USDA Natural Resources
Conservation Service

Ecological site R009XY008OR
Cold Wet Swale 17-24 PZ

Last updated: 5/05/2025
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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.

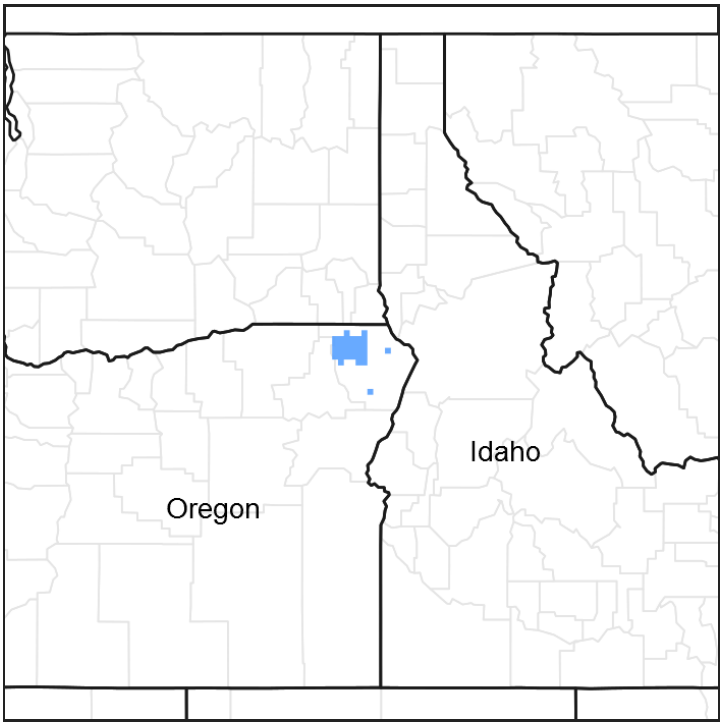


Figure 1. Mapped extent

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

R009XY007OR	**Cold Swale 17-24 PZ** Mountain Swale 17-24 PZ, Friged, normal production 1600 lbs/acre.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs as narrow open drainage areas in forestlands on mountain plateaus. Slope range from 2-15%. Elevation varies from 3400 to 4500 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Swale
Elevation	3,400–4,500 ft
Slope	2–15%
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 17 to 24 inches. It occurs primarily as snow during the months of November through March. Spring rainfall is ample followed by summer localized convection storms. Ephemeral subsurface moisture flows augments thye precipitation. The mean annual air temperature is approximately 43 degrees F. to -30 deegrees F. Soil temperature regimes are fridgid. The frost free period ranges from 30 to 100 days. The period of optimum plant growth is from late April through July.

Table 3. Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	
Precipitation total (average)	24 in

Influencing water features

Soil features

The soils of this site are formed in alluvium and loess over basalt. They are moderately deep with a silt loam surface layer and a silty clay loam to clay subsoil. Surface intake rates are good. Subsoil permeability rates are low with a seasonal water table. The drainage class is poor. Available water holding capacity (AWC) is 4 to 8 inches. The potential for erosion is moderate.

