United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product 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 participants

Custom Soil Resource Report for Spokane County, Washington

Buob Land LLC Property

November 19, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is 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.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. 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.

The National Cooperative Soil Survey is 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 (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile 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 or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

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

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

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

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

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. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

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.

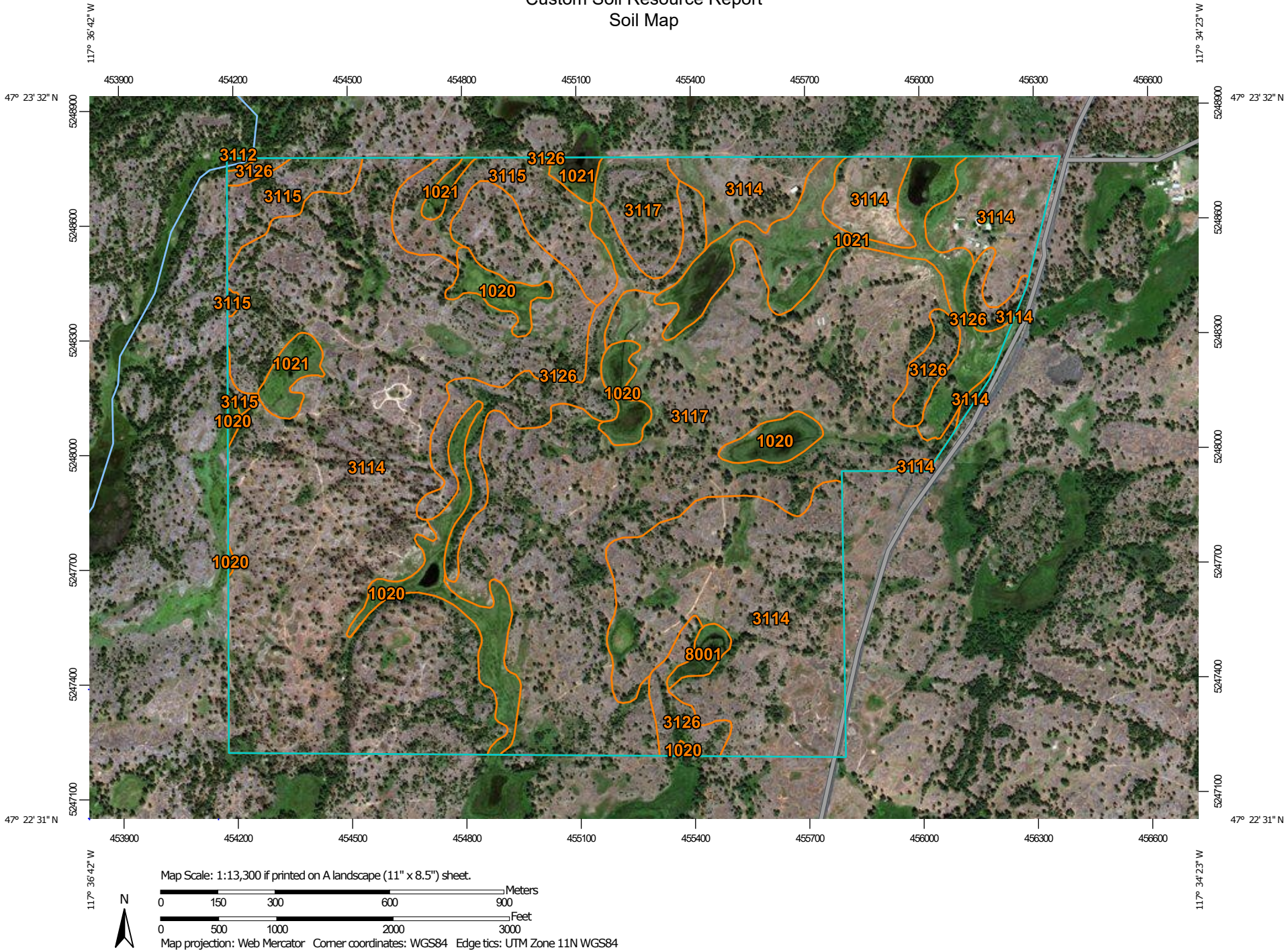
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Spokane County, Washington
Survey Area Data: Version 12, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 18, 2014—Sep 8, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1020	Cocolalla ashy silt loam, 0 to 3 percent slopes	33.8	4.7%
1021	Cocolalla-Hardesty complex, 0 to 3 percent slopes	47.1	6.6%
3112	Stutler gravelly ashy loam, 0 to 15 percent slopes, extremely bouldery surface	0.4	0.1%
3114	Rockly-Fourmound complex, 0 to 15 percent slopes	354.5	49.6%
3115	Northstar-Rock outcrop complex, 3 to 15 percent slopes	35.6	5.0%
3117	Northstar-Rock outcrop-Rockly complex, 0 to 15 percent slopes	192.8	27.0%
3126	Rock outcrop-Northstar complex, 15 to 30 percent slopes	47.7	6.7%
8001	Saltese muck, 0 to 3 percent slopes	3.0	0.4%
Totals for Area of Interest		**714.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

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. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. 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 important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one 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, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Spokane County, Washington

1020—Cocolalla ashy silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2wfy
Elevation: 2,020 to 2,450 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Cocolalla and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cocolalla

Setting

Landform: Depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium derived from volcanic ash with loess mixed in the upper part

Typical profile

A1 - 0 to 11 inches: ashy silt loam
A2 - 11 to 28 inches: ashy silt loam
Cg1 - 28 to 37 inches: ashy silt loam
Cg2 - 37 to 43 inches: ashy silt loam
Ab - 43 to 54 inches: ashy silt loam
Cgb - 54 to 60 inches: ashy silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 11 inches
Frequency of flooding: FrequentNone
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R009XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Minor Components

