7-19	Clay, loam, clay loam, silty clay loam	CL, CH	A-7, A-6	0-2	0-5	95-100	90-100	75-100	55-95	37-61	18-37
	19-34	Clay, clay loam, silty clay, silty clay loam	CL, CH	A-7	0-2	0-5	95-100	90-100	80-100	65-95	45-69	25-44
	34-39	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2	0-2	0-5	95-100	90-100	55-85	25-55	16-27	2-10
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1444461: Abbaye-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	2-4	Sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	45-70	25-40	0-25	2-7
	4-13	Loamy sand, loamy fine sand, fine sandy loam, sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	0-28	NP-9
	13-25	Sandy loam, fine sandy loam	SM, SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	45-85	25-55	17-28	2-10
	25-32	Sandy loam, loamy sand, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	18-30	4-12
	32-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444461: Zeba-----	0-2	Sandy loam	SM	A-2-4, A-4	0	0-30	85-100	75-100	40-70	20-40	20-35	2-10
	2-5	Sandy loam, cobbly fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-30	85-100	75-100	35-85	15-55	0-25	NP-7
	5-13	Sandy loam, cobbly fine sandy loam, fine sandy loam, cobbly sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-30	85-100	75-100	40-85	15-55	0-23	NP-6
	13-21	Sandy loam, fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-15	85-100	75-100	40-85	15-55	16-27	2-10
	21-33	Sandy loam, fine sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-4, A-2-4, A-1-b	0	0-15	85-100	75-100	35-85	15-55	15-25	1-7
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
1444477: Cublake-----	0-3	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-70	5-15	0-25	NP-4
	3-4	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-24	NP-6
	4-23	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-29	NP-6
	23-32	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-23	NP-6
	32-40	Sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	40-48	Stratified fine sand to very fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	48-60	Stratified very fine sandy loam to silt loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0	95-100	90-100	75-95	45-85	20-32	6-13
Croswell-----	0-1	Sand	SP-SM, SM	A-1-b, A-2-4	0	0	80-100	75-100	30-75	10-35	0-29	NP-6
	1-7	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-26	NP-6
	7-16	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-24	NP-6
	16-39	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-23	NP-6
	39-60	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-19	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444477: Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
1444478: Cublake-----	0-3	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-70	5-15	0-25	NP-4
	3-4	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-24	NP-6
	4-23	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-29	NP-6
	23-32	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-23	NP-6
	32-40	Sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	40-48	Stratified fine sand to very fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	48-60	Stratified very fine sandy loam to silt loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0	95-100	90-100	75-95	45-85	20-32	6-13
Croswell-----	0-1	Sand	SP-SM, SM	A-1-b, A-2-4	0	0	80-100	75-100	30-75	10-35	0-29	NP-6
	1-7	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-26	NP-6
	7-16	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-24	NP-6
	16-39	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-30	0-23	NP-6
	39-60	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-19	NP-2

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1444478: Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
1444479: Morganlake-----	0-4	Loamy sand	SM	A-2-4	0	0-7	95-100	90-100	50-75	15-30	0-33	NP-10
	4-8	Loamy sand, sand, loamy fine sand, fine sand	SM, SC-SM	A-3, A-4, A-1-b, A-2-4	0	0-7	95-100	90-100	45-80	5-45	0-26	NP-4
	8-26	Loamy fine sand, sand, loamy sand, fine sand	SP-SM, SM, SC-SM	A-3, A-4, A-1-b, A-2-4	0	0-7	95-100	90-100	45-80	5-45	0-25	NP-7
	26-31	Loamy fine sand, sand, loamy sand	SP-SM, SM, SC-SM	A-3, A-4, A-1-b, A-2-4	0	0-7	95-100	90-100	45-80	5-45	0-22	NP-4
	31-40	Silty clay loam, clay loam, loam, sandy clay loam, sandy loam, silt loam	SC, SC-SM, CL	A-2, A-6, A-7	0	0-7	80-95	75-95	40-95	25-90	29-46	12-25
	40-60	Silty clay loam, clay loam, loam, sandy clay loam, sandy loam	SC-SM, SC, CL	A-7, A-6, A-2	0	0-7	80-95	75-95	40-95	25-90	22-42	6-21
1444480: Morganlake-----	0-4	Loamy sand	SM	A-2-4	0	0-7	95-100	90-100	50-75	15-30	0-33	NP-10
	4-8	Loamy sand, sand, loamy fine sand, fine sand	SM, SC-SM	A-3, A-4, A-1-b, A-2-4	0	0-7	95-100	90-100	45-80	5-45	0-26	NP-4
	8-26	Loamy fine sand, sand, loamy sand, fine sand	SP-SM, SM, SC-SM	A-3, A-4, A-1-b, A-2-4	0	0-7	95-100	90-100	45-80	5-45	0-25	NP-7
	26-31	Loamy fine sand, sand, loamy sand	SP-SM, SM, SC-SM	A-3, A-4, A-1-b, A-2-4	0	0-7	95-100	90-100	45-80	5-45	0-22	NP-4
	31-40	Silty clay loam, clay loam, loam, sandy clay loam, sandy loam, silt loam	SC, SC-SM, CL	A-2, A-6, A-7	0	0-7	80-95	75-95	40-95	25-90	29-46	12-25
	40-60	Silty clay loam, clay loam, loam, sandy clay loam, sandy loam	SC-SM, SC, CL	A-7, A-6, A-2	0	0-7	80-95	75-95	40-95	25-90	22-42	6-21

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1444481: Kellogg-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-70	5-15	0-22	NP-4
	6-26	Sand, loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-26	NP-7
	26-29	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44
	29-40	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	45-69	25-44
	40-80	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44
Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444482: Kellogg-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-70	5-15	0-22	NP-4
	6-26	Sand, loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-26	NP-7
	26-29	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44
	29-40	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	45-69	25-44
	40-80	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44
Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444486: Sedgwick-----	0-5	Sandy loam	SM, SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-80	20-50	23-37	4-12
	5-8	Loamy sand, fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM, SC	A-4, A-2-4, A-1-b	0	0-3	80-100	75-98	30-90	10-50	0-28	NP-10
	8-16	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	21-33	4-12
	16-19	Clay, silty clay loam, sandy loam, clay loam	CL, CH	A-7, A-6	0	0-3	98-100	95-98	60-95	50-85	31-78	12-51
	19-53	Clay, clay loam, silty clay loam, silty clay	CL, CH	A-7	0	0-3	98-100	95-98	85-95	75-85	41-78	21-51
	53-80	Silty clay, silty clay loam, clay, clay loam	CL, CH	A-7	0	0-3	98-100	95-98	85-95	75-95	41-78	21-51
Munuscong-----	0-8	Fine sandy loam	SM, SC-SM, SC	A-4	0	0	95-100	90-100	65-85	35-55	20-33	2-10
	8-30	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2	0	0	95-100	90-100	55-85	25-55	18-30	4-12
	30-60	Silty clay, silty clay loam, clay	CL, CH	A-7	0	0	95-100	90-100	80-100	70-95	45-86	25-59
1444487: Superior-----	0-3	Fine sandy loam	SC-SM, SM, SC, CL-ML, ML	A-4, A-2	0	0	85-100	75-100	55-85	30-55	20-33	3-10
	3-6	Sandy loam, fine sandy loam, loam	SC-SM, SM, ML, SC, CL-ML	A-4, A-2	0	0	85-100	75-100	45-95	25-75	17-27	2-8
	6-14	Sandy loam, fine sandy loam, loam	SC, SC-SM, CL-ML, SM, CL	A-4, A-2	0	0	85-100	75-100	45-95	25-75	19-28	3-10
	14-19	Clay loam, sandy loam, clay, silty clay	CH, CL	A-7	0	0	95-100	90-100	55-100	25-95	45-74	25-48
	19-26	Clay, silty clay	CH	A-7	0	0	95-100	90-100	80-100	70-95	54-82	32-55
	26-60	Clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	80-100	70-95	49-78	29-51
Sedgwick-----	0-5	Loamy sand	SM, SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	23-37	4-12
	5-8	Loamy sand, fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM, SC	A-4, A-2-4, A-1-b	0	0-3	80-100	75-98	30-90	10-50	0-28	NP-10
	8-16	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	21-33	4-12
	16-19	Clay, silty clay loam, sandy loam, clay loam	CL, CH	A-7, A-6	0	0-3	98-100	95-98	60-95	50-85	31-78	12-51
	19-53	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-85	41-78	21-51
	53-80	Silty clay, silty clay loam, clay, clay loam	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-95	41-78	21-51

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444488: Superior-----	0-3	Fine sandy loam	SC-SM, SM, SC, CL-ML, ML	A-4, A-2	0	0	85-100	75-100	55-85	30-55	20-33	3-10
	3-6	Sandy loam, fine sandy loam, loam	SC-SM, SM, ML, SC, CL-ML	A-4, A-2	0	0	85-100	75-100	45-95	25-75	17-27	2-8
	6-14	Sandy loam, fine sandy loam, loam	SC, SC-SM, CL-ML, SM, CL	A-4, A-2	0	0	85-100	75-100	45-95	25-75	19-28	3-10
	14-19	Sandy loam, clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	90-100	55-100	25-95	45-74	25-48
	19-26	Clay, silty clay	CH	A-7	0	0	95-100	90-100	80-100	70-95	54-82	32-55
	26-60	Clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	80-100	70-95	49-78	29-51
Sedgwick-----	0-5	Loamy sand	SM, SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	23-37	4-12
	5-8	Loamy sand, fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM, SC	A-4, A-2-4, A-1-b	0	0-3	80-100	75-98	30-90	10-50	0-28	NP-10
	8-16	Sandy loam, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-3	80-100	75-98	45-90	20-50	21-33	4-12
	16-19	Clay, silty clay loam, sandy loam, clay loam	CL, CH	A-7, A-6	0	0-3	98-100	95-98	60-95	50-85	31-78	12-51
	19-53	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-85	41-78	21-51
	53-80	Silty clay, silty clay loam, clay, clay loam	CH, CL	A-7	0	0-3	98-100	95-98	85-95	75-95	41-78	21-51
1444489: Sultz-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand, loamy sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	40-75	5-30	0-20	NP-2
	6-18	Sand, loamy sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	40-75	5-30	0-23	NP-3
	18-25	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	35-75	5-35	0-17	NP-1
	25-43	Sand, fine sand	SP-SM, SM	A-3, A-1-b	0	0-7	80-100	75-100	35-75	5-35	0-17	NP-1
	43-60	Stratified sand to fine sand to loamy sand to very fine sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2-4	0	0-7	90-100	75-100	35-95	5-65	0-32	NP-13

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1444489:												
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
Rubicon-----	0-1	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-22	NP-2
	1-6	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-19	NP-2
	6-18	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-24	NP-6
	18-36	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-24	NP-6
	36-60	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-70	0-15	0-19	NP-2
1444492:												
Manistee-----	0-3	Sand	SM	A-2-4, A-1-b	0	0	95-100	90-100	45-70	5-15	0-32	NP-7
	3-11	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	90-100	45-80	5-45	0-24	NP-7
	11-28	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	90-100	45-80	5-45	0-24	NP-7
	28-30	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	90-100	45-80	5-45	0-24	NP-7
	30-38	Clay, silty clay, clay loam, silty clay loam	CH, CL	A-7	0	0	95-100	90-100	80-100	65-95	45-68	25-44
	38-60	Clay, silty clay, clay loam, silty clay loam	CL, CH	A-7	0	0	95-100	90-100	80-100	65-95	45-68	25-44
Kellogg-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	---	---
	2-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-70	5-15	0-22	NP-4
	6-26	Sand, loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-26	NP-7
	26-29	Silty clay, clay, silty clay loam, loamy sand	SM, CL-ML, SC-SM, CH, CL	A-7	0	0	96-100	96-100	50-100	40-95	19-65	3-40
	29-40	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	45-69	25-44
	40-80	Silty clay, clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	70-95	41-69	21-44

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
1444492:												
Ashwabay-----	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-35	0-14	NP-1
	4-5	Sand, fine sand, loamy sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	5-12	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-45	0-19	NP-1
	12-32	Sand, loamy sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-19	NP-1
	32-45	Sand, fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	90-100	80-100	40-80	5-35	0-14	NP
	45-62	Clay, clay loam, silty clay	CL, CH	A-7	0	0	90-100	80-100	70-100	55-95	45-69	25-44
	62-80	Stratified clay to silt to sand	CL, CH	A-7	0	0	90-100	80-100	40-100	5-95	0-69	NP-44
1444506:												
Keweenaw-----	0-2	Loamy sand	SM, SC-SM, SC	A-2-4, A-2	0-2	0-20	90-100	75-100	40-75	15-30	0-20	NP-10
	2-4	Gravelly loamy fine sand, cobbly loamy sand, sandy loam, loamy sand	SM, SC-SM, SC	A-2-4, A-2, A-1-b	0	0-50	85-100	65-100	45-75	15-35	0-20	NP-10
	4-16	Loamy sand, gravelly loamy sand, sandy loam, cobbly loamy fine sand	SM, SC-SM, SC	A-2-4, A-1-b, A-2	0	0-25	85-100	65-100	45-75	15-35	0-20	NP-10
	16-20	Loamy sand, cobbly loamy fine sand, gravelly loamy sand, sand	SM, SP-SM, SC, SC-SM	A-1-b, A-2	0	0-25	85-100	65-100	45-75	10-25	0-20	NP-10
	20-27	Loamy sand, cobbly sand, gravelly loamy fine sand	SM, SP-SM, SC, SC-SM	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-75	10-25	0-23	NP-10
	27-43	Sand, cobbly loamy sand, gravelly loamy fine sand, sandy loam	SM, SP-SM, SC, SC-SM	A-2, A-2-4, A-3, A-1-b	0	0-25	85-100	65-100	40-80	5-20	0-27	NP-10
	43-75	Loamy sand, sandy loam, gravelly loamy fine sand, fine sandy loam	SM, SC-SM, SC	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-80	10-30	0-30	NP-10
	75-80	Loamy sand, gravelly loamy sand, cobbly sand	SM, SP-SM, SC, SC-SM	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-75	10-25	0-20	NP-10

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444506: Rubicon-----	0-1	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	1-6	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	6-18	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	18-36	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	36-60	Coarse sand, sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
1444507: Keweenaw-----	0-2	Loamy sand	SM, SC-SM, SC	A-2-4, A-2	0-2	0-20	90-100	75-100	40-75	15-30	0-20	NP-10
	2-4	Gravelly loamy fine sand, cobbly loamy sand, sandy loam, loamy sand	SM, SC-SM, SC	A-2-4, A-2, A-1-b	0	0-50	85-100	65-100	45-75	15-35	0-20	NP-10
	4-16	Loamy sand, gravelly loamy sand, sandy loam, cobbly loamy fine sand	SM, SC-SM, SC	A-2-4, A-1-b, A-2	0	0-25	85-100	65-100	45-75	15-35	0-20	NP-10
	16-20	Loamy sand, cobbly loamy fine sand, gravelly loamy sand, sand	SM, SP-SM, SC, SC-SM	A-1-b, A-2	0	0-25	85-100	65-100	45-75	10-25	0-20	NP-10
	20-27	Loamy sand, cobbly sand, gravelly loamy fine sand	SM, SP-SM, SC, SC-SM	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-75	10-25	0-23	NP-10
	27-43	Sand, cobbly loamy sand, gravelly loamy fine sand, sandy loam	SM, SP-SM, SC, SC-SM	A-2, A-2-4, A-3, A-1-b	0	0-25	85-100	65-100	40-80	5-20	0-27	NP-10
	43-75	Loamy sand, sandy loam, gravelly loamy fine sand, fine sandy loam	SM, SC-SM, SC	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-80	10-30	0-30	NP-10
	75-80	Loamy sand, gravelly loamy sand, cobbly sand	SM, SP-SM, SC, SC-SM	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-75	10-25	0-20	NP-10
Rubicon-----	0-1	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	1-6	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	6-18	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	18-36	Sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP
	36-60	Coarse sand, sand	SP-SM, SM	A-3, A-2-4, A-1	0	0	90-100	80-100	40-70	5-15	0-14	NP

Table 14.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1444585: Meehan, beaches-	0-4	Sand	SM	A-2, A-1	0	0	90-100	75-100	40-90	5-15	0-14	NP
	4-29	Sand, loamy sand, loamy coarse sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	90-100	75-100	40-90	3-30	0-14	NP
	29-60	Sand, coarse sand	SP-SM, SP	A-3, A-2, A-1	0	0	90-100	75-100	40-90	0-5	0-14	NP
1444586: Wurtsmith, beaches-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Sand	SP-SM, SM	A-2, A-1	0	0	90-100	80-100	30-75	10-30	0-14	NP
	4-24	Sand, coarse sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	90-100	80-100	25-70	3-15	0-14	NP
	24-48	Sand, coarse sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	90-100	80-100	25-70	3-15	0-14	NP
	48-80	Sand, coarse sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	90-100	80-100	25-70	3-15	0-14	NP
1444587: Grayling, beaches-----	0-3	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	3-15	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	15-23	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	23-60	Sand, coarse sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP
1529830: Meehan, beaches-	0-4	Sand	SM	A-2, A-1	0	0	90-100	75-100	40-90	5-15	0-14	NP
	4-29	Sand, loamy sand, loamy coarse sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	90-100	75-100	40-90	3-30	0-14	NP
	29-60	Sand, coarse sand	SP-SM, SP	A-3, A-2, A-1	0	0	90-100	75-100	40-90	0-5	0-14	NP
1700372: Loxley-----	0-13	Mucky peat	PT	A-8	0	0	100	100	100	100	---	NP
	13-60	Muck	PT	A-8	0	0	100	100	100	100	---	NP
Beseman-----	0-36	Muck	PT	A-8	0	0	100	100	100	100	---	---
	36-60	Loam, silt loam, sandy loam	SC-SM, CL-ML, CL	A-2-4, A-4	0	0-2	80-100	75-100	45-100	25-90	20-33	4-13
Dawson-----	0-8	Peat	PT	A-8	0	0	100	100	100	100	---	---
	8-38	Muck	PT	A-8	0	0	100	100	100	100	---	---
	38-40	Silt loam, loam, fine sand, mucky sand	ML, SM	A-4, A-2-4	0	0	100	100	50-100	10-90	0-59	NP-9
	40-60	Sand, gravelly sand, very gravelly very fine sand	SP, SP-SM, GP, SM	A-3, A-4, A-1, A-2	0	0	45-100	35-100	15-90	0-45	0-23	NP-6

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					in	in						
				Pct	Pct					Pct		
1700373:	<u>In</u>											
Rifle-----	0-4	Peat	PT	A-8	0	0	100	100	100	100	---	NP
	4-60	Mucky peat	PT	A-8	0	0	100	100	100	100	---	NP
1700374:												
Allendale-----	0-3	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	65-80	25-40	0-31	NP-6
	3-10	Sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-85	5-40	0-28	NP-10
	10-13	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	13-26	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-1-b, A-4, A-3	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	26-28	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	95-100	90-100	45-80	5-40	0-23	NP-6
	28-34	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
	34-60	Clay, silty clay	CH	A-7	0	0	100	98-100	90-100	75-95	49-69	29-44
Wakeley-----	0-4	Muck	PT	A-8	0	0	100	100	100	100	---	---
	4-23	Loamy sand, sand, loamy fine sand, fine sand	SP-SM, SM, SC-SM	A-4, A-3, A-2-4	0	0-5	90-100	80-100	40-90	5-45	0-24	NP-6
	23-28	Loamy sand, sand, loamy fine sand, fine sand	SP-SM, SC-SM, SM	A-4, A-3, A-2-4	0	0-5	90-100	80-100	40-90	5-45	0-24	NP-6
	28-80	Clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	90-100	75-95	49-69	29-44
Kinross-----	0-6	Muck	PT	A-8	0	0	100	100	100	100	---	---
	6-10	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-24	NP-6
	10-12	Sand, fine sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-31	NP-6
	12-24	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-26	NP-6
	24-42	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	100	90-100	50-80	5-30	0-26	NP-6
	42-60	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-80	5-30	0-23	NP-6

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1702605: Menominee-----	0-4	Loamy sand	SP-SM, SM	A-2-4	0	0-7	75-100	75-100	20-90	5-50	0-33	NP-10
	4-7	Sand, loamy sand, fine sand, gravelly loamy fine sand	SP-SM, SM	A-2-4	0	0-7	75-100	65-100	20-90	5-50	16-27	2-10
	7-23	Sand, loamy sand, fine sand, gravelly loamy fine sand	SP-SM, SM	A-2-4	0	0-7	75-100	65-100	20-90	5-50	0-25	NP-7
	23-39	Clay loam, loam, silty clay loam, sandy loam	SC, SC-SM, CL, CL-ML	A-6, A-4, A-2	0	0	95-100	85-95	50-95	25-75	20-44	6-25
	39-59	Clay loam, loam, silty clay loam, sandy loam	SC, SC-SM, CL, CL-ML	A-6, A-4, A-2-4	0	0	95-100	85-95	50-95	25-75	24-46	7-25
	59-80	Loam, clay loam, silty clay loam, sandy loam	SC, SC-SM, CL, CL-ML	A-6, A-4, A-2-4	0	0	95-100	85-95	50-95	25-75	22-42	6-21
1702606: Deerton-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	1-9	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-70	0-15	0-26	NP-6
	9-10	Loamy sand, sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7
	10-25	Sand, loamy sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10	3-10	4	10	40	200			
					in	in							
				Pct	Pct					Pct			
1702606: Brownstone-----	In												
	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP	
	2-12	Very cobbly sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-65	3-30	0-14	NP	
	12-15	Extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-24	NP-2	
	15-23	Extremely cobbly sand, extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-22	NP-2	
	23-33	Extremely cobbly coarse sand, extremely cobbly sand, extremely gravelly coarse sand, gravelly loamy coarse sand	GP-GM, GP, GM, SM, SP, SP-SM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-19	NP-2	
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---	
1702607: Deerton-----	0-1	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP	
	1-9	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-70	0-15	0-26	NP-6	
	9-10	Loamy sand, sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7	
	10-25	Sand, loamy sand, channery loamy sand, flaggy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0-7	0-30	55-100	45-100	25-75	0-30	0-26	NP-7	
	25-39	Weathered bedrock	---	---	---	---	---	---	---	---	---	---	
	39-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---	

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1702607: Brownstone-----	0-2	Highly decomposed plant material	PT	A-8	0	0	100	100	100	100	---	NP
	2-12	Very cobbly sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-65	3-30	0-14	NP
	12-15	Extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-24	NP-2
	15-23	Extremely cobbly sand, extremely gravelly coarse sand, extremely cobbly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-22	NP-2
	23-33	Extremely cobbly coarse sand, extremely cobbly sand, extremely gravelly coarse sand, gravelly loamy coarse sand	SM, SP, SP-SM, GM, GP, GP-GM	A-3, A-1-b	0-15	15-55	20-95	10-85	5-70	0-25	0-19	NP-2
	33-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
	1702608: Abbaye-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100	100	---
2-4		Loamy sand	SM, SC-SM	A-2-4	0	0-7	85-100	75-100	40-75	15-30	0-33	NP-10
4-13		Loamy sand, loamy fine sand, fine sandy loam, sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	0-28	NP-9
13-25		Sandy loam, fine sandy loam	SM, SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	45-85	25-55	17-28	2-10
25-32		Sandy loam, loamy sand, fine sandy loam	SC-SM, SC	A-4, A-2-4	0	0-7	85-100	75-100	40-85	15-55	18-30	4-12
32-80		Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 14.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
	In				Pct	Pct					Pct	
1711685: Cublake-----	0-3	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-70	5-15	0-25	NP-4
	3-4	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-24	NP-6
	4-23	Sand, loamy sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-29	NP-6
	23-32	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-4, A-1-b, A-2-4	0	0	80-100	75-100	40-80	5-45	0-23	NP-6
	32-40	Sand, fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	40-48	Stratified fine sand to very fine sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	80-100	75-100	40-80	5-35	0-19	NP-2
	48-60	Stratified very fine sandy loam to silt loam	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0	95-100	90-100	75-95	45-85	20-32	6-13
Keweenaw-----	0-2	Loamy sand	SM, SC-SM, SC	A-2-4, A-2	0-2	0-20	90-100	75-100	40-75	15-30	0-20	NP-10
	2-4	Gravelly loamy fine sand, cobbly loamy sand, sandy loam, loamy sand	SM, SC-SM, SC	A-2-4, A-2, A-1-b	0	0-50	85-100	65-100	45-75	15-35	0-20	NP-10
	4-16	Loamy sand, gravelly loamy sand, sandy loam, cobbly loamy fine sand	SM, SC-SM, SC	A-2-4, A-1-b, A-2	0	0-25	85-100	65-100	45-75	15-35	0-20	NP-10
	16-20	Loamy sand, cobbly loamy fine sand, gravelly loamy sand, sand	SM, SP-SM, SC, SC-SM	A-1-b, A-2	0	0-25	85-100	65-100	45-75	10-25	0-20	NP-10
	20-27	Loamy sand, cobbly sand, gravelly loamy fine sand	SM, SP-SM, SC, SC-SM	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-75	10-25	0-23	NP-10
	27-43	Sand, cobbly loamy sand, gravelly loamy fine sand, sandy loam	SM, SP-SM, SC, SC-SM	A-2, A-2-4, A-3, A-1-b	0	0-25	85-100	65-100	40-80	5-20	0-27	NP-10
	43-75	Loamy sand, sandy loam, gravelly loamy fine sand, fine sandy loam	SM, SC-SM, SC	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-80	10-30	0-30	NP-10
	75-80	Loamy sand, gravelly loamy sand, cobbly sand	SM, SP-SM, SC, SC-SM	A-2-4, A-2, A-1-b	0	0-25	85-100	65-100	45-75	10-25	0-20	NP-10

Table 15.—Physical Soil Properties

(Sand, silt, and clay values are shown either as a range or as 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 unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
433292: Lerch-----	0-3	0-0	0-0	0-0	0.15-0.40	6.0-20.0	0.35-0.45	---	65-85
	3-7	10	0-35	60-95	1.25-1.35	0.0-0.1	0.11-0.13	9.0-12.0	1.0-3.0
	7-12	0-35	0-60	40-95	1.25-1.50	0.0-0.1	0.11-0.14	9.0-12.0	0.0-1.0
	12-29	0-35	0-60	40-95	1.25-1.50	0.0-0.1	0.09-0.13	9.0-12.0	0.0-0.5
	29-56	0-35	0-60	40-95	1.25-1.50	0.0-0.1	0.08-0.12	9.0-12.0	0.0-0.5
	56-80	0-80	5-80	5-25	1.45-1.65	0.6-20.0	0.08-0.22	0.0-2.9	0.0-0.5
Herbster-----	0-5	27	54	10-27	1.35-1.55	0.6-2.0	0.17-0.22	0.0-2.9	1.0-3.0
	5-10	16	30-70	15-45	1.45-1.60	0.2-2.0	0.12-0.20	0.0-2.9	0.5-1.0
	10-13	5-40	30-70	25-60	1.45-1.60	0.0-0.6	0.09-0.20	6.0-8.9	0.5-1.0
	13-28	23	29	35-60	1.45-1.60	0.0-0.1	0.09-0.13	6.0-8.9	0.5-1.0
	28-33	5-35	20-65	35-60	1.40-1.65	0.0-0.1	0.09-0.13	6.0-8.9	0.0-0.5
	33-55	5-35	20-65	35-60	1.40-1.65	0.0-0.1	0.09-0.13	6.0-8.9	0.0-0.5
	55-80	20-80	10-65	5-20	1.45-1.70	0.6-2.0	0.10-0.16	0.0-2.9	0.0-0.5
433296: Cublake-----	0-3	95	1	0-8	1.35-1.60	2.0-20.0	0.05-0.09	0.0-2.9	0.5-2.0
	3-4	80-95	1	0-10	1.35-1.65	2.0-20.0	0.05-0.12	0.0-2.9	0.0-1.0
	4-23	80-95	2	1-10	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	1.0-3.0
	23-32	80-95	2	1-10	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	32-40	96	2	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	40-48	90-100	0-10	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	48-60	20-70	5-70	10-20	1.40-1.80	0.2-2.0	0.12-0.18	0.0-2.9	0.0-0.5
Croswell-----	0-1	75-100	6	0-10	1.35-1.65	6.0-20.0	0.06-0.11	0.0-2.9	1.0-3.0
	1-7	75-100	0-20	0-10	1.30-1.50	6.0-20.0	0.06-0.11	0.0-2.9	0.5-2.0
	7-16	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	16-39	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.0-0.5
	39-60	96	2	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
433299:									
Cublake-----	0-3	95	1	0-8	1.35-1.60	2.0-20.0	0.05-0.09	0.0-2.9	0.5-2.0
	3-4	80-95	1	0-10	1.35-1.65	2.0-20.0	0.05-0.12	0.0-2.9	0.0-1.0
	4-23	80-95	2	1-10	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	1.0-3.0
	23-32	80-95	2	1-10	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	32-40	96	2	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	40-48	90-100	0-10	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	48-60	20-70	5-80	10-20	1.40-1.80	0.2-2.0	0.12-0.18	0.0-2.9	0.0-0.5
Croswell-----	0-1	75-100	6	0-10	1.35-1.65	6.0-20.0	0.06-0.11	0.0-2.9	1.0-3.0
	1-7	75-100	0-20	0-10	1.30-1.50	6.0-20.0	0.06-0.11	0.0-2.9	0.5-2.0
	7-16	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	16-39	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.0-0.5
	39-60	96	2	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
433300:									
Kellogg-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-6	94	1	2-8	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	6-26	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	26-29	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	29-40	5-35	20-60	35-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	40-80	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
433301:									
Kellogg-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-6	94	1	2-8	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	6-26	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	26-29	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	29-40	5-35	20-60	35-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	40-80	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
433304:									
Sedgwick-----	0-5	67	20	8-18	1.35-1.65	0.6-2.0	0.10-0.15	0.0-2.9	2.0-4.0
	5-8	82	9	3-15	1.45-1.70	0.6-2.0	0.08-0.17	0.0-2.9	0.5-1.0
	8-16	67	20	8-18	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	1.0-2.0
	16-19	5-60	20-65	18-70	1.40-1.70	0.0-2.0	0.07-0.16	6.0-8.9	0.0-0.5
	19-53	5-40	25-65	30-70	1.45-1.70	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
	53-80	5-40	25-65	30-70	1.50-1.80	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
Munuscong-----	0-8	68	22	5-15	1.30-1.65	2.0-6.0	0.13-0.15	0.0-2.9	2.0-3.0
	8-30	67	20	8-18	1.30-1.70	2.0-6.0	0.12-0.17	0.0-2.9	0.0-0.5
	30-60	1	20-70	35-80	1.35-1.70	0.1-0.2	0.08-0.18	6.0-8.9	0.0-0.5
433305:									
Superior-----	0-3	68	21	7-15	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	1.0-3.0
	3-6	68	23	5-13	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	0.5-1.0
	6-14	66	23	7-15	1.55-1.65	0.6-2.0	0.11-0.19	0.0-2.9	0.5-1.0
	14-19	22	28	15-65	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	19-26	12	28	45-75	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	26-60	17	28	40-70	1.60-1.70	0.0-0.1	0.07-0.13	6.0-8.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
433305: Sedgwick-----	0-5	82	9	3-15	1.35-1.65	0.6-2.0	0.10-0.15	0.0-2.9	2.0-4.0
	5-8	82	9	3-15	1.45-1.70	0.6-2.0	0.08-0.17	0.0-2.9	0.5-1.0
	8-16	67	20	8-18	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	1.0-2.0
	16-19	5-60	20-65	18-70	1.40-1.70	0.0-2.0	0.07-0.16	6.0-8.9	0.0-0.5
	19-53	5-40	25-65	30-70	1.45-1.70	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
	53-80	5-40	25-65	30-70	1.50-1.80	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
433309: Superior-----	0-3	68	21	7-15	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	1.0-3.0
	3-6	68	23	5-13	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	0.5-1.0
	6-14	66	23	7-15	1.55-1.65	0.6-2.0	0.11-0.19	0.0-2.9	0.5-1.0
	14-19	22	28	15-65	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	19-26	12	28	45-75	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	26-60	17	28	40-70	1.60-1.70	0.0-0.1	0.07-0.13	6.0-8.9	0.0-0.5
Sedgwick-----	0-5	82	9	3-15	1.35-1.65	0.6-2.0	0.10-0.15	0.0-2.9	2.0-4.0
	5-8	82	9	3-15	1.45-1.70	0.6-2.0	0.08-0.17	0.0-2.9	0.5-1.0
	8-16	67	20	8-18	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	1.0-2.0
	16-19	5-60	20-65	18-70	1.40-1.70	0.0-2.0	0.07-0.16	6.0-8.9	0.0-0.5
	19-53	5-40	25-65	30-70	1.45-1.70	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
	53-80	5-40	25-65	30-70	1.50-1.80	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
433310: Sultz-----	0-2	0-0	0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-6	80-100	2	1-5	1.40-1.65	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	6-18	80-100	2	1-6	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	1.0-2.0
	18-25	96	2	1-3	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.0-0.5
	25-43	96	2	1-3	1.50-1.70	6.0-20.0	0.04-0.07	0.0-2.9	0.0-0.5
	43-60	50-90	5-50	2-20	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
Rubicon-----	0-1	96	2	0-5	1.25-1.45	6.0-20.0	0.05-0.09	0.0-2.9	0.5-2.0
	1-6	96	2	0-5	1.30-1.60	6.0-20.0	0.04-0.08	0.0-2.9	0.0-0.5
	6-18	94	1	0-10	1.30-1.60	6.0-20.0	0.04-0.08	0.0-2.9	0.6-1.0
	18-36	94	1	0-10	1.30-1.60	6.0-20.0	0.04-0.08	0.0-2.9	0.6-1.0
	36-60	96	2	0-5	1.40-1.65	6.0-20.0	0.04-0.06	0.0-2.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
433314:									
Manistee-----	0-3	91	2	3-12	1.35-1.60	6.0-20.0	0.10-0.12	0.0-2.9	2.0-4.0
	3-11	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	1.0-2.0
	11-28	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.3-0.8
	28-30	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.3-0.8
	30-38	10-40	25-50	35-60	1.50-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	38-60	10-40	25-50	35-60	1.60-1.75	0.1-0.2	0.08-0.16	6.0-8.9	0.0-0.5
Kellogg-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	60-85
	2-6	94	1	2-8	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	6-26	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	26-29	10-80	5-60	5-55	1.35-1.65	0.0-0.2	0.09-0.15	6.0-9.0	0.0-0.5
	29-40	5-35	20-60	35-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	40-80	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
433326:									
Rubicon-----	0-1	90-98	2	0-5	1.35-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.5-2.0
	1-6	90-98	2	0-5	1.35-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.0-0.5
	6-18	90-98	2	0-5	1.60-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.0-0.5
	18-36	90-98	2	0-5	1.60-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.0-0.5
	36-60	90-98	2	0-5	1.60-1.80	6.0-20.0	0.02-0.07	0.0-2.9	0.0-0.5
433379:									
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
433515:									
Lupton-----	0-65	0-0	0-0	0-0	0.15-0.40	0.2-6.0	0.35-0.45	---	30-80
Cathro-----	0-28	0-0	0	0-0	0.28-0.45	0.2-6.0	0.35-0.45	---	60-85
	28-49	15-70	10-55	10-30	1.50-1.70	0.2-2.0	0.11-0.22	0.0-2.9	0.0-0.5
	49-60	15-70	10-55	10-30	1.50-1.70	0.2-2.0	0.11-0.22	0.0-2.9	0.0-0.5
Tawas-----	0-31	0-0	0-0	0-0	0.15-0.40	0.2-6.0	0.35-0.45	---	30-80
	31-60	75-100	2-20	0-10	1.55-1.80	6.0-20.0	0.02-0.10	0.0-2.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
433572:									
Portwing-----	0-4	27	54	10-27	1.35-1.55	0.6-2.0	0.17-0.22	0.0-2.9	1.0-3.0
	4-9	15-40	20-70	15-45	1.45-1.60	0.2-2.0	0.12-0.20	0.0-2.9	0.5-1.0
	9-32	15-40	20-60	35-60	1.40-1.55	0.1-0.2	0.08-0.14	6.0-8.9	0.0-1.0
	32-51	15-40	20-60	35-60	1.40-1.55	0.1-0.2	0.08-0.14	6.0-8.9	0.0-1.0
	51-80	15-90	10-85	5-15	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
Herbster-----	0-5	27	54	10-27	1.35-1.55	0.6-2.0	0.17-0.22	0.0-2.9	1.0-3.0
	5-10	16	30-70	15-45	1.45-1.60	0.2-2.0	0.12-0.20	0.0-2.9	0.5-1.0
	10-13	5-40	30-70	25-60	1.45-1.60	0.0-0.6	0.09-0.20	6.0-8.9	0.5-1.0
	13-28	23	29	35-60	1.45-1.60	0.0-0.1	0.09-0.13	6.0-8.9	0.5-1.0
	28-33	18	20-65	35-60	1.40-1.65	0.0-0.1	0.09-0.13	6.0-8.9	0.0-0.5
	33-55	18	20-65	35-60	1.40-1.65	0.0-0.1	0.09-0.13	6.0-8.9	0.0-0.5
	55-80	20-80	10-65	5-20	1.45-1.70	0.6-2.0	0.10-0.16	0.0-2.9	0.0-0.5
433573:									
Cornucopia-----	0-3	27	54	10-27	1.35-1.55	0.6-2.0	0.17-0.22	0.0-2.9	1.0-3.0
	3-10	10-70	15-65	15-45	1.45-1.60	0.2-2.0	0.12-0.20	0.0-2.9	0.5-1.0
	10-32	10-40	20-50	40-60	1.40-1.55	0.1-0.2	0.08-0.14	6.0-8.9	0.0-1.0
	32-45	10-40	20-50	40-60	1.40-1.55	0.1-0.2	0.08-0.14	6.0-8.9	0.0-1.0
	45-50	15-90	10-85	5-20	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
	50-72	15-90	10-85	5-15	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
433582:									
Croswell-----	0-1	92	6	0-10	1.35-1.65	6.0-20.0	0.07-0.09	0.0-2.9	1.0-3.0
	1-7	75-100	0-20	0-10	1.30-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.5-2.0
	7-16	75-100	0-20	0-10	1.55-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.6-1.0
	16-39	75-100	0-20	0-10	1.55-1.70	6.0-20.0	0.05-0.08	0.0-2.9	0.0-0.5
	39-60	96	2	0-5	1.60-1.70	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
433599:									
Annalake-----	0-3	68	22	5-15	1.25-1.60	0.6-2.0	0.16-0.18	0.0-2.9	1.0-3.0
	3-6	40-75	10-40	2-15	1.30-1.60	0.6-2.0	0.13-0.22	0.0-2.9	0.5-1.0
	6-17	68	22	5-15	1.45-1.60	0.6-2.0	0.13-0.22	0.0-2.9	0.5-1.0
	17-31	40-75	10-40	5-15	1.45-1.60	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5
	31-39	40-75	10-40	8-18	1.45-1.60	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5
	39-60	40-90	5-55	5-15	1.45-1.70	0.6-2.0	0.05-0.22	0.0-2.9	0.0-0.5
433600:									
Annalake-----	0-3	68	22	5-15	1.25-1.60	0.6-2.0	0.16-0.18	0.0-2.9	1.0-3.0
	3-6	40-75	10-40	2-15	1.30-1.60	0.6-2.0	0.13-0.22	0.0-2.9	0.5-1.0
	6-17	68	22	5-15	1.45-1.60	0.6-2.0	0.13-0.22	0.0-2.9	0.5-1.0
	17-31	40-75	10-40	5-15	1.45-1.60	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5
	31-39	40-75	10-40	8-18	1.45-1.60	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5
	39-60	40-90	5-55	5-15	1.45-1.70	0.6-2.0	0.05-0.22	0.0-2.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
433671: Arnheim-----	0-5	30	55	12-18	1.15-1.60	0.6-6.0	0.12-0.35	0.0-2.9	3.0-15
	5-10	30	55	12-18	1.50-1.80	0.6-2.0	0.20-0.22	0.0-2.9	0.5-2.0
	10-15	0-80	5-80	5-18	1.50-1.80	0.6-2.0	0.14-0.22	0.0-2.9	0.5-2.0
	15-24	0-80	5-80	5-18	1.50-1.80	0.6-2.0	0.14-0.22	0.0-2.9	0.5-2.0
	24-60	50-85	5-30	5-15	1.50-1.80	0.6-2.0	0.14-0.22	0.0-2.9	0.0-1.0
433676: Redrim-----	0-1	0-0	0-0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	1-3	0-0	0-0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	3-11	97	2	1-2	1.35-1.60	20.0-20.0	0.03-0.08	0.0-2.9	0.5-2.0
	11-18	75-95	0-20	2-5	1.50-1.70	20.0-20.0	0.02-0.10	0.0-2.9	0.0-0.5
	18-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
433679: Lapoin-----	0-1	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	1-4	44	40	12-20	1.35-1.55	0.6-2.0	0.18-0.22	0.0-2.9	2.0-8.0
	4-7	30-80	5-50	10-25	1.40-1.65	0.6-2.0	0.12-0.19	3.0-5.9	1.0-3.0
	7-19	5-45	20-60	25-60	1.35-1.60	0.1-0.6	0.10-0.18	6.0-8.9	0.0-0.5
	19-34	5-40	20-60	35-60	1.35-1.50	0.1-0.2	0.08-0.15	6.0-8.9	0.0-0.5
	34-39	67	23	5-15	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	0.0-0.5
	39-80	---	---	---	---	0.2-2.0	0.00-0.00	---	0.0-0.0
433686: Zeba-----	0-2	78	12	5-15	1.30-1.70	0.6-2.0	0.13-0.15	0.0-2.9	2.0-4.0
	2-5	69	24	3-12	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	5-13	65	29	3-10	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	13-21	55-85	21	5-15	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	21-33	68	24	4-12	1.40-1.80	0.6-2.0	0.09-0.15	0.0-2.9	0.0-0.5
	33-80	---	---	---	---	0.2-2.0	0.09-0.13	---	0.0-0.5
433729: Sultz-----	0-2	0-0	0-0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-6	80-100	2	1-5	1.40-1.65	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	6-18	80-100	2	1-6	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	1.0-2.0
	18-25	96	2	1-3	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.0-0.5
	25-43	96	2	1-3	1.50-1.70	6.0-20.0	0.04-0.07	0.0-2.9	0.0-0.5
	43-60	50-90	5-50	2-20	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
433739: Moquah-----	0-5	71	17	10-15	1.40-1.70	0.6-2.0	0.13-0.22	0.0-2.9	2.0-3.0
	5-19	10-90	5-80	8-18	1.55-1.70	0.2-2.0	0.12-0.22	0.0-2.9	0.5-1.0
	19-48	10-90	5-80	8-18	1.55-1.70	0.2-2.0	0.12-0.22	0.0-2.9	0.5-1.0
	48-55	30	55	12-18	1.50-1.80	0.6-2.0	0.20-0.22	0.0-2.9	0.5-2.0
	55-60	95	2	0-6	1.60-1.75	0.6-2.0	0.05-0.07	0.0-2.9	0.5-1.0

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
452765:									
Abbaye-----	0-2	0-0	---	0-0	0.15-0.30	5.9-19.8	0.55-0.65	---	65-85
	2-4	82	5	5-20	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	1.0-3.0
	4-13	82	10	2-14	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	0.5-1.0
	13-25	67	23	5-15	1.35-1.65	0.6-2.0	0.11-0.15	0.0-2.9	0.5-1.0
	25-32	55-85	20	8-18	1.35-1.70	0.6-2.0	0.08-0.14	0-2.9	0.0-0.5
	32-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
Lapoin-----	0-1	0-0	---	0-0	0.15-0.30	5.9-19.8	0.55-0.65	---	65-85
	1-4	44	40	12-20	1.35-1.55	0.6-2.0	0.18-0.22	0.0-2.9	2.0-8.0
	4-7	30-80	5-50	10-25	1.40-1.65	0.6-2.0	0.12-0.19	3.0-5.9	1.0-3.0
	7-19	5-45	20-60	25-60	1.35-1.60	0.1-0.6	0.10-0.18	6.0-8.9	0.0-0.5
	19-34	5-40	20-60	35-60	1.35-1.50	0.1-0.2	0.08-0.15	6.0-8.9	0.0-0.5
	34-39	67	23	5-15	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	0.0-0.5
	39-80	---	---	---	---	0.2-2.0	0.00-0.00	---	0.0-0.0
1383557:									
Au Gres-----	0-2	0-0	0-0	0-0	0.15-0.30	0.6-2.0	0.35-0.45	---	65-85
	2-5	75-100	0-20	0-10	1.50-1.70	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	5-8	75-100	0-20	0-10	1.50-1.70	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	8-16	75-100	0-20	0-10	1.50-1.70	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	16-28	90-100	1	0-10	1.50-1.70	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	28-60	96	2	0-5	1.50-1.70	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
1383580:									
Loxley-----	0-13	0-0	0	0-0	0.30-0.40	6.0-20.0	0.55-0.65	---	70-90
	13-60	0-0	0	0-0	0.10-0.35	0.2-6.0	0.35-0.45	---	70-90
Beseman-----	0-36	0-0	0	0-0	0.10-0.25	0.6-6.0	0.35-0.45	---	25-75
	36-60	25-70	20-80	8-25	1.35-1.60	0.2-0.6	0.09-0.22	0.0-2.9	0.5-1.0
Dawson-----	0-8	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	8-38	0-0	---	0-0	0.15-0.40	0.2-6.0	0.35-0.45	---	65-85
	38-40	31	57	0-15	1.55-1.75	0.6-2.0	0.18-0.20	0.0-2.9	5.0-15
	40-60	94	1	0-10	1.55-1.75	6.0-20.0	0.03-0.07	0.0-2.9	0.0-0.5
1383581:									
Rifle-----	0-4	0-0	0	0-0	0.20-0.35	2.0-6.0	0.55-0.65	---	70-90
	4-60	0-0	0	0-0	0.08-0.20	2.0-6.0	0.45-0.55	---	70-90

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1383603:									
Cornucopia-----	0-3	27	54	10-27	1.35-1.55	0.6-2.0	0.17-0.22	0.0-2.9	1.0-3.0
	3-10	10-70	15-65	15-45	1.45-1.60	0.2-2.0	0.12-0.20	0.0-2.9	0.5-1.0
	10-32	10-40	20-50	40-60	1.40-1.55	0.1-0.2	0.08-0.14	6.0-8.9	0.0-1.0
	32-45	10-40	20-50	40-60	1.40-1.55	0.1-0.2	0.08-0.14	6.0-8.9	0.0-1.0
	45-50	15-90	10-85	5-20	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
	50-72	15-90	10-85	5-15	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
1383658:									
Deerton-----	0-1	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	1-9	92	2	2-10	1.30-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.5-2.0
	9-10	84	9	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	10-25	91	2	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	25-39	---	---	---	---	0.2-2.0	---	---	0.0-0.5
	39-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
Brownstone-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-12	97	2	1-2	1.55-1.85	6.0-20.0	0.04-0.09	0.0-2.9	0.5-2.0
	12-15	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	2.0-3.0
	15-23	80-100	2	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	1.0-2.0
	23-33	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.06	0.0-2.9	0.0-0.5
	33-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
1383660:									
Deerton-----	0-1	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	1-9	92	2	2-10	1.30-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.5-2.0
	9-10	84	9	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	10-25	91	2	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	25-39	---	---	---	---	0.2-2.0	---	---	0.0-0.5
	39-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
Brownstone-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-12	97	2	1-2	1.55-1.85	6.0-20.0	0.04-0.09	0.0-2.9	0.5-2.0
	12-15	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	2.0-3.0
	15-23	80-100	2	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	1.0-2.0
	23-33	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.06	0.0-2.9	0.0-0.5
	33-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
1383662:									
Abbaye-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-4	82	9	3-15	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	1.0-3.0
	4-13	82	10	2-14	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	0.5-1.0
	13-25	67	23	5-15	1.35-1.65	0.6-2.0	0.11-0.15	0.0-2.9	0.5-1.0
	25-32	55-85	20	8-18	1.35-1.70	0.6-2.0	0.08-0.14	0.0-2.9	0.0-0.5
	32-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1383665:									
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	Wakeley-----	0-4	0-0		0-0	0.10-0.35	2.0-20.0	0.35-0.45	---
Wakeley-----	4-23	75-95	5-20	2-10	1.40-1.55	6.0-20.0	0.06-0.11	0.0-2.9	0.3-0.8
	23-28	75-95	5-20	2-10	1.40-1.55	6.0-20.0	0.06-0.11	0.0-2.9	0.3-0.8
	28-80	10-30	20-60	40-60	1.50-1.70	0.0-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	Kinross-----	0-6	0-0	---	0-0	0.10-0.35	2.0-20.0	0.35-0.45	---
Kinross-----	6-10	75-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	0.5-1.0
	10-12	75-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	1.0-4.0
	12-24	90-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	1.0-2.0
	24-42	75-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	1.0-2.0
	42-60	94	1	0-10	1.40-1.70	6.0-20.0	0.04-0.06	0.0-2.9	0.0-0.5
	1383960:								
Flink-----	0-2	0-0	0-0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-3	0-0	0-0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	3-6	96	2	1-5	1.35-1.60	6.0-20.0	0.06-0.09	0.0-2.9	1.0-3.0
	6-9	80-95	2	1-10	1.35-1.65	2.0-20.0	0.05-0.10	0.0-2.9	1.0-3.0
	9-26	80-95	2	1-10	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	1.0-3.0
	26-35	96	2	1-3	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	0.0-0.5
	35-46	96	2	1-3	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	0.0-0.5
	46-52	5-15	50-90	10-35	1.40-1.80	0.2-2.0	0.13-0.19	0.0-2.9	0.0-0.5
	52-80	10-80	15-85	5-35	1.40-1.80	0.2-2.0	0.13-0.19	0.0-2.9	0.0-0.5
	144435:								
Arnheim-----	0-5	30	55	12-18	1.15-1.60	0.6-6.0	0.12-0.35	0.0-2.9	3.0-15
	5-10	30	55	12-18	1.50-1.80	0.6-2.0	0.20-0.22	0.0-2.9	0.5-2.0
	10-15	0-80	5-80	5-18	1.50-1.80	0.6-2.0	0.14-0.22	0.0-2.9	0.5-2.0
	15-24	0-80	5-80	5-18	1.50-1.80	0.6-2.0	0.14-0.22	0.0-2.9	0.5-2.0
	24-60	50-85	5-30	5-15	1.50-1.80	0.6-2.0	0.14-0.22	0.0-2.9	0.0-1.0

