USDA Natural Resources Conservation Service

Ecological site R010XY007OR
Sodic Bottom

Accessed: 05/10/2025

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.

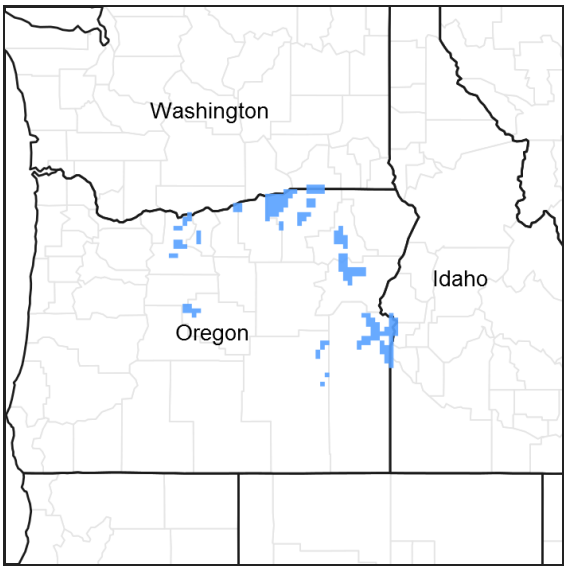


Figure 1. Mapped extent

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.

Associated sites

R010XY003OR	**Wet Meadow** Wet Meadow.
R010XY005OR	**Loamy Bottom** Loamy bottom.
R010XY008OR	**Sodic Meadow** Sodic Meadow.

Similar sites

R010XY008OR	**Sodic Meadow** Sodic Meadow (lower position, higher and longer duration water table).
R010XY005OR	**Loamy Bottom** Loamy bottom (not salt affected, higher production).

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Sarcobatus vermiculatus*

Herbaceous	(1) *Leymus cinereus* (2) *Distichlis spicata*

Physiographic features

This site occurs on low to mid-elevation floodplains of perennial streams and rivers. Slopes range from 0 to 3%. Elevation varies from 500 to 4,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Elevation	500–4,000 ft
Slope	0–3%
Aspect	Aspect is not a significant factor

Climatic features

9The annual precipitation ranges from 9 to 12 inches, which occurs in the form of snow and rain during the months of November through March. A perennial supply of subsurface moisture augments the precipitation. Localized convection storms occasionally occur during the summer. The soil temperature regime is mesic with a mean annual air temperature of 52 degrees F. Temperature extemes range from 100 to -10 degrees F. The frost-free period ranges from 90 to 180 days. The optimum growth period for native plants is from April through August.

Table 3. Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	0 days
Precipitation total (average)	12 in

Influencing water features

Soil features

The soils of this site are recent, very deep and somewhat poorly drained. Saturated conditions occur during the winter and spring months. Typically the surface layer is a silt loam about 9 inches thick. The subsoil is a silt loam to 60 inches or more. The upper 40 inches of soil is moderately to very strongly alkaline (pH 8.4 to 9.6) with a Sodium Absorbtion Ratio exceeding 13 in the upper 20 inches. Permeability is moderate to moderately slow. The available water holding capacity (AWC) is about 10 to 12 inches for the profile. Perennial to near perennial subsurface flows augment the available water. The potential for water erosion is high. See Appendix II for soils on which this site occurs.