Hardesty

Percent of map unit: 10 percent
Landform: Stream terraces, drainageways, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: ponderosa pine/ninebark (CN190)
Hydric soil rating: No

Rockly

Percent of map unit: 3 percent
Landform: Plateaus
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R009XY301WA - VERY SHALLOW 16-24 PZ
Hydric soil rating: No

Northstar

Percent of map unit: 3 percent
Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Water

Percent of map unit: 2 percent

Saltese

Percent of map unit: 2 percent
Landform: Drainageways, depressions, flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R044XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

1021—Cocolalla-Hardesty complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2wd5
Elevation: 1,950 to 2,400 feet
Mean annual precipitation: 15 to 18 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 100 to 140 days

Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Cocolalla and similar soils: 50 percent
Hardesty and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cocolalla

Setting

Landform: Depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium derived from volcanic ash with loess mixed in the upper part

Typical profile

A1 - 0 to 11 inches: ashy silt loam
A2 - 11 to 28 inches: ashy silt loam
Cg1 - 28 to 37 inches: ashy silt loam
Cg2 - 37 to 43 inches: ashy silt loam
Ab - 43 to 54 inches: ashy silt loam
Cgb - 54 to 60 inches: ashy silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 11 inches
Frequency of flooding: FrequentNone
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R009XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Description of Hardesty

Setting

Landform: Stream terraces, drainageways, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Alluvium derived from volcanic ash mixed with loess in the upper part

Typical profile

A1 - 0 to 4 inches: ashy silt loam
A2 - 4 to 11 inches: ashy silt loam
Bw1 - 11 to 23 inches: ashy silt loam
Bw2 - 23 to 32 inches: ashy silt loam
C1 - 32 to 39 inches: ashy very fine sandy loam
C2 - 39 to 60 inches: ashy loamy very fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 23 to 30 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Available water capacity: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Other vegetative classification: ponderosa pine/ninebark (CN190)
Hydric soil rating: No

Minor Components

Rockly

Percent of map unit: 4 percent
Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R009XY301WA - VERY SHALLOW 16-24 PZ
Hydric soil rating: No

Saltese

Percent of map unit: 3 percent
Landform: Drainageways, depressions, flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R044XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Northstar

Percent of map unit: 1 percent
Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Speigle

Percent of map unit: 1 percent
Landform: Escarpments
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Water

Percent of map unit: 1 percent

3112—Stutler gravelly ashy loam, 0 to 15 percent slopes, extremely bouldery surface

Map Unit Setting

National map unit symbol: 1t59b
Elevation: 2,000 to 2,500 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Stutler, extremely bouldery surface, and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stutler, Extremely Bouldery Surface

Setting

Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits with minor amounts of volcanic ash and loess in the upper part

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 5 inches: gravelly ashy loam
Bw1 - 5 to 12 inches: cobbly ashy loam
Bw2 - 12 to 22 inches: extremely bouldery coarse sandy loam
Bw3 - 22 to 32 inches: extremely bouldery coarse sandy loam
Bq1 - 32 to 42 inches: extremely bouldery coarse sandy loam
Bq2 - 42 to 61 inches: extremely bouldery loamy coarse sand

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 15.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Minor Components

Rockly

Percent of map unit: 8 percent
Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R009XY301WA - VERY SHALLOW 16-24 PZ
Hydric soil rating: No

Northstar

Percent of map unit: 7 percent
Landform: Plateaus
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Springdale

Percent of map unit: 5 percent
Landform: Outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Cocolalla

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave

Ecological site: R009XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Rock outcrop
Percent of map unit: 5 percent
Hydric soil rating: No

3114—Rockly-Fourmound complex, 0 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2wgn
Elevation: 1,800 to 2,600 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition
Rockly and similar soils: 55 percent
Fourmound and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rockly

Setting
Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess mixed with minor amounts of volcanic ash over residuum derived from basalt

Typical profile
A - 0 to 3 inches: very cobbly loam
Bw - 3 to 6 inches: very cobbly loam
R - 6 to 16 inches: bedrock

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: 4 to 12 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 0.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R009XY301WA - VERY SHALLOW 16-24 PZ
Hydric soil rating: No

Description of Fourmound

Setting

Landform: Plateaus
Microfeatures of landform position: Mounds
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Glaciofluvial deposits and loess mixed with minor amounts of volcanic ash over residuum derived from basalt

Typical profile

A1 - 0 to 4 inches: gravelly ashy silt loam
A2 - 4 to 9 inches: ashy silt loam
A3 - 9 to 15 inches: ashy silt loam
Bw1 - 15 to 30 inches: silt loam
Bw2 - 30 to 43 inches: silt loam
2BC - 43 to 47 inches: extremely gravelly silt loam
2R - 47 to 57 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F043AY502WA - Warm Mesic Xeric Loamy Foothills, Terraces, mixed ash surface (Ponderosa Pine/Shrub) Pinus ponderosa / Symphoricarpos albus, Pinus ponderosa / Physocarpus malvaceus
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Minor Components

Northstar

Percent of map unit: 8 percent
Landform: Plateaus
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear

Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Rock outcrop
Percent of map unit: 7 percent
Hydric soil rating: No

Cocolalla
Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R009XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Water
Percent of map unit: 1 percent
Microfeatures of landform position: Ponds

