

LOCATION CASCADE OR

Established Series
Rev. GLG
07/1999

CASCADE SERIES

The Cascade series consists of moderately deep to a fragipan, somewhat poorly drained soils that formed in silty materials. Cascade soils are on uplands and have slopes of 3 to 60 percent. The mean annual precipitation is about 60 inches and the mean annual air temperature is about 52 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Humic Fragixerepts

TYPICAL PEDON: Cascade silt loam, woodland. (Colors are for moist soil unless otherwise noted.)

A--0 to 8 inches; dark brown (7.5YR 3/2) silt loam, brown (10YR 5/3) dry; strong fine granular and very fine subangular blocky structure; friable, slightly sticky and slightly plastic; many very fine and few fine to coarse roots; many very fine pores; 10 percent fine concretions; 10 percent gravel; moderately acid (pH 6.0); clear smooth boundary. (5 to 10 inches thick)

Bw1--8 to 16 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate fine subangular blocky structure; friable, slightly hard, slightly sticky and slightly plastic; common very fine roots; many very fine pores; 5 percent fine concretions; moderately acid (pH 5.9); clear wavy boundary. (5 to 9 inches thick)

Bw2--16 to 27 inches; dark brown (7.5YR 3/4) silt loam, brown (7.5YR 5/4) dry; moderate fine subangular blocky structure; friable, slightly hard, slightly sticky and slightly plastic; few fine and coarse roots; many very fine pores; common fine concretions and very firm peds; moderately acid (pH 5.6); clear wavy boundary. (6 to 12 inches thick)

2Bx--27 to 35 inches; dark brown (7.5YR 4/4) silt loam, light yellowish brown (10YR 6/4) dry; 10 percent brown (7.5YR 5/2) silt loam tongues with strong brown (7.5YR 5/6) redox features at the margins; weak coarse prismatic structure parting to moderate fine subangular blocky; firm, brittle, hard, slightly sticky and moderately plastic; few fine and medium roots; many very fine pores; few fine concretions; few fine black stains; strongly acid (pH 5.3); clear wavy boundary. (6 to 10 inches thick)

2Btx1--35 to 45 inches; dark brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; 20 percent brown (7.5YR 5/2) tongues with brown and strong brown (7.5YR 5/4 and 5/6) redox features at the margins; weak coarse prismatic and weak medium blocky structure; very firm brittle, very hard, slightly sticky and moderately plastic; few very fine roots; few very fine pores; few faint and distinct clay films in pores and on faces of peds; common medium and coarse black stains; strongly acid (pH 5.3); clear irregular boundary. (5 to 15 inches thick)

2Btx2--45 to 60 inches; dark brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; 10 percent brown (7.5YR 5/2) tongues with brown and strong brown (7.5YR 5/4 and 5/6) redox features at the margins; weak coarse prismatic structure; very firm, brittle, very hard, slightly sticky and slightly plastic; few very fine pores; few faint and distinct clay films on faces of peds; few fine black stains; moderately acid (pH 5.8).

TYPE LOCATION: Multnomah County, Oregon; 7 miles northwest of Portland and about 25 feet north of Skyline Blvd; SW1/4 SE1/4 NE1/4 section 10, T. 2 N., R. 2 W.

RANGE IN CHARACTERISTICS: The profiles are usually moist but are dry throughout between depths of 4 and 12 inches for about 45 to 60 consecutive days during the summer. The mean annual soil temperature ranges

from 52 to 56 degrees F. The thickness of the solum and depth to the fragipan range from 20 to 30 inches. There is a perched water table over the fragipan during the winter. The umbric epipedon ranges in thickness from 10 to 19 inches. Very stony silty clay loam textures occur below 30 inches in some areas. Soil reaction ranges from strongly or moderately acid throughout the solum.

The A horizon has hue of 7.5YR or 10YR and chroma of 2 or 3 moist.

The Bw horizon has hue of 10YR or 7.5YR, value of 3 or 4 moist, 5 or 6 dry and chroma of 3 or 4 moist and dry. It is silt loam or silty clay loam with 18 to 30 percent clay and less than 10 percent coarser than very fine sand.

The fragipan (Bx and Btx) has redox features and tongues with chroma of 2 or less and ranges from 2 to over 4 feet thick. It is silt loam or silty clay loam, firm or very firm and hard or very hard. Clay films are few or common and faint or distinct on the fractures and in pores in the fragipan. Few rock fragments of basalt are at or near the upper boundary of the fragipan. In some areas a buried strong silty clay loam occurs below 30 inches.