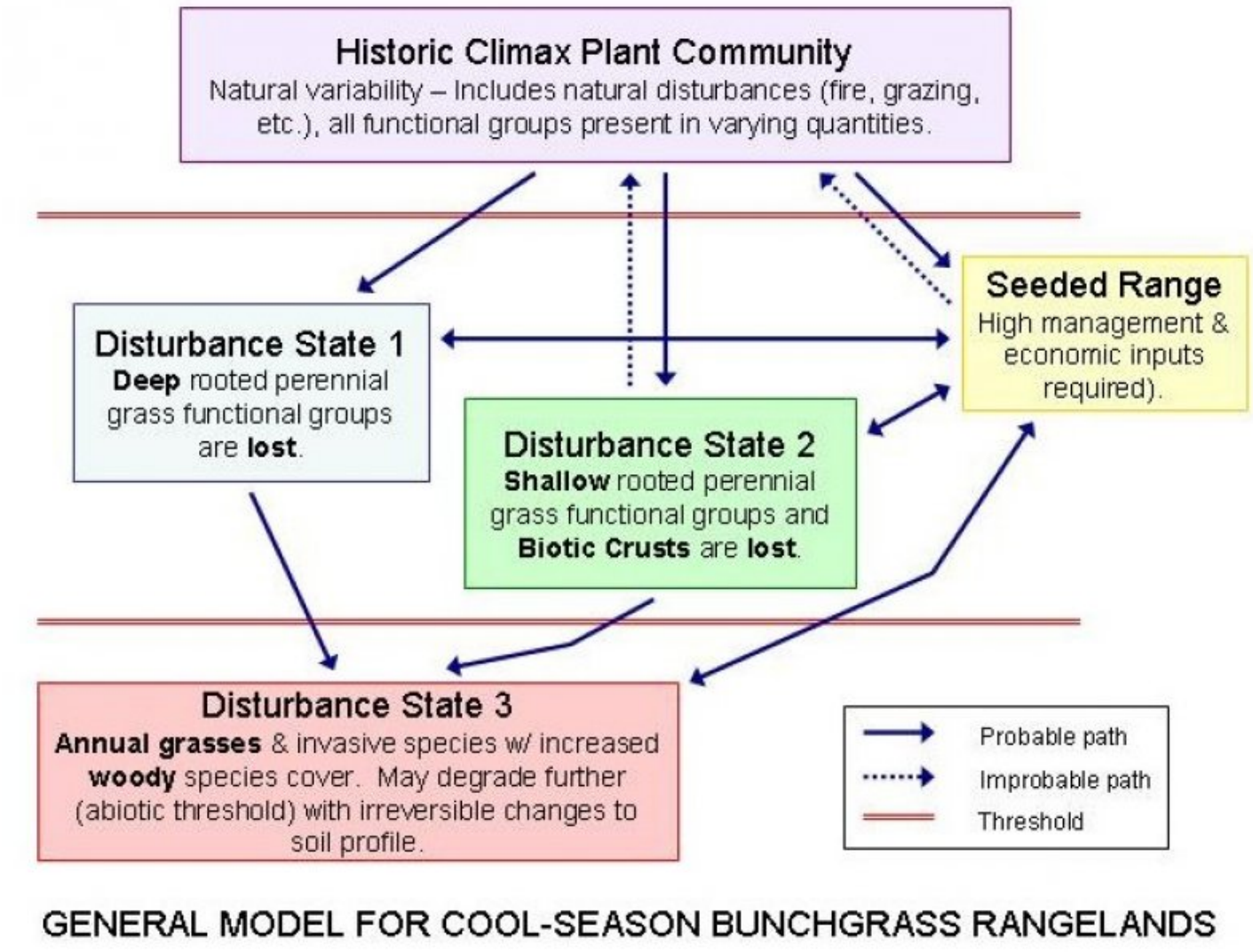
Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Slow to moderately slow

Ecological dynamics

Range in Characteristics:
Variability in plant composition and yeild is dependant on soil depth and the extent and duration of lateral subsurface water flows. Tufted hairgrass is well adapted to this site. In areas with season long high water tables, Nebraska sedge increases. In shallow soil areas with limited late season subsurface flow California oatgrass and other drought tolerant species increase. Production follows a similar pattern, increasing with soil depth and late duration subsurface flows.
Response to Disturbance:
If ht econdidtion of the site deteriorates as a result of overgrazing, tufted hairgrass decreases. Kentucky bluegrass, redtop and timothy invade, unpalatable rushes and forbs increase and production decreases. With further deterioration other bluegrasses and annuals invade, streambeds and banks become unstable from loss of vegetation and channels degrade, incising and becoming wider in the process. Peak discharge increases and seasonal water tables are lowered reducing water for late season use. Erosion from concentrated flows increase, contributing to downstream sedimentation and reducing site productivity.