3115—Northstar-Rock outcrop complex, 3 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2wgm
Elevation: 1,800 to 2,550 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 42 to 50 degrees F
Frost-free period: 90 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition
Northstar and similar soils: 50 percent
Rock outcrop: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Northstar

Setting
Landform: Plateaus
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess with an influence of volcanic ash over residuum and/or colluvium derived from basalt

Typical profile
Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 3 inches: moderately decomposed plant material

A1 - 3 to 6 inches: extremely cobbly ashy loam
A2 - 6 to 11 inches: extremely cobbly ashy loam
BA - 11 to 17 inches: very gravelly ashy loam
Bw - 17 to 26 inches: extremely gravelly loam
R - 26 to 36 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 23 to 43 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F044AY501WA - Warm Mesic Xeric Loamy Foothills, Terraces, low AWC subsoils (Ponderosa Pine/Shrub) Pinus ponderosa / Symphoricarpos albus, Pinus ponderosa / Physocarpus malvaceus
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Hardesty

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: ponderosa pine/ninebark (CN190)
Hydric soil rating: No

Rockly

Percent of map unit: 5 percent
Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: R009XY301WA - VERY SHALLOW 16-24 PZ
Hydric soil rating: No

Rubble land

Percent of map unit: 5 percent
Hydric soil rating: No

Cocolalla

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R009XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Stutler

Percent of map unit: 4 percent
Landform: Outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Klickson

Percent of map unit: 2 percent
Landform: Escarpments
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/ninebark (CN260)
Hydric soil rating: No

3117—Northstar-Rock outcrop-Rockly complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wgq
Elevation: 1,800 to 2,550 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Northstar and similar soils: 30 percent
Rock outcrop: 25 percent
Rockly and similar soils: 20 percent

Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Northstar

Setting

Landform: Plateaus
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess with an influence of volcanic ash over residuum and/or colluvium derived from basalt

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 3 inches: moderately decomposed plant material
A1 - 3 to 6 inches: extremely cobbly ashy loam
A2 - 6 to 11 inches: extremely cobbly ashy loam
BA - 11 to 17 inches: very gravelly ashy loam
Bw - 17 to 26 inches: extremely gravelly loam
R - 26 to 36 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 23 to 43 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F044AY501WA - Warm Mesic Xeric Loamy Foothills, Terraces, low AWC subsoils (Ponderosa Pine/Shrub) Pinus ponderosa / Symphoricarpos albus, Pinus ponderosa / Physocarpus malvaceus
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Rockly

Setting

Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess mixed with minor amounts of volcanic ash over residuum derived from basalt

Typical profile

A - 0 to 3 inches: very cobbly loam
Bw - 3 to 6 inches: very cobbly loam
R - 6 to 16 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 4 to 12 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 0.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R009XY301WA - VERY SHALLOW 16-24 PZ
Hydric soil rating: No

Minor Components

Fourmound

Percent of map unit: 10 percent
Landform: Plateaus
Microfeatures of landform position: Mounds
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Cocolalla

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R009XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Rubble land

Percent of map unit: 5 percent
Hydric soil rating: No

Speigle

Percent of map unit: 5 percent
Landform: Escarpments
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

3126—Rock outcrop-Northstar complex, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 1r4nv
Elevation: 1,800 to 2,500 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 40 percent
Northstar and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Northstar

Setting

Landform: Plateaus
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Loess with an influence of volcanic ash over residuum and/or colluvium derived from basalt

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 3 inches: moderately decomposed plant material
A1 - 3 to 6 inches: extremely cobbly ashy loam
A2 - 6 to 11 inches: extremely cobbly ashy loam
BA - 11 to 17 inches: very gravelly ashy loam
Bw - 17 to 26 inches: extremely gravelly loam
R - 26 to 36 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 23 to 43 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F044AY501WA - Warm Mesic Xeric Loamy Foothills, Terraces, low AWC subsoils (Ponderosa Pine/Shrub) Pinus ponderosa / Symphoricarpos albus, Pinus ponderosa / Physocarpus malvaceus
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Minor Components

Speigle

Percent of map unit: 10 percent
Landform: Escarpments
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Fourmound

Percent of map unit: 5 percent
Landform: Plateaus
Microfeatures of landform position: Mounds
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Other vegetative classification: ponderosa pine/common snowberry (CN170)
Hydric soil rating: No

Rubble land

Percent of map unit: 5 percent
Hydric soil rating: No

Rockly

Percent of map unit: 5 percent
Landform: Plateaus
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R009XY301WA - VERY SHALLOW 16-24 PZ
Hydric soil rating: No

8001—Saltese muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: nvfj
Elevation: 2,000 to 2,440 feet
Mean annual precipitation: 18 to 25 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 130 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Saltese and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saltese

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Decomposed organic herbaceous material

Typical profile

Oap - 0 to 5 inches: muck
Oa - 5 to 12 inches: muck
Oe - 12 to 16 inches: mucky peat
Oa1 - 16 to 24 inches: muck
Oa2 - 24 to 40 inches: muck
Oa3 - 40 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water capacity: Very high (about 26.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R044XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Minor Components

Cocolalla

Percent of map unit: 10 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R009XY601WA - WET MEADOW 16-24 PZ
Hydric soil rating: Yes

Narcisse

Percent of map unit: 5 percent
Landform: Drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R009XY402WA - LOAMY BOTTOM 16-24 PZ
Hydric soil rating: No

Water

Percent of map unit: 5 percent

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Harvest Equipment Operability

Ratings for this interpretation indicate the suitability for use of forestland harvesting equipment. The ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification of the soil, depth to a water table, and ponding. Standard rubber-tire skidders and bulldozers are assumed to be used for ground-based harvesting and transport.

The ratings are both verbal and numerical. Rating class terms indicate the degree to which the soils are suited to this aspect of forestland management. "Well suited" indicates that the soil has features that are favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. "Moderately suited" indicates that the soil has features that are moderately favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. "Poorly suited" indicates that the soil has one or more properties that are unfavorable for the specified management aspect. Overcoming

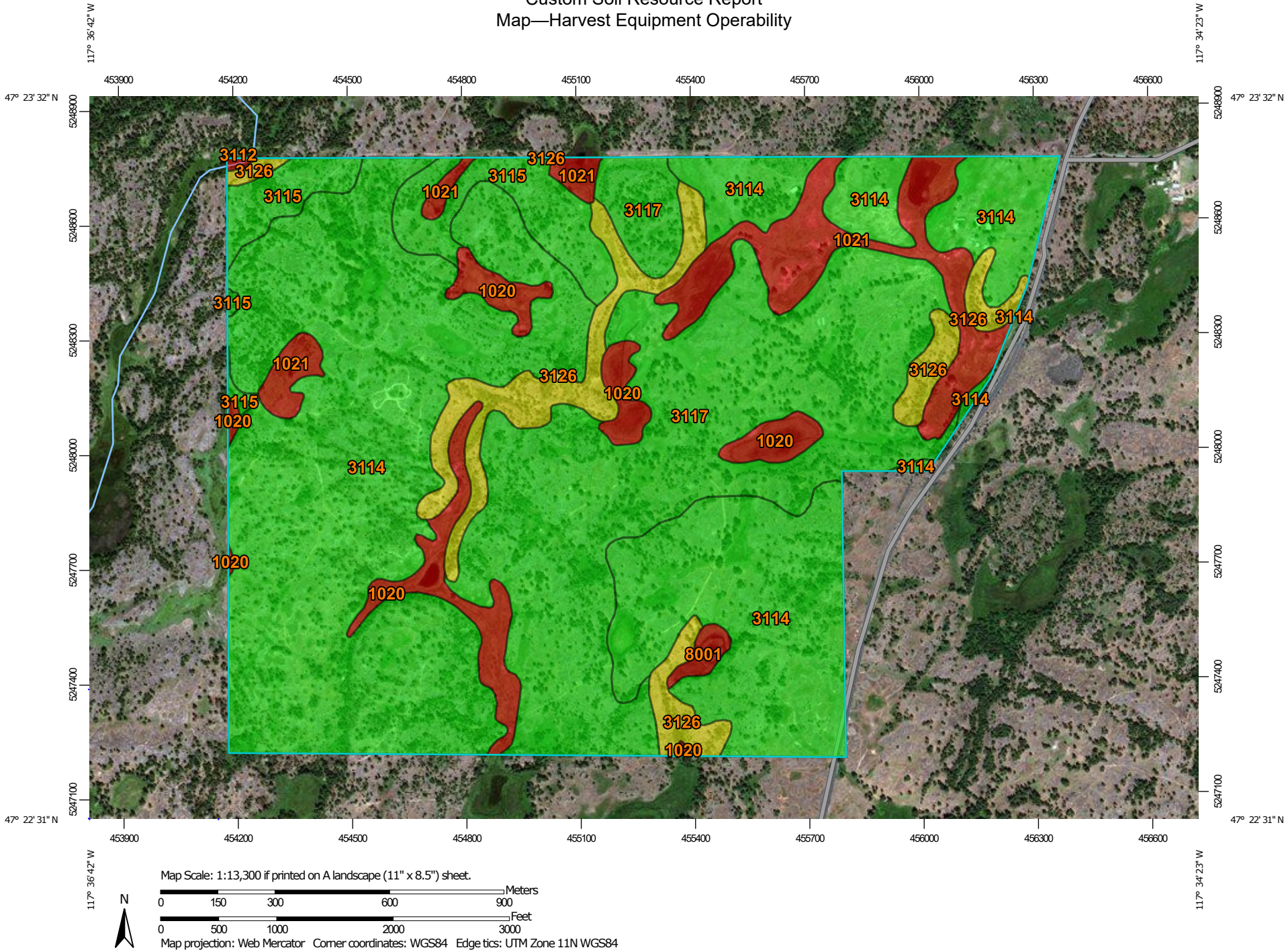
the unfavorable properties requires special design, extra maintenance, and costly alteration.

Numerical ratings 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 aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Harvest Equipment Operability



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Soil Rating Lines

- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Soil Rating Points

- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Spokane County, Washington
Survey Area Data: Version 12, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 18, 2014—Sep 8, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Harvest Equipment Operability

