

Ecological site R002XN502WA

Xeric Prairie

Last updated: 12/09/2024
Accessed: 05/11/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.



Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 002X–Willamette and Puget Sound Valleys

Major Land Resource Area-[MLRA][LRU]: 002X N Willamette and Puget Sound Valleys, North Puget. The Land Resource Unit (LRU) is described in detail in the reference Washington NRCS Pasture TN-101 Forage Zones available on the eFOTG. For more information on MLRA's, refer to the following web site: http://www.essc.psu.edu/soil_info/soil_lrr/. Additional information on Common Resource Areas is available on the eFOTG for NRCS Washington: http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=WA and the following website: <http://soils.usda.gov/survey/geography/cra.html>. This ecological site occurs in the following Common Resource Areas: 2.10 - Fraser Lowland; 2.11 - Eastern Puget Riverine Lowlands; 2.11 - Eastern Puget Mountain River Valleys; 2.12 - San Juan Islands; 2.13 - Olympic Rainshadow; 2.5 - Eastern Puget Uplands; and 2.6 - Central Puget Lowland

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

Occurs on gentle slopes or flats, part of rolling or planar glacial landforms.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Till plain (3) Beach terrace
Flooding frequency	None
Ponding frequency	None
Elevation	0–220 ft
Slope	0–20%
Aspect	SE, S, SW

Climatic features

The average annual precipitation ranges from 18 to 60 inches, although most areas range from 30 to 50 inches. Annual precipitation less than 30 inches occurs in the rainshadow of the Olympic Mountains along the western border of this area and in the San Juan Islands. Higher average annual precipitation, 50 to 60 inches, occurs next to the foothills of the surrounding mountains. Most of the precipitation occurs as low intensity, Pacific frontal storms. The distribution is 75% in the fall and winter, 15% in the spring and 10% in the summer. Rain turns to snow at the higher elevations, although accumulations are usually small and of short duration. The number of days with snow on the ground varies from 0 to 9, with an average of 3 days. Summers are cool and dry. Recorded temperature extremes range from -1 degrees to 107 degrees fahrenheit. See the climate tables in this document for information on temperatures and frost-free periods.

Table 3. Representative climatic features

Frost-free period (average)	202 days
Freeze-free period (average)	258 days
Precipitation total (average)	39 in

Influencing water features

Soil features

Landscape Position: The soils that support this native plant community typically occur on outwash plains. The soils are generally deep, coarse textured soils with good internal drainage with very dark A horizons in the soil profile. They often contain significant amounts of sand. Soils may be deep sandy loam outwash or somewhat shallow gravelly loam glacial till.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Gravelly loam (3) Coarse sandy loam
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to moderately well drained
Permeability class	Moderate to moderately rapid
Soil depth	20–40 in
Surface fragment cover <=3"	0–10%

Surface fragment cover >3"	0%
Available water capacity (0-40in)	1.6–3.4 in
Soil reaction (1:1 water) (0-40in)	5.5–6.5
Subsurface fragment volume <=3" (Depth not specified)	0–46%
Subsurface fragment volume >3" (Depth not specified)	0–2%

Ecological dynamics

Native prairies and introduced grassland communities are maintained by both biotic and abiotic pressures. Fire, both human and lightning caused, was an influence on development of all the prairie soils, regardless of location. Human caused fires were periodic, used to stimulate the growth of carbohydrate-rich forbs which were harvested by Native American tribes in the area. Wild game would also be attracted into the area by the nutritious regrowth of grasses and forbs. Fire also controlled invasion of woody plants which can outcompete and replace grasses and forbs as the dominant species on a site. Human influence continues to be a major factor affecting these grassland communities, as farming, livestock grazing, conversion to woodland, reduction of fire occurrence, removal of active management, and development of home sites all have significant effects on both native and introduced grassland communities.