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 strongly domnated by tufted hairgrass. Nebraska sedge and a variety of rushes and forbs are present. The potential vegetative composition is approximately 95 percent grasses and 5 percent forbs.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1720	2250	2780
Forb	40	100	160
Total	**1760**	**2350**	**2940**

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	**Perennail Deep-rooted Dominant**			1200–1600	
2	**Perennial Deep-rooted Subdominant**			460–980	
	smallwing sedge	CAMI7	*Carex microptera*	100–200	–
	Nebraska sedge	CANE2	*Carex nebrascensis*	100–200	–
	Bolander's spikerush	ELBO	*Eleocharis bolanderi*	60–80	–
	fewflower spikerush	ELQU2	*Eleocharis quinqueflora*	60–80	–
	toad rush	JUBU	*Juncus bufonius*	20–60	–
	Colorado rush	JUCO2	*Juncus confusus*	20–60	–
	common rush	JUEF	*Juncus effusus*	20–60	–
	swordleaf rush	JUEN	*Juncus ensifolius*	20–60	–
	poverty rush	JUTE	*Juncus tenuis*	20–60	–
5	**PPGG**			60–200	
	bluejoint	CACA4	*Calamagrostis canadensis*	2–20	–
	California oatgrass	DACA3	*Danthonia californica*	2–20	–
	timber oatgrass	DAIN	*Danthonia intermedia*	2–20	–
	fowl mannagrass	GLST	*Glyceria striata*	2–20	–
	bluegrass	POA	*Poa*	2–20	–
	pale false mannagrass	TOPA6	*Torreyochloa pallida*	2–20	–
Forb					
9	**PPFF**			40–160	
	camas	CAMAS	*Camassia*	5–20	–
	aster	EUCEP2	*Eucephalus*	5–20	–
	American bird's-foot trefoil	LOUN	*Lotus unifoliolatus*	5–20	–
	wild mint	MEAR4	*Mentha arvensis*	5–20	–
	beardtongue	PENST	*Penstemon*	5–20	–
	American bistort	POBI6	*Polygonum*	5–20	–

			bistortoides		
	cinquefoil	POTEN	*Potentilla*	5–20	–
	ragwort	SENEC	*Senecio*	5–20	–

Animal community

Livestock Grazing:
This site is well suited to late summer and fall ise by livestock under a planned grazing system. The key species si tufted hairgrass. This site can be damaged if heavily grazed during periods of tufted hairgrass flowering and seed formation when root reserves are low. Tufted harigrass provides excellent standing forage during late summer and fall dormancy. Grazing system design and implementation should consisider the improvement and maintenance of streambed and bank cover during all seasons. Use in late spring and early summer should be postponed until soil and streambanks are firm enough to withstand trampling damage. In the fall it is particularly important to leave enough residue in the swale and on the banks for protection during early spring runoff events.
Wildlife:
When the ecological condition is high this site provides excellent forage for elk, deer and various other mammals. It is an important summer and fall use area for elk and mule deer.
Native Wildlife Associalted With the Potential Climax Community:
Elk, mule deer, whitetail deer, rodents and a variety of upland birds ue this site for food and limited cover.

Hydrological functions

The soils of this site have moderate intake rates and low subsoil permeability rates. Water holding capacities are good, providing late season water for plant growth and water release to streams. the hydrologic cover condition is good when the ecological conditon is high. Under high ecological conditions the primary channel is shallow and not well defined. Adequate vegetative cover protects the swale from incision during the runoff events. High flows spread out across this site and energy is dissipated. The vegetative cover flattens, catches sediment and protects the soil surface from erosion.

Other information

In fair condition this site responds rapidly to god management. Periodic deferment allows seed productio and rapid improvement of tufted hairgrass. If incised channels are present, periodic rest and/or deferment will restore good hydrologic chracterisitcs.

Contributors

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Approval

Kirt Walstad, 5/05/2025

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	07/30/2012
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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2. **Presence of water flow patterns:** Very frequent flooding with seasonal high water table

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0-5%

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5. **Number of gullies and erosion associated with gullies:** Poor resistance to erosion when

cover is lacking - subject to incision and downcutting

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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 - 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 with adequate cover; aggregate stability = 2-4

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Moderately deep alluvium with a silt loam surface; 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 (90-110%) and gentle slopes (2-15%) 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: Tufted hairgrass > sedges > rushes > other perennial grasses > spikerush > 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

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Favorable: 2500, Normal: 2000, Unfavorable: 1500 lbs/acre/year at high RSI (HCPC)

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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:** With deterioration of plant community, bluegrasses and meadow foxtail invade sites that have lost deep rooted perennial grass functional groups

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

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