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1020	Cocolalla ashy silt loam, 0 to 3 percent slopes	Poorly suited	Cocolalla (80%)	Wetness (1.00)	33.8	4.7%
				Low strength (0.50)		
				Dusty (0.31)		
			Saltese (2%)	Low strength (1.00)		
				Wetness (1.00)		
				Dusty (0.31)		
1021	Cocolalla-Hardesty complex, 0 to 3 percent slopes	Poorly suited	Cocolalla (50%)	Wetness (1.00)	47.1	6.6%
				Low strength (0.50)		
				Dusty (0.31)		
			Saltese (3%)	Low strength (1.00)		
				Wetness (1.00)		
				Dusty (0.31)		
3112	Stutler gravelly ashy loam, 0 to 15 percent slopes, extremely bouldery surface	Poorly suited	Stutler, extremely bouldery surface (70%)	Rock fragments (1.00)	0.4	0.1%
				Dusty (0.13)		
			Cocolalla (5%)	Wetness (1.00)		
				Low strength (0.50)		
				Dusty (0.28)		
3114	Rockly-Fourmound complex, 0 to 15 percent slopes	Well suited	Rockly (55%)	Dusty (0.20)	354.5	49.6%
			Northstar (8%)	Dusty (0.18)		
3115	Northstar-Rock outcrop complex, 3 to 15 percent slopes	Well suited	Northstar (50%)	Dusty (0.18)	35.6	5.0%
			Rockly (5%)	Dusty (0.20)		
			Stutler (4%)	Dusty (0.24)		
3117	Northstar-Rock outcrop-Rockly complex, 0 to 15 percent slopes	Well suited	Northstar (30%)	Dusty (0.18)	192.8	27.0%
			Rockly (20%)	Dusty (0.20)		
3126	Rock outcrop-Northstar complex, 15 to 30 percent slopes	Moderately suited	Northstar (35%)	Slope (0.50)	47.7	6.7%
				Dusty (0.18)		
			Speigle (10%)	Low strength (0.50)		
				Slope (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Dusty (0.18)		
			Fourmound (5%)	Low strength (0.50)		
				Dusty (0.31)		
8001	Saltese muck, 0 to 3 percent slopes	Poorly suited	Saltese (80%)	Low strength (1.00)	3.0	0.4%
				Wetness (1.00)		
				Dusty (0.24)		
			Cocolalla (10%)	Wetness (1.00)		
				Low strength (0.50)		
				Dusty (0.24)		
Totals for Area of Interest					**714.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Well suited	582.9	81.5%
Poorly suited	84.3	11.8%
Moderately suited	47.7	6.7%
Totals for Area of Interest	**714.9**	**100.0%**

Rating Options—Harvest Equipment Operability

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Suitability for Roads (Natural Surface) (WA)

The ratings in this interpretation indicate the suitability for using the natural surface of the soil for roads. The ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification of the soil, depth to a water table, ponding, flooding, and the hazard of soil slippage.

The ratings are both verbal and numerical. The soils are described as "well suited," "moderately suited," or "poorly suited" to this use. "Well suited" indicates that the soil has features that are favorable for the specified kind of roads 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 kind of roads. 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

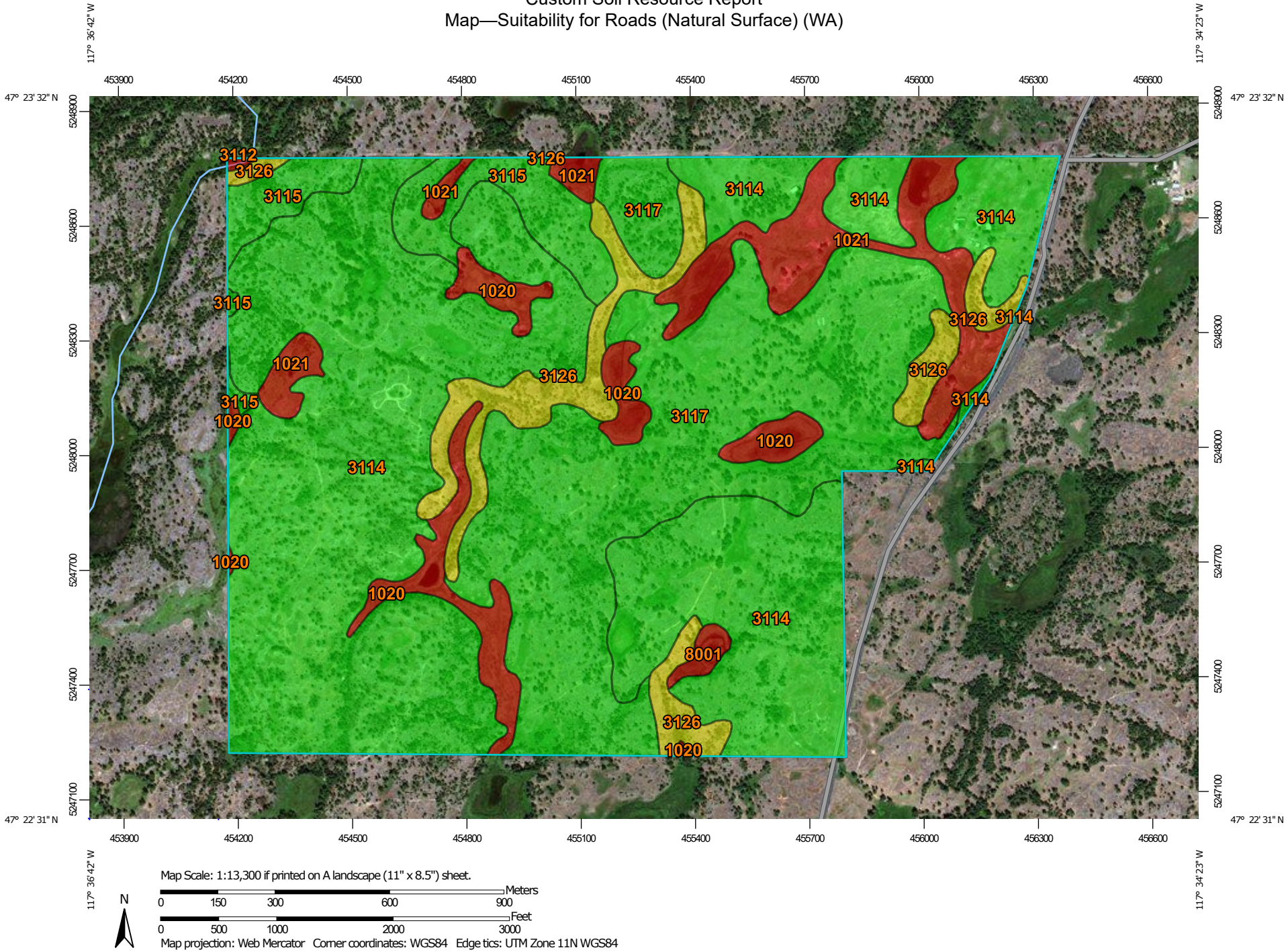
unfavorable for the specified kind of roads. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration.