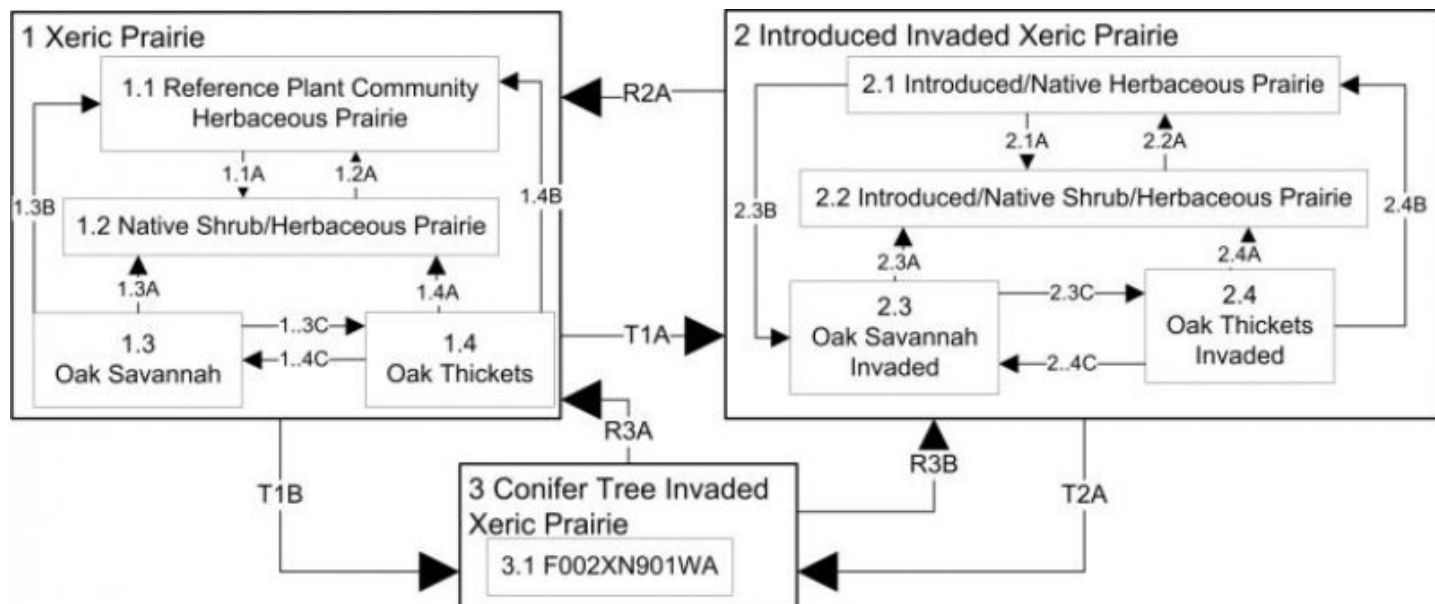
Typical native plant species found on the site include Roemer's fescue (*Festuca idahoensis* v. *roemeri*), camas (*Camassia quamash*), Blue Wildrye (*Elymus glaucus*), Slender Wheatgrass (*Elymus trachycaulus*), common wooley sunflower (*Eriophyllum lanatum*), field chickweed (*Cerastium arvense* ssp *strictum*) and Oregon White Oak (*Quercus garryana*).

Some disturbance is natural in these plant communities, including: fire, both natural and human caused; soil perturbation resulting from causes such as small mammals, earthworms, root activity; freeze-thaw cycles; and harvest of bulbs and rhizomes; and wildlife grazing. Disturbances can be reduced or eliminated through actions such as fire control, or cessation of activities such as mowing, soil disturbance, livestock grazing or vehicle access. If no disturbance occurs, this plant community will be invaded by shrub and tree species. Typical shrub and tree species include snowberry, rose, Douglas fir and lodgepole pine. Disturbance will affect the different plant classes in varying ways. Timing of disturbance will also affect shifts in plant communities. The Disturbance Effects Table (below) summarizes some of these effects.

If nonnative species are present in the area, these will invade the site whether or not disturbance is maintained, increased, or eliminated. Their dominance in the community will be affected by the type and intensity of disturbance, as will the dominance of the different plant classes. If disturbance such as tillage, herbicide use, or intensive vehicle traffic eliminates the plant community, then a nonnative plant community will be established, either through planting, or invasion of introduced seral species.

Restoration – It's possible to reestablish plant communities on suitable soils. Native species can be replanted and the site managed to maintain or increase the percentage cover of these species. The Disturbance Effects table lists appropriate types of disturbance to help establish the desired plant community. If nonnatives are present on the site, there will always be a presence in the community as these species are adapted to a wide range of soils, climates and disturbance regimes. However, the management of disturbance types can affect the balance of species on a site.

State and transition model



LEGEND

1.1A, 2.1A, T1B, T2A = No Fire or Other Disturbance

T1A = Overuse & Other Disturbance

1.2A, 1.3A, 1.4A, 1.4B, 2.3A, 2.4A, 2.2A, 1.3B, 2.3B = Fire or Brush Control or Other Disturbance

R2A = Restoration

R3A = Tree Removal & Restoration

1.4C, 2.4C, R3B = Tree Removal

1.3C, 2.3C = Death removal of old trees with resprouting

Disturbance Effects on Plant Classes

Disturbance type	Grasses	Forbs	Grass-like	Palatable shrubs	Unpalatable shrubs	Trees
Fire, periodic	M	E	D	D	D	D
Fire, frequent	D	E	D	D	D	D
Soil perturbation	E	E	E	E	E	D
Soil inversion	D	D	D	D	D	D
Managed livestock grazing	D	E	D	D	E	D
Grazing during spring bloom of native species	D	D	E	E	E	E
Overgrazing	D	D	E	D	E	D
Wildlife grazing	E	D	E	D	E	M
Light vehicle traffic	M	M	M	D	D	D
Excessive vehicle traffic	D	D	D	D	D	D
Grass specific herbicides	D	E	E	E	E	E
Forb & Shrub specific herbicides	E	D	E	D	D	E
Non specific herbicides	D	D	D	D	D	E

Effect: E = Enhance/Increase; D = Decrease; M = Maintain

State 1
Reference

Community 1.1
Herbaceous Prairie



Figure 6. Roemers fescue Community



Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	660	825	990
Forb	480	600	720
Shrub/Vine	48	60	72
Tree	12	15	18
Total	1200	1500	1800

Figure 8. Plant community growth curve (percent production by month).
WA0222, Droughty. Droughty or limited depth soils (available water-holding capacity generally < 4.5"/40" soil depth).

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	8	15	23	19	17	5	1	1	5	3	1

Community 1.2
Native Shrub and Herbaceous Prairie

Community 1.3
Oak Savanna

Community 1.4
Oak Thickets

Pathway 1.1A

Community 1.1 to 1.2

No fire or other disturbance – This pathway/transition occurs when disturbances, either natural or man-made, are reduced or eliminated through actions such as fire control, or cessation of activities such as mowing, soil perturbation grazing or vehicle access

Pathway 1.2A

Community 1.2 to 1.1

Fire, Brush Control or Other Disturbance – This pathway occurs when controlled disturbance is restored to the system, through methods such as prescribed fire, brush control, invasive plant control, mowing, thatching, grazing, and/or soil aeration.

Pathway 1.3B

Community 1.3 to 1.1

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

Pathway 1.3A

Community 1.3 to 1.2

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

Pathway 1.4B

Community 1.4 to 1.1

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

Pathway 1.4A

Community 1.4 to 1.2

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

State 2

Introduced Invaded

These sites generally occur on coarse-textured soils with good internal drainage, oak occurs on aspects protected from strong marine winds and regenerates slowly. Vegetation is composed of a mixture of non-native and native plant species.

Community 2.1

Introduced and Native Herbaceous Prairie

Community 2.2

Introduced, Native Shrub, and Herbaceous Prairie

Community 2.3

Oak Savanna Invaded

Community 2.4

Oak Thickets Invaded

Pathway 2.1A

Community 2.1 to 2.2

No fire or other disturbance – This pathway/transition occurs when disturbances, either natural or man-made, are reduced or eliminated through actions such as fire control, or cessation of activities such as mowing, soil perturbation grazing or vehicle access.

Pathway 2.2A

Community 2.2 to 2.1

Fire, Brush Control or Other Disturbance – This pathway occurs when controlled disturbance is restored to the system, through methods such as prescribed fire, brush control, invasive plant control, mowing, thatching, grazing, and/or soil aeration.

Pathway 2.3B

Community 2.3 to 2.1

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

Pathway 2.3A

Community 2.3 to 2.2

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

Pathway 2.4B

Community 2.4 to 2.1

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

Pathway 2.4A

Community 2.4 to 2.2

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

State 3

Conifer Invaded

Community 3.1

F002XN901WA

Transition T1A

State 1 to 2

This transition occurs when uncontrolled disturbance is persistent in the system, such as: overgrazing; mowing in the wrong season, wrong height, or at the wrong frequency; vehicle use which causes vegetation damage; or too-frequent fire. In addition, non-native plant seeds or propagules or present on or near the site.

Transition T1B

State 1 to 3

No fire or other disturbance – This pathway/transition occurs when disturbances, either natural or man-made, are reduced or eliminated through actions such as fire control, or cessation of activities such as mowing, soil perturbation grazing or vehicle access.

Restoration pathway R2A

State 2 to 1

Transition T2A

State 2 to 3

No fire or other disturbance – This pathway/transition occurs when disturbances, either natural or man-made, are reduced or eliminated through actions such as fire control, or cessation of activities such as mowing, soil perturbation grazing or vehicle access.