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444378:									
Wakefield-----	0-4	70	16	8-18	1.30-1.60	0.6-2.0	0.16-0.18	0.0-2.9	1.0-3.0
	4-7	25-75	15-60	6-16	1.30-1.65	0.6-2.0	0.15-0.21	0.0-2.9	0.0-0.5
	7-18	25-75	15-60	8-18	1.30-1.65	0.6-2.0	0.15-0.21	0.0-2.9	0.0-0.5
	18-24	40-75	15-40	10-20	1.80-2.05	0.0-0.1	0.03-0.05	0.0-2.9	0.0-0.5
	24-36	35-70	10-40	12-28	1.80-2.05	0.0-0.1	0.03-0.05	0.0-2.9	0.0-0.5
	36-49	39	37	18-30	1.45-1.70	0.6-2.0	0.14-0.18	0.0-2.9	0.0-0.5
	49-64	40-75	15-40	10-20	1.45-1.75	0.6-2.0	0.14-0.19	0.0-2.9	0.0-0.5
1444379:									
Wakefield-----	0-4	70	16	8-18	1.30-1.60	0.6-2.0	0.16-0.18	0.0-2.9	1.0-3.0
	4-7	25-75	15-60	6-16	1.30-1.65	0.6-2.0	0.15-0.21	0.0-2.9	0.0-0.5
	7-18	25-75	15-60	8-18	1.30-1.65	0.6-2.0	0.15-0.21	0.0-2.9	0.0-0.5
	18-24	40-75	15-40	10-20	1.80-2.05	0.0-0.1	0.03-0.05	0.0-2.9	0.0-0.5
	24-36	35-70	10-40	12-28	1.80-2.05	0.0-0.1	0.03-0.05	0.0-2.9	0.0-0.5
	36-49	39	37	18-30	1.45-1.70	0.6-2.0	0.14-0.18	0.0-2.9	0.0-0.5
	49-64	40-75	15-40	10-20	1.45-1.75	0.6-2.0	0.14-0.19	0.0-2.9	0.0-0.5
1444388:									
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
1444402:									
Tonkey-----	0-8	67	20	8-18	1.10-1.60	0.6-2.0	0.13-0.15	0.0-2.9	4.0-7.0
	8-14	40-75	10-40	5-18	1.30-1.80	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
	14-28	40-75	10-40	5-18	1.30-1.80	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5
	28-60	10-95	5-75	0-20	1.60-1.80	0.6-2.0	0.05-0.19	0.0-2.9	0.0-0.5
1444410:									
Tula-----	0-1	0-0		0-0	0.15-0.40	6.0-20.0	0.35-0.45	---	30-80
	1-5	64	30	2-10	1.25-1.60	0.6-2.0	0.16-0.18	0.0-2.9	1.0-3.0
	5-8	64	32	2-8	1.25-1.60	0.6-2.0	0.08-0.18	0.0-2.9	0.5-1.0
	8-20	65	28	2-12	1.45-1.60	0.6-2.0	0.10-0.18	0.0-2.9	0.5-1.0
	20-28	65	28	2-12	1.50-1.60	0.6-2.0	0.07-0.18	0.0-2.9	0.5-1.0
	28-37	60-85	22	2-10	1.80-2.05	0.0-0.1	0.01-0.04	0.0-2.9	0.0-0.5
	37-62	40	40	7-25	1.80-2.05	0.0-0.1	0.01-0.04	0.0-2.9	0.0-0.5
	62-80	71	20	5-13	1.50-1.60	0.6-2.0	0.01-0.04	0.0-2.9	0.0-0.5
1444414:									
Lupton-----	0-65	0-0	0-0	0-0	0.15-0.40	0.2-6.0	0.35-0.45	---	30-80
Cathro-----	0-28	0-0	0	0-0	0.28-0.45	0.2-6.0	0.35-0.45	---	60-85
	28-49	15-70	10-55	10-30	1.50-1.70	0.2-2.0	0.11-0.22	0.0-2.9	0.0-0.5
	49-60	15-70	10-55	10-30	1.50-1.70	0.2-2.0	0.11-0.22	0.0-2.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444414: Tawas-----	0-31 31-60	0-0 75-100	0-0 2-20	0-0 0-10	0.15-0.40 1.55-1.80	0.2-6.0 6.0-20.0	0.35-0.45 0.02-0.10	--- 0.0-2.9	30-80 0.0-0.5
1444425: Lerch-----	0-3 3-7 7-12 12-29 29-56 56-80	0-0 10 0-35 0-35 0-35 0-80	0-0 0-35 0-60 0-60 0-60 5-80	0-0 60-95 40-95 40-95 40-95 5-25	0.15-0.40 1.25-1.35 1.25-1.50 1.25-1.50 1.25-1.50 1.45-1.65	6.0-20.0 0.0-0.1 0.0-0.1 0.0-0.1 0.0-0.1 0.6-20.0	0.35-0.45 0.11-0.13 0.11-0.14 0.09-0.13 0.08-0.12 0.08-0.22	--- 9.0-12.0 9.0-12.0 9.0-12.0 9.0-12.0 0.0-2.9	65-85 1.0-3.0 0.0-1.0 0.0-0.5 0.0-0.5 0.0-0.5
Herbster-----	0-5 5-10 10-13 13-28 28-33 33-55 55-80	27 16 5-40 23 5-35 5-35 20-80	54 30-70 30-70 29 20-65 20-65 10-65	10-27 15-45 25-60 35-60 35-60 35-60 5-20	1.35-1.55 1.45-1.60 1.45-1.60 1.45-1.60 1.40-1.65 1.40-1.65 1.45-1.70	0.6-2.0 0.2-2.0 0.0-0.6 0.0-0.1 0.0-0.1 0.0-0.1 0.6-2.0	0.17-0.22 0.12-0.20 0.09-0.20 0.09-0.13 0.09-0.13 0.09-0.13 0.10-0.16	0.0-2.9 0.0-2.9 6.0-8.9 6.0-8.9 6.0-8.9 6.0-8.9 0.0-2.9	1.0-3.0 0.5-1.0 0.5-1.0 0.5-1.0 0.0-0.5 0.0-0.5 0.0-0.5
1444426: Portwing-----	0-4 4-9 9-32 32-51 51-80	27 15-40 15-40 15-40 15-90	54 20-70 20-60 20-60 10-85	10-27 15-45 35-60 35-60 5-15	1.35-1.55 1.45-1.60 1.40-1.55 1.40-1.55 1.45-1.70	0.6-2.0 0.2-2.0 0.1-0.2 0.1-0.2 0.6-2.0	0.17-0.22 0.12-0.20 0.08-0.14 0.08-0.14 0.10-0.15	0.0-2.9 0.0-2.9 6.0-8.9 6.0-8.9 0.0-2.9	1.0-3.0 0.5-1.0 0.0-1.0 0.0-1.0 0.0-0.5
Herbster-----	0-5 5-10 10-13 13-28 28-33 33-55 55-80	27 16 5-40 23 18 18 20-80	54 30-70 30-70 29 20-65 20-65 10-65	10-27 15-45 25-60 35-60 35-60 35-60 5-20	1.35-1.55 1.45-1.60 1.45-1.60 1.45-1.60 1.40-1.65 1.40-1.65 1.45-1.70	0.6-2.0 0.2-2.0 0.0-0.6 0.0-0.1 0.0-0.1 0.0-0.1 0.6-2.0	0.17-0.22 0.12-0.20 0.09-0.20 0.09-0.13 0.09-0.13 0.09-0.13 0.10-0.16	0.0-2.9 0.0-2.9 6.0-8.9 6.0-8.9 6.0-8.9 6.0-8.9 0.0-2.9	1.0-3.0 0.5-1.0 0.5-1.0 0.5-1.0 0.0-0.5 0.0-0.5 0.0-0.5
1444427: Cornucopia-----	0-3 3-10 10-32 32-45 45-50 50-72	27 10-70 10-40 10-40 15-90 15-90	54 15-65 20-50 20-50 10-85 10-85	10-27 15-45 40-60 40-60 5-20 5-15	1.35-1.55 1.45-1.60 1.40-1.55 1.40-1.55 1.45-1.70 1.45-1.70	0.6-2.0 0.2-2.0 0.1-0.2 0.1-0.2 0.6-2.0 0.6-2.0	0.17-0.22 0.12-0.20 0.08-0.14 0.08-0.14 0.10-0.15 0.10-0.15	0.0-2.9 0.0-2.9 6.0-8.9 6.0-8.9 0.0-2.9 0.0-2.9	1.0-3.0 0.5-1.0 0.0-1.0 0.0-1.0 0.0-0.5 0.0-0.5
1444428: Cornucopia-----	0-3 3-10 10-32 32-45 45-50 50-72	27 10-70 10-40 10-40 15-90 15-90	54 15-65 20-50 20-50 10-85 10-85	10-27 15-45 40-60 40-60 5-20 5-15	1.35-1.55 1.45-1.60 1.40-1.55 1.40-1.55 1.45-1.70 1.45-1.70	0.6-2.0 0.2-2.0 0.1-0.2 0.1-0.2 0.6-2.0 0.6-2.0	0.17-0.22 0.12-0.20 0.08-0.14 0.08-0.14 0.10-0.15 0.10-0.15	0.0-2.9 0.0-2.9 6.0-8.9 6.0-8.9 0.0-2.9 0.0-2.9	1.0-3.0 0.5-1.0 0.0-1.0 0.0-1.0 0.0-0.5 0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444431: Croswell-----	0-1	92	6	0-10	1.35-1.65	6.0-20.0	0.07-0.09	0.0-2.9	1.0-3.0
	1-7	75-100	0-20	0-10	1.30-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.5-2.0
	7-16	75-100	0-20	0-10	1.55-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.6-1.0
	16-39	75-100	0-20	0-10	1.55-1.70	6.0-20.0	0.05-0.08	0.0-2.9	0.0-0.5
	39-60	96	2	0-5	1.60-1.70	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
1444432: Gogebic-----	0-1	0-0	---	0-0	0.15-0.30	6.0-20.0	0.45-0.55	---	60-85
	1-5	55-80	5-35	5-15	1.30-1.60	0.6-2.0	0.16-0.18	0.0-2.9	1.0-3.0
	5-7	55-80	5-35	5-15	1.50-1.60	0.6-2.0	0.08-0.18	0.0-2.9	0.0-0.5
	7-17	55-80	5-35	5-15	1.50-1.60	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	17-26	55-80	5-35	5-15	1.50-1.65	0.6-2.0	0.05-0.17	0.0-2.9	0.0-0.5
	26-36	55-80	10-35	5-15	1.80-2.05	0.0-0.1	0.01-0.04	0.0-2.9	0.0-0.5
	36-53	55-80	10-35	5-25	1.80-2.05	0.0-0.1	0.01-0.04	0.0-2.9	0.0-0.5
	53-71	55-80	10-35	5-15	1.45-1.60	0.6-20.0	0.01-0.04	0.0-2.9	0.0-0.5
	71-80	55-80	10-35	5-15	1.50-1.60	0.6-20.0	0.01-0.04	0.0-2.9	0.0-0.5
1444435: Iosco-----	0-7	81	9	5-15	1.25-1.40	6.0-20.0	0.10-0.12	0.0-2.9	1.0-4.0
	7-9	80-95	9	0-15	1.35-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.0-1.0
	9-11	80-95	9	0-15	1.35-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.0-1.0
	11-28	80-95	2	0-15	1.35-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.0-1.0
	28-34	80-95	2	0-15	1.35-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.0-1.0
	34-40	10-60	25-60	18-40	1.50-1.70	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.5
	40-60	10-60	25-60	18-35	1.50-1.70	0.2-0.6	0.17-0.20	3.0-5.9	0.0-0.5
1444457: Redrim-----	0-1	0-0	0-0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	1-3	0-0	0-0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	3-11	97	2	1-2	1.35-1.60	20.0-20.0	0.03-0.08	0.0-2.9	0.5-2.0
	11-18	75-95	0-20	2-5	1.50-1.70	20.0-20.0	0.02-0.10	0.0-2.9	0.0-0.5
	18-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
1444459: Zeba-----	0-2	78	12	5-15	1.30-1.70	0.6-2.0	0.13-0.15	0.0-2.9	2.0-4.0
	2-5	69	24	3-12	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	5-13	65	29	3-10	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	13-21	55-85	21	5-15	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	21-33	68	24	4-12	1.40-1.80	0.6-2.0	0.09-0.15	0.0-2.9	0.0-0.5
	33-80	---	---	---	---	0.2-2.0	0.09-0.13	---	0.0-0.5
1444460: Abbaye-----	0-2	0-0	---	0-0	0.15-0.30	5.9-19.8	0.55-0.65	---	65-85
	2-4	82	5	5-20	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	1.0-3.0
	4-13	82	10	2-14	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	0.5-1.0
	13-25	67	23	5-15	1.35-1.65	0.6-2.0	0.11-0.15	0.0-2.9	0.5-1.0
	25-32	55-85	20	8-18	1.35-1.70	0.6-2.0	0.08-0.14	0.0-2.9	0.0-0.5
	32-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444460:									
Lapoin-----	0-1	0-0	---	0-0	0.15-0.30	5.9-19.8	0.55-0.65	---	65-85
	1-4	44	40	12-20	1.35-1.55	0.6-2.0	0.18-0.22	0.0-2.9	2.0-8.0
	4-7	30-80	5-50	10-25	1.40-1.65	0.6-2.0	0.12-0.19	3.0-5.9	1.0-3.0
	7-19	5-45	20-60	25-60	1.35-1.60	0.1-0.6	0.10-0.18	6.0-8.9	0.0-0.5
	19-34	5-40	20-60	35-60	1.35-1.50	0.1-0.2	0.08-0.15	6.0-8.9	0.0-0.5
	34-39	67	23	5-15	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	0.0-0.5
	39-80	---	---	---	---	0.2-2.0	0.00-0.00	---	0.0-0.0
1444461:									
Abbaye-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-4	82	5	5-20	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	1.0-3.0
	4-13	82	10	2-14	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	0.5-1.0
	13-25	67	23	5-15	1.35-1.65	0.6-2.0	0.11-0.15	0.0-2.9	0.5-1.0
	25-32	55-85	20	8-18	1.35-1.70	0.6-2.0	0.08-0.14	0.0-2.9	0.0-0.5
	32-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
Zeba-----	0-2	78	12	5-15	1.30-1.70	0.6-2.0	0.13-0.15	0.0-2.9	2.0-4.0
	2-5	69	24	3-12	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	5-13	65	29	3-10	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	13-21	55-85	21	5-15	1.40-1.80	0.6-2.0	0.09-0.17	0.0-2.9	0.0-0.5
	21-33	68	24	4-12	1.40-1.80	0.6-2.0	0.09-0.15	0.0-2.9	0.0-0.5
	33-80	---	---	---	---	0.2-2.0	0.09-0.13	---	0.0-0.5
1444477:									
Cublake-----	0-3	95	1	0-8	1.35-1.60	2.0-20.0	0.05-0.09	0.0-2.9	0.5-2.0
	3-4	80-95	1	0-10	1.35-1.65	2.0-20.0	0.05-0.12	0.0-2.9	0.0-1.0
	4-23	80-95	2	1-10	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	1.0-3.0
	23-32	80-95	2	1-10	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	32-40	96	2	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	40-48	90-100	0-10	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	48-60	20-70	5-70	10-20	1.40-1.80	0.2-2.0	0.12-0.18	0.0-2.9	0.0-0.5
Croswell-----	0-1	75-100	6	0-10	1.35-1.65	6.0-20.0	0.06-0.11	0.0-2.9	1.0-3.0
	1-7	75-100	0-20	0-10	1.30-1.50	6.0-20.0	0.06-0.11	0.0-2.9	0.5-2.0
	7-16	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	16-39	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.0-0.5
	39-60	96	2	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444478:									
Cublake-----	0-3	95	1	0-8	1.35-1.60	2.0-20.0	0.05-0.09	0.0-2.9	0.5-2.0
	3-4	80-95	1	0-10	1.35-1.65	2.0-20.0	0.05-0.12	0.0-2.9	0.0-1.0
	4-23	80-95	2	1-10	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	1.0-3.0
	23-32	80-95	2	1-10	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	32-40	96	2	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	40-48	90-100	0-10	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	48-60	20-70	5-80	10-20	1.40-1.80	0.2-2.0	0.12-0.18	0.0-2.9	0.0-0.5
Croswell-----	0-1	75-100	6	0-10	1.35-1.65	6.0-20.0	0.06-0.11	0.0-2.9	1.0-3.0
	1-7	75-100	0-20	0-10	1.30-1.50	6.0-20.0	0.06-0.11	0.0-2.9	0.5-2.0
	7-16	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.06-0.11	0.0-2.9	0.6-1.0
	16-39	75-100	0-20	0-10	1.40-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.0-0.5
	39-60	96	2	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
1444479:									
Morganlake-----	0-4	82	9	2-15	1.35-1.65	2.0-6.0	0.10-0.12	0.0-2.9	0.5-3.0
	4-8	75-95	5-20	1-7	1.35-1.60	2.0-20.0	0.09-0.14	0.0-2.9	1.0-3.0
	8-26	75-95	5-20	1-11	1.40-1.65	2.0-20.0	0.06-0.12	0.0-2.9	0.0-1.0
	26-31	75-95	5-20	1-7	1.40-1.65	2.0-20.0	0.06-0.12	0.0-2.9	0.0-1.0
	31-40	10-70	20-65	18-40	1.45-1.65	0.2-0.6	0.13-0.20	3.0-5.9	0.0-0.5
	40-60	10-70	20-65	15-35	1.45-1.65	0.2-0.6	0.13-0.20	3.0-5.9	0.0-0.5
1444480:									
Morganlake-----	0-4	82	9	2-15	1.35-1.65	2.0-6.0	0.10-0.12	0.0-2.9	0.5-3.0
	4-8	75-95	5-20	1-7	1.35-1.60	2.0-20.0	0.09-0.14	0.0-2.9	1.0-3.0
	8-26	75-95	5-20	1-11	1.40-1.65	2.0-20.0	0.06-0.12	0.0-2.9	0.0-1.0
	26-31	75-95	5-20	1-7	1.40-1.65	2.0-20.0	0.06-0.12	0.0-2.9	0.0-1.0
	31-40	10-70	20-65	18-40	1.45-1.65	0.2-0.6	0.13-0.20	3.0-5.9	0.0-0.5
	40-60	10-70	20-65	15-35	1.45-1.65	0.2-0.6	0.13-0.20	3.0-5.9	0.0-0.5
1444481:									
Kellogg-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-6	94	1	2-8	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	6-26	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	26-29	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	29-40	5-35	20-60	35-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	40-80	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444481:									
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
1444482:									
Kellogg-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-6	94	1	2-8	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	6-26	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	26-29	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	29-40	5-35	20-60	35-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	40-80	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
1444486:									
Sedgwick-----	0-5	67	20	8-18	1.35-1.65	0.6-2.0	0.10-0.15	0.0-2.9	2.0-4.0
	5-8	82	9	3-15	1.45-1.70	0.6-2.0	0.08-0.17	0.0-2.9	0.5-1.0
	8-16	67	20	8-18	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	1.0-2.0
	16-19	5-60	20-65	18-70	1.40-1.70	0.0-2.0	0.07-0.16	6.0-8.9	0.0-0.5
	19-53	5-40	25-65	30-70	1.45-1.70	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
	53-80	5-40	25-65	30-70	1.50-1.80	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444486:									
Munuscong-----	0-8	68	22	5-15	1.30-1.65	2.0-6.0	0.13-0.15	0.0-2.9	2.0-3.0
	8-30	67	20	8-18	1.30-1.70	2.0-6.0	0.12-0.17	0.0-2.9	0.0-0.5
	30-60	1	20-70	35-80	1.35-1.70	0.1-0.2	0.08-0.18	6.0-8.9	0.0-0.5
1444487:									
Superior-----	0-3	68	21	7-15	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	1.0-3.0
	3-6	68	23	5-13	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	0.5-1.0
	6-14	66	23	7-15	1.55-1.65	0.6-2.0	0.11-0.19	0.0-2.9	0.5-1.0
	14-19	22	28	15-65	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	19-26	12	28	45-75	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	26-60	17	28	40-70	1.60-1.70	0.0-0.1	0.07-0.13	6.0-8.9	0.0-0.5
Sedgwick-----	0-5	82	9	3-15	1.35-1.65	0.6-2.0	0.10-0.15	0.0-2.9	2.0-4.0
	5-8	82	9	3-15	1.45-1.70	0.6-2.0	0.08-0.17	0.0-2.9	0.5-1.0
	8-16	67	20	8-18	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	1.0-2.0
	16-19	5-60	20-65	18-70	1.40-1.70	0.0-2.0	0.07-0.16	6.0-8.9	0.0-0.5
	19-53	5-40	25-65	30-70	1.45-1.70	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
	53-80	5-40	25-65	30-70	1.50-1.80	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
1444488:									
Superior-----	0-3	68	21	7-15	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	1.0-3.0
	3-6	68	23	5-13	1.35-1.65	0.6-2.0	0.12-0.18	0.0-2.9	0.5-1.0
	6-14	66	23	7-15	1.55-1.65	0.6-2.0	0.11-0.19	0.0-2.9	0.5-1.0
	14-19	22	28	15-65	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	19-26	12	28	45-75	1.60-1.70	0.0-0.1	0.08-0.13	6.0-8.9	0.0-0.5
	26-60	17	28	40-70	1.60-1.70	0.0-0.1	0.07-0.13	6.0-8.9	0.0-0.5
Sedgwick-----	0-5	82	9	3-15	1.35-1.65	0.6-2.0	0.10-0.15	0.0-2.9	2.0-4.0
	5-8	82	9	3-15	1.45-1.70	0.6-2.0	0.08-0.17	0.0-2.9	0.5-1.0
	8-16	67	20	8-18	1.40-1.70	0.6-2.0	0.10-0.17	0.0-2.9	1.0-2.0
	16-19	5-60	20-65	18-70	1.40-1.70	0.0-2.0	0.07-0.16	6.0-8.9	0.0-0.5
	19-53	5-40	25-65	30-70	1.45-1.70	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
	53-80	5-40	25-65	30-70	1.50-1.80	0.0-0.2	0.07-0.16	6.0-8.9	0.0-0.5
1444489:									
Sultz-----	0-2	0-0	0	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-6	80-100	2	1-5	1.40-1.65	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	6-18	80-100	2	1-6	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	1.0-2.0
	18-25	96	2	1-3	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.0-0.5
	25-43	96	2	1-3	1.50-1.70	6.0-20.0	0.04-0.07	0.0-2.9	0.0-0.5
	43-60	50-90	5-50	2-20	1.45-1.70	0.6-2.0	0.10-0.15	0.0-2.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444489:									
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
Rubicon-----	0-1	96	2	0-5	1.25-1.45	6.0-20.0	0.05-0.09	0.0-2.9	0.5-2.0
	1-6	96	2	0-5	1.30-1.60	6.0-20.0	0.04-0.08	0.0-2.9	0.0-0.5
	6-18	94	1	0-10	1.30-1.60	6.0-20.0	0.04-0.08	0.0-2.9	0.6-1.0
	18-36	94	1	0-10	1.30-1.60	6.0-20.0	0.04-0.08	0.0-2.9	0.6-1.0
	36-60	96	2	0-5	1.40-1.65	6.0-20.0	0.04-0.06	0.0-2.9	0.0-0.5
1444492:									
Manistee-----	0-3	91	2	3-12	1.35-1.60	6.0-20.0	0.10-0.12	0.0-2.9	2.0-4.0
	3-11	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	1.0-2.0
	11-28	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.3-0.8
	28-30	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.3-0.8
	30-38	10-40	25-50	35-60	1.50-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	38-60	10-40	25-50	35-60	1.60-1.75	0.1-0.2	0.08-0.16	6.0-8.9	0.0-0.5
Kellogg-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	60-85
	2-6	94	1	2-8	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	6-26	80-95	2	2-12	1.35-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.6-1.0
	26-29	10-80	5-60	5-55	1.35-1.65	0.0-0.2	0.09-0.15	6.0-9.0	0.0-0.5
	29-40	5-35	20-60	35-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
	40-80	5-35	20-60	30-60	1.50-1.70	0.0-0.2	0.09-0.17	6.0-8.9	0.0-0.5
Ashwabay-----	0-4	85	9	2-10	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	4-5	80-100	2	1-4	1.35-1.65	6.0-20.0	0.09-0.12	0.0-2.9	0.5-1.0
	5-12	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	12-32	80-100	2	1-4	1.45-1.70	6.0-20.0	0.05-0.11	0.0-2.9	0.5-1.0
	32-45	97	2	1-2	1.55-1.70	6.0-20.0	0.04-0.08	0.0-2.9	0.5-1.0
	45-62	10-40	25-60	35-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
	62-80	10-90	5-85	2-60	1.45-1.55	0.1-0.2	0.08-0.12	6.0-8.9	0.0-0.5
1444506:									
Keweenaw-----	0-2	75-95	12	2-10	1.35-1.60	2.0-6.0	0.10-0.12	0.0-2.9	1.0-2.0
	2-4	55-95	12	2-15	1.45-1.80	2.0-6.0	0.09-0.14	0.0-2.9	0.5-1.0
	4-16	55-95	12	2-15	1.55-1.80	2.0-6.0	0.08-0.13	0.0-2.9	0.0-0.5
	16-20	75-95	9	2-10	1.55-1.80	2.0-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	20-27	75-95	9	2-10	1.55-1.80	0.6-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	27-43	75-95	2	2-15	1.55-1.80	0.6-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	43-75	55-85	4	5-20	1.55-1.80	0.6-6.0	0.08-0.13	0.0-2.9	0.0-0.5
	75-80	75-95	9	2-10	1.50-1.70	2.0-6.0	0.05-0.10	0.0-2.9	0.0-0.5

Table 15.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1444506:									
Rubicon-----	0-1	90-98	2	0-5	1.35-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.5-2.0
	1-6	90-98	2	0-5	1.35-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.0-0.5
	6-18	90-98	2	0-5	1.60-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.0-0.5
	18-36	90-98	2	0-5	1.60-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.0-0.5
	36-60	90-98	2	0-5	1.60-1.80	6.0-20.0	0.02-0.07	0.0-2.9	0.0-0.5
1444507:									
Keweenaw-----	0-2	75-95	12	2-10	1.35-1.60	2.0-6.0	0.10-0.12	0.0-2.9	1.0-2.0
	2-4	55-95	12	2-15	1.45-1.80	2.0-6.0	0.09-0.14	0.0-2.9	0.5-1.0
	4-16	55-95	12	2-15	1.55-1.80	2.0-6.0	0.08-0.13	0.0-2.9	0.0-0.5
	16-20	75-95	9	2-10	1.55-1.80	2.0-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	20-27	75-95	9	2-10	1.55-1.80	0.6-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	27-43	75-95	2	2-15	1.55-1.80	0.6-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	43-75	55-85	4	5-20	1.55-1.80	0.6-6.0	0.08-0.13	0.0-2.9	0.0-0.5
	75-80	75-95	9	2-10	1.50-1.70	2.0-6.0	0.05-0.10	0.0-2.9	0.0-0.5
Rubicon-----	0-1	90-98	2	0-5	1.35-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.5-2.0
	1-6	90-98	2	0-5	1.35-1.70	6.0-20.0	0.07-0.09	0.0-2.9	0.0-0.5
	6-18	90-98	2	0-5	1.60-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.0-0.5
	18-36	90-98	2	0-5	1.60-1.70	6.0-20.0	0.06-0.08	0.0-2.9	0.0-0.5
	36-60	90-98	2	0-5	1.60-1.80	6.0-20.0	0.02-0.07	0.0-2.9	0.0-0.5
1444585:									
Meehan, beaches-	0-4	96	2	1-4	1.35-1.65	2.0-6.0	0.10-0.12	0.0-2.9	0.5-3.0
	4-29	80-95	2	4-9	1.60-1.70	6.0-20.0	0.06-0.11	0.0-2.9	0.0-0.5
	29-60	96	2	1-4	1.60-1.70	6.0-20.0	0.02-0.07	0.0-2.9	0.0-0.5
1444586:									
Wurtsmith, beaches-----	0-1	---	---	---	0.15-0.30	5.9-20.0	0.55-0.65	---	65-85
	1-4	96	2	0-5	1.30-1.55	6.0-20.0	0.06-0.09	0.0-2.9	0.5-2.0
	4-24	80-100	2	0-5	1.40-1.60	6.0-20.0	0.06-0.08	0.0-2.9	0.0-0.5
	24-48	96	2	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
	48-80	96	2	0-5	1.50-1.65	6.0-20.0	0.05-0.07	0.0-2.9	0.0-0.5
1444587:									
Grayling, beaches-----	0-3	94	1	0-10	1.30-1.65	6.0-20.0	0.07-0.09	0.0-2.9	1.0-6.0
	3-15	94	1	0-10	1.30-1.65	6.0-20.0	0.06-0.08	0.0-2.9	0.3-0.5
	15-23	94	1	0-10	1.30-1.65	6.0-20.0	0.06-0.08	0.0-2.9	0.3-0.5
	23-60	94	1	0-10	1.45-1.65	6.0-20.0	0.04-0.06	0.0-2.9	0.0-0.5
1529830:									
Meehan, beaches-	0-4	96	2	1-4	1.35-1.65	2.0-6.0	0.10-0.12	0.0-2.9	0.5-3.0
	4-29	80-95	2	4-9	1.60-1.70	6.0-20.0	0.06-0.11	0.0-2.9	0.0-0.5
	29-60	96	2	1-4	1.60-1.70	6.0-20.0	0.02-0.07	0.0-2.9	0.0-0.5

Table 15.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1700372:									
Loxley-----	0-13	0-0	0	0-0	0.30-0.40	6.0-20.0	0.55-0.65	---	70-90
	13-60	0-0	0	0-0	0.10-0.35	0.2-6.0	0.35-0.45	---	70-90
Beseman-----	0-36	0-0	0	0-0	0.10-0.25	0.6-6.0	0.35-0.45	---	25-75
	36-60	25-70	20-80	8-25	1.35-1.60	0.2-0.6	0.09-0.22	0.0-2.9	0.5-1.0
Dawson-----	0-8	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	8-38	0-0	---	0-0	0.15-0.40	0.2-6.0	0.35-0.45	---	65-85
	38-40	31	57	0-15	1.55-1.75	0.6-2.0	0.18-0.20	0.0-2.9	5.0-15
	40-60	94	1	0-10	1.55-1.75	6.0-20.0	0.03-0.07	0.0-2.9	0.0-0.5
1700373:									
Rifle-----	0-4	0-0	0	0-0	0.20-0.35	2.0-6.0	0.55-0.65	---	70-90
	4-60	0-0	0	0-0	0.08-0.20	2.0-6.0	0.45-0.55	---	70-90
1700374:									
Allendale-----	0-3	79	16	0-10	1.25-1.40	6.0-20.0	0.09-0.12	0.0-2.9	2.0-4.0
	3-10	70-95	2	0-15	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.5-1.0
	10-13	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	13-26	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	26-28	80-95	1	0-10	1.35-1.45	6.0-20.0	0.06-0.10	0.0-2.9	0.0-0.5
	28-34	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
	34-60	15-25	25-45	40-60	1.45-1.70	0.0-0.1	0.08-0.12	6.0-8.9	0.0-0.5
Wakeley-----	0-4	0-0	---	0-0	0.10-0.35	2.0-20.0	0.35-0.45	---	20-70
	4-23	75-95	5-20	2-10	1.40-1.55	6.0-20.0	0.06-0.11	0.0-2.9	0.3-0.8
	23-28	75-95	5-20	2-10	1.40-1.55	6.0-20.0	0.06-0.11	0.0-2.9	0.3-0.8
	28-80	10-30	20-60	40-60	1.50-1.70	0.0-0.2	0.08-0.12	6.0-8.9	0.0-0.5
Kinross-----	0-6	0-0	---	0-0	0.10-0.35	2.0-20.0	0.35-0.45	---	20-70
	6-10	75-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	0.5-1.0
	10-12	75-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	1.0-4.0
	12-24	90-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	1.0-2.0
	24-42	75-100	1	0-10	1.40-1.70	6.0-20.0	0.04-0.09	0.0-2.9	1.0-2.0
	42-60	94	1	0-10	1.40-1.70	6.0-20.0	0.04-0.06	0.0-2.9	0.0-0.5
1702605:									
Menominee-----	0-4	82	9	2-15	1.35-1.65	6.0-20.0	0.10-0.12	0.0-2.9	0.5-3.0
	4-7	80-95	4	2-10	1.45-1.70	6.0-20.0	0.10-0.12	0.0-2.9	0.0-0.5
	7-23	80-95	2	2-12	1.35-1.65	6.0-20.0	0.10-0.12	0.0-2.9	0.3-0.8
	23-39	15-65	25-50	15-40	1.45-1.70	0.2-0.6	0.03-0.17	0.0-2.9	0.0-0.5
	39-59	15-65	25-50	15-40	1.45-1.75	0.2-0.6	0.13-0.18	3.0-5.9	0.0-0.5
	59-80	15-65	25-50	10-30	1.45-1.75	0.2-0.6	0.13-0.18	3.0-5.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1702606:									
Deerton-----	0-1	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	1-9	92	2	2-10	1.30-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.5-2.0
	9-10	84	9	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	10-25	91	2	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	25-39	---	---	---	---	0.2-2.0	---	---	0.0-0.5
	39-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
Brownstone-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-12	97	2	1-2	1.55-1.85	6.0-20.0	0.04-0.09	0.0-2.9	0.5-2.0
	12-15	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	2.0-3.0
	15-23	80-100	2	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	1.0-2.0
	23-33	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.06	0.0-2.9	0.0-0.5
	33-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
1702607:									
Deerton-----	0-1	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	1-9	92	2	2-10	1.30-1.60	6.0-20.0	0.06-0.10	0.0-2.9	0.5-2.0
	9-10	84	9	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	10-25	91	2	3-12	1.30-1.60	6.0-20.0	0.05-0.10	0.0-2.9	0.1-1.0
	25-39	---	---	---	---	0.2-2.0	---	---	0.0-0.5
	39-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
Brownstone-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-12	97	2	1-2	1.55-1.85	6.0-20.0	0.04-0.09	0.0-2.9	0.5-2.0
	12-15	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	2.0-3.0
	15-23	80-100	2	2-5	1.60-1.90	6.0-20.0	0.03-0.08	0.0-2.9	1.0-2.0
	23-33	80-100	6	2-5	1.60-1.90	6.0-20.0	0.03-0.06	0.0-2.9	0.0-0.5
	33-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
1702608:									
Abbaye-----	0-2	0-0	---	0-0	0.15-0.30	6.0-20.0	0.55-0.65	---	65-85
	2-4	82	9	3-15	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	1.0-3.0
	4-13	82	10	2-14	1.30-1.65	0.6-2.0	0.09-0.12	0.0-2.9	0.5-1.0
	13-25	67	23	5-15	1.35-1.65	0.6-2.0	0.11-0.15	0.0-2.9	0.5-1.0
	25-32	55-85	20	8-18	1.35-1.70	0.6-2.0	0.08-0.14	0.0-2.9	0.0-0.5
	32-80	---	---	---	---	0.2-2.0	---	---	0.0-0.0
1711685:									
Cublake-----	0-3	95	1	0-8	1.35-1.60	2.0-20.0	0.05-0.09	0.0-2.9	0.5-2.0
	3-4	80-95	1	0-10	1.35-1.65	2.0-20.0	0.05-0.12	0.0-2.9	0.0-1.0
	4-23	80-95	2	1-10	1.40-1.70	2.0-20.0	0.05-0.08	0.0-2.9	1.0-3.0
	23-32	80-95	2	1-10	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	32-40	90-100	2	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	40-48	90-100	0-10	0-5	1.45-1.70	2.0-20.0	0.04-0.11	0.0-2.9	0.0-0.5
	48-60	20-70	5-80	10-20	1.40-1.80	0.2-2.0	0.12-0.18	0.0-2.9	0.0-0.5

Table 15.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1711685: Keweenaw-----	0-2	75-95	12	2-10	1.35-1.60	2.0-6.0	0.10-0.12	0.0-2.9	1.0-2.0
	2-4	55-95	12	2-15	1.45-1.80	2.0-6.0	0.09-0.14	0.0-2.9	0.5-1.0
	4-16	55-95	12	2-15	1.55-1.80	2.0-6.0	0.08-0.13	0.0-2.9	0.0-0.5
	16-20	75-95	9	2-10	1.55-1.80	2.0-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	20-27	75-95	9	2-10	1.55-1.80	0.6-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	27-43	75-95	2	2-15	1.55-1.80	0.6-6.0	0.05-0.10	0.0-2.9	0.0-0.5
	43-75	55-85	4	5-20	1.55-1.80	0.6-6.0	0.08-0.13	0.0-2.9	0.0-0.5
	75-80	75-95	9	2-10	1.50-1.70	2.0-6.0	0.05-0.10	0.0-2.9	0.0-0.5

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Table 16.—Erosion Properties

(Entries under "Erosion factors" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
433292:						
Lerch-----	0-3	.02	.02	5	4	86
	3-7	.20	.20			
	7-12	.28	.28			
	12-29	.28	.28			
	29-56	.28	.28			
	56-80	.24	.24			
Herbster-----						
	0-5	.37	.37	5	5	56
	5-10	.37	.37			
	10-13	.37	.37			
	13-28	.24	.24			
	28-33	.32	.32			
	33-55	.32	.32			
	55-80	.24	.24			
433296:						
Cublake-----	0-3	.02	.02	5	1	220
	3-4	.17	.17			
	4-23	.15	.15			
	23-32	.15	.15			
	32-40	.15	.15			
	40-48	.15	.15			
	48-60	.32	.32			
Crowell-----						
	0-1	.02	.02	5	1	220
	1-7	.02	.02			
	7-16	.02	.02			
	16-39	.02	.02			
	39-60	.02	.02			
Ashwabay-----						
	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
433299:						
Cublake-----	0-3	.02	.02	5	1	220
	3-4	.17	.17			
	4-23	.15	.15			
	23-32	.15	.15			
	32-40	.15	.15			
	40-48	.15	.15			
	48-60	.32	.32			
Crowell-----						
	0-1	.02	.02	5	1	220
	1-7	.02	.02			
	7-16	.02	.02			
	16-39	.02	.02			
	39-60	.02	.02			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
433299: Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
433300: Kellogg-----	0-2	.02	.02	4	1	220
	2-6	.02	.02			
	6-26	.15	.15			
	26-29	.32	.32			
	29-40	.32	.32			
	40-80	.32	.32			
Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
433301: Kellogg-----	0-2	.02	.02	4	1	220
	2-6	.02	.02			
	6-26	.15	.15			
	26-29	.32	.32			
	29-40	.32	.32			
	40-80	.32	.32			
Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
433304: Sedgwick-----	0-5	.28	.28	3	3	86
	5-8	.24	.24			
	8-16	.28	.28			
	16-19	.43	.43			
	19-53	.28	.28			
	53-80	.28	.28			
Munuscong-----	0-8	.28	.28	4	3	86
	8-30	.24	.24			
	30-60	.28	.28			
433305: Superior-----	0-3	.37	.37	3	3	86
	3-6	.28	.28			
	6-14	.28	.28			
	14-19	.28	.28			
	19-26	.28	.28			
	26-60	.28	.28			
Sedgwick-----	0-5	.10	.10	3	3	86
	5-8	.24	.24			
	8-16	.28	.28			
	16-19	.43	.43			
	19-53	.28	.28			
	53-80	.28	.28			
433309: Superior-----	0-3	.37	.37	3	3	86
	3-6	.28	.28			
	6-14	.28	.28			
	14-19	.28	.28			
	19-26	.28	.28			
	26-60	.28	.28			
Sedgwick-----	0-5	.10	.10	3	3	86
	5-8	.24	.24			
	8-16	.28	.28			
	16-19	.43	.43			
	19-53	.28	.28			
	53-80	.28	.28			
433310: Sultz-----	0-2	.02	.02	5	1	220
	2-6	.02	.02			
	6-18	.15	.15			
	18-25	.15	.15			
	25-43	.15	.15			
	43-60	.24	.24			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
Rubicon-----	0-1	.02	.02	5	1	220
	1-6	.10	.15			
	6-18	.10	.15			
	18-36	.10	.15			
	36-60	.10	.15			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
433314: Manistee-----	0-3	.02	.02	4	1	220
	3-11	.02	.02			
	11-28	.02	.02			
	28-30	.02	.02			
	30-38	.32	.32			
	38-60	.32	.32			
Kellogg-----	0-2	.02	.02	4	1	220
	2-6	.02	.02			
	6-26	.15	.15			
	26-29	.32	.32			
	29-40	.32	.32			
	40-80	.32	.32			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
433326: Rubicon-----	0-1	.02	.02	5	1	220
	1-6	.02	.02			
	6-18	.02	.02			
	18-36	.02	.02			
	36-60	.02	.02			
433379: Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
433515: Lupton-----	0-65	.02	.02	3	8	0
Cathro-----	0-28	.02	.02	2	8	0
	28-49	.28	.28			
	49-60	.28	.28			
Tawas-----	0-31	.02	.02	2	8	0
	31-60	.15	.15			
433572: Portwing-----	0-4	.43	.43	5	5	56
	4-9	.37	.37			
	9-32	.24	.24			
	32-51	.24	.24			
	51-80	.24	.24			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
433572: Herbster-----	0-5	.37	.37	5	5	56
	5-10	.37	.37			
	10-13	.37	.37			
	13-28	.24	.24			
	28-33	.32	.32			
	33-55	.32	.32			
	55-80	.24	.24			
433573: Cornucopia-----	0-3	.43	.43	5	5	56
	3-10	.43	.43			
	10-32	.24	.24			
	32-45	.24	.24			
	45-50	.24	.24			
	50-72	.24	.24			
433582: Croswell-----	0-1	.02	.02	5	1	220
	1-7	.02	.02			
	7-16	.02	.02			
	16-39	.02	.02			
	39-60	.02	.02			
433599: Annalake-----	0-3	.28	.28	5	3	86
	3-6	.24	.24			
	6-17	.24	.24			
	17-31	.24	.24			
	31-39	.24	.24			
	39-60	.24	.24			
433600: Annalake-----	0-3	.28	.28	5	3	86
	3-6	.24	.24			
	6-17	.24	.24			
	17-31	.24	.24			
	31-39	.24	.24			
	39-60	.24	.24			
433671: Arnheim-----	0-5	.37	.37	5	8	0
	5-10	.37	.37			
	10-15	.37	.37			
	15-24	.37	.37			
	24-60	.37	.37			
433676: Redrim-----	0-1	.02	.02	2	8	0
	1-3	.02	.02			
	3-11	.02	.02			
	11-18	.05	.17			
	18-80	---	---			
433679: Lapoin-----	0-1	.02	.02	3	5	56
	1-4	.32	.32			
	4-7	.32	.32			
	7-19	.24	.24			
	19-34	.24	.24			
	34-39	.28	.28			
	39-80	---	---			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
433686: Zeba-----	0-2	.24	.24	3	2	134
	2-5	.24	.24			
	5-13	.24	.24			
	13-21	.24	.24			
	21-33	.24	.24			
	33-80	---	---			
433729: Sultz-----	0-2	.02	.02	5	1	220
	2-6	.02	.02			
	6-18	.15	.15			
	18-25	.15	.15			
	25-43	.15	.15			
	43-60	.24	.24			
433739: Moquah-----	0-5	.28	.28	5	3	86
	5-19	.24	.24			
	19-48	.24	.24			
	48-55	.37	.37			
	55-60	.15	.15			
433771. Beaches						
433802. Udorthents, ravines and escarpments						
452739. Water						
452765: Abbaye-----	0-2	.02	.02	3	3	86
	2-4	.24	.24			
	4-13	.17	.17			
	13-25	.24	.24			
	25-32	.24	.24			
	32-80	---	---			
Lapoin-----	0-1	.02	.02	3	5	56
	1-4	.32	.32			
	4-7	.32	.32			
	7-19	.24	.24			
	19-34	.24	.24			
	34-39	.28	.28			
	39-80	---	---			
1383557: Au Gres-----	0-2	.02	.02	5	2	134
	2-5	.10	.10			
	5-8	.10	.10			
	8-16	.10	.10			
	16-28	.02	.02			
	28-60	.02	.02			
1383580: Loxley-----	0-13	.02	.02	3	8	0
	13-60	.02	.02			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1383580:						
Beseman-----	0-36	.02	.02	2	8	0
	36-60	.43	.43			
Dawson-----	0-8	.02	.02	2	8	0
	8-38	.02	.02			
	38-40	.37	.37			
	40-60	.15	.15			
1383581:						
Rifle-----	0-4	.02	.02	3	8	0
	4-60	.02	.02			
1383603:						
Cornucopia-----	0-3	.43	.43	5	5	56
	3-10	.43	.43			
	10-32	.24	.24			
	32-45	.24	.24			
	45-50	.24	.24			
	50-72	.24	.24			
1383658:						
Deerton-----	0-1	.02	.02	3	8	0
	1-9	.02	.02			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
Brownstone-----	0-2	.02	.02	3	8	0
	2-12	.02	.02			
	12-15	.10	.17			
	15-23	.10	.15			
	23-33	.10	.15			
	33-80	---	---			
1383660:						
Deerton-----	0-1	.02	.02	3	8	0
	1-9	.02	.02			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
Brownstone-----	0-2	.02	.02	3	8	0
	2-12	.02	.02			
	12-15	.10	.17			
	15-23	.10	.15			
	23-33	.10	.15			
	33-80	---	---			
1383662:						
Abbaye-----	0-2	.02	.02	3	2	134
	2-4	.15	.15			
	4-13	.17	.17			
	13-25	.24	.24			
	25-32	.24	.24			
	32-80	---	---			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1383665: Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
Wakeley-----	0-4	.02	.02	4	8	0
	4-23	.17	.17			
	23-28	.17	.17			
	28-80	.32	.32			
Kinross-----	0-6	.02	.02	5	8	0
	6-10	.02	.02			
	10-12	.02	.02			
	12-24	.02	.02			
	24-42	.02	.02			
	42-60	.02	.02			
1383960: Flink-----	0-2	.02	.02	5	1	220
	2-3	.02	.02			
	3-6	.02	.02			
	6-9	.15	.15			
	9-26	.15	.15			
	26-35	.15	.15			
	35-46	.15	.15			
	46-52	.32	.32			
	52-80	.32	.32			
1444357: Arnheim-----	0-5	.37	.37	5	8	0
	5-10	.37	.37			
	10-15	.37	.37			
	15-24	.37	.37			
	24-60	.37	.37			
1444359. Beaches						
1444367: Udorthents, ravines and escarpments						
1444378: Wakefield-----	0-4	.28	.28	3	3	86
	4-7	.28	.28			
	7-18	.37	.37			
	18-24	.37	.37			
	24-36	.37	.37			
	36-49	.37	.37			
	49-64	.37	.37			
1444379: Wakefield-----	0-4	.28	.28	3	3	86
	4-7	.28	.28			
	7-18	.37	.37			
	18-24	.37	.37			
	24-36	.37	.37			
	36-49	.37	.37			
	49-64	.37	.37			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1444388: Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
1444402: Tonkey-----	0-8	.24	.24	5	3	86
	8-14	.24	.24			
	14-28	.24	.24			
	28-60	.24	.24			
1444410: Tula-----	0-1	.02	.02	4	3	86
	1-5	.24	.28			
	5-8	.24	.24			
	8-20	.24	.24			
	20-28	.24	.24			
	28-37	.28	.37			
	37-62	.28	.37			
	62-80	.28	.37			
1444414: Lupton-----	0-65	.02	.02	3	8	0
Cathro-----	0-28	.02	.02	2	8	0
	28-49	.28	.28			
	49-60	.28	.28			
Tawas-----	0-31	.02	.02	2	8	0
	31-60	.15	.15			
1444425: Lerch-----	0-3	.02	.02	5	4	86
	3-7	.20	.20			
	7-12	.28	.28			
	12-29	.28	.28			
	29-56	.28	.28			
	56-80	.24	.24			
Herbster-----	0-5	.37	.37	5	5	56
	5-10	.37	.37			
	10-13	.37	.37			
	13-28	.24	.24			
	28-33	.32	.32			
	33-55	.32	.32			
	55-80	.24	.24			
1444426: Portwing-----	0-4	.43	.43	5	5	56
	4-9	.37	.37			
	9-32	.24	.24			
	32-51	.24	.24			
	51-80	.24	.24			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1444426: Herbster-----	0-5	.37	.37	5	5	56
	5-10	.37	.37			
	10-13	.37	.37			
	13-28	.24	.24			
	28-33	.32	.32			
	33-55	.32	.32			
	55-80	.24	.24			
1444427: Cornucopia-----	0-3	.43	.43	5	5	56
	3-10	.43	.43			
	10-32	.24	.24			
	32-45	.24	.24			
	45-50	.24	.24			
	50-72	.24	.24			
1444428: Cornucopia-----	0-3	.43	.43	5	5	56
	3-10	.43	.43			
	10-32	.24	.24			
	32-45	.24	.24			
	45-50	.24	.24			
	50-72	.24	.24			
1444431: Crowell-----	0-1	.02	.02	5	1	220
	1-7	.02	.02			
	7-16	.02	.02			
	16-39	.02	.02			
	39-60	.02	.02			
1444432: Gogebic-----	0-1	.02	.02	4	3	86
	1-5	.28	.28			
	5-7	.28	.28			
	7-17	.28	.28			
	17-26	.28	.28			
	26-36	.37	.37			
	36-53	.37	.37			
	53-71	.37	.37			
	71-80	.37	.37			
1444435: Iosco-----	0-7	.10	.10	5	2	134
	7-9	.17	.17			
	9-11	.17	.17			
	11-28	.15	.15			
	28-34	.15	.15			
	34-40	.37	.37			
	40-60	.37	.37			
1444457: Redrim-----	0-1	.02	.02	2	8	0
	1-3	.02	.02			
	3-11	.02	.02			
	11-18	.05	.17			
	18-80	---	---			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1444459:						
Zeba-----	0-2	.24	.24	3	2	134
	2-5	.24	.24			
	5-13	.24	.24			
	13-21	.24	.24			
	21-33	.24	.24			
	33-80	---	---			
1444460:						
Abbaye-----	0-2	.02	.02	3	3	86
	2-4	.24	.24			
	4-13	.17	.17			
	13-25	.24	.24			
	25-32	.24	.24			
	32-80	---	---			
Lapoin-----	0-1	.02	.02	3	5	56
	1-4	.32	.32			
	4-7	.32	.32			
	7-19	.24	.24			
	19-34	.24	.24			
	34-39	.28	.28			
	39-80	---	---			
1444461:						
Abbaye-----	0-2	.02	.02	3	3	86
	2-4	.24	.24			
	4-13	.17	.17			
	13-25	.24	.24			
	25-32	.24	.24			
	32-80	---	---			
Zeba-----	0-2	.24	.24	3	2	134
	2-5	.24	.24			
	5-13	.24	.24			
	13-21	.24	.24			
	21-33	.24	.24			
	33-80	---	---			
1444477:						
Cublake-----	0-3	.02	.02	5	1	220
	3-4	.17	.17			
	4-23	.15	.15			
	23-32	.15	.15			
	32-40	.15	.15			
	40-48	.15	.15			
	48-60	.32	.32			
Croswell-----	0-1	.02	.02	5	1	220
	1-7	.02	.02			
	7-16	.02	.02			
	16-39	.02	.02			
	39-60	.02	.02			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1444478: Cublake-----	0-3	.02	.02	5	1	220
	3-4	.17	.17			
	4-23	.15	.15			
	23-32	.15	.15			
	32-40	.15	.15			
	40-48	.15	.15			
	48-60	.32	.32			
Croswell-----	0-1	.02	.02	5	1	220
	1-7	.02	.02			
	7-16	.02	.02			
	16-39	.02	.02			
	39-60	.02	.02			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
1444479: Morganlake-----	0-4	.10	.10	5	2	134
	4-8	.17	.17			
	8-26	.17	.17			
	26-31	.17	.17			
	31-40	.43	.43			
	40-60	.43	.43			
1444480: Morganlake-----	0-4	.10	.10	5	2	134
	4-8	.17	.17			
	8-26	.17	.17			
	26-31	.17	.17			
	31-40	.43	.43			
	40-60	.43	.43			
1444481: Kellogg-----	0-2	.02	.02	4	1	220
	2-6	.02	.02			
	6-26	.15	.15			
	26-29	.32	.32			
	29-40	.32	.32			
	40-80	.32	.32			
Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1444482: Kellogg-----	0-2	.02	.02	4	1	220
	2-6	.02	.02			
	6-26	.15	.15			
	26-29	.32	.32			
	29-40	.32	.32			
	40-80	.32	.32			
Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
1444486: Sedgwick-----	0-5	.28	.28	3	3	86
	5-8	.24	.24			
	8-16	.28	.28			
	16-19	.43	.43			
	19-53	.28	.28			
	53-80	.28	.28			
Munuscong-----	0-8	.28	.28	4	3	86
	8-30	.24	.24			
	30-60	.28	.28			
1444487: Superior-----	0-3	.37	.37	3	3	86
	3-6	.28	.28			
	6-14	.28	.28			
	14-19	.28	.28			
	19-26	.28	.28			
	26-60	.28	.28			
Sedgwick-----	0-5	.10	.10	3	3	86
	5-8	.24	.24			
	8-16	.28	.28			
	16-19	.43	.43			
	19-53	.28	.28			
	53-80	.28	.28			
1444488: Superior-----	0-3	.37	.37	3	3	86
	3-6	.28	.28			
	6-14	.28	.28			
	14-19	.28	.28			
	19-26	.28	.28			
	26-60	.28	.28			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1444488: Sedgwick-----	0-5	.10	.10	3	3	86
	5-8	.24	.24			
	8-16	.28	.28			
	16-19	.43	.43			
	19-53	.28	.28			
	53-80	.28	.28			
1444489: Sultz-----	0-2	.02	.02	5	1	220
	2-6	.02	.02			
	6-18	.15	.15			
	18-25	.15	.15			
	25-43	.15	.15			
	43-60	.24	.24			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
Rubicon-----	0-1	.02	.02	5	1	220
	1-6	.10	.15			
	6-18	.10	.15			
	18-36	.10	.15			
	36-60	.10	.15			
1444492: Manistee-----	0-3	.02	.02	4	1	220
	3-11	.02	.02			
	11-28	.02	.02			
	28-30	.02	.02			
	30-38	.32	.32			
	38-60	.32	.32			
Kellogg-----	0-2	.02	.02	4	1	220
	2-6	.02	.02			
	6-26	.15	.15			
	26-29	.32	.32			
	29-40	.32	.32			
	40-80	.32	.32			
Ashwabay-----	0-4	.10	.10	4	1	220
	4-5	.17	.17			
	5-12	.17	.17			
	12-32	.17	.17			
	32-45	.17	.17			
	45-62	.28	.28			
	62-80	.28	.28			
1444506: Keweenaw-----	0-2	.10	.10	5	2	134
	2-4	.17	.24			
	4-16	.17	.24			
	16-20	.17	.24			
	20-27	.17	.24			
	27-43	.17	.24			
	43-75	.17	.24			
	75-80	.17	.17			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1444506: Rubicon-----	0-1	.02	.02	5	1	220
	1-6	.02	.02			
	6-18	.02	.02			
	18-36	.02	.02			
	36-60	.02	.02			
1444507: Keweenaw-----	0-2	.10	.10	5	2	134
	2-4	.17	.24			
	4-16	.17	.24			
	16-20	.17	.24			
	20-27	.17	.24			
	27-43	.17	.24			
	43-75	.17	.24			
	75-80	.17	.17			
Rubicon-----	0-1	.02	.02	5	1	220
	1-6	.02	.02			
	6-18	.02	.02			
	18-36	.02	.02			
	36-60	.02	.02			
1444585: Meehan, beaches-----	0-4	.02	.02	5	1	220
	4-29	.15	.15			
	29-60	.15	.15			
1444586: Wurtsmith, beaches---	0-1	---	---	5	1	220
	1-4	.02	.02			
	4-24	.15	.15			
	24-48	.15	.15			
	48-80	.15	.15			
1444587: Grayling, beaches----	0-3	.02	.02	5	1	220
	3-15	.15	.15			
	15-23	.15	.15			
	23-60	.15	.15			
1529830: Meehan, beaches-----	0-4	.02	.02	5	1	220
	4-29	.15	.15			
	29-60	.15	.15			
1700372: Loxley-----	0-13	.02	.02	3	8	0
	13-60	.02	.02			
Beseman-----	0-36	.02	.02	2	8	0
	36-60	.43	.43			
Dawson-----	0-8	.02	.02	2	8	0
	8-38	.02	.02			
	38-40	.37	.37			
	40-60	.15	.15			
1700373: Rifle-----	0-4	.02	.02	3	8	0
	4-60	.02	.02			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1700374:						
Allendale-----	0-3	.10	.10	4	2	134
	3-10	.02	.02			
	10-13	.02	.02			
	13-26	.02	.02			
	26-28	.02	.02			
	28-34	.28	.28			
	34-60	.28	.28			
Wakeley-----	0-4	.02	.02	4	8	0
	4-23	.17	.17			
	23-28	.17	.17			
	28-80	.32	.32			
Kinross-----	0-6	.02	.02	5	8	0
	6-10	.02	.02			
	10-12	.02	.02			
	12-24	.02	.02			
	24-42	.02	.02			
	42-60	.02	.02			
1702605:						
Menominee-----	0-4	.10	.10	5	2	134
	4-7	.17	.17			
	7-23	.17	.17			
	23-39	.28	.32			
	39-59	.32	.37			
	59-80	.32	.37			
1702606:						
Deerton-----	0-1	.02	.02	3	8	0
	1-9	.02	.02			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
Brownstone-----	0-2	.02	.02	3	8	0
	2-12	.02	.02			
	12-15	.10	.17			
	15-23	.10	.15			
	23-33	.10	.15			
	33-80	---	---			
1702607:						
Deerton-----	0-1	.02	.02	3	8	0
	1-9	.02	.02			
	9-10	.15	.15			
	10-25	.15	.15			
	25-39	---	---			
	39-80	---	---			
Brownstone-----	0-2	.02	.02	3	8	0
	2-12	.02	.02			
	12-15	.10	.17			
	15-23	.10	.15			
	23-33	.10	.15			
	33-80	---	---			

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Table 16.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1702608: Abbaye-----	0-2	.02	.02	3	2	134
	2-4	.15	.15			
	4-13	.17	.17			
	13-25	.24	.24			
	25-32	.24	.24			
	32-80	---	---			
1711685: Cublake-----	0-3	.02	.02	5	1	220
	3-4	.17	.17			
	4-23	.15	.15			
	23-32	.15	.15			
	32-40	.15	.15			
	40-48	.15	.15			
	48-60	.32	.32			
Keweenaw-----	0-2	.10	.10	5	2	134
	2-4	.17	.24			
	4-16	.17	.24			
	16-20	.17	.24			
	20-27	.17	.24			
	27-43	.17	.24			
	43-75	.17	.24			
	75-80	.17	.17			

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 17.—Total Soil Carbon

(This table displays soil organic carbon (SOC) and soil inorganic carbon (SIC) in kilograms per square meter to a depth of 2 meters or to the representative top depth of any kind of bedrock or any cemented soil horizon. SOC and SIC are reported on a volumetric whole soil basis, corrected for representative rock fragments indicated in the database. SOC is converted from horizon soil organic matter of the fraction of the soil less than 2 mm in diameter. If soil organic matter indicated in the database is NULL, SOC is assumed to be zero. SIC is converted from horizon calcium carbonate content fraction of the soil less than 2 mm in diameter. If horizon calcium carbonate indicated in the database is NULL, SIC is assumed to be zero. A weighted average of all horizons is used in the calculations. Only major components of a map unit are displayed in this table)

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m ²	kg/m ²
433292:		
Lerch (50%)-----	15	21
Herbster (35%)-----	9	8
433296:		
Cublake (35%)-----	11	0
Croswell (20%)-----	6	0
Ashwabay (20%)-----	11	0
433299:		
Cublake (35%)-----	11	0
Croswell (20%)-----	6	0
Ashwabay (20%)-----	11	0
433300:		
Kellogg (35%)-----	12	8
Allendale (25%)-----	6	8
Ashwabay (20%)-----	11	0
433301:		
Kellogg (40%)-----	12	8
Allendale (25%)-----	6	8
Ashwabay (20%)-----	11	0
433304:		
Sedgwick (50%)-----	10	32
Munuscong (30%)-----	7	27
433305:		
Superior (50%)-----	6	21
Sedgwick (30%)-----	10	32

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Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m ²	kg/m ²
433309:		
Superior (50%)-----	6	21
Sedgwick (30%)-----	10	32
433310:		
Sultz (35%)-----	12	4
Ashwabay (25%)-----	11	0
Rubicon (20%)-----	7	0
433314:		
Manistee (40%)-----	8	16
Kellogg (30%)-----	12	7
Ashwabay (20%)-----	11	0
433326:		
Rubicon (85%)-----	4	0
433379:		
Allendale (80%)-----	6	8
433515:		
Lupton (40%)-----	147	0
Cathro (30%)-----	112	0
Tawas (25%)-----	72	0
433572:		
Portwing (50%)-----	8	18
Herbster (30%)-----	9	8
433573:		
Cornucopia (80%)-----	8	17
433582:		
Croswell (82%)-----	7	0
433599:		
Annalake (85%)-----	6	0
433600:		
Annalake (80%)-----	6	0
433671:		
Arnheim (85%)-----	19	0
433676:		
Redrim (85%)-----	10	0
433679:		
Lapoin (85%)-----	9	4
433686:		
Zeba (90%)-----	3	0

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Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m ²	kg/m ²
433729: Sultz (85%)-----	12	4
433739: Moquah (85%)-----	14	8
433771: Beaches (97%)-----	0	0
433802: Udorthents, ravines and escarpments (85%)-----	0	0
452739: Water (100%)-----	0	0
452765: Abbaye (55%)-----	9	0
Lapoin (40%)-----	9	4
1383557: Au Gres (85%)-----	11	0
1383580: Loxley (40%)-----	181	0
Beseman (30%)-----	51	0
Dawson (28%)-----	119	0
1383581: Rifle (90%)-----	105	0
1383603: Cornucopia (80%)-----	8	17
1383658: Deerton (50%)-----	7	0
Brownstone (40%)-----	9	0
1383660: Deerton (50%)-----	7	0
Brownstone (40%)-----	9	0
1383662: Abbaye (90%)-----	9	0
1383665: Allendale (35%)-----	6	8
Wakeley (30%)-----	11	44
Kinross (20%)-----	22	0
1383960: Flink (75%)-----	21	0

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Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC		SIC	
	kg/m ²		kg/m ²	
1444357: Arnheim (85%)-----	19		0	
1444359: Beaches (97%)-----	0		0	
1444367: Udorthents, ravines and escarpments (85%)-----	0		0	
1444378: Wakefield (85%)-----	5		0	
1444379: Wakefield (85%)-----	5		0	
1444388: Allendale (80%)-----	6		8	
1444402: Tonkey (90%)-----	12		8	
1444410: Tula (80%)-----	9		0	
1444414: Lupton (40%)-----	147		0	
Cathro (30%)-----	112		0	
Tawas (25%)-----	72		0	
1444425: Lerch (50%)-----	15		21	
Herbster (35%)-----	9		8	
1444426: Portwing (50%)-----	8		18	
Herbster (30%)-----	9		8	
1444427: Cornucopia (80%)-----	8		17	
1444428: Cornucopia (80%)-----	8		17	
1444431: Crosswell (82%)-----	7		0	
1444432: Gogebic (85%)-----	8		0	
1444435: Iosco (85%)-----	7		22	
1444457: Redrim (85%)-----	10		0	

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m ²	kg/m ²
1444459: Zeba (90%)-----	3	0
1444460: Abbaye (55%)-----	9	0
Lapoin (40%)-----	9	4
1444461: Abbaye (55%)-----	9	0
Zeba (40%)-----	3	0
1444477: Cublake (35%)-----	11	0
Croswell (20%)-----	6	0
Ashwabay (20%)-----	11	0
1444478: Cublake (35%)-----	11	0
Croswell (20%)-----	6	0
Ashwabay (20%)-----	11	0
1444479: Morganlake (85%)-----	7	19
1444480: Morganlake (85%)-----	7	18
1444481: Kellogg (35%)-----	12	8
Allendale (25%)-----	6	8
Ashwabay (20%)-----	11	0
1444482: Kellogg (40%)-----	12	8
Allendale (25%)-----	6	8
Ashwabay (20%)-----	11	0
1444486: Sedgwick (50%)-----	10	32
Munuscong (30%)-----	7	27
1444487: Superior (50%)-----	6	21
Sedgwick (30%)-----	10	32

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m ²	kg/m ²
1444488:		
Superior (50%)-----	6	21
Sedgwick (30%)-----	10	32
1444489:		
Sultz (35%)-----	12	4
Ashwabay (25%)-----	11	0
Rubicon (20%)-----	7	0
1444492:		
Manistee (40%)-----	8	16
Kellogg (30%)-----	12	7
Ashwabay (20%)-----	11	0
1444506:		
Keweenaw (60%)-----	5	0
Rubicon (30%)-----	4	0
1444507:		
Keweenaw (60%)-----	5	0
Rubicon (30%)-----	4	0
1444585:		
Meehan, beaches (90%)-----	5	0
1444586:		
Wurtsmith, beaches (90%)-----	8	0
1444587:		
Grayling, beaches (95%)-----	6	14
1529830:		
Meehan, beaches (90%)-----	5	0
1700372:		
Loxley (40%)-----	181	0
Beseman (30%)-----	51	0
Dawson (28%)-----	119	0
1700373:		
Rifle (90%)-----	105	0
1700374:		
Allendale (35%)-----	6	8
Wakeley (30%)-----	11	44
Kinross (20%)-----	22	0
1702605:		
Menominee (85%)-----	6	30

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Table 17.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m²</u>	<u>kg/m²</u>
1702606:		
Deerton (50%)-----	7	0
Brownstone (40%)-----	9	0
1702607:		
Deerton (50%)-----	7	0
Brownstone (40%)-----	9	0
1702608:		
Abbaye (90%)-----	9	0
1711685:		
Cublake (50%)-----	11	0
Keweenaw (30%)-----	5	0

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 18.—Chemical Soil Properties

(Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
433292:					
Lerch-----	0-3	60.0-160.0	---	5.1-6.5	0
	3-7	32.0-54.0	---	5.1-6.5	0
	7-12	20.0-50.0	---	5.1-6.5	0
	12-29	20.0-49.0	---	7.4-8.4	5-10
	29-56	20.0-49.0	---	7.4-8.4	5-10
	56-80	3.0-14.0	---	7.4-8.4	0-10
Herbster-----	0-5	6.0-40.0	---	5.1-7.3	0
	5-10	4.0-35.0	---	5.1-6.5	0
	10-13	4.0-35.0	---	5.1-7.3	0
	13-28	4.0-35.0	---	6.1-7.8	0
	28-33	20.0-30.0	---	6.1-7.8	0
	33-55	20.0-30.0	---	7.4-9.0	0-10
	55-80	1.0-20.0	---	7.4-8.4	0-5
433296:					
Cublake-----	0-3	---	1.0-10.0	3.5-6.0	0
	3-4	---	0.0-10.0	3.5-6.0	0
	4-23	---	0.0-4.0	3.5-6.5	0
	23-32	---	0.0-5.0	3.5-6.5	0
	32-40	---	0.0-5.0	3.5-7.3	0
	40-48	---	0.0-5.0	3.1-7.3	0
	48-60	2.0-20.0	---	5.1-7.3	0
Croswell-----	0-1	2.0-10.0	---	3.5-6.5	0
	1-7	---	1.0-5.0	3.5-6.5	0
	7-16	---	1.0-4.0	4.5-7.3	0
	16-39	---	1.0-3.0	4.5-7.3	0
	39-60	1.0-2.0	---	5.1-8.4	0
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
433299:					
Cublake-----	0-3	---	1.0-10.0	3.5-6.0	0
	3-4	---	0.0-10.0	3.5-6.0	0
	4-23	---	0.0-4.0	3.5-6.5	0
	23-32	---	0.0-5.0	3.5-6.5	0
	32-40	---	0.0-5.0	3.5-7.3	0
	40-48	---	0.0-5.0	3.1-7.3	0
	48-60	2.0-20.0	---	5.1-7.3	0
Croswell-----	0-1	2.0-10.0	---	3.5-6.5	0
	1-7	---	1.0-5.0	3.5-6.5	0
	7-16	---	1.0-4.0	4.5-7.3	0
	16-39	---	1.0-3.0	4.5-7.3	0
	39-60	1.0-2.0	---	5.1-8.4	0

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
433299:					
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
433300:					
Kellogg-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-6	---	1.0-5.0	4.5-6.0	0
	6-26	---	1.0-5.0	4.5-6.5	0
	26-29	10.0-25.0	---	6.1-7.8	0-5
	29-40	10.0-25.0	---	6.1-7.8	0-5
	40-80	10.0-25.0	---	6.1-8.5	0-5
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
433301:					
Kellogg-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-6	---	1.0-5.0	4.5-6.0	0
	6-26	---	1.0-5.0	4.5-6.5	0
	26-29	10.0-25.0	---	6.1-7.8	0-5
	29-40	10.0-25.0	---	6.1-7.8	0-5
	40-80	10.0-25.0	---	6.1-8.5	0-5
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
433304:					
Sedgwick-----	0-5	6.0-20.0	---	4.5-7.3	0
	5-8	2.0-15.0	---	4.5-6.0	0
	8-16	4.0-20.0	---	4.5-6.0	0
	16-19	7.0-70.0	---	5.1-7.3	0
	19-53	7.0-70.0	---	7.4-9.0	0-10
	53-80	7.0-70.0	---	7.4-9.0	2-35
Munuscong-----	0-8	5.0-15.0	---	6.1-7.8	0
	8-30	2.0-10.0	---	6.1-7.8	0
	30-60	10.0-30.0	---	7.4-8.4	10-30
433305:					
Superior-----	0-3	3.0-15.0	---	5.1-7.3	0
	3-6	3.0-15.0	---	5.1-7.3	0
	6-14	---	2.0-15.0	4.5-6.0	0
	14-19	8.0-65.0	---	5.1-6.0	0
	19-26	8.0-65.0	---	5.1-7.3	0
	26-60	8.0-65.0	---	7.4-8.4	0-25
Sedgwick-----	0-5	6.0-20.0	---	4.5-7.3	0
	5-8	2.0-15.0	---	4.5-6.0	0
	8-16	4.0-20.0	---	4.5-6.0	0
	16-19	7.0-70.0	---	5.1-7.3	0
	19-53	7.0-70.0	---	7.4-9.0	0-10
	53-80	7.0-70.0	---	7.4-9.0	2-35
433309:					
Superior-----	0-3	3.0-15.0	---	5.1-7.3	0
	3-6	3.0-15.0	---	5.1-7.3	0
	6-14	---	2.0-15.0	4.5-6.0	0
	14-19	8.0-65.0	---	5.1-6.0	0
	19-26	8.0-65.0	---	5.1-7.3	0
	26-60	8.0-65.0	---	7.4-8.4	0-25
Sedgwick-----	0-5	6.0-20.0	---	4.5-7.3	0
	5-8	2.0-15.0	---	4.5-6.0	0
	8-16	4.0-20.0	---	4.5-6.0	0
	16-19	7.0-70.0	---	5.1-7.3	0
	19-53	7.0-70.0	---	7.4-9.0	0-10
	53-80	7.0-70.0	---	7.4-9.0	2-35
433310:					
Sultz-----	0-2	---	80.0-120.0	5.1-6.5	0
	2-6	1.0-6.0	---	3.6-7.3	0
	6-18	---	2.0-9.0	3.6-6.5	0
	18-25	1.0-6.0	---	5.1-6.5	0
	25-43	1.0-3.0	---	5.1-6.5	0
	43-60	1.0-15.0	---	5.1-7.3	0-10
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
433310:					
Rubicon-----	0-1	---	1.0-6.0	4.5-6.0	0
	1-6	---	1.0-4.0	4.5-6.0	0
	6-18	---	1.0-4.0	4.5-6.0	0
	18-36	---	1.0-4.0	4.5-6.0	0
	36-60	1.0-2.0	---	4.5-7.3	0
433314:					
Manistee-----	0-3	5.0-15.0	---	4.5-7.3	0
	3-11	1.0-5.0	---	4.5-7.3	0
	11-28	1.0-5.0	---	5.1-6.5	0
	28-30	1.0-5.0	---	5.1-7.3	0
	30-38	10.0-25.0	---	5.1-7.3	0
	38-60	10.0-25.0	---	6.6-8.4	5-25
Kellogg-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-6	---	1.0-5.0	4.5-6.0	0
	6-26	---	1.0-5.0	4.5-6.5	0
	26-29	10.0-25.0	---	6.1-7.8	0-5
	29-40	10.0-25.0	---	6.1-7.8	0-5
	40-80	10.0-25.0	---	6.1-8.5	0-5
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
433326:					
Rubicon-----	0-1	---	1.0-7.0	4.5-6.0	0
	1-6	---	0.0-4.0	4.5-6.0	0
	6-18	---	0.0-4.0	4.5-6.0	0
	18-36	---	0.0-4.0	4.5-6.0	0
	36-60	0.0-4.0	---	4.5-7.3	0
433379:					
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10
433515:					
Lupton-----	0-65	160.0-190.0	---	4.5-7.8	0
Cathro-----	0-28	150.0-230.0	---	4.5-7.8	0
	28-49	2.0-20.0	---	5.6-7.3	0
	49-60	2.0-20.0	---	5.6-7.3	0
Tawas-----	0-31	160.0-190.0	---	4.5-7.8	0
	31-60	1.0-7.0	---	5.6-8.4	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
433572:					
Portwing-----	0-4	6.0-40.0	---	4.5-7.3	0
	4-9	4.0-35.0	---	5.1-7.3	0
	9-32	7.0-50.0	---	6.1-7.8	0-5
	32-51	7.0-50.0	---	7.4-9.0	2-20
	51-80	1.0-15.0	---	6.1-8.4	0-10
Herbster-----	0-5	6.0-40.0	---	5.1-7.3	0
	5-10	4.0-35.0	---	5.1-6.5	0
	10-13	4.0-35.0	---	5.1-7.3	0
	13-28	4.0-35.0	---	6.1-7.8	0
	28-33	20.0-30.0	---	6.1-7.8	0
	33-55	20.0-30.0	---	7.4-9.0	0-10
	55-80	1.0-20.0	---	7.4-8.4	0-5
433573:					
Cornucopia-----	0-3	6.0-40.0	---	4.5-6.5	0
	3-10	4.0-35.0	---	5.1-7.3	0
	10-32	7.0-50.0	---	5.6-7.8	0-5
	32-45	7.0-50.0	---	7.4-9.0	2-20
	45-50	1.0-15.0	---	7.4-8.4	2-20
	50-72	1.0-15.0	---	6.1-8.4	0-10
433582:					
Croswell-----	0-1	---	2.0-11.0	3.5-6.5	0
	1-7	---	1.0-9.0	3.5-6.5	0
	7-16	1.0-7.0	---	4.5-7.3	0
	16-39	0.0-6.0	---	4.5-7.3	0
	39-60	0.0-4.0	---	5.1-8.4	0-10
433599:					
Annalake-----	0-3	---	6.0-17.0	4.5-6.0	0
	3-6	---	2.0-13.0	4.5-6.0	0
	6-17	---	5.0-13.0	4.5-6.0	0
	17-31	---	4.0-12.0	5.1-7.3	0
	31-39	---	6.0-14.0	5.1-7.3	0
	39-60	4.0-12.0	---	5.1-8.4	0-10
433600:					
Annalake-----	0-3	---	6.0-17.0	4.5-6.0	0
	3-6	---	2.0-13.0	4.5-6.0	0
	6-17	---	5.0-13.0	4.5-6.0	0
	17-31	---	4.0-12.0	5.1-7.3	0
	31-39	---	6.0-14.0	5.1-7.3	0
	39-60	4.0-12.0	---	5.1-8.4	0-10
433671:					
Arnheim-----	0-5	5.0-20.0	---	5.1-7.3	0
	5-10	5.0-15.0	---	5.1-7.3	0
	10-15	5.0-15.0	---	5.1-7.3	0
	15-24	5.0-15.0	---	5.1-7.3	0
	24-60	5.0-15.0	---	5.1-7.3	0
433676:					
Redrim-----	0-1	---	80.0-120.0	3.6-5.5	0
	1-3	---	80.0-120.0	3.6-5.5	0
	3-11	---	1.0-6.0	3.6-5.5	0
	11-18	---	0.0-5.0	3.6-5.5	0
	18-80	---	---	---	---

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
433679:					
Lapoin-----	0-1	---	80.0-120.0	3.5-5.5	0
	1-4	---	6.0-30.0	3.5-5.5	0
	4-7	---	5.0-25.0	3.5-5.5	0
	7-19	5.0-40.0	---	5.1-7.8	0-5
	19-34	7.0-50.0	---	5.6-7.8	0-5
	34-39	2.0-15.0	---	6.6-7.8	0-5
	39-80	---	0.0-0.0	---	---
433686:					
Zeba-----	0-2	---	5.0-15.0	4.5-6.5	0
	2-5	---	1.0-10.0	4.5-6.5	0
	5-13	---	1.0-10.0	4.5-6.5	0
	13-21	---	1.0-10.0	4.5-6.5	0
	21-33	---	1.0-10.0	4.5-6.5	0
	33-80	---	---	---	---
433729:					
Sultz-----	0-2	---	80.0-120.0	5.1-6.5	0
	2-6	1.0-6.0	---	3.6-7.3	0
	6-18	---	2.0-9.0	3.6-6.5	0
	18-25	1.0-6.0	---	5.1-6.5	0
	25-43	1.0-3.0	---	5.1-6.5	0
	43-60	1.0-15.0	---	5.1-7.3	0-10
433739:					
Moquah-----	0-5	9.1-13.4	---	4.5-7.8	0-5
	5-19	7.1-15.1	---	4.5-7.8	0-5
	19-48	7.1-15.1	---	4.5-7.8	0-5
	48-55	10.2-15.5	---	4.5-7.8	0
	55-60	0.0-5.6	---	4.5-7.8	0-5
452765:					
Abbaye-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-4	---	3.0-30.0	4.5-6.0	0
	4-13	---	3.0-30.0	4.5-6.0	0
	13-25	---	2.0-15.0	4.5-6.0	0
	25-32	---	1.0-2.0	4.5-6.0	0
	32-80	---	---	---	---
Lapoin-----	0-1	---	80.0-120.0	3.5-5.5	0
	1-4	---	6.0-30.0	3.5-5.5	0
	4-7	---	5.0-25.0	3.5-5.5	0
	7-19	5.0-40.0	---	5.1-7.8	0-5
	19-34	7.0-50.0	---	5.6-7.8	0-5
	34-39	2.0-15.0	---	6.6-7.8	0-5
	39-80	---	0.0-0.0	---	---
1383557:					
Au Gres-----	0-2	---	80.0-120.0	4.5-7.3	0
	2-5	---	2.0-5.0	3.5-7.3	0
	5-8	---	2.0-5.0	4.5-6.0	0
	8-16	---	2.0-5.0	4.5-6.5	0
	16-28	---	2.0-5.0	3.5-7.3	0
	28-60	1.0-2.0	---	4.5-7.3	0

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1383580:					
Loxley-----	0-13	---	50.0-100.0	3.5-4.4	0
	13-60	---	50.0-120.0	3.5-4.4	0
Beseman-----	0-36	---	50.0-150.0	3.5-4.4	0
	36-60	3.0-15.0	---	3.5-7.3	0
Dawson-----	0-8	---	80.0-120.0	3.5-4.4	0
	8-38	---	150.0-230.0	3.5-4.4	0
	38-40	10.0-25.0	---	3.5-4.4	0
	40-60	1.0-2.0	---	3.5-6.5	0
1383581:					
Rifle-----	0-4	140.0-180.0	---	5.6-7.3	0
	4-60	140.0-180.0	---	5.6-7.3	0
1383603:					
Cornucopia-----	0-3	6.0-40.0	---	4.5-6.5	0
	3-10	4.0-35.0	---	5.1-7.3	0
	10-32	7.0-50.0	---	5.6-7.8	0-5
	32-45	7.0-50.0	---	7.4-9.0	2-20
	45-50	1.0-15.0	---	7.4-8.4	2-20
	50-72	1.0-15.0	---	6.1-8.4	0-10
1383658:					
Deerton-----	0-1	---	80.0-120.0	3.6-5.5	0
	1-9	---	2.0-10.0	3.5-6.0	0
	9-10	---	1.0-5.0	3.5-6.0	0
	10-25	---	1.0-5.0	3.5-6.0	0
	25-39	---	---	---	0
	39-80	---	---	---	0
Brownstone-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-12	---	1.0-6.0	3.5-6.5	0
	12-15	---	4.0-10.0	3.5-6.5	0
	15-23	---	2.0-8.0	3.5-6.5	0
	23-33	---	0.0-5.0	3.5-6.5	0
	33-80	---	---	---	0
1383660:					
Deerton-----	0-1	---	80.0-120.0	3.6-5.5	0
	1-9	---	2.0-10.0	3.5-6.0	0
	9-10	---	1.0-5.0	3.5-6.0	0
	10-25	---	1.0-5.0	3.5-6.0	0
	25-39	---	---	---	0
	39-80	---	---	---	0
Brownstone-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-12	---	1.0-6.0	3.5-6.5	0
	12-15	---	4.0-10.0	3.5-6.5	0
	15-23	---	2.0-8.0	3.5-6.5	0
	23-33	---	0.0-5.0	3.5-6.5	0
	33-80	---	---	---	0
1383662:					
Abbaye-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-4	---	3.0-30.0	4.5-6.0	0
	4-13	---	3.0-30.0	4.5-6.0	0
	13-25	---	2.0-15.0	4.5-6.0	0
	25-32	---	1.0-2.0	4.5-6.0	0
	32-80	---	---	---	---

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1383665:					
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10
Wakeley-----	0-4	---	100.0-140.0	3.6-5.0	0
	4-23	1.0-5.0	---	5.6-7.8	0
	23-28	1.0-5.0	---	5.6-7.8	0
	28-80	12.0-18.0	---	7.4-8.4	12-26
Kinross-----	0-6	---	100.0-140.0	3.6-5.0	0
	6-10	---	1.0-10.0	3.6-5.0	0
	10-12	---	1.0-10.0	3.6-6.0	0
	12-24	---	1.0-10.0	3.6-6.0	0
	24-42	---	1.0-10.0	4.5-6.5	0
	42-60	1.0-2.0	---	4.5-6.5	0
1383960:					
Flink-----	0-2	---	80.0-120.0	3.5-6.0	0
	2-3	---	80.0-120.0	3.5-6.0	0
	3-6	---	2.0-10.0	3.5-6.0	0
	6-9	---	2.0-10.0	3.5-6.0	0
	9-26	---	0.0-4.0	3.5-6.0	0
	26-35	0.0-3.0	---	5.1-7.3	0
	35-46	0.0-3.0	---	5.1-7.3	0
	46-52	2.0-20.0	---	5.1-7.3	0
	52-80	2.0-20.0	---	5.1-7.3	0
1444357:					
Arnheim-----	0-5	5.0-20.0	---	5.1-7.3	0
	5-10	5.0-15.0	---	5.1-7.3	0
	10-15	5.0-15.0	---	5.1-7.3	0
	15-24	5.0-15.0	---	5.1-7.3	0
	24-60	5.0-15.0	---	5.1-7.3	0
1444378:					
Wakefield-----	0-4	3.0-15.0	---	4.5-6.5	0
	4-7	3.0-15.0	---	4.5-6.5	0
	7-18	3.0-15.0	---	4.5-6.5	0
	18-24	10.0-20.0	---	4.5-6.5	0
	24-36	10.0-20.0	---	4.5-6.5	0
	36-49	10.0-20.0	---	4.5-6.5	0
	49-64	5.0-15.0	---	4.5-6.5	0
1444379:					
Wakefield-----	0-4	3.0-15.0	---	4.5-6.5	0
	4-7	3.0-15.0	---	4.5-6.5	0
	7-18	3.0-15.0	---	4.5-6.5	0
	18-24	10.0-20.0	---	4.5-6.5	0
	24-36	10.0-20.0	---	4.5-6.5	0
	36-49	10.0-20.0	---	4.5-6.5	0
	49-64	5.0-15.0	---	4.5-6.5	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1444388:					
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10
1444402:					
Tonkey-----	0-8	10.0-25.0	---	5.6-7.8	0
	8-14	2.0-10.0	---	5.6-7.8	0
	14-28	2.0-10.0	---	5.6-7.8	0
	28-60	1.0-10.0	---	7.4-8.4	0-10
1444410:					
Tula-----	0-1	---	60.0-160.0	4.5-6.5	0
	1-5	---	3.0-13.0	5.1-6.5	0
	5-8	2.0-8.0	---	5.1-6.5	0
	8-20	2.0-10.0	---	5.1-6.5	0
	20-28	2.0-10.0	---	5.1-6.5	0
	28-37	1.0-8.0	---	5.1-6.0	0
	37-62	4.0-12.0	---	5.6-6.5	0
	62-80	4.0-10.0	---	5.6-6.5	0
1444414:					
Lupton-----	0-65	160.0-190.0	---	4.5-7.8	0
Cathro-----	0-28	150.0-230.0	---	4.5-7.8	0
	28-49	2.0-20.0	---	5.6-7.3	0
	49-60	2.0-20.0	---	5.6-7.3	0
Tawas-----	0-31	160.0-190.0	---	4.5-7.8	0
	31-60	1.0-7.0	---	5.6-8.4	0
1444425:					
Lerch-----	0-3	60.0-160.0	---	5.1-6.5	0
	3-7	32.0-54.0	---	5.1-6.5	0
	7-12	20.0-50.0	---	5.1-6.5	0
	12-29	20.0-49.0	---	7.4-8.4	5-10
	29-56	20.0-49.0	---	7.4-8.4	5-10
	56-80	3.0-14.0	---	7.4-8.4	0-10
Herbster-----	0-5	6.0-40.0	---	5.1-7.3	0
	5-10	4.0-35.0	---	5.1-6.5	0
	10-13	4.0-35.0	---	5.1-7.3	0
	13-28	4.0-35.0	---	6.1-7.8	0
	28-33	20.0-30.0	---	6.1-7.8	0
	33-55	20.0-30.0	---	7.4-9.0	0-10
	55-80	1.0-20.0	---	7.4-8.4	0-5
1444426:					
Portwing-----	0-4	6.0-40.0	---	4.5-7.3	0
	4-9	4.0-35.0	---	5.1-7.3	0
	9-32	7.0-50.0	---	6.1-7.8	0-5
	32-51	7.0-50.0	---	7.4-9.0	2-20
	51-80	1.0-15.0	---	6.1-8.4	0-10

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1444426:					
Herbster-----	0-5	6.0-40.0	---	5.1-7.3	0
	5-10	4.0-35.0	---	5.1-6.5	0
	10-13	4.0-35.0	---	5.1-7.3	0
	13-28	4.0-35.0	---	6.1-7.8	0
	28-33	20.0-30.0	---	6.1-7.8	0
	33-55	20.0-30.0	---	7.4-9.0	0-10
	55-80	1.0-20.0	---	7.4-8.4	0-5
1444427:					
Cornucopia-----	0-3	6.0-40.0	---	4.5-6.5	0
	3-10	4.0-35.0	---	5.1-7.3	0
	10-32	7.0-50.0	---	5.6-7.8	0-5
	32-45	7.0-50.0	---	7.4-9.0	2-20
	45-50	1.0-15.0	---	7.4-8.4	2-20
	50-72	1.0-15.0	---	6.1-8.4	0-10
1444428:					
Cornucopia-----	0-3	6.0-40.0	---	4.5-6.5	0
	3-10	4.0-35.0	---	5.1-7.3	0
	10-32	7.0-50.0	---	5.6-7.8	0-5
	32-45	7.0-50.0	---	7.4-9.0	2-20
	45-50	1.0-15.0	---	7.4-8.4	2-20
	50-72	1.0-15.0	---	6.1-8.4	0-10
1444431:					
Croswell-----	0-1	---	2.0-11.0	3.5-6.5	0
	1-7	---	1.0-9.0	3.5-6.5	0
	7-16	1.0-7.0	---	4.5-7.3	0
	16-39	0.0-6.0	---	4.5-7.3	0
	39-60	0.0-4.0	---	5.1-8.4	0-10
1444432:					
Gogebic-----	0-1	---	80.0-180.0	3.6-5.5	0
	1-5	---	8.0-14.0	3.6-6.0	0
	5-7	---	5.0-10.0	3.6-6.0	0
	7-17	---	5.0-10.0	3.6-6.0	0
	17-26	---	5.0-10.0	3.6-6.0	0
	26-36	---	4.0-12.0	3.6-6.0	0
	36-53	---	5.0-14.0	3.6-6.0	0
	53-71	---	6.0-19.0	3.6-6.0	0
	71-80	---	7.0-15.0	4.5-6.5	0
1444435:					
Iosco-----	0-7	4.0-10.0	---	5.1-7.3	0
	7-9	2.0-10.0	---	5.1-7.3	0
	9-11	2.0-10.0	---	5.1-6.0	0
	11-28	2.0-10.0	---	5.1-6.5	0
	28-34	2.0-10.0	---	5.1-6.5	0
	34-40	4.0-10.0	---	6.1-7.8	3-6
	40-60	8.0-20.0	---	6.6-8.4	15-30
1444457:					
Redrim-----	0-1	---	80.0-120.0	3.6-5.5	0
	1-3	---	80.0-120.0	3.6-5.5	0
	3-11	---	1.0-6.0	3.6-5.5	0
	11-18	---	0.0-5.0	3.6-5.5	0
	18-80	---	---	---	---

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1444459:					
Zeba-----	0-2	---	5.0-15.0	4.5-6.5	0
	2-5	---	1.0-10.0	4.5-6.5	0
	5-13	---	1.0-10.0	4.5-6.5	0
	13-21	---	1.0-10.0	4.5-6.5	0
	21-33	---	1.0-10.0	4.5-6.5	0
	33-80	---	---	---	---
1444460:					
Abbaye-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-4	---	3.0-30.0	4.5-6.0	0
	4-13	---	3.0-30.0	4.5-6.0	0
	13-25	---	2.0-15.0	4.5-6.0	0
	25-32	---	1.0-2.0	4.5-6.0	0
	32-80	---	---	---	---
Lapoin-----	0-1	---	80.0-120.0	3.5-5.5	0
	1-4	---	6.0-30.0	3.5-5.5	0
	4-7	---	5.0-25.0	3.5-5.5	0
	7-19	5.0-40.0	---	5.1-7.8	0-5
	19-34	7.0-50.0	---	5.6-7.8	0-5
	34-39	2.0-15.0	---	6.6-7.8	0-5
	39-80	---	0.0-0.0	---	---
1444461:					
Abbaye-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-4	---	3.0-30.0	4.5-6.0	0
	4-13	---	3.0-30.0	4.5-6.0	0
	13-25	---	2.0-15.0	4.5-6.0	0
	25-32	---	1.0-2.0	4.5-6.0	0
	32-80	---	---	---	---
Zeba-----	0-2	---	5.0-15.0	4.5-6.5	0
	2-5	---	1.0-10.0	4.5-6.5	0
	5-13	---	1.0-10.0	4.5-6.5	0
	13-21	---	1.0-10.0	4.5-6.5	0
	21-33	---	1.0-10.0	4.5-6.5	0
	33-80	---	---	---	---
1444477:					
Cublake-----	0-3	---	1.0-10.0	3.5-6.0	0
	3-4	---	0.0-10.0	3.5-6.0	0
	4-23	---	0.0-4.0	3.5-6.5	0
	23-32	---	0.0-5.0	3.5-6.5	0
	32-40	---	0.0-5.0	3.5-7.3	0
	40-48	---	0.0-5.0	3.1-7.3	0
	48-60	2.0-20.0	---	5.1-7.3	0
Croswell-----	0-1	2.0-10.0	---	3.5-6.5	0
	1-7	---	1.0-5.0	3.5-6.5	0
	7-16	---	1.0-4.0	4.5-7.3	0
	16-39	---	1.0-3.0	4.5-7.3	0
	39-60	1.0-2.0	---	5.1-8.4	0
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1444478:					
Cublake-----	0-3	---	1.0-10.0	3.5-6.0	0
	3-4	---	0.0-10.0	3.5-6.0	0
	4-23	---	0.0-4.0	3.5-6.5	0
	23-32	---	0.0-5.0	3.5-6.5	0
	32-40	---	0.0-5.0	3.5-7.3	0
	40-48	---	0.0-5.0	3.1-7.3	0
	48-60	2.0-20.0	---	5.1-7.3	0
Crowell-----	0-1	2.0-10.0	---	3.5-6.5	0
	1-7	---	1.0-5.0	3.5-6.5	0
	7-16	---	1.0-4.0	4.5-7.3	0
	16-39	---	1.0-3.0	4.5-7.3	0
	39-60	1.0-2.0	---	5.1-8.4	0
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
1444479:					
Morganlake-----	0-4	---	2.0-10.0	3.5-6.5	0
	4-8	2.0-15.0	---	3.5-6.0	0
	8-26	0.0-10.0	---	3.5-6.0	0
	26-31	0.0-10.0	---	3.5-6.0	0
	31-40	4.0-30.0	---	5.6-8.4	0-30
	40-60	4.0-30.0	---	5.6-8.4	0-30
1444480:					
Morganlake-----	0-4	---	2.0-10.0	3.5-6.5	0
	4-8	2.0-15.0	---	3.5-6.0	0
	8-26	0.0-10.0	---	3.5-6.0	0
	26-31	0.0-10.0	---	3.5-6.0	0
	31-40	4.0-30.0	---	5.6-8.4	0-30
	40-60	4.0-30.0	---	5.6-8.4	0-30
1444481:					
Kellogg-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-6	---	1.0-5.0	4.5-6.0	0
	6-26	---	1.0-5.0	4.5-6.5	0
	26-29	10.0-25.0	---	6.1-7.8	0-5
	29-40	10.0-25.0	---	6.1-7.8	0-5
	40-80	10.0-25.0	---	6.1-8.5	0-5
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1444481:					
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
1444482:					
Kellogg-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-6	---	1.0-5.0	4.5-6.0	0
	6-26	---	1.0-5.0	4.5-6.5	0
	26-29	10.0-25.0	---	6.1-7.8	0-5
	29-40	10.0-25.0	---	6.1-7.8	0-5
	40-80	10.0-25.0	---	6.1-8.5	0-5
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
1444486:					
Sedgwick-----	0-5	6.0-20.0	---	4.5-7.3	0
	5-8	2.0-15.0	---	4.5-6.0	0
	8-16	4.0-20.0	---	4.5-6.0	0
	16-19	7.0-70.0	---	5.1-7.3	0
	19-53	7.0-70.0	---	7.4-9.0	0-10
	53-80	7.0-70.0	---	7.4-9.0	2-35
Munuscong-----	0-8	5.0-15.0	---	6.1-7.8	0
	8-30	2.0-10.0	---	6.1-7.8	0
	30-60	10.0-30.0	---	7.4-8.4	10-30
1444487:					
Superior-----	0-3	3.0-15.0	---	5.1-7.3	0
	3-6	3.0-15.0	---	5.1-7.3	0
	6-14	---	2.0-15.0	4.5-6.0	0
	14-19	8.0-65.0	---	5.1-6.0	0
	19-26	8.0-65.0	---	5.1-7.3	0
	26-60	8.0-65.0	---	7.4-8.4	0-25
Sedgwick-----	0-5	6.0-20.0	---	4.5-7.3	0
	5-8	2.0-15.0	---	4.5-6.0	0
	8-16	4.0-20.0	---	4.5-6.0	0
	16-19	7.0-70.0	---	5.1-7.3	0
	19-53	7.0-70.0	---	7.4-9.0	0-10
	53-80	7.0-70.0	---	7.4-9.0	2-35

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1444488:					
Superior-----	0-3	3.0-15.0	---	5.1-7.3	0
	3-6	3.0-15.0	---	5.1-7.3	0
	6-14	---	2.0-15.0	4.5-6.0	0
	14-19	8.0-65.0	---	5.1-6.0	0
	19-26	8.0-65.0	---	5.1-7.3	0
	26-60	8.0-65.0	---	7.4-8.4	0-25
Sedgwick-----	0-5	6.0-20.0	---	4.5-7.3	0
	5-8	2.0-15.0	---	4.5-6.0	0
	8-16	4.0-20.0	---	4.5-6.0	0
	16-19	7.0-70.0	---	5.1-7.3	0
	19-53	7.0-70.0	---	7.4-9.0	0-10
	53-80	7.0-70.0	---	7.4-9.0	2-35
1444489:					
Sultz-----	0-2	---	80.0-120.0	5.1-6.5	0
	2-6	1.0-6.0	---	3.6-7.3	0
	6-18	---	2.0-9.0	3.6-6.5	0
	18-25	1.0-6.0	---	5.1-6.5	0
	25-43	1.0-3.0	---	5.1-6.5	0
	43-60	1.0-15.0	---	5.1-7.3	0-10
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0
Rubicon-----	0-1	---	1.0-6.0	4.5-6.0	0
	1-6	---	1.0-4.0	4.5-6.0	0
	6-18	---	1.0-4.0	4.5-6.0	0
	18-36	---	1.0-4.0	4.5-6.0	0
	36-60	1.0-2.0	---	4.5-7.3	0
1444492:					
Manistee-----	0-3	5.0-15.0	---	4.5-7.3	0
	3-11	1.0-5.0	---	4.5-7.3	0
	11-28	1.0-5.0	---	5.1-6.5	0
	28-30	1.0-5.0	---	5.1-7.3	0
	30-38	10.0-25.0	---	5.1-7.3	0
	38-60	10.0-25.0	---	6.6-8.4	5-25
Kellogg-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-6	---	1.0-5.0	4.5-6.0	0
	6-26	---	1.0-5.0	4.5-6.5	0
	26-29	10.0-25.0	---	6.1-7.8	0-5
	29-40	10.0-25.0	---	6.1-7.8	0-5
	40-80	10.0-25.0	---	6.1-8.5	0-5
Ashwabay-----	0-4	5.0-10.0	---	5.1-6.5	0
	4-5	2.0-4.0	---	4.5-6.5	0
	5-12	---	2.0-4.0	4.5-6.0	0
	12-32	2.0-4.0	---	5.6-7.3	0
	32-45	2.0-3.0	---	6.1-7.3	0
	45-62	18.0-31.0	---	6.1-7.3	0
	62-80	1.0-31.0	---	6.1-7.3	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1444506:					
Keweenaw-----	0-2	3.0-9.0	---	4.5-6.5	0
	2-4	3.0-12.0	---	4.5-6.5	0
	4-16	1.0-9.0	---	4.5-6.5	0
	16-20	0.0-15.0	---	4.5-6.5	0
	20-27	0.0-15.0	---	4.5-6.5	0
	27-43	0.0-15.0	---	4.5-6.5	0
	43-75	0.0-15.0	---	4.5-6.5	0
	75-80	0.0-15.0	---	5.1-6.5	0
Rubicon-----	0-1	---	1.0-7.0	4.5-6.0	0
	1-6	---	0.0-4.0	4.5-6.0	0
	6-18	---	0.0-4.0	4.5-6.0	0
	18-36	---	0.0-4.0	4.5-6.0	0
	36-60	0.0-4.0	---	4.5-7.3	0
1444507:					
Keweenaw-----	0-2	3.0-9.0	---	4.5-6.5	0
	2-4	3.0-12.0	---	4.5-6.5	0
	4-16	1.0-9.0	---	4.5-6.5	0
	16-20	0.0-15.0	---	4.5-6.5	0
	20-27	0.0-15.0	---	4.5-6.5	0
	27-43	0.0-15.0	---	4.5-6.5	0
	43-75	0.0-15.0	---	4.5-6.5	0
	75-80	0.0-15.0	---	5.1-6.5	0
Rubicon-----	0-1	---	1.0-7.0	4.5-6.0	0
	1-6	---	0.0-4.0	4.5-6.0	0
	6-18	---	0.0-4.0	4.5-6.0	0
	18-36	---	0.0-4.0	4.5-6.0	0
	36-60	0.0-4.0	---	4.5-7.3	0
1444585:					
Meehan, beaches-----	0-4	---	2.0-15.0	3.5-7.3	0
	4-29	---	1.0-8.0	3.5-6.5	0
	29-60	---	0.0-4.0	3.5-7.3	0
1444586:					
Wurtsmith, beaches---	0-1	---	80.0-120.0	3.6-5.5	0
	1-4	---	1.0-4.0	3.5-6.0	0
	4-24	---	1.0-2.0	3.5-6.0	0
	24-48	---	1.0-2.0	3.5-7.3	0
	48-80	---	1.0-2.0	3.5-7.3	0
1444587:					
Grayling, beaches-----	0-3	---	2.0-14.0	3.5-5.5	0
	3-15	---	1.0-4.0	3.5-5.5	0
	15-23	---	1.0-4.0	3.5-5.5	0
	23-60	1.0-2.0	---	3.5-8.4	0-15
1529830:					
Meehan, beaches-----	0-4	---	2.0-15.0	3.5-7.3	0
	4-29	---	1.0-8.0	3.5-6.5	0
	29-60	---	0.0-4.0	3.5-7.3	0
1700372:					
Loxley-----	0-13	---	50.0-100.0	3.5-4.4	0
	13-60	---	50.0-120.0	3.5-4.4	0
Beseman-----	0-36	---	50.0-150.0	3.5-4.4	0
	36-60	3.0-15.0	---	3.5-7.3	0

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Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1700372:					
Dawson-----	0-8	---	80.0-120.0	3.5-4.4	0
	8-38	---	150.0-230.0	3.5-4.4	0
	38-40	10.0-25.0	---	3.5-4.4	0
	40-60	1.0-2.0	---	3.5-6.5	0
1700373:					
Rifle-----	0-4	140.0-180.0	---	5.6-7.3	0
	4-60	140.0-180.0	---	5.6-7.3	0
1700374:					
Allendale-----	0-3	4.0-20.0	---	3.5-7.3	0
	3-10	1.0-5.0	---	4.5-7.3	0
	10-13	1.0-5.0	---	4.5-6.0	0
	13-26	1.0-5.0	---	4.5-6.5	0
	26-28	1.0-5.0	---	4.5-7.3	0
	28-34	8.0-25.0	---	6.1-8.4	0-10
	34-60	8.0-25.0	---	6.1-8.4	0-10
Wakeley-----	0-4	---	100.0-140.0	3.6-5.0	0
	4-23	1.0-5.0	---	5.6-7.8	0
	23-28	1.0-5.0	---	5.6-7.8	0
	28-80	12.0-18.0	---	7.4-8.4	12-26
Kinross-----	0-6	---	100.0-140.0	3.6-5.0	0
	6-10	---	1.0-10.0	3.6-5.0	0
	10-12	---	1.0-10.0	3.6-6.0	0
	12-24	---	1.0-10.0	3.6-6.0	0
	24-42	---	1.0-10.0	4.5-6.5	0
	42-60	1.0-2.0	---	4.5-6.5	0
1702605:					
Menominee-----	0-4	---	2.0-10.0	3.5-6.5	0
	4-7	---	2.0-10.0	3.5-6.5	0
	7-23	---	2.0-10.0	3.5-6.0	0
	23-39	5.0-20.0	---	5.1-7.8	0-10
	39-59	5.0-25.0	---	5.1-7.8	0-30
	59-80	5.0-25.0	---	6.1-8.4	0-30
1702606:					
Deerton-----	0-1	---	80.0-120.0	3.6-5.5	0
	1-9	---	2.0-10.0	3.5-6.0	0
	9-10	---	1.0-5.0	3.5-6.0	0
	10-25	---	1.0-5.0	3.5-6.0	0
	25-39	---	---	---	0
	39-80	---	---	---	0
Brownstone-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-12	---	1.0-6.0	3.5-6.5	0
	12-15	---	4.0-10.0	3.5-6.5	0
	15-23	---	2.0-8.0	3.5-6.5	0
	23-33	---	0.0-5.0	3.5-6.5	0
	33-80	---	---	---	0
1702607:					
Deerton-----	0-1	---	80.0-120.0	3.6-5.5	0
	1-9	---	2.0-10.0	3.5-6.0	0
	9-10	---	1.0-5.0	3.5-6.0	0
	10-25	---	1.0-5.0	3.5-6.0	0
	25-39	---	---	---	0
	39-80	---	---	---	0

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 18.—Chemical Soil Properties—Continued

Map unit symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1702607:					
Brownstone-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-12	---	1.0-6.0	3.5-6.5	0
	12-15	---	4.0-10.0	3.5-6.5	0
	15-23	---	2.0-8.0	3.5-6.5	0
	23-33	---	0.0-5.0	3.5-6.5	0
	33-80	---	---	---	0
1702608:					
Abbaye-----	0-2	---	80.0-120.0	3.6-5.5	0
	2-4	---	3.0-30.0	4.5-6.0	0
	4-13	---	3.0-30.0	4.5-6.0	0
	13-25	---	2.0-15.0	4.5-6.0	0
	25-32	---	1.0-2.0	4.5-6.0	0
	32-80	---	---	---	---
1711685:					
Cublake-----	0-3	---	1.0-10.0	3.5-6.0	0
	3-4	---	0.0-10.0	3.5-6.0	0
	4-23	---	0.0-4.0	3.5-6.5	0
	23-32	---	0.0-5.0	3.5-6.5	0
	32-40	---	0.0-5.0	3.5-7.3	0
	40-48	---	0.0-5.0	3.1-7.3	0
	48-60	2.0-20.0	---	5.1-7.3	0
Keweenaw-----	0-2	3.0-9.0	---	4.5-6.5	0
	2-4	3.0-12.0	---	4.5-6.5	0
	4-16	1.0-9.0	---	4.5-6.5	0
	16-20	0.0-15.0	---	4.5-6.5	0
	20-27	0.0-15.0	---	4.5-6.5	0
	27-43	0.0-15.0	---	4.5-6.5	0
	43-75	0.0-15.0	---	4.5-6.5	0
	75-80	0.0-15.0	---	5.1-6.5	0

Table 19.—Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. If a soil is ponded, the water table limits are listed twice; the ponding depth is given as 0.0 to a certain depth and the depths of the below-the-surface water table are given on the next line. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433292: Lerch-----	D	January	0.0 3.5	2.0 >6.0	0.0-1.0	Long	Frequent	---	None
		February	0.0 3.5	2.0 >6.0	0.0-1.0	Long	Frequent	---	None
		March	0.0 3.5	2.0 >6.0	0.0-1.0	Long	Frequent	---	None
		April	0.0 3.5	2.5 >6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0 3.5	2.0 >6.0	0.0-1.0	Long	Frequent	---	None
		June	0.0 3.5	1.5 >6.0	0.0-1.0	Long	Frequent	---	None
		July	0.5 4.0	1.0 >6.0	0.0-1.0	Brief	Occasional	---	None
		August	4.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		September	4.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		October	0.0 4.0	1.5 >6.0	0.0-1.0	Brief	Frequent	---	None
		November	0.0 3.5	2.5 >6.0	0.0-1.0	Long	Frequent	---	None
		December	0.0 3.5	2.5 >6.0	0.0-1.0	Long	Frequent	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433292: Herbster-----	D	January	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		February	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		March	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		April	0.0	2.0	---	---	None	---	None
			3.5	>6.0					
		May	0.0	1.5	---	---	None	---	None
			3.5	>6.0					
		June	4.0	>6.0	---	---	None	---	None
			5.0	>6.0					
July	5.0	>6.0	---	---	None	---	None		
	5.0	>6.0							
August	5.0	>6.0	---	---	None	---	None		
	5.0	>6.0							
September	5.0	>6.0	---	---	None	---	None		
	5.0	>6.0							
October	0.0	1.0	---	---	None	---	None		
	4.0	>6.0							
November	0.0	1.5	---	---	None	---	None		
	3.5	>6.0							
December	0.0	0.5	---	---	None	---	None		
	3.5	>6.0							
433296: Cublake-----	A	January	3.0	4.0	---	---	None	---	None
		February	3.0	4.0	---	---	None	---	None
		March	2.5	4.0	---	---	None	---	None
		April	2.0	4.5	---	---	None	---	None
		May	2.0	4.5	---	---	None	---	None
		June	3.0	4.0	---	---	None	---	None
		October	3.0	4.5	---	---	None	---	None
		November	2.5	5.0	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
Croswell-----	A	January	4.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	3.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.5	>6.0	---	---	None	---	None
		June	4.0	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	3.5	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	3.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
			Ft	Ft	Ft						
433296: Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None		
		February	3.5	4.5	---	---	None	---	None		
		March	3.0	4.5	---	---	None	---	None		
		April	2.5	4.5	---	---	None	---	None		
		May	2.5	4.5	---	---	None	---	None		
		June	3.5	4.5	---	---	None	---	None		
		October	3.0	4.0	---	---	None	---	None		
		November	3.0	4.5	---	---	None	---	None		
		December	3.0	4.5	---	---	None	---	None		
		433299: Cublake-----	A	January	3.0	4.0	---	---	None	---	None
				February	3.0	4.0	---	---	None	---	None
				March	2.5	4.0	---	---	None	---	None
April	2.0			4.5	---	---	None	---	None		
May	2.0			4.5	---	---	None	---	None		
June	3.0			4.0	---	---	None	---	None		
October	3.0			4.5	---	---	None	---	None		
November	2.5			5.0	---	---	None	---	None		
December	3.0			4.5	---	---	None	---	None		
Croswell-----	A			January	4.0	>6.0	---	---	None	---	None
				February	5.0	>6.0	---	---	None	---	None
				March	3.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None		
		May	2.5	>6.0	---	---	None	---	None		
		June	4.0	>6.0	---	---	None	---	None		
		July	4.5	>6.0	---	---	None	---	None		
		August	5.0	>6.0	---	---	None	---	None		
		September	4.0	>6.0	---	---	None	---	None		
		October	3.5	>6.0	---	---	None	---	None		
		November	3.0	>6.0	---	---	None	---	None		
		December	3.5	>6.0	---	---	None	---	None		
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None		
		February	3.5	4.5	---	---	None	---	None		
		March	3.0	4.5	---	---	None	---	None		
		April	2.0	4.5	---	---	None	---	None		
		May	2.5	4.5	---	---	None	---	None		
		June	3.5	4.5	---	---	None	---	None		
		October	3.0	4.0	---	---	None	---	None		
		November	3.0	4.5	---	---	None	---	None		
		December	3.0	4.5	---	---	None	---	None		

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding			
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency		
			Ft	Ft	Ft						
433300: Kellogg-----	C	January	2.0	3.0	---	---	None	---	None		
		February	2.0	3.0	---	---	None	---	None		
		March	2.0	3.0	---	---	None	---	None		
		April	1.5	3.0	---	---	None	---	None		
		May	2.0	3.0	---	---	None	---	None		
		June	2.0	3.0	---	---	None	---	None		
		October	2.0	2.5	---	---	None	---	None		
		November	2.0	3.0	---	---	None	---	None		
		December	2.0	3.0	---	---	None	---	None		
		Allendale-----	C	January	1.0	2.5	---	---	None	---	None
				February	1.0	2.5	---	---	None	---	None
				March	1.0	3.0	---	---	None	---	None
April	0.5			3.0	---	---	None	---	None		
May	0.5			3.0	---	---	None	---	None		
June	1.0			2.5	---	---	None	---	None		
July	1.5			2.5	---	---	None	---	None		
August	2.0			2.5	---	---	None	---	None		
September	2.0			2.5	---	---	None	---	None		
October	1.0			2.5	---	---	None	---	None		
November	1.0			2.5	---	---	None	---	None		
December	1.5			2.5	---	---	None	---	None		
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None		
		February	3.5	4.5	---	---	None	---	None		
		March	3.0	4.5	---	---	None	---	None		
		April	2.5	4.5	---	---	None	---	None		
		May	2.5	4.5	---	---	None	---	None		
		June	3.5	4.5	---	---	None	---	None		
		October	3.0	4.0	---	---	None	---	None		
		November	3.0	4.5	---	---	None	---	None		
		December	3.0	4.5	---	---	None	---	None		
		433301: Kellogg-----	C	January	2.0	3.0	---	---	None	---	None
				February	2.0	3.0	---	---	None	---	None
				March	2.0	3.0	---	---	None	---	None
April	1.5			3.0	---	---	None	---	None		
May	2.0			3.0	---	---	None	---	None		
June	2.0			3.0	---	---	None	---	None		
October	2.0			2.5	---	---	None	---	None		
November	2.0			3.0	---	---	None	---	None		
December	2.0			3.0	---	---	None	---	None		

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433301: Allendale-----	C	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	1.0	3.0	---	---	None	---	None
		April	0.5	3.0	---	---	None	---	None
		May	0.5	3.0	---	---	None	---	None
		June	1.0	2.5	---	---	None	---	None
		July	1.5	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	2.0	2.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	3.0	4.5	---	---	None	---	None
		April	2.5	4.5	---	---	None	---	None
		May	2.5	4.5	---	---	None	---	None
		June	3.5	4.5	---	---	None	---	None
		October	3.0	4.0	---	---	None	---	None
		November	3.0	4.5	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
433304: Sedgwick-----	D	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	0.5	2.5	---	---	None	---	None
		April	0.5	2.5	---	---	None	---	None
		May	0.5	2.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		October	1.0	1.5	---	---	None	---	None
		November	0.5	2.5	---	---	None	---	None
		December	0.5	2.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433304: Munuscong-----	B/D	January	0.0	3.0	---	---	None	---	None
		February	0.0	3.0	---	---	None	---	None
		March	0.0	3.0	---	---	None	---	None
		April	0.0	3.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	3.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	3.0	---	---	None	---	None
		July	1.0	3.0	---	---	None	---	None
		August	1.5	2.5	---	---	None	---	None
		September	1.5	2.0	---	---	None	---	None
		October	0.5	2.0	---	---	None	---	None
		November	0.0	3.0	0.5-0.5	Brief	Occasional	---	None
		December	0.0	3.0	---	---	None	---	None
433305: Superior-----	C	April	0.5	2.0	---	---	None	---	None
		May	1.0	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.0	2.0	---	---	None	---	None
		December	1.0	1.5	---	---	None	---	None
Sedgwick-----	D	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	0.5	2.5	---	---	None	---	None
		April	0.5	2.5	---	---	None	---	None
		May	0.5	2.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		October	1.0	1.5	---	---	None	---	None
		November	0.5	2.5	---	---	None	---	None
		December	0.5	2.5	---	---	None	---	None
433309: Superior-----	C	April	0.5	2.0	---	---	None	---	None
		May	1.0	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.0	2.0	---	---	None	---	None
		December	1.0	1.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433309: Sedgwick-----	D	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	0.5	2.5	---	---	None	---	None
		April	0.5	2.5	---	---	None	---	None
		May	0.5	2.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	0.5	2.5	---	---	None	---	None
		December	0.5	2.5	---	---	None	---	None
		433310: Sultz-----	A	Jan-Dec	---	---	---	---	None
Ashwabay-----	B			January	3.5	4.5	---	---	None
February		3.5	4.5	---	---	None	---	None	
March		3.0	4.5	---	---	None	---	None	
April		2.5	4.5	---	---	None	---	None	
May		2.5	4.5	---	---	None	---	None	
June		3.5	4.5	---	---	None	---	None	
October		3.0	4.0	---	---	None	---	None	
November		3.0	4.5	---	---	None	---	None	
December		3.0	4.5	---	---	None	---	None	
Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
433314: Manistee-----	A	Jan-Dec	---	---	---	---	None	---	None
		Kellogg-----	C	January	2.0	3.0	---	---	None
February	2.0	3.0		---	---	None	---	None	
March	2.0	3.0		---	---	None	---	None	
April	1.5	3.0		---	---	None	---	None	
May	2.0	3.0		---	---	None	---	None	
June	2.0	3.0		---	---	None	---	None	
October	2.0	2.5		---	---	None	---	None	
November	2.0	3.0		---	---	None	---	None	
December	2.0	3.0		---	---	None	---	None	

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433314: Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	3.0	4.5	---	---	None	---	None
		April	2.5	4.5	---	---	None	---	None
		May	2.5	4.5	---	---	None	---	None
		June	3.5	4.5	---	---	None	---	None
		October	3.0	4.0	---	---	None	---	None
		November	3.0	4.5	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
433326: Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
433379: Allendale-----	C	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	1.0	3.0	---	---	None	---	None
		April	0.5	3.0	---	---	None	---	None
		May	0.5	3.0	---	---	None	---	None
		June	1.0	2.5	---	---	None	---	None
		July	1.5	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	2.0	2.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
433515: Lupton-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433515: Cathro-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None
Tawas-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None
433572: Portwing-----	D	January	4.0	>6.0	---	---	None	---	None
		February	4.0	>6.0	---	---	None	---	None
		March	4.0	>6.0	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
			3.5	>6.0	---	---	None	---	None
		May	1.0	2.5	---	---	None	---	None
			3.5	>6.0	---	---	None	---	None
		June	4.5	>6.0	---	---	None	---	None
		July	5.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	5.0	>6.0	---	---	None	---	None
		October	4.5	>6.0	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
			4.0	>6.0	---	---	None	---	None
		December	4.0	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433572: Herbster-----	D	January	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		February	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		March	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		April	0.0	2.0	---	---	None	---	None
			3.5	>6.0					
		May	0.0	1.5	---	---	None	---	None
			3.5	>6.0					
		June	4.0	>6.0	---	---	None	---	None
		July	5.0	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	5.0	>6.0	---	---	None	---	None
		October	0.0	1.0	---	---	None	---	None
			4.0	>6.0					
		November	0.0	1.5	---	---	None	---	None
			3.5	>6.0					
		December	0.0	0.5	---	---	None	---	None
			3.5	>6.0					
433573: Cornucopia-----	D	Jan-Dec	---	---	---	---	None	---	None
433582: Croswell-----	B	January	4.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	3.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.5	>6.0	---	---	None	---	None
		June	4.0	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	3.5	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	3.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433599: Annalake-----	B	January	3.0	4.5	---	---	None	---	None
		February	3.0	4.5	---	---	None	---	None
		March	2.5	5.0	---	---	None	---	None
		April	2.5	>6.0	---	---	None	---	None
		May	2.5	>6.0	---	---	None	---	None
		June	4.0	>6.0	---	---	None	---	None
		September	2.5	3.5	---	---	None	---	None
		October	2.5	4.0	---	---	None	---	None
		November	2.5	4.5	---	---	None	---	None
		December	2.5	4.5	---	---	None	---	None
433600: Annalake-----	B	January	3.0	4.5	---	---	None	---	None
		February	3.0	4.5	---	---	None	---	None
		March	2.5	5.0	---	---	None	---	None
		April	2.5	>6.0	---	---	None	---	None
		May	2.5	>6.0	---	---	None	---	None
		June	4.0	>6.0	---	---	None	---	None
		September	2.5	3.5	---	---	None	---	None
		October	2.5	4.0	---	---	None	---	None
		November	2.5	4.5	---	---	None	---	None
		December	2.5	4.5	---	---	None	---	None
433671: Arnheim-----	D	January	2.0	>6.0	---	---	None	Brief	Rare
		February	2.5	>6.0	---	---	None	Brief	Rare
		March	1.0	>6.0	---	---	None	Long	Occasional
		April	0.0	>6.0	0.5-0.5	Long	Frequent	Long	Frequent
		May	0.0	>6.0	0.5-0.5	Long	Frequent	Long	Frequent
		June	1.0	>6.0	---	---	None	Long	Occasional
		July	2.0	>6.0	---	---	None	Brief	Rare
		August	2.5	>6.0	---	---	None	Brief	Rare
		September	1.5	>6.0	---	---	None	Brief	Occasional
		October	0.5	>6.0	---	---	None	Brief	Occasional
		November	0.0	>6.0	0.5-0.5	Brief	Occasional	Brief	Occasional
		December	0.5	>6.0	---	---	None	Brief	Rare
433676: Redrim-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
433679: Lapoin-----	C	April	1.5	2.5	---	---	None	---	None
		May	2.0	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	2.0	2.5	---	---	None	---	None
433686: Zeba-----	C	January	1.5	2.5	---	---	None	---	None
		February	1.5	2.5	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	1.5	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
433729: Sultz-----	A	Jan-Dec	---	---	---	---	None	---	None
433739: Moquah-----	C	January	4.0	>6.0	---	---	None	---	None
		February	4.0	>6.0	---	---	None	---	None
		March	3.5	>6.0	---	---	None	Brief	Occasional
		April	2.5	>6.0	---	---	None	Brief	Frequent
		May	3.0	>6.0	---	---	None	Brief	Frequent
		June	3.5	>6.0	---	---	None	Brief	Occasional
		July	4.0	>6.0	---	---	None	Brief	Rare
		August	4.5	>6.0	---	---	None	Brief	Rare
		September	4.0	>6.0	---	---	None	Brief	Rare
		October	3.5	>6.0	---	---	None	Brief	Occasional
		November	3.0	>6.0	---	---	None	Brief	Occasional
		December	3.5	>6.0	---	---	None	Brief	Rare
433771. Beaches									
433802: Udorthents, ravines and escarpments-----	C	Jan-Dec	---	---	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
452739. Water									
452765: Abbaye-----	B	April	1.5	2.5	---	---	None	---	None
		May	2.0	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	2.0	2.5	---	---	None	---	None
Lapoin-----	C	April	1.5	2.5	---	---	None	---	None
		May	2.0	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	2.0	2.5	---	---	None	---	None
1383557: Au Gres-----	B	January	3.0	>6.0	---	---	None	---	None
		February	4.0	>6.0	---	---	None	---	None
		March	2.5	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	1.0	>6.0	---	---	None	---	None
		June	2.5	>6.0	---	---	None	---	None
		July	3.5	>6.0	---	---	None	---	None
		August	4.0	>6.0	---	---	None	---	None
		September	3.0	>6.0	---	---	None	---	None
		October	2.0	>6.0	---	---	None	---	None
		November	1.0	>6.0	---	---	None	---	None
		December	2.0	>6.0	---	---	None	---	None
1383580: Loxley-----	A/D	January	1.0	>6.0	---	---	None	---	None
		February	1.0	>6.0	---	---	None	---	None
		March	0.5	>6.0	---	---	None	---	None
		April	0.0	>6.0	0.0-0.5	Long	Occasional	---	None
		May	0.0	>6.0	---	---	None	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	---	---	None	---	None
		December	0.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1383580: Beseman-----	A/D	January	1.0	>6.0	---	---	None	---	None
		February	1.0	>6.0	---	---	None	---	None
		March	0.5	>6.0	---	---	None	---	None
		April	0.0	>6.0	0.0-0.5	Long	Occasional	---	None
		May	0.0	>6.0	---	---	None	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	---	---	None	---	None
		December	0.5	>6.0	---	---	None	---	None
Dawson-----	A/D	January	0.5	>6.0	---	---	None	---	None
		February	0.5	>6.0	---	---	None	---	None
		March	0.5	>6.0	---	---	None	---	None
		April	0.0	>6.0	0.0-0.5	Long	Occasional	---	None
		May	0.0	>6.0	---	---	None	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	---	---	None	---	None
		December	0.5	>6.0	---	---	None	---	None
1383581: Rifle-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None
1383603: Cornucopia-----	D	Jan-Dec	---	---	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1383658: Deerton-----	A	Jan-Dec	---	---	---	---	None	---	None
Brownstone-----	B	Jan-Dec	---	---	---	---	None	---	None
1383660: Deerton-----	A	Jan-Dec	---	---	---	---	None	---	None
Brownstone-----	B	Jan-Dec	---	---	---	---	None	---	None
1383662: Abbaye-----	B	April	1.5	2.5	---	---	None	---	None
		May	2.0	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	2.0	2.5	---	---	None	---	None
1383665: Allendale-----	C	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	1.0	3.0	---	---	None	---	None
		April	0.5	3.0	---	---	None	---	None
		May	0.5	3.0	---	---	None	---	None
		June	1.0	2.5	---	---	None	---	None
		July	1.5	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	2.0	2.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1383665: Wakeley-----	B/D	January	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		February	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		March	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		April	3.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	3.5	0.0-1.0	Long	Frequent	---	None
		June	0.0	3.0	---	---	None	---	None
		July	1.0	3.0	---	---	None	---	None
		August	1.5	3.0	---	---	None	---	None
		September	1.0	3.0	---	---	None	---	None
		October	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		November	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		December	0.0	3.0	0.0-1.0	Long	Frequent	---	None
Kinross-----	A/D	January	0.0	2.0	---	---	None	---	None
		February	3.5	>6.0	---	---	None	---	None
		March	0.0	2.0	---	---	None	---	None
		April	0.0	2.5	0.5-0.5	Long	Frequent	---	None
		May	0.0	2.0	0.5-0.5	Long	Frequent	---	None
		June	0.0	1.5	---	---	None	---	None
		July	0.5	1.0	---	---	None	---	None
		August	4.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	0.0	1.5	---	---	None	---	None
		November	0.0	2.5	---	---	None	---	None
		December	0.0	2.5	---	---	None	---	None
			3.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1383960: Flink-----	C	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	2.5	4.5	---	---	None	---	None
		April	1.0	4.5	---	---	None	---	None
		May	1.5	4.5	---	---	None	---	None
		June	2.5	4.5	---	---	None	---	None
		July	3.5	4.5	---	---	None	---	None
		August	4.0	4.5	---	---	None	---	None
		September	3.5	4.5	---	---	None	---	None
		October	2.5	4.5	---	---	None	---	None
		November	2.0	4.5	---	---	None	---	None
		December	2.5	4.5	---	---	None	---	None
1444357: Arnheim-----	D	January	2.0	>6.0	---	---	None	Brief	Rare
		February	2.5	>6.0	---	---	None	Brief	Rare
		March	1.0	>6.0	---	---	None	Long	Occasional
		April	0.0	>6.0	0.5-0.5	Long	Frequent	Long	Frequent
		May	0.0	>6.0	0.5-0.5	Long	Frequent	Long	Frequent
		June	1.0	>6.0	---	---	None	Long	Occasional
		July	2.0	>6.0	---	---	None	Brief	Rare
		August	2.5	>6.0	---	---	None	Brief	Rare
		September	1.5	>6.0	---	---	None	Brief	Occasional
		October	0.5	>6.0	---	---	None	Brief	Occasional
		November	0.0	>6.0	0.5-0.5	Brief	Occasional	Brief	Occasional
		December	0.5	>6.0	---	---	None	Brief	Rare
1444359. Beaches									
1444367: Udorthents, ravines and escarpments-----	C	Jan-Dec	---	---	---	---	None	---	None
1444378: Wakefield-----	C	January	1.5	2.5	---	---	None	---	None
		February	1.5	2.5	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444379: Wakefield-----	C	January	1.5	2.5	---	---	None	---	None
		February	1.5	2.5	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
1444388: Allendale-----	C	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	1.0	3.0	---	---	None	---	None
		April	0.5	3.0	---	---	None	---	None
		May	0.5	3.0	---	---	None	---	None
		June	1.0	2.5	---	---	None	---	None
		July	1.5	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	2.0	2.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
1444402: Tonkey-----	B/D	January	1.0	2.5	---	---	None	---	None
			5.0	>6.0					
		February	1.0	2.5	---	---	None	---	None
			5.5	>6.0					
		March	0.0	2.5	---	---	None	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	2.0	>6.0	---	---	None	---	None
		August	2.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	0.0	1.5	0.5-0.5	Brief	Occasional	---	None
			4.0	>6.0					
		November	0.0	2.5	---	---	None	---	None
			4.5	>6.0					
		December	0.5	2.5	---	---	None	---	None
			4.5	>6.0					

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444410: Tula-----	D	January	5.5	>6.0	---	---	None	---	None
		February	5.5	>6.0	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	5.0	>6.0	---	---	None	---	None
		May	0.0	2.5	---	---	None	---	None
		June	4.5	>6.0	---	---	None	---	None
		July	0.5	2.5	---	---	None	---	None
		October	4.5	>6.0	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	5.5	>6.0	---	---	None	---	None
			1.5	2.5	---	---	None	---	None
			5.5	>6.0	---	---	None	---	None
			1.0	2.5	---	---	None	---	None
			5.5	>6.0	---	---	None	---	None
			1.5	2.0	---	---	None	---	None
			5.5	>6.0	---	---	None	---	None
1444414: Lupton-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None
Cathro-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444414: Tawas-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.0-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None
1444425: Lerch-----	D	January	0.0	2.0	0.0-1.0	Long	Frequent	---	None
		February	3.5	>6.0					
		February	0.0	2.0	0.0-1.0	Long	Frequent	---	None
		February	3.5	>6.0					
		March	0.0	2.0	0.0-1.0	Long	Frequent	---	None
		March	3.5	>6.0					
		April	0.0	2.5	0.0-1.0	Long	Frequent	---	None
		April	3.5	>6.0					
		May	0.0	2.0	0.0-1.0	Long	Frequent	---	None
		May	3.5	>6.0					
		June	0.0	1.5	0.0-1.0	Long	Frequent	---	None
		June	3.5	>6.0					
		July	0.5	1.0	0.0-1.0	Brief	Occasional	---	None
		July	4.0	>6.0					
		August	4.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		September	4.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		October	0.0	1.5	0.0-1.0	Brief	Frequent	---	None
		October	4.0	>6.0					
		November	0.0	2.5	0.0-1.0	Long	Frequent	---	None
		November	3.5	>6.0					
		December	0.0	2.5	0.0-1.0	Long	Frequent	---	None
		December	3.5	>6.0					

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444425: Herbster-----	D	January	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		February	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		March	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		April	0.0	2.0	---	---	None	---	None
			3.5	>6.0					
		May	0.0	1.5	---	---	None	---	None
			3.5	>6.0					
		June	4.0	>6.0	---	---	None	---	None
		July	5.0	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	5.0	>6.0	---	---	None	---	None
		October	0.0	1.0	---	---	None	---	None
			4.0	>6.0					
		November	0.0	1.5	---	---	None	---	None
			3.5	>6.0					
		December	0.0	0.5	---	---	None	---	None
			3.5	>6.0					
1444426: Portwing-----	D	January	4.0	>6.0	---	---	None	---	None
		February	4.0	>6.0	---	---	None	---	None
		March	4.0	>6.0	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
			3.5	>6.0					
		May	1.0	2.5	---	---	None	---	None
			3.5	>6.0					
		June	4.5	>6.0	---	---	None	---	None
		July	5.5	>6.0	---	---	None	---	None
		August	5.5	>6.0	---	---	None	---	None
		September	5.0	>6.0	---	---	None	---	None
		October	4.5	>6.0	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
			4.0	>6.0					
		December	4.0	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444426: Herbster-----	D	January	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		February	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		March	0.0	1.0	---	---	None	---	None
			3.5	>6.0					
		April	0.0	2.0	---	---	None	---	None
			3.5	>6.0					
		May	0.0	1.5	---	---	None	---	None
			3.5	>6.0					
		June	4.0	>6.0	---	---	None	---	None
		July	5.0	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	5.0	>6.0	---	---	None	---	None
		October	0.0	1.0	---	---	None	---	None
			4.0	>6.0					
		November	0.0	1.5	---	---	None	---	None
			3.5	>6.0					
		December	0.0	0.5	---	---	None	---	None
			3.5	>6.0					
1444427: Cornucopia-----	D	Jan-Dec	---	---	---	---	None	---	None
1444428: Cornucopia-----	D	Jan-Dec	---	---	---	---	None	---	None
1444431: Croswell-----	B	January	4.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	3.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.5	>6.0	---	---	None	---	None
		June	4.0	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	3.5	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	3.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444432: Gogebic-----	C	January	1.5	2.5	---	---	None	---	None
		February	1.5	2.5	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
1444435: Iosco-----	C	January	1.0	>6.0	---	---	None	---	None
		February	1.0	>6.0	---	---	None	---	None
		March	1.0	>6.0	---	---	None	---	None
		April	0.5	>6.0	---	---	None	---	None
		May	1.0	>6.0	---	---	None	---	None
		June	1.5	>6.0	---	---	None	---	None
		July	3.0	>6.0	---	---	None	---	None
		August	4.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	2.5	>6.0	---	---	None	---	None
		November	0.5	>6.0	---	---	None	---	None
		December	1.0	>6.0	---	---	None	---	None
1444457: Redrim-----	B	Jan-Dec	---	---	---	---	None	---	None
1444459: Zeba-----	C	January	1.5	2.5	---	---	None	---	None
		February	1.5	2.5	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	1.0	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	1.5	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444460: Abbaye-----	B	April	1.5	2.5	---	---	None	---	None
May		2.0	2.5	---	---	None	---	None	
October		2.0	2.5	---	---	None	---	None	
November		1.5	2.5	---	---	None	---	None	
December		2.0	2.5	---	---	None	---	None	
Lapoin-----	C	April	1.5	2.5	---	---	None	---	None
May		2.0	2.5	---	---	None	---	None	
October		2.0	2.5	---	---	None	---	None	
November		1.5	2.5	---	---	None	---	None	
December		2.0	2.5	---	---	None	---	None	
1444461: Abbaye-----	B	April	1.5	2.5	---	---	None	---	None
May		2.0	2.5	---	---	None	---	None	
October		2.0	2.5	---	---	None	---	None	
November		1.5	2.5	---	---	None	---	None	
December		2.0	2.5	---	---	None	---	None	
Zeba-----	C	January	1.5	2.5	---	---	None	---	None
February		1.5	2.5	---	---	None	---	None	
March		1.5	2.5	---	---	None	---	None	
April		1.0	2.5	---	---	None	---	None	
May		1.5	2.5	---	---	None	---	None	
October		1.5	2.5	---	---	None	---	None	
November		1.0	2.5	---	---	None	---	None	
December		1.5	2.5	---	---	None	---	None	
1444477: Cublake-----	A	January	3.0	4.0	---	---	None	---	None
February		3.0	4.0	---	---	None	---	None	
March		2.5	4.0	---	---	None	---	None	
April		2.0	4.5	---	---	None	---	None	
May		2.0	4.5	---	---	None	---	None	
June		3.0	4.0	---	---	None	---	None	
October		3.0	4.5	---	---	None	---	None	
November		2.5	5.0	---	---	None	---	None	
December		3.0	4.5	---	---	None	---	None	

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444477: Croswell-----	A	January	4.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	3.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.5	>6.0	---	---	None	---	None
		June	4.0	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	3.5	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	3.5	>6.0	---	---	None	---	None
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	3.0	4.5	---	---	None	---	None
		April	2.5	4.5	---	---	None	---	None
		May	2.5	4.5	---	---	None	---	None
		June	3.5	4.5	---	---	None	---	None
		October	3.0	4.0	---	---	None	---	None
		November	3.0	4.5	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
1444478: Cublake-----	A	January	3.0	4.0	---	---	None	---	None
		February	3.0	4.0	---	---	None	---	None
		March	2.5	4.0	---	---	None	---	None
		April	2.0	4.5	---	---	None	---	None
		May	2.0	4.5	---	---	None	---	None
		June	3.0	4.0	---	---	None	---	None
		October	3.0	4.5	---	---	None	---	None
		November	2.5	5.0	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444478: Croswell-----	A	January	4.0	>6.0	---	---	None	---	None
		February	5.0	>6.0	---	---	None	---	None
		March	3.5	>6.0	---	---	None	---	None
		April	2.0	>6.0	---	---	None	---	None
		May	2.5	>6.0	---	---	None	---	None
		June	4.0	>6.0	---	---	None	---	None
		July	4.5	>6.0	---	---	None	---	None
		August	5.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	3.5	>6.0	---	---	None	---	None
		November	3.0	>6.0	---	---	None	---	None
		December	3.5	>6.0	---	---	None	---	None
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	3.0	4.5	---	---	None	---	None
		April	2.0	4.5	---	---	None	---	None
		May	2.5	4.5	---	---	None	---	None
		June	3.5	4.5	---	---	None	---	None
		October	3.0	4.0	---	---	None	---	None
		November	3.0	4.5	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
1444479: Morganlake-----	C	January	1.5	2.5	---	---	None	---	None
		February	1.5	2.5	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	1.5	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	1.5	4.0	---	---	None	---	None
1444480: Morganlake-----	C	January	1.5	2.5	---	---	None	---	None
		February	1.5	2.5	---	---	None	---	None
		March	1.5	2.5	---	---	None	---	None
		April	1.5	2.5	---	---	None	---	None
		May	1.5	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
			Ft	Ft	Ft						
1444481: Kellogg-----	C	January	2.0	3.0	---	---	None	---	None		
		February	2.0	3.0	---	---	None	---	None		
		March	2.0	3.0	---	---	None	---	None		
		April	1.5	3.0	---	---	None	---	None		
		May	2.0	3.0	---	---	None	---	None		
		June	2.0	3.0	---	---	None	---	None		
		October	2.0	2.5	---	---	None	---	None		
		November	2.0	3.0	---	---	None	---	None		
		December	2.0	3.0	---	---	None	---	None		
		Allendale-----	C	January	1.0	2.5	---	---	None	---	None
				February	1.0	2.5	---	---	None	---	None
				March	1.0	3.0	---	---	None	---	None
April	0.5			3.0	---	---	None	---	None		
May	0.5			3.0	---	---	None	---	None		
June	1.0			2.5	---	---	None	---	None		
July	1.5			2.5	---	---	None	---	None		
August	2.0			2.5	---	---	None	---	None		
September	2.0			2.5	---	---	None	---	None		
October	1.0			2.5	---	---	None	---	None		
November	1.0			2.5	---	---	None	---	None		
December	1.5			2.5	---	---	None	---	None		
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None		
		February	3.5	4.5	---	---	None	---	None		
		March	3.0	4.5	---	---	None	---	None		
		April	2.5	4.5	---	---	None	---	None		
		May	2.5	4.5	---	---	None	---	None		
		June	3.5	4.5	---	---	None	---	None		
		October	3.0	4.0	---	---	None	---	None		
		November	3.0	4.5	---	---	None	---	None		
		December	3.0	4.5	---	---	None	---	None		
		1444482: Kellogg-----	C	January	2.0	3.0	---	---	None	---	None
				February	2.0	3.0	---	---	None	---	None
				March	2.0	3.0	---	---	None	---	None
April	1.5			3.0	---	---	None	---	None		
May	2.0			3.0	---	---	None	---	None		
June	2.0			3.0	---	---	None	---	None		
October	2.0			2.5	---	---	None	---	None		
November	2.0			3.0	---	---	None	---	None		
December	2.0			3.0	---	---	None	---	None		

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444482: Allendale-----	C	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	1.0	3.0	---	---	None	---	None
		April	0.5	3.0	---	---	None	---	None
		May	0.5	3.0	---	---	None	---	None
		June	1.0	2.5	---	---	None	---	None
		July	1.5	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	2.0	2.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	3.0	4.5	---	---	None	---	None
		April	2.5	4.5	---	---	None	---	None
		May	2.5	4.5	---	---	None	---	None
		June	3.5	4.5	---	---	None	---	None
		October	3.0	4.0	---	---	None	---	None
		November	3.0	4.5	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
1444486: Sedgwick-----	D	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	0.5	2.5	---	---	None	---	None
		April	0.5	2.5	---	---	None	---	None
		May	0.5	2.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		October	1.0	1.5	---	---	None	---	None
		November	0.5	2.5	---	---	None	---	None
		December	0.5	2.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444486: Munuscong-----	B/D	January	0.0	3.0	---	---	None	---	None
		February	0.0	3.0	---	---	None	---	None
		March	0.0	3.0	---	---	None	---	None
		April	0.0	3.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	3.0	0.5-0.5	Long	Frequent	---	None
		June	0.5	3.0	---	---	None	---	None
		July	1.0	3.0	---	---	None	---	None
		August	1.5	2.5	---	---	None	---	None
		September	1.5	2.0	---	---	None	---	None
		October	0.5	2.0	---	---	None	---	None
		November	0.0	3.0	0.5-0.5	Brief	Occasional	---	None
		December	0.0	3.0	---	---	None	---	None
1444487: Superior-----	C	April	0.5	2.0	---	---	None	---	None
		May	1.0	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.0	2.0	---	---	None	---	None
		December	1.0	1.5	---	---	None	---	None
Sedgwick-----	D	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	0.5	2.5	---	---	None	---	None
		April	0.5	2.5	---	---	None	---	None
		May	0.5	2.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		October	1.0	1.5	---	---	None	---	None
		November	0.5	2.5	---	---	None	---	None
		December	0.5	2.5	---	---	None	---	None
1444488: Superior-----	C	April	0.5	2.0	---	---	None	---	None
		May	1.0	2.0	---	---	None	---	None
		October	1.5	2.0	---	---	None	---	None
		November	1.0	2.0	---	---	None	---	None
		December	1.0	1.5	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444488: Sedgwick-----	D	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	0.5	2.5	---	---	None	---	None
		April	0.5	2.5	---	---	None	---	None
		May	0.5	2.5	---	---	None	---	None
		June	0.5	1.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	0.5	2.5	---	---	None	---	None
		December	0.5	2.5	---	---	None	---	None
1444489: Sultz-----	A	Jan-Dec	---	---	---	---	None	---	None
Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	3.0	4.5	---	---	None	---	None
		April	2.5	4.5	---	---	None	---	None
		May	2.5	4.5	---	---	None	---	None
		June	3.5	4.5	---	---	None	---	None
		October	3.0	4.0	---	---	None	---	None
		November	3.0	4.5	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
1444492: Manistee-----	A	Jan-Dec	---	---	---	---	None	---	None
Kellogg-----	C	January	2.0	3.0	---	---	None	---	None
		February	2.0	3.0	---	---	None	---	None
		March	2.0	3.0	---	---	None	---	None
		April	1.5	3.0	---	---	None	---	None
		May	2.0	3.0	---	---	None	---	None
		June	2.0	3.0	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	2.0	3.0	---	---	None	---	None
		December	2.0	3.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444492: Ashwabay-----	B	January	3.5	4.5	---	---	None	---	None
		February	3.5	4.5	---	---	None	---	None
		March	3.0	4.5	---	---	None	---	None
		April	2.5	4.5	---	---	None	---	None
		May	2.5	4.5	---	---	None	---	None
		June	3.5	4.5	---	---	None	---	None
		October	3.0	4.0	---	---	None	---	None
		November	3.0	4.5	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
1444506: Keweenaw-----	A	Jan-Dec	---	---	---	---	None	---	None
Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
1444507: Keweenaw-----	A	Jan-Dec	---	---	---	---	None	---	None
Rubicon-----	A	Jan-Dec	---	---	---	---	None	---	None
1444585: Meehan, beaches-----	B	January	3.0	>6.0	---	---	---	---	None
		February	4.0	>6.0	---	---	---	---	None
		March	2.5	>6.0	---	---	---	---	None
		April	0.5	>6.0	---	---	---	---	None
		May	1.0	>6.0	---	---	---	---	None
		June	2.5	>6.0	---	---	---	---	None
		July	3.5	>6.0	---	---	---	---	None
		August	4.0	>6.0	---	---	---	---	None
		September	3.0	>6.0	---	---	---	---	None
		October	2.0	>6.0	---	---	---	---	None
		November	1.0	>6.0	---	---	---	---	None
		December	2.0	>6.0	---	---	---	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1444586: Wurtsmith, beaches-----	A	January	4.0	>6.0	---	---	---	---	None
		February	5.0	>6.0	---	---	---	---	None
		March	3.5	>6.0	---	---	---	---	None
		April	2.0	>6.0	---	---	---	---	None
		May	2.5	>6.0	---	---	---	---	None
		June	4.0	>6.0	---	---	---	---	None
		July	4.5	>6.0	---	---	---	---	None
		August	5.0	>6.0	---	---	---	---	None
		September	4.0	>6.0	---	---	---	---	None
		October	3.5	>6.0	---	---	---	---	None
		November	3.0	>6.0	---	---	---	---	None
		December	3.5	>6.0	---	---	---	---	None
1444587: Grayling, beaches-----	A	Jan-Dec	---	---	---	---	None	---	None
1529830: Meehan, beaches-----	B	January	3.0	>6.0	---	---	---	---	None
		February	4.0	>6.0	---	---	---	---	None
		March	2.5	>6.0	---	---	---	---	None
		April	0.5	>6.0	---	---	---	---	None
		May	1.0	>6.0	---	---	---	---	None
		June	2.5	>6.0	---	---	---	---	None
		July	3.5	>6.0	---	---	---	---	None
		August	4.0	>6.0	---	---	---	---	None
		September	3.0	>6.0	---	---	---	---	None
		October	2.0	>6.0	---	---	---	---	None
		November	1.0	>6.0	---	---	---	---	None
		December	2.0	>6.0	---	---	---	---	None
1700372: Loxley-----	A/D	January	1.0	>6.0	---	---	None	---	None
		February	1.0	>6.0	---	---	None	---	None
		March	0.5	>6.0	---	---	None	---	None
		April	0.0	>6.0	0.0-0.5	Long	Occasional	---	None
		May	0.0	>6.0	---	---	None	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	---	---	None	---	None
		December	0.5	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1700372: Beseman-----	A/D	January	1.0	>6.0	---	---	None	---	None
		February	1.0	>6.0	---	---	None	---	None
		March	0.5	>6.0	---	---	None	---	None
		April	0.0	>6.0	0.0-0.5	Long	Occasional	---	None
		May	0.0	>6.0	---	---	None	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	---	---	None	---	None
		December	0.5	>6.0	---	---	None	---	None
Dawson-----	A/D	January	0.5	>6.0	---	---	None	---	None
		February	0.5	>6.0	---	---	None	---	None
		March	0.5	>6.0	---	---	None	---	None
		April	0.0	>6.0	0.0-0.5	Long	Occasional	---	None
		May	0.0	>6.0	---	---	None	---	None
		June	0.0	>6.0	---	---	None	---	None
		July	0.5	>6.0	---	---	None	---	None
		August	0.5	>6.0	---	---	None	---	None
		September	0.5	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	---	---	None	---	None
		December	0.5	>6.0	---	---	None	---	None
1700373: Rifle-----	A/D	January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	---	---	None	---	None
		March	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		April	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0	>6.0	0.5-0.5	Long	Frequent	---	None
		June	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		July	0.0	>6.0	---	---	None	---	None
		August	0.0	>6.0	---	---	None	---	None
		September	0.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	---	---	None	---	None
		November	0.0	>6.0	0.5-0.5	Brief	Occasional	---	None
		December	0.0	>6.0	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1700374: Allendale-----	C	January	1.0	2.5	---	---	None	---	None
		February	1.0	2.5	---	---	None	---	None
		March	1.0	3.0	---	---	None	---	None
		April	0.5	3.0	---	---	None	---	None
		May	0.5	3.0	---	---	None	---	None
		June	1.0	2.5	---	---	None	---	None
		July	1.5	2.5	---	---	None	---	None
		August	2.0	2.5	---	---	None	---	None
		September	2.0	2.5	---	---	None	---	None
		October	1.0	2.5	---	---	None	---	None
		November	1.0	2.5	---	---	None	---	None
		December	1.5	2.5	---	---	None	---	None
Wakeley-----	B/D	January	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		February	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		March	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		April	3.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	3.5	0.0-1.0	Long	Frequent	---	None
		June	0.0	3.0	---	---	None	---	None
		July	1.0	3.0	---	---	None	---	None
		August	1.5	3.0	---	---	None	---	None
		September	1.0	3.0	---	---	None	---	None
		October	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		November	0.0	3.0	0.0-1.0	Long	Frequent	---	None
		December	0.0	3.0	0.0-1.0	Long	Frequent	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1700374: Kinross-----	A/D	January	0.0 3.5	2.0 >6.0	---	---	None	---	None
		February	0.0 3.5	2.0 >6.0	---	---	None	---	None
		March	0.0 3.5	2.0 >6.0	---	---	None	---	None
		April	0.0 3.5	2.5 >6.0	0.5-0.5	Long	Frequent	---	None
		May	0.0 3.5	2.0 >6.0	0.5-0.5	Long	Frequent	---	None
		June	0.0 3.5	1.5 >6.0	---	---	None	---	None
		July	0.5 4.0	1.0 >6.0	---	---	None	---	None
		August	4.0	>6.0	---	---	None	---	None
		September	4.0	>6.0	---	---	None	---	None
		October	0.0 4.0	1.5 >6.0	---	---	None	---	None
		November	0.0 3.5	2.5 >6.0	---	---	None	---	None
		December	0.0 3.5	2.5 >6.0	---	---	None	---	None
1702605: Menominee-----	A	Jan-Dec	---	---	---	---	None	---	None
1702606: Deerton-----	A	Jan-Dec	---	---	---	---	None	---	None
Brownstone-----	B	Jan-Dec	---	---	---	---	None	---	None
1702607: Deerton-----	A	Jan-Dec	---	---	---	---	None	---	None
Brownstone-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.—Water Features—Continued

National symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1702608: Abbaye-----	B	April	1.5	2.5	---	---	None	---	None
		May	2.0	2.5	---	---	None	---	None
		October	2.0	2.5	---	---	None	---	None
		November	1.5	2.5	---	---	None	---	None
		December	2.0	2.5	---	---	None	---	None
1711685: Cublake-----	A	January	3.0	4.0	---	---	None	---	None
		February	3.0	4.0	---	---	None	---	None
		March	2.5	4.0	---	---	None	---	None
		April	2.0	4.5	---	---	None	---	None
		May	2.0	4.5	---	---	None	---	None
		June	3.0	4.0	---	---	None	---	None
		October	3.0	4.5	---	---	None	---	None
		November	2.5	5.0	---	---	None	---	None
		December	3.0	4.5	---	---	None	---	None
Keweenaw-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 20.-Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
433292: Lerch-----	---	---	---	---	High	High	Moderate
Herbster-----	Abrupt textural change	40-60	40-60	Noncemented	Moderate	High	Moderate
433296: Cublake-----	---	---	---	---	Low	Low	Moderate
Croswell-----	---	---	---	---	Low	Low	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
433299: Cublake-----	---	---	---	---	Low	Low	Moderate
Croswell-----	---	---	---	---	Low	Low	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
433300: Kellogg-----	---	---	---	---	Low	High	Moderate
Allendale-----	---	---	---	---	Moderate	High	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
433301: Kellogg-----	---	---	---	---	Low	High	Moderate
Allendale-----	---	---	---	---	Moderate	High	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
433304: Sedgwick-----	---	---	---	---	High	High	Moderate
Munuscong-----	---	---	---	---	High	High	Low
433305: Superior-----	---	---	---	---	Moderate	Moderate	Moderate
Sedgwick-----	---	---	---	---	High	High	Moderate

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top	In				
433309: Superior-----	---	---	---	---	Moderate	Moderate	Moderate
Sedgwick-----	---	---	---	---	High	High	Moderate
433310: Sultz-----	---	---	---	---	Low	Low	High
Ashwabay-----	---	---	---	---	Low	Low	Moderate
Rubicon-----	---	---	---	---	Low	Low	High
433314: Manistee-----	---	---	---	---	Low	High	Moderate
Kellogg-----	---	---	---	---	Low	High	High
Ashwabay-----	---	---	---	---	Low	Low	Moderate
433326: Rubicon-----	---	---	---	---	Low	Low	High
433379: Allendale-----	---	---	---	---	Moderate	High	Moderate
433515: Lupton-----	---	---	---	---	High	Moderate	Low
Cathro-----	---	---	---	---	High	Moderate	Moderate
Tawas-----	---	---	---	---	High	Moderate	Low
433572: Portwing-----	---	---	---	---	Moderate	High	Moderate
Herbster-----	Abrupt textural change	40-60	40-60	Noncemented	Moderate	High	Moderate
433573: Cornucopia-----	---	---	---	---	Moderate	High	Moderate
433582: Croswell-----	---	---	---	---	Low	Low	High
433599: Annalake-----	---	---	---	---	Moderate	Moderate	High

Table 20.--Soil Features--Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top	In				
433600: Annalake-----	---	---	---	---	Moderate	Moderate	High
433671: Arnheim-----	---	---	---	---	High	High	Moderate
433676: Redrim-----	Lithic bedrock	10-20	---	---	Low	Moderate	High
433679: Lapoin-----	Lithic bedrock	20-40	---	---	Moderate	High	Moderate
433686: Zeba-----	Lithic bedrock	20-40	---	---	High	Moderate	Moderate
433729: Sultz-----	---	---	---	---	Low	Low	High
433739: Moquah-----	---	---	---	---	Moderate	Moderate	Moderate
433771. Beaches							
433802. Udorthents, ravines and escarpments							
452739. Water							
452765: Abbaye-----	Lithic bedrock	20-40	---	---	Moderate	Low	Moderate
Lapoin-----	Lithic bedrock	20-40	---	---	Moderate	High	Moderate
1383557: Au Gres-----	---	---	---	---	Low	Low	High
1383580: Loxley-----	---	---	---	---	High	Moderate	High
Beseman-----	---	---	---	---	High	Moderate	High
Dawson-----	---	---	---	---	High	Moderate	High
1383581: Rifle-----	---	---	---	---	High	High	Low

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1383603: Cornucopia-----	---	---	---	---	Moderate	High	Moderate
1383658: Deerton-----	Lithic bedrock	20-40	---	---	Low	Low	High
Brownstone-----	Lithic bedrock	20-40	---	---	Low	Low	High
1383660: Deerton-----	Lithic bedrock	20-40	---	---	Low	Low	High
Brownstone-----	Lithic bedrock	20-40	---	---	Low	Low	High
1383662: Abbaye-----	Lithic bedrock	20-40	---	---	Moderate	Low	Moderate
1383665: Allendale-----	---	---	---	---	Moderate	High	Moderate
Wakeley-----	---	---	---	---	Moderate	High	Moderate
Kinross-----	---	---	---	---	Moderate	High	Moderate
1383960: Flink-----	---	---	---	---	Moderate	Moderate	High
1444357: Arnheim-----	---	---	---	---	High	High	Moderate
1444359. Beaches							
1444367. Udorthents, ravines and escarpments							
1444378: Wakefield-----	Fragipan	16-24	8-26	---	Moderate	Moderate	Moderate
1444379: Wakefield-----	Fragipan	16-24	8-26	---	Moderate	Moderate	Moderate
1444388: Allendale-----	---	---	---	---	Moderate	High	Moderate
1444402: Tonkey-----	---	---	---	---	High	High	Low

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top	In				
1444410: Tula-----	Fragipan	15-30	10-48	---	High	High	Moderate
1444414: Lupton-----	---	---	---	---	High	Moderate	Low
Cathro-----	---	---	---	---	High	Moderate	Moderate
Tawas-----	---	---	---	---	High	Moderate	Low
1444425: Lerch-----	---	---	---	---	High	High	Moderate
Herbster-----	Abrupt textural change	40-60	40-60	Noncemented	Moderate	High	Moderate
1444426: Portwing-----	---	---	---	---	Moderate	High	Moderate
Herbster-----	Abrupt textural change	40-60	40-60	Noncemented	Moderate	High	Moderate
1444427: Cornucopia-----	---	---	---	---	Moderate	High	Moderate
1444428: Cornucopia-----	---	---	---	---	Moderate	High	Moderate
1444431: Croswell-----	---	---	---	---	Low	Low	High
1444432: Gogebic-----	Fragipan	18-36	10-48	---	Moderate	Moderate	High
1444435: Iosco-----	---	---	---	---	Moderate	High	Low
1444457: Redrim-----	Lithic bedrock	10-20	---	---	Low	Moderate	High
1444459: Zeba-----	Lithic bedrock	20-40	---	---	High	Moderate	Moderate
1444460: Abbaye-----	Lithic bedrock	20-40	---	---	Moderate	Low	Moderate
Lapoin-----	Lithic bedrock	20-40	---	---	Moderate	High	Moderate

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1444461: Abbaye-----	Lithic bedrock	20-40	---	---	Moderate	Low	Moderate
Zeba-----	Lithic bedrock	20-40	---	---	High	Moderate	Moderate
1444477: Cublake-----	---	---	---	---	Low	Low	Moderate
Croswell-----	---	---	---	---	Low	Low	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
1444478: Cublake-----	---	---	---	---	Low	Low	Moderate
Croswell-----	---	---	---	---	Low	Low	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
1444479: Morganlake-----	---	---	---	---	Low	Low	Moderate
1444480: Morganlake-----	---	---	---	---	Low	Low	Moderate
1444481: Kellogg-----	---	---	---	---	Low	High	Moderate
Allendale-----	---	---	---	---	Moderate	High	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
1444482: Kellogg-----	---	---	---	---	Low	High	Moderate
Allendale-----	---	---	---	---	Moderate	High	Moderate
Ashwabay-----	---	---	---	---	Low	Low	Moderate
1444486: Sedgwick-----	---	---	---	---	High	High	Moderate
Munuscong-----	---	---	---	---	High	High	Low
1444487: Superior-----	---	---	---	---	Moderate	Moderate	Moderate
Sedgwick-----	---	---	---	---	High	High	Moderate

Table 20.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		In to top	In				
1444488: Superior-----	---	---	---	---	Moderate	Moderate	Moderate
Sedgwick-----	---	---	---	---	High	High	Moderate
1444489: Sultz-----	---	---	---	---	Low	Low	High
Ashwabay-----	---	---	---	---	Low	Low	Moderate
Rubicon-----	---	---	---	---	Low	Low	High
1444492: Manistee-----	---	---	---	---	Low	High	Moderate
Kellogg-----	---	---	---	---	Low	High	High
Ashwabay-----	---	---	---	---	Low	Low	Moderate
1444506: Keweenaw-----	---	---	---	---	Low	Low	Moderate
Rubicon-----	---	---	---	---	Low	Low	High
1444507: Keweenaw-----	---	---	---	---	Low	Low	Moderate
Rubicon-----	---	---	---	---	Low	Low	High
1444585: Meehan, beaches-----	---	---	---	---	Moderate	Low	Moderate
1444586: Wurtsmith, beaches-----	---	---	---	---	Low	Low	Moderate
1444587: Grayling, beaches-----	---	---	---	---	Low	Low	Moderate
1529830: Meehan, beaches-----	---	---	---	---	Moderate	Low	Moderate
1700372: Loxley-----	---	---	---	---	High	Moderate	High
Beseman-----	---	---	---	---	High	Moderate	High
Dawson-----	---	---	---	---	High	Moderate	High

Table 20.--Soil Features--Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		to top					
1700373: Rifle-----	---	---	---	---	High	High	Low
1700374: Allendale-----	---	---	---	---	Moderate	High	Moderate
Wakeley-----	---	---	---	---	Moderate	High	Moderate
Kinross-----	---	---	---	---	Moderate	High	Moderate
1702605: Menominee-----	---	---	---	---	Low	Low	Moderate
1702606: Deerton-----	Lithic bedrock	20-40	---	---	Low	Low	High
Brownstone-----	Lithic bedrock	20-40	---	---	Low	Low	High
1702607: Deerton-----	Lithic bedrock	20-40	---	---	Low	Low	High
Brownstone-----	Lithic bedrock	20-40	---	---	Low	Low	High
1702608: Abbaye-----	Lithic bedrock	20-40	---	---	Moderate	Low	Moderate
1711685: Cublake-----	---	---	---	---	Low	Low	Moderate
Keweenaw-----	---	---	---	---	Low	Low	Moderate

Soil Survey of Apostle Islands National Lakeshore, Wisconsin

Table 21.—Taxonomic Classification of the Soils

Soil name	Family or higher taxonomic class
Abbaye-----	Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods
Allendale-----	Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods
Annalake-----	Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
Arnheim-----	Coarse-loamy, mixed, superactive, nonacid, frigid Typic Fluvaquents
Ashwabay-----	Sandy, isotic, frigid Alfic Oxyaquic Haplorthods
Au Gres-----	Sandy, mixed, frigid Typic Endoaquods
Beseman-----	Loamy, mixed, dysic, frigid Terric Haplosaprists
Brownstone-----	Sandy-skeletal, mixed, frigid Typic Haplorthods
Cathro-----	Loamy, mixed, euic, frigid Terric Haplosaprists
Cornucopia-----	Fine, mixed, active, frigid Haplic Glossudalfs
Croswell-----	Sandy, mixed, frigid Oxyaquic Haplorthods
Cublake-----	Sandy, mixed, frigid Oxyaquic Haplorthods
Dawson-----	Sandy or sandy-skeletal, mixed, dysic, frigid Terric Haplosaprists
Deerton-----	Sandy, mixed, frigid Typic Haplorthods
Flink-----	Sandy, mixed, frigid Typic Epiaquods
Gogebic-----	Coarse-loamy, isotic, frigid Alfic Oxyaquic Fragiorthods
Grayling-----	Isotc, frigid Typic Udipsammments
Herbster-----	Fine, mixed, active, frigid Aeric Glossaqualfs
Iosco-----	Sandy over loamy, mixed, active, frigid Argic Endoaquods
Kellogg-----	Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods
Keweenaw-----	Sandy, mixed, frigid Alfic Haplorthods
Kinross-----	Sandy, mixed, frigid Typic Endoaquods
Lapoin-----	Fine, mixed, active, frigid Alfic Oxyaquic Haplorthods
Lerch-----	Very fine, mixed, active, nonacid, frigid Vertic Epiaquepts
Loxley-----	Dysic, frigid Typic Haplosaprists
Lupton-----	Euic, frigid Typic Haplosaprists
Manistee-----	Sandy over clayey, mixed, active, frigid Alfic Haplorthods
Meehan-----	Mixed, frigid Aquic Udipsammments
Menominee-----	Sandy over loamy, mixed, active, frigid Alfic Haplorthods
Moquah-----	Coarse-loamy, mixed, superactive, nonacid, frigid Typic Udifluvents
Morganlake-----	Sandy over loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods
Munuscong-----	Coarse-loamy over clayey, mixed, active, nonacid, frigid Mollic Epiaquepts
Portwing-----	Fine, mixed, active, frigid Oxyaquic Glossudalfs
Redrim-----	Sandy-skeletal, mixed, frigid Entic Lithic Haplorthods
Rifle-----	Euic, frigid Typic Haplohemists
Rubicon-----	Sandy, mixed, frigid Entic Haplorthods
Sedgwick-----	Coarse-loamy over clayey, mixed, active, frigid Alfic Epiaquods
Sultz-----	Sandy, mixed, frigid Entic Haplorthods
Superior-----	Coarse-loamy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods
Tawas-----	Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists
Tonkey-----	Coarse-loamy, mixed, semiactive, nonacid, frigid Mollic Endoaquepts
Tula-----	Coarse-loamy, mixed, superactive, frigid Argic Fragiaquods
Udorthents, ravines and escarpments-----	Udorthents
Wakefield-----	Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Fragiorthods
Wakeley-----	Sandy over clayey, mixed, semiactive, nonacid, frigid Aeric Epiaquents
Wurtsmith-----	Mixed, frigid Oxyaquic Udipsammments
Zeba-----	Coarse-loamy, mixed, active, frigid Argic Endoaquods

Table 22.--Soil Classification Key

ORDER	Suborder	Great Group	Subgroup	Series or Higher Category
ALFISOLS	Aqualfs	Glossaqualfs	Aeric Glossaqualfs	Herbster-----Fine, mixed, active, frigid Aeric Glossaqualfs
	Udalfs	Glossudalfs	Haplic Glossudalfs	Cornucopia-----Fine, mixed, active, frigid Haplic Glossudalfs
		Oxyaquic Glossudalfs	Portwing-----Fine, mixed, active, frigid Oxyaquic Glossudalfs	
ENTISOLS	Aquents	Fluvaquents	Typic Fluvaquents	Arnheim-----Coarse-loamy, mixed, superactive, nonacid, frigid Typic Fluvaquents
		Epiaquents	Aeric Epiaquents	Wakeley-----Sandy over clayey, mixed, semiactive, nonacid, frigid Aeric Epiaquents
	Fluvents	Udifluvents	Typic Udifluvents	Moquah-----Coarse-loamy, mixed, superactive, nonacid, frigid Typic Udifluvents
	Orthents	Udorthents	Udorthents, ravines and escarpments-----Udorthents	
	Psamments	Udipsamments	Typic Udipsamments	Grayling-----Isotic, frigid Typic Udipsamments
		Aquic Udipsamments	Meehan-----Mixed, frigid Aquic Udipsamments	
		Oxyaquic Udipsamments	Wurtsmith-----Mixed, frigid Oxyaquic Udipsamments	

Table 22.—Soil Classification Key—Continued

ORDER	Suborder	Great Group	Subgroup	Series or Higher Category
HISTOSOLS				
	Hemists			
	Haplohemists			
		Typic Haplohemists		
		Rifle-----	Euic, frigid	Typic Haplohemists
	Saprists			
	Haplosaprists			
		Typic Haplosaprists		
		Loxley-----	Dysic, frigid	Typic Haplosaprists
		Lupton-----	Euic, frigid	Typic Haplosaprists
		Terric Haplosaprists		
		Beseman-----	Loamy, mixed, dysic, frigid	Terric Haplosaprists
		Cathro-----	Loamy, mixed, euic, frigid	Terric Haplosaprists
		Dawson-----	Sandy or sandy-skeletal, mixed, dysic, frigid	Terric Haplosaprists
		Tawas-----	Sandy or sandy-skeletal, mixed, euic, frigid	Terric Haplosaprists
INCEPTISOLS				
	Aquepts			
	Endoaquepts			
		Mollic Endoaquepts		
		Tonkey-----	Coarse-loamy, mixed, semiactive, nonacid, frigid	Mollic Endoaquepts
	Epiaquepts			
		Vertic Epiaquepts		
		Lerch-----	Very fine, mixed, active, nonacid, frigid	Vertic Epiaquepts
		Mollic Epiaquepts		
		Munuscong-----	Coarse-loamy over clayey, mixed, active, nonacid, frigid	Mollic Epiaquepts
SPODOSOLS				
	Aquods			
	Fragiaquods			
		Argic Fragiaquods		
		Tula-----	Coarse-loamy, mixed, superactive, frigid	Argic Fragiaquods
	Endoaquods			
		Typic Endoaquods		
		Au Gres-----	Sandy, mixed, frigid	Typic Endoaquods
		Kinross-----	Sandy, mixed, frigid	Typic Endoaquods
		Argic Endoaquods		
		Zeba-----	Coarse-loamy, mixed, active, frigid	Argic Endoaquods
		Iosco-----	Sandy over loamy, mixed, active, frigid	Argic Endoaquods
	Epiaquods			
		Typic Epiaquods		
		Flink-----	Sandy, mixed, frigid	Typic Epiaquods
		Alfic Epiaquods		
		Sedgwick-----	Coarse-loamy over clayey, mixed, active, frigid	Alfic Epiaquods
		Allendale-----	Sandy over clayey, mixed, semiactive, frigid	Alfic Epiaquods

Table 22.—Soil Classification Key—Continued

ORDER	
	Suborder
	Great Group
	Subgroup
	Series or Higher Category
SPODOSOLS—Continued	
	Orthods
	Fragiorthods
	Alfic Oxyaquic Fragiorthods
	Gogebic-----Coarse-loamy, isotic, frigid Alfic Oxyaquic Fragiorthods
	Wakefield-----Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Fragiorthods
	Haplorthods
	Typic Haplorthods
	Deerton-----Sandy, mixed, frigid Typic Haplorthods
	Brownstone-----Sandy-skeletal, mixed, frigid Typic Haplorthods
	Alfic Haplorthods
	Manistee-----Sandy over clayey, mixed, active, frigid Alfic Haplorthods
	Menominee-----Sandy over loamy, mixed, active, frigid Alfic Haplorthods
	Keweenaw-----Sandy, mixed, frigid Alfic Haplorthods
	Entic Lithic Haplorthods
	Redrim-----Sandy-skeletal, mixed, frigid Entic Lithic Haplorthods
	Entic Haplorthods
	Rubicon-----Sandy, mixed, frigid Entic Haplorthods
	Sultz-----Sandy, mixed, frigid Entic Haplorthods
	Oxyaquic Haplorthods
	Croswell-----Sandy, mixed, frigid Oxyaquic Haplorthods
	Cublake-----Sandy, mixed, frigid Oxyaquic Haplorthods
	Alfic Oxyaquic Haplorthods
	Superior-----Coarse-loamy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods
	Abbaye-----Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods
	Annalake-----Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
	Lapoin-----Fine, mixed, active, frigid Alfic Oxyaquic Haplorthods
	Kellogg-----Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods
	Morganlake-----Sandy over loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods
	Ashwabay-----Sandy, isotic, frigid Alfic Oxyaquic Haplorthods

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