Numerical ratings 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 aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Suitability for Roads (Natural Surface) (WA)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Poorly suited

Moderately suited

Well suited

Not rated or not available

Soil Rating Lines

Poorly suited

Moderately suited

Well suited

Not rated or not available

Soil Rating Points

Poorly suited

Moderately suited

Well suited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Spokane County, Washington
Survey Area Data: Version 12, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 18, 2014—Sep 8, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Suitability for Roads (Natural Surface) (WA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1020	Cocolalla ashy silt loam, 0 to 3 percent slopes	Poorly suited	Cocolalla (80%)	Ponding (1.00)	33.8	4.7%
				Flooding (1.00)		
				Low strength (0.50)		
			Saltese (2%)	Low strength (1.00)		
				Ponding (1.00)		
				Wetness (0.50)		
1021	Cocolalla-Hardesty complex, 0 to 3 percent slopes	Poorly suited	Cocolalla (50%)	Ponding (1.00)	47.1	6.6%
				Flooding (1.00)		
				Low strength (0.50)		
			Saltese (3%)	Low strength (1.00)		
				Ponding (1.00)		
				Wetness (0.50)		
3112	Stutler gravelly ashy loam, 0 to 15 percent slopes, extremely bouldery surface	Poorly suited	Stutler, extremely bouldery surface (70%)	Rock fragments (1.00)	0.4	0.1%
			Cocolalla (5%)	Ponding (1.00)		
				Flooding (1.00)		
				Low strength (0.50)		
3114	Rockly-Fourmound complex, 0 to 15 percent slopes	Well suited	Rockly (55%)		354.5	49.6%
3115	Northstar-Rock outcrop complex, 3 to 15 percent slopes	Well suited	Northstar (50%)		35.6	5.0%
			Rockly (5%)			
3117	Northstar-Rock outcrop-Rockly complex, 0 to 15 percent slopes	Well suited	Northstar (30%)		192.8	27.0%
			Rockly (20%)			
3126	Rock outcrop-Northstar complex, 15 to 30 percent slopes	Moderately suited	Northstar (35%)	Slope (0.50)	47.7	6.7%
			Speigle (10%)	Slope (0.50)		
				Low strength (0.50)		
			Fourmound (5%)	Low strength (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
8001	Saltese muck, 0 to 3 percent slopes	Poorly suited	Saltese (80%)	Low strength (1.00)	3.0	0.4%
				Ponding (1.00)		
				Wetness (1.00)		
			Cocolalla (10%)	Ponding (1.00)		
				Flooding (1.00)		
				Low strength (0.50)		
Totals for Area of Interest					**714.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Well suited	582.9	81.5%
Poorly suited	84.3	11.8%
Moderately suited	47.7	6.7%
Totals for Area of Interest	**714.9**	**100.0%**

Rating Options—Suitability for Roads (Natural Surface) (WA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Potential for Seedling Mortality

The ratings in this interpretation indicate the likelihood of death of naturally or artificially propagated tree seedlings, as influenced by soil characteristics, physiographic features, and climatic conditions. Considered in the ratings are flooding, ponding, depth to a water table, content of lime, reaction, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope.

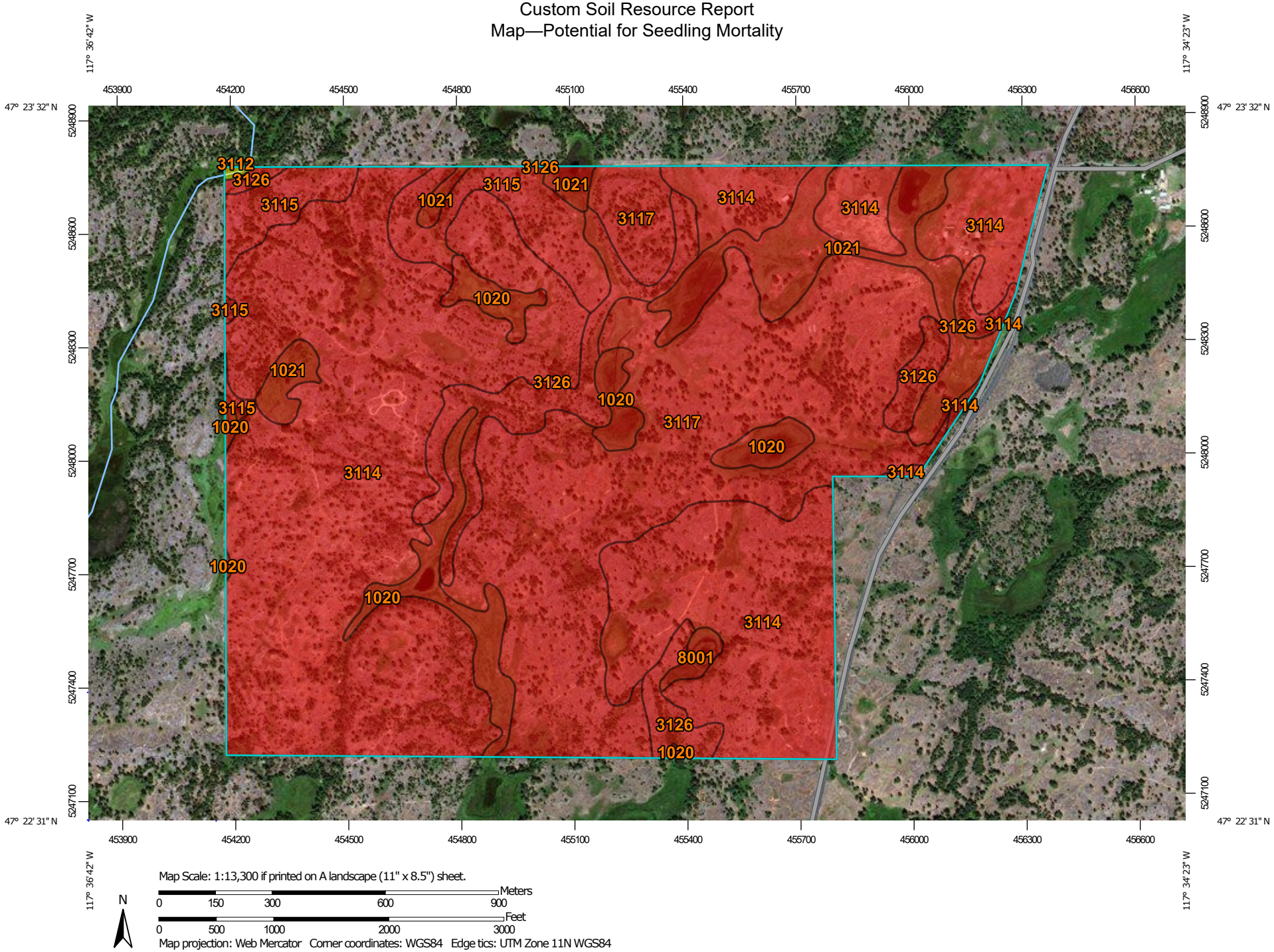
The ratings are both verbal and numerical. The soils are described as having a "low," "moderate," or "high" potential for seedling mortality. "Low" indicates that seedling mortality is unlikely. Good performance can be expected, and little or no maintenance is needed. "Moderate" indicates that seedling mortality can occur because one or more soil properties are less than desirable. Fair performance can be expected, and some maintenance is needed. "High" indicates that seedling mortality can occur because of one or more soil properties and that overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration.

Numerical ratings indicate gradations between the point at which the potential for seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Potential for Seedling Mortality



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Moderate

Low

Not rated or not available

Soil Rating Lines

High

Moderate

Low

Not rated or not available

Soil Rating Points

High

Moderate

Low

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Spokane County, Washington
Survey Area Data: Version 12, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 18, 2014—Sep 8, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Potential for Seedling Mortality

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1020	Cocolalla ashy silt loam, 0 to 3 percent slopes	High	Cocolalla (80%)	Wetness (1.00)	33.8	4.7%
			Rockly (3%)	Available water (1.00)		
			Northstar (3%)	Available water (1.00)		
			Saltese (2%)	Wetness (1.00)		
1021	Cocolalla-Hardesty complex, 0 to 3 percent slopes	High	Cocolalla (50%)	Wetness (1.00)	47.1	6.6%
			Rockly (4%)	Available water (1.00)		
			Saltese (3%)	Wetness (1.00)		
			Northstar (1%)	Available water (1.00)		
3112	Stutler gravelly ashy loam, 0 to 15 percent slopes, extremely bouldery surface	Moderate	Stutler, extremely bouldery surface (70%)	Available water (0.50)	0.4	0.1%
3114	Rockly-Fourmound complex, 0 to 15 percent slopes	High	Rockly (55%)	Available water (1.00)	354.5	49.6%
			Northstar (8%)	Available water (1.00)		
			Cocolalla (4%)	Wetness (1.00)		
3115	Northstar-Rock outcrop complex, 3 to 15 percent slopes	High	Northstar (50%)	Available water (1.00)	35.6	5.0%
			Rockly (5%)	Available water (1.00)		
			Cocolalla (4%)	Wetness (1.00)		
3117	Northstar-Rock outcrop-Rockly complex, 0 to 15 percent slopes	High	Northstar (30%)	Available water (1.00)	192.8	27.0%
			Rockly (20%)	Available water (1.00)		
			Cocolalla (5%)	Wetness (1.00)		
3126	Rock outcrop-Northstar complex, 15 to 30 percent slopes	High	Northstar (35%)	Available water (1.00)	47.7	6.7%
			Speigle (10%)	Available water (1.00)		
			Rockly (5%)	Available water (1.00)		
8001	Saltese muck, 0 to 3 percent slopes	High	Saltese (80%)	Wetness (1.00)	3.0	0.4%
			Cocolalla (10%)	Wetness (1.00)		
Totals for Area of Interest					**714.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
High	714.5	99.9%
Moderate	0.4	0.1%
Totals for Area of Interest	**714.9**	**100.0%**