Restoration pathway R3A

State 3 to 1

Tree Removal and Restoration – Harvest and removal of trees from the site; or girdling of trees. Additionally, removal of non-native species grass, forb and shrub species and restoration of the original plant community through methods such as prescribed fire, brush control, invasive plant control, mowing, thatching, grazing, and/or soil aeration and reseeding.

Restoration pathway R3B

State 3 to 2

Tree Removal – Harvest and removal of trees from the site; or girdling of trees.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Perennial Grasses			0	
	Lemmon's needlegrass	ACLE8	<i>Achnatherum lemmonii</i>	0	–
	California oatgrass	DACA3	<i>Danthonia californica</i>	0	–
	blue wildrye	ELGL	<i>Elymus glaucus</i>	0	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	0	–
	Roemer's fescue	FEIDR2	<i>Festuca idahoensis ssp. roemerii</i>	0	–
	red fescue	FERU2	<i>Festuca rubra</i>	0	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0	–
2	Perennial Grasslike			0	
	long-stolon sedge	CAIN9	<i>Carex inops</i>	0	–
	Pacific woodrush	LUCO6	<i>Luzula comosa</i>	0	–
3	Annual Grasses			0	
	Howell's bluegrass	POHO6	<i>Poa howellii</i>	0	–
Forb					
6	Bulbs			0	
	tapertip onion	ALAC4	<i>Allium acuminatum</i>	0	–
	crown brodiaea	BRCO3	<i>Brodiaea coronaria</i>	0	–
	large camas	CALE5	<i>Camassia leichtlinii</i>	0	–
	small camas	CAQU2	<i>Camassia quamash</i>	0	–
	checker lily	FRAFA2	<i>Fritillaria affinis var. affinis</i>	0	–
	meadow deathcamas	ZIVE	<i>Zigadenus venenosus</i>	0	–
7	Perennial Forbs/Fibrous-rooted			0	
	darkthroat shootingstar	DOPU	<i>Dodecatheon pulchellum</i>	0	–
	hookedspur violet	VIAD	<i>Viola adunca</i>	0	–

8	biscuitroots			0	
	barestem biscuitroot	LONU2	<i>Lomatium nudicaule</i>	0	–
	common lomatium	LOUT	<i>Lomatium utriculatum</i>	0	–
9	Balsamroot			0	
	deltoid balsamroot	BADE2	<i>Balsamorhiza deltoidea</i>	0	–
10	Perennial Forbs			0	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0	–
	field chickweed	CEAR4	<i>Cerastium arvense</i>	0	–
	Menzies' larkspur	DEME	<i>Delphinium menziesii</i>	0	–
	common woolly sunflower	ERLA6	<i>Eriophyllum lanatum</i>	0	–
	Virginia strawberry	FRVI	<i>Fragaria virginiana</i>	0	–
	western buttercup	RAOC	<i>Ranunculus occidentalis</i>	0	–
11	Ferns			0	
	western brackenfern	PTAQ	<i>Pteridium aquilinum</i>	0	–
12	Perennial Legume			0	
	American vetch	VIAM	<i>Vicia americana</i>	0	–
13	Annual			0	
	giant blue eyed Mary	COGR2	<i>Collinsia grandiflora</i>	0	–
14	Annual Legume			0	
	desert deervetch	LOMI	<i>Lotus micranthus</i>	0	–
	smallflower lupine	LUP03	<i>Lupinus polycarpus</i>	0	–
Shrub/Vine					
20	Shrubs			0	
	Nootka rose	RONU	<i>Rosa nutkana</i>	0	–
	common snowberry	SYAL	<i>Symphoricarpos albus</i>	0	–
Tree					
25	Tree			0	
	Pacific madrone	ARME	<i>Arbutus menziesii</i>	0	–
	lodgepole pine	PICO	<i>Pinus contorta</i>	0	–
	Douglas-fir	PSME	<i>Pseudotsuga menziesii</i>	0	–
	Oregon white oak	QUGA4	<i>Quercus garryana</i>	0	–

Contributors

Martha Chaney

Approval

Kirt Walstad, 12/09/2024

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	11/27/2024
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups** (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):

Dominant:

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence** (include which functional groups are expected to show mortality or decadence):
-

14. **Average percent litter cover (%) and depth (in):**
-

15. **Expected annual annual-production** (this is TOTAL above-ground annual-production, not just forage annual-production):
-

16. **Potential invasive (including noxious) species (native and non-native).** List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:
-

17. **Perennial plant reproductive capability:**
-