COMPETING SERIES: These are the Bornstedt, Delena, Goble, Kinton and Powell series in a similar family. Bornstedt soils have ochric epipedons and heavy silty clay loam B horizons and clayey fragipans with less than 35 percent base saturation. Delena soils have an aquic moisture regime. Goble soils have a udic moisture regime, have evidence of amorphous clays and are 30 to 45 inches deep to the fragipan. Kinton soils have ochric epipedons and lack mottles above depth of 30 inches.

GEOGRAPHIC SETTING: The Cascade soils are on smooth or rolling, convex, long slopes and ridgetops at elevations of 250 to 1,400 feet. Slopes range from 3 to 60 percent. The soils formed in loess-like materials. The climate is humid temperate with cool moist winters and warm dry summers. The mean July temperature is 67 degrees F., mean January temperature is 39 degrees F., and mean annual temperature is 50 to 54 degrees F. Mean annual precipitation is 50 to 60 inches. Frost-free period is 165 to 210 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Goble, Kinton and Delena soils and the Helvetia soils. Helvetia soils have argillic horizons and lack fragipans.

DRAINAGE AND PERMEABILITY: Somewhat poorly drained; slow to rapid runoff; slow permeability.

USE AND VEGETATION: Small grain, grass seed, hay, pasture, some berries and woodland. Native vegetation is Douglas-fir, big leaf maple, salal, red huckleberry, vine maple, swordfern, grasses and weeds.

DISTRIBUTION AND EXTENT: Northwestern Oregon; MLRA 2. The soil is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Multnomah County, Oregon, 1919.

REMARKS: Diagnostic horizons and other features:

Umbric epipedon - from 0 to 16 inches
Fragipan - from 27 to 60 inches
Cambic horizon - from 16 to 27 inches

ADDITIONAL DATA: Characterization data on two profiles (S70 Oreg-26-6, 7) reported in Riverside Soil Survey Laboratory computer printouts for soils sampled in Multnomah, Clackamas and Washington Counties, Oregon, 1971. Percent clay in the control section based on 15-bar water values of about 9 to 13 percent.

National Cooperative Soil Survey
U.S.A.

LOCATION CASCADE OR

Established Series
Rev. GLG
07/1999

CASCADE SERIES

The Cascade series consists of moderately deep to a fragipan, somewhat poorly drained soils that formed in silty materials. Cascade soils are on uplands and have slopes of 3 to 60 percent. The mean annual precipitation is about 60 inches and the mean annual air temperature is about 52 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Humic Fragixerepts

TYPICAL PEDON: Cascade silt loam, woodland. (Colors are for moist soil unless otherwise noted.)

A--0 to 8 inches; dark brown (7.5YR 3/2) silt loam, brown (10YR 5/3) dry; strong fine granular and very fine subangular blocky structure; friable, slightly sticky and slightly plastic; many very fine and few fine to coarse roots; many very fine pores; 10 percent fine concretions; 10 percent gravel; moderately acid (pH 6.0); clear smooth boundary. (5 to 10 inches thick)

Bw1--8 to 16 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate fine subangular blocky structure; friable, slightly hard, slightly sticky and slightly plastic; common very fine roots; many very fine pores; 5 percent fine concretions; moderately acid (pH 5.9); clear wavy boundary. (5 to 9 inches thick)

Bw2--16 to 27 inches; dark brown (7.5YR 3/4) silt loam, brown (7.5YR 5/4) dry; moderate fine subangular blocky structure; friable, slightly hard, slightly sticky and slightly plastic; few fine and coarse roots; many very fine pores; common fine concretions and very firm peds; moderately acid (pH 5.6); clear wavy boundary. (6 to 12 inches thick)

2Bx--27 to 35 inches; dark brown (7.5YR 4/4) silt loam, light yellowish brown (10YR 6/4) dry; 10 percent brown (7.5YR 5/2) silt loam tongues with strong brown (7.5YR 5/6) redox features at the margins; weak coarse prismatic structure parting to moderate fine subangular blocky; firm, brittle, hard, slightly sticky and moderately plastic; few fine and medium roots; many very fine pores; few fine concretions; few fine black stains; strongly acid (pH 5.3); clear wavy boundary. (6 to 10 inches thick)

2Btx1--35 to 45 inches; dark brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; 20 percent brown (7.5YR 5/2) tongues with brown and strong brown (7.5YR 5/4 and 5/6) redox features at the margins; weak coarse prismatic and weak medium blocky structure; very firm brittle, very hard, slightly sticky and moderately plastic; few very fine roots; few very fine pores; few faint and distinct clay films in pores and on faces of peds; common medium and coarse black stains; strongly acid (pH 5.3); clear irregular boundary. (5 to 15 inches thick)

2Btx2--45 to 60 inches; dark brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; 10 percent brown (7.5YR 5/2) tongues with brown and strong brown (7.5YR 5/4 and 5/6) redox features at the margins; weak coarse prismatic structure; very firm, brittle, very hard, slightly sticky and slightly plastic; few very fine pores; few faint and distinct clay films on faces of peds; few fine black stains; moderately acid (pH 5.8).

TYPE LOCATION: Multnomah County, Oregon; 7 miles northwest of Portland and about 25 feet north of Skyline Blvd; SW1/4 SE1/4 NE1/4 section 10, T. 2 N., R. 2 W.

RANGE IN CHARACTERISTICS: The profiles are usually moist but are dry throughout between depths of 4 and 12 inches for about 45 to 60 consecutive days during the summer. The mean annual soil temperature ranges

from 52 to 56 degrees F. The thickness of the solum and depth to the fragipan range from 20 to 30 inches. There is a perched water table over the fragipan during the winter. The umbric epipedon ranges in thickness from 10 to 19 inches. Very stony silty clay loam textures occur below 30 inches in some areas. Soil reaction ranges from strongly or moderately acid throughout the solum.

The A horizon has hue of 7.5YR or 10YR and chroma of 2 or 3 moist.

The Bw horizon has hue of 10YR or 7.5YR, value of 3 or 4 moist, 5 or 6 dry and chroma of 3 or 4 moist and dry. It is silt loam or silty clay loam with 18 to 30 percent clay and less than 10 percent coarser than very fine sand.

The fragipan (Bx and Btx) has redox features and tongues with chroma of 2 or less and ranges from 2 to over 4 feet thick. It is silt loam or silty clay loam, firm or very firm and hard or very hard. Clay films are few or common and faint or distinct on the fractures and in pores in the fragipan. Few rock fragments of basalt are at or near the upper boundary of the fragipan. In some areas a buried strong silty clay loam occurs below 30 inches.

COMPETING SERIES: These are the Bornstedt, Delena, Goble, Kinton and Powell series in a similar family. Bornstedt soils have ochric epipedons and heavy silty clay loam B horizons and clayey fragipans with less than 35 percent base saturation. Delena soils have an aquic moisture regime. Goble soils have a udic moisture regime, have evidence of amorphous clays and are 30 to 45 inches deep to the fragipan. Kinton soils have ochric epipedons and lack mottles above depth of 30 inches.

GEOGRAPHIC SETTING: The Cascade soils are on smooth or rolling, convex, long slopes and ridgetops at elevations of 250 to 1,400 feet. Slopes range from 3 to 60 percent. The soils formed in loess-like materials. The climate is humid temperate with cool moist winters and warm dry summers. The mean July temperature is 67 degrees F., mean January temperature is 39 degrees F., and mean annual temperature is 50 to 54 degrees F. Mean annual precipitation is 50 to 60 inches. Frost-free period is 165 to 210 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Goble, Kinton and Delena soils and the Helvetia soils. Helvetia soils have argillic horizons and lack fragipans.

DRAINAGE AND PERMEABILITY: Somewhat poorly drained; slow to rapid runoff; slow permeability.

USE AND VEGETATION: Small grain, grass seed, hay, pasture, some berries and woodland. Native vegetation is Douglas-fir, big leaf maple, salal, red huckleberry, vine maple, swordfern, grasses and weeds.

DISTRIBUTION AND EXTENT: Northwestern Oregon; MLRA 2. The soil is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Multnomah County, Oregon, 1919.

REMARKS: Diagnostic horizons and other features:

Umbric epipedon - from 0 to 16 inches

Fragipan - from 27 to 60 inches

Cambic horizon - from 16 to 27 inches

ADDITIONAL DATA: Characterization data on two profiles (S70 Oreg-26-6, 7) reported in Riverside Soil Survey Laboratory computer printouts for soils sampled in Multnomah, Clackamas and Washington Counties, Oregon, 1971. Percent clay in the control section based on 15-bar water values of about 9 to 13 percent.

National Cooperative Soil Survey
U.S.A.

Multnomah County Area, Oregon

7D—Cascade silt loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 22cs
Elevation: 250 to 1,400 feet
Mean annual precipitation: 50 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cascade and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cascade

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 27 inches: silt loam
H3 - 27 to 60 inches: silt loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 30 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

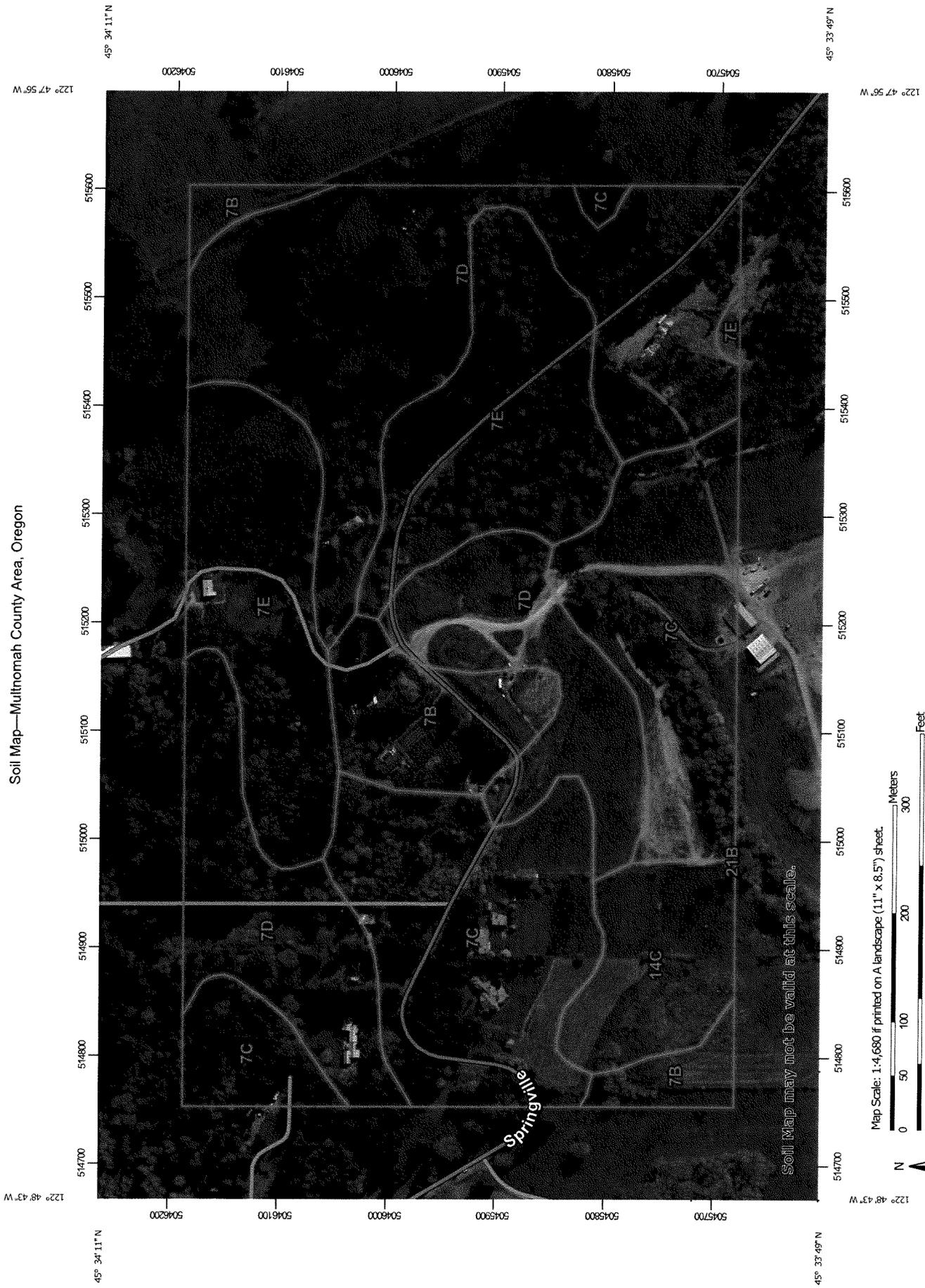
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F002XB005OR - Loess Hill Group
Forage suitability group: Somewhat Poorly Drained (G002XY005OR)
Other vegetative classification: Somewhat Poorly Drained (G002XY005OR)

Hydric soil rating: No

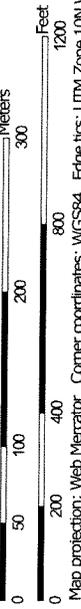
Data Source Information

Soil Survey Area: Multnomah County Area, Oregon
Survey Area Data: Version 21, Sep 14, 2022

Soil Map—Multnomah County Area, Oregon



Map Scale: 1:4,680 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

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
- 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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Multnomah County Area, Oregon
 Survey Area Data: Version 21, Sep 14, 2022

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

Date(s) aerial images were photographed: Apr 16, 2021—Apr 18, 2021

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
7B	Cascade silt loam, 3 to 8 percent slopes	8.4	7.8%
7C	Cascade silt loam, 8 to 15 percent slopes	29.2	27.2%
7D	Cascade silt loam, 15 to 30 percent slopes	40.7	38.0%
7E	Cascade silt loam, 30 to 60 percent slopes	22.9	21.3%
14C	Delena silt loam, 3 to 12 percent slopes	6.0	5.6%
21B	Helvetia silt loam, 3 to 8 percent slopes	0.0	0.0%
Totals for Area of Interest		107.1	100.0%