Rating Options—Potential for Seedling Mortality

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Vegetative Productivity

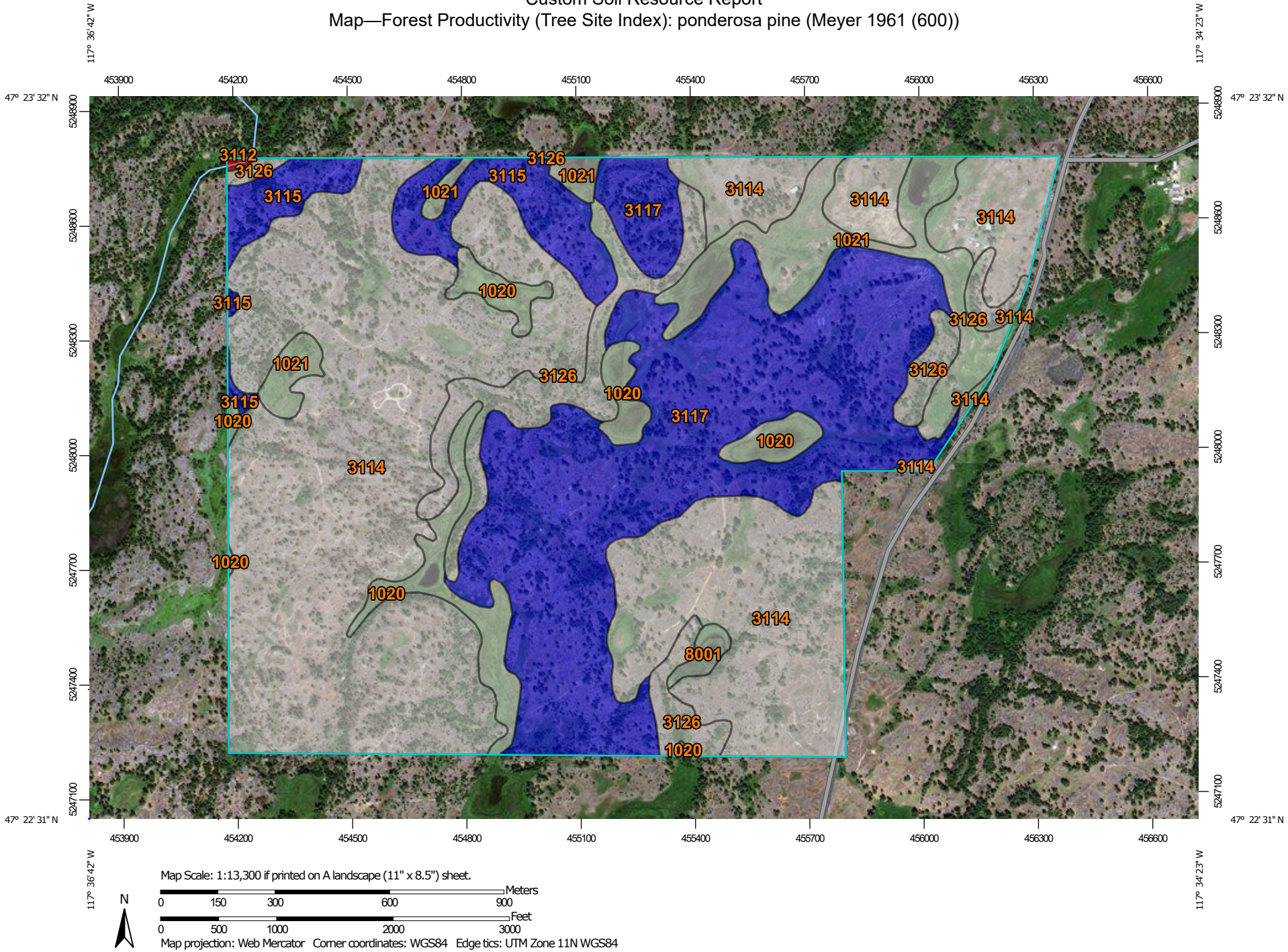
Vegetative productivity includes estimates of potential vegetative production for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture and rangeland. In the underlying database, some states maintain crop yield data by individual map unit component. Other states maintain the data at the map unit level. Attributes are included for both, although only one or the other is likely to contain data for any given geographic area. For other land uses, productivity data is shown only at the map unit component level. Examples include potential crop yields under irrigated and nonirrigated conditions, forest productivity, forest site index, and total rangeland production under of normal, favorable and unfavorable conditions.

Forest Productivity (Tree Site Index): ponderosa pine (Meyer 1961 (600))

The "site index" is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this attribute, only the representative value is used.

Map—Forest Productivity (Tree Site Index): ponderosa pine (Meyer 1961 (600))



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 64
- > 64 and <= 73
- Not rated or not available

Soil Rating Lines

- <= 64
- > 64 and <= 73
- Not rated or not available

Soil Rating Points

- <= 64
- > 64 and <= 73
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Spokane County, Washington
Survey Area Data: Version 12, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 18, 2014—Sep 8, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Forest Productivity (Tree Site Index): ponderosa pine (Meyer 1961 (600))

Map unit symbol	Map unit name	Rating (feet)	Acres in AOI	Percent of AOI
1020	Cocolalla ashy silt loam, 0 to 3 percent slopes		33.8	4.7%
1021	Cocolalla-Hardesty complex, 0 to 3 percent slopes		47.1	6.6%
3112	Stutler gravelly ashy loam, 0 to 15 percent slopes, extremely bouldery surface	64	0.4	0.1%
3114	Rockly-Fourmound complex, 0 to 15 percent slopes		354.5	49.6%
3115	Northstar-Rock outcrop complex, 3 to 15 percent slopes	73	35.6	5.0%
3117	Northstar-Rock outcrop-Rockly complex, 0 to 15 percent slopes	73	192.8	27.0%
3126	Rock outcrop-Northstar complex, 15 to 30 percent slopes		47.7	6.7%
8001	Saltese muck, 0 to 3 percent slopes		3.0	0.4%
Totals for Area of Interest			**714.9**	**100.0%**

Rating Options—Forest Productivity (Tree Site Index): ponderosa pine (Meyer 1961 (600))

Units of Measure: feet

Tree: ponderosa pine

Site Index Base: Meyer 1961 (600)

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf