

Ecological site R009XY006OR

Cold Clayey Swale

13-17 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.

Associated sites

R009XY005OR	Cold Swale 13-17 PZ Mountain Swale 13-17 PZ
R009XY017OR	Cold Loamy 13-17 PZ Mountain Loamy 13-17 PZ
R009XY022OR	Cold Shallow 13+ PZ Mountain Shallow 13-17 PZ
R009XY034OR	Cold South 13-17 PZ Mountain South 13-17 PZ
R009XY040OR	North 14-17 PZ North 13-17 PZ

Similar sites

R009XY005OR	Cold Swale 13-17 PZ Mountain Swale 13-17 PZ
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on upper basalt tablelands adjacent to and on the floodplains of ephemeral drainages. It typically occurs at the upper end of drainages occupying broad to narrow swale areas. Slopes range from 1-15% with slopes of 0 to 3% being most typical. Elevation varies from 3400 to 5000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Swale
Elevation	1,040 – 1,520 m
Slope	0 – 20 %
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 13 to 17 inches. It occurs as snow during the months of November through March followed by ample spring rainfall. Localized, occasionally severe, convection storms occur during the summer. Ephemeral surface moisture flow augments the precipitation. The mean annual air temperature is approximately 43 degrees F. Extreme temperatures range from 90 degrees F. to -30 degrees F. Soil temperature regimes are frigid. The frost-free period ranges from 30 to 100 days. The period of optimum plant growth is from mid April through July.

Table 3 Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	
Precipitation total (average)	430 mm

Influencing water features

Soil features

The soil of this site are formed in deep alluvium and loess over basalt. They are deep to very deep. Typically the surface layer is a silty clay loam over a clay subsoil. Stoniness is variable. Soil permeability is low. The available water holding capacity (AWC) is 8 to 10 inches. A perched seasonal water table occurs following snow melt. The potential for erosion is moderate.

Table 4. Representative soil features

Surface texture	(1) Silty clay loam
Family particle size	(1) Clayey

Drainage class	Well drained
Permeability class	Moderate

Ecological dynamics

Range in Characteristics:

Variability in plant composition and yield is dependent on soil surface texture and drainage area. Idaho fescue increases on heavier textured soils and in areas with limited drainage. Basin wildrye increases on coarser textured surface soils and in areas with extensive drainage systems. Production follows a similar pattern, increasing on swales with large drainage areas that receive late duration flows.

Response to Disturbance:

If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases along with basin wildrye. Native bluegrass and forbs increase. Introduced bluegrasses, including Kentucky, Canadian and bulbous bluegrass, invade along with annuals and unpalatable forbs continue to increase, annuals strongly invade and useable forage production decreases. Intermittent streambeds and banks become unstable from loss of vegetation and channels degrade, incising and becoming deeper and wider in the process. Surface flows are affected. Peak discharge increase, seasonal watertables are lowered and erosion from concentrated flows reduces the site productivity and contributes to downstream sedimentation.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Perennial Deep-rooted Dominant			1184-2116	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	897-1255	–
2	Perennial Deep-rooted Subdominant			179-538	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	90-269	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	90-269	–
4	Perennial Shallow-rooted Subdominant			54-143	
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	54-143	–
5	PPGG			54-179	
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	8-26	–
	sedge	CAREX	<i>Carex</i>	8-26	–
	California oatgrass	DACA3	<i>Danthonia californica</i>	8-26	–
	onespike danthonia	DAUN	<i>Danthonia unispicata</i>	8-26	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	8-26	–
	bluegrass	POA	<i>Poa</i>	8-26	–
Forb					
7	Perennial All Dominant			72-108	
	arnica	ARNIC	<i>Arnica</i>	36-54	–
	cinquefoil	POTEN	<i>Potentilla</i>	36-54	–
9	PPFF			36-143	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	3-13	–
	pearly everlasting	ANAPH	<i>Anaphalis</i>	3-13	–
	milkvetch	ASTRA	<i>Astragalus</i>	3-13	–
	mariposa lily	CALOC	<i>Calochortus</i>	3-13	–

	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	3-13	–
	old man's whiskers	GETR	<i>Geum triflorum</i>	3-13	–
	desertparsley	LOMAT	<i>Lomatium</i>	3-13	–
	lupine	LUPIN	<i>Lupinus</i>	3-13	–
	owl's-clover	ORTHO	<i>Orthocarpus</i>	3-13	–
	beardtongue	PENST	<i>Penstemon</i>	3-13	–
	ragwort	SENEC	<i>Senecio</i>	3-13	–
Shrub/Vine					
13	Perennial Deciduous Dominant			18-54	
	rose	ROSA5	<i>Rosa</i>	18-54	–

Animal community

Livestock grazing: This site is well suited to late spring, summer and fall use by livestock under a planned grazing system. The key species is Idaho fescue. This site can be damaged if heavily grazed during periods of Idaho fescue flowering and seed formation when root reserves are low. Idaho fescue and basin wildryecan provide excellent standing dry forage during fall dormancy. Grazing system design and implementation should consider the improvement and maintenance of streambed and bank cover during the all seasons. This is particularly important in the fall when enough residue should be left over winter for protection during spring runoff events. Wildlife: When the ecological condition is high this site provides excellent forage for deer, elk and various other mammals. It provides excellent nesting areas for a variety of upland birds. It is an important wintering area for mule deer and elk. Native Wildlife Associated With the Potential Climax Community: Mule deer, whitetail deer, elk, rodents and a variety of upland birds use this site for food and limited cover.

Hydrological functions

The soils of this site have slow intake and 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 condition is high. Under a high ecological condition the primary channel is shallow and not well defined. Adequate vegetative cover protects the swale from incision. During the runoff events flows are broad and shallow across vegetative cover which flattens, protecting the soil surface and catching additional sediment.

Other information

In fair condition this site responds rapidly to good management. Periodic deferment allows seed production and improvement of Idaho fescue. If incised channels are present, rehabilitation will restore good hydrologic characteristics, including late season water storage, and improved production. On altered sites in poor condition the reintroduction of desirable deep rooted plants may be needed to fully restore the site potential.

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
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Contact for lead author	Oregon NRCS State Rangeland Management Specialist
Date	07/30/2012
Approved by	
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

2. Presence of water flow patterns: Frequent flooding with seasonal high water table

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

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground): 5-10%

5. Number of gullies and erosion associated with gullies: Poor resistance to erosion when cover is lacking - subject to incision and downcutting

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

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

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 = 3-4

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Deep alluvium with a silty clay loam surface; moderate OM (2-4%)

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Significant ground cover (90-100%) and gentle slopes (0-3 - up to 15%) effectively limit rainfall impact and overland flow

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

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: Idaho fescue > Basin wildrye = Bluebunch wheatgrass > other perennial grasses > Prairie junegrass > other forbs > cinquefoil > arnica > rose

Sub-dominant:

Other:

Additional:

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: 2000, Normal: 1600, Unfavorable: 1400 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: With deterioration of plant community, bluegrasses invade sites that have lost deep rooted perennial grass functional groups

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