Table 4. Representative soil features

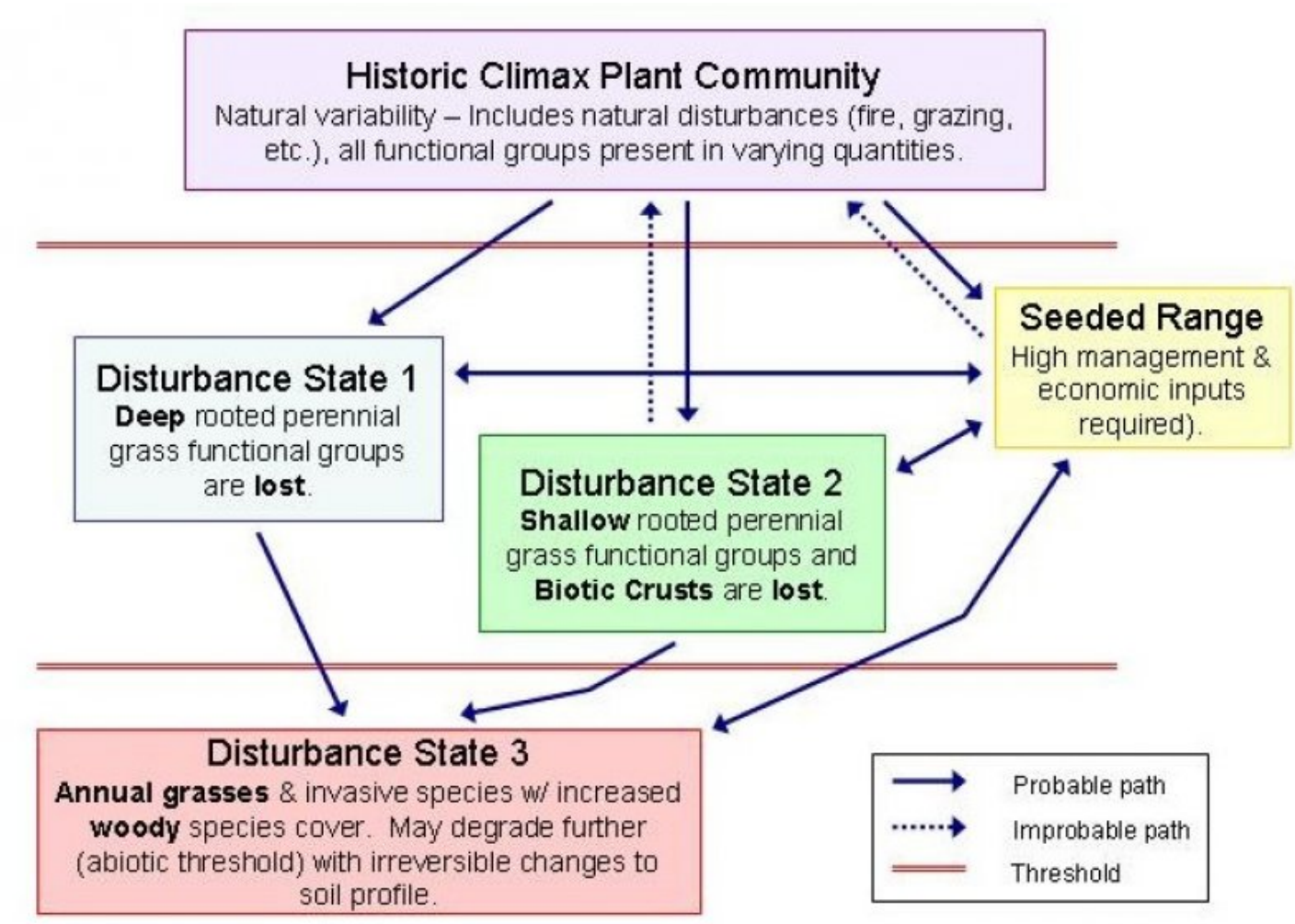
Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Permeability class	Moderate to moderately slow
Soil depth	0–60 in
Available water capacity (0-40in)	10–12 in
Sodium adsorption ratio (0-40in)	0–13

Ecological dynamics

Range in Characteristics-
Basin wildrye production is dependent on soil salinity and the quality and duration of subsurface water flows. Production increases as soil salinity decreases and where subsurface water flows are of higher quality and longer duration. Conversely, basin wildrye production decreases and inland saltgrass increases as soil salinity increases, as salts in subsurface flow increase and as a subsurface flows decrease. The flow frequency of fire influences the amount of basin big sagebrush.

Response to Disturbance-
If the condition of the site deteriorates as a result of overgrazing basin wildrye decreases. Black greasewood, inland saltgrass and poverty weed increase. Rabbitbrush and iris increase in areas of lower soil salinity. Similarily quackgrass and foxtail barley invade areas of bare ground increases and saline conditions are accentuated. Streambanks become unstable from loss of vegetation and channels may degrade, becoming deeper and wider in the process. Subsurface flows are affected. The water table drops and production decreases substantially.

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The potential native plant community is dominated by basin wildrye. Black greasewood and inland saltgrass are

common in the stand. Vegetative composition of the community is approximately 90 percent grasses and grasslike plants, 2 percent forbs and 8 percent shrubs. The approximate ground cover is 80-90 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	3160	3960	4760
Shrub/Vine	240	400	560
Forb	40	60	80
Total	**3440**	**4420**	**5400**

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, Deep-rooted, Dominant**			2800–3600	
	basin wildrye	LECI4	*Leymus cinereus*	2800–3600	–
2	**Perennial, Deep-rooted, Sub-Dominant**			200–600	
	saltgrass	DISP	*Distichlis spicata*	200–600	–
5	**Perennial, Other (PPGG), All**			80–400	
	squirreltail	ELEL5	*Elymus elymoides*	13–67	–
	rush	JUNCU	*Juncus*	13–67	–
	bluegrass	POA	*Poa*	13–67	–
	Lemmon's alkaligrass	PULE	*Puccinellia lemmonii*	13–67	–
	alkali sacaton	SPAI	*Sporobolus airoides*	13–67	–
	alkali cordgrass	SPGR	*Spartina gracilis*	13–67	–
	clustered field sedge	CAPR5	*Carex praegracilis*	0–20	–
Forb					
9	**Perennial, Other (PPFF), ALL]**			40–80	
	common yarrow	ACMI2	*Achillea millefolium*	7–13	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	7–13	–
	milkvetch	ASTRA	*Astragalus*	7–13	–
	iris	IRIS	*Iris*	7–13	–
	povertyweed	IVAX	*Iva axillaris*	7–13	–
	thelypody	THELY	*Thelypodium*	7–13	–
Shrub/Vine					
11	**Perennial, Evergreen, Dominant**			120–320	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	120–320	–
12	**Perennial, Evergreen, Sub-Dominant**			80–160	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	40–80	–
	rabbitbrush	CHRYS9	*Chrysothamnus*	40–80	–
15	**Perennial, Other(SSSS), ALL**			40–80	
	horsebrush	TETRA3	*Tetradymia*	40–80	–

Animal community

Wildlife-
This site will offer food and cover for mule deer, rodents and a variety of birds. It is an important wintering area for mule deer.

Livestock grazing-
This site is suited to use by cattle, sheep and horses in the late spring, summer, fall and early winter. Limitations in the late winter and early spring are saturated wet soils and unstable banks. Use should be postponed until the soils are firm enough to prevent trampling damage and soil compaction yet, while soil moisture is adequate to allow the completion of the plant growth cycle. Improvement and/or maintenance of bank protecting vegetation should be considered during al lseasons, particularly in the fall and winter for spring high flow periods.

Hydrological functions

Watershed-
The soils are in hydrologic group D. the soils of this site have high runoff potential. This site is potentially subject to three high flow periods: low elevation snowmelt, high elevation snowmelt, and summer cloudburst flow.

Other information

The soils in this site have good water holding capacities providing late season water for plant growth and slow water release to streams. As a salinity affected site it is imperative to maintain vigorous plant growth. With a reduction of plant cover and organic matter, surface salts increase, soil particles become dispersed, water intake rates are reduced and production is afffected. When incised channels are present, rehabilitation will improve production and restore good hydrologic characteristics. On altered sites the reintroduction of desirable deep rooted plants maybe needed to fully restore the site potential. The soils are corrosive to conrete and steel.

Contributors

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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)	Jeff Repp
Contact for lead author	Oregon NRCS State Rangeland Management Specialist
Date	08/07/2012
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None to some, severe sheet & rill erosion hazard

2. **Presence of water flow patterns:** Occasional flooding eith seasonal high water table

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3. **Number and height of erosional pedestals or terracettes:** None to some

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0-10%

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5. **Number of gullies and erosion associated with gullies:** None

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None, slight wind erosion hazard

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine to moderately coarse - limited movement

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Moderately resistant to erosion: aggregate stability = 3-4

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Deep, very deep, somewhat poorly drained with a silt loam surface about 12" thick - upper 30" of soil is moderately to very strongly alkaline (pH 8.4-9.6): Moderate OM (2-4%)

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (80-90%) and very gentle slopes (0-3%) effectively limit rainfall impact and overland flow

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

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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: Basin wildrye > Inland saltgrass > other grasses > Black greasewood > other shrubs > forbs

    Sub-dominant:

    Other:

    Additional:

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

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):** Favorable: 5000, Normal: 4000, Unfavorable: 3000 lbs/acre/year at high RSI (HCPC)

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:** Black greasewood will increase with deterioration of plant community. Inland saltgrass strongly increases on sites that have lost deep rooted perennial grass functional groups. Bare alkali areas will increase with loss of vegetation.

17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually