

Ecological site R009XY007OR

Cold 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.

Associated sites

R009XY008OR	Cold Wet Swale 17-24 PZ
	Wet Mountain Swale 17-24 PZ

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. It occurs along the shallow edges and upper ends of coalescing swales. Slopes range from 2-15%. Elevation varies from 3400 to 4500 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Swale
Elevation	1,040 – 1,370 m
Slope	0 – 20 %
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 occasional summer convection storms. Ephemeral subsurface 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 late April through July.

Table 3 Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	
Precipitation total (average)	610 mm

Influencing water features

Soil features

The soils of this site are formed in alluvium and loess over basalt. They are shallow and stony. Typical the surface layer is a stony silt loam over a silty clay loam to clayey subsoil. Surface intake rates are moderate. Subsoil permeability rates are low with a seasonal water table. Classification is somewhat poorly drained. The available water holding capacity (AWC) is 2 to 4 inches. The potential for erosion is moderate.

Table 4. Representative soil features

Surface texture	(1) Stony silt loam (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Slow

Ecological dynamics

Range in Characteristics:

As a shallow site, variability in plant composition and yeild is dependent primarily on the extent and duration of both surface and lateral subsurface water flows. California oatgrass, rushes and sedge increase on soils that recieve longer duration surface and subsurface flows. Bluegrasses, fescues and needlegrassincrease on soils that recieve limited surface and subsurface flows. Production follows a similar pattern, increasing or decreasing with flow duration.

Response to Disturbance:

If the condition of the site deteriorates as a result of overgrazing, California oatgrass and palatable rushes and sedges decrease. Unpalatable rushes, annual hairgrass and forbs increase. Kentucky bluegrass, other bluegrass and annuals invade. With further deterioration annual hairgrass continues to increase, Japanese brome and other annuals strongly invade and usable forage production decreases. Bare ground increases and intermittent streambeds and banks become unstable from loss of vegetation. Peak discharge increases and seasonal watertables are lowered reducing water for late season use. Erosion from concentrated flows increase, sediment yields increase and the inherent productivity of the site decreases.

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					
2	Perennial Deep-rooted Subdominant			457-726	
	smallwing sedge	CAMI7	<i>Carex microptera</i>	67-108	–
	sedge	CAREX	<i>Carex</i>	67-108	–
	toad rush	JUBU	<i>Juncus bufonius</i>	40-67	–
	Colorado rush	JUCO2	<i>Juncus confusus</i>	40-67	–
	common rush	JUEF	<i>Juncus effusus</i>	40-67	–
	swordleaf rush	JUEN	<i>Juncus ensifolius</i>	40-67	–
	Bolander's spikerush	ELBO	<i>Eleocharis bolanderi</i>	40-54	–
	fewflower spikerush	ELQU2	<i>Eleocharis quinqueflora</i>	40-54	–
3	Perennial Shallow-rooted Dominant			336-538	
	California oatgrass	DACA3	<i>Danthonia californica</i>	336-538	–
4	Perennial Shallow-rooted subdominant			40-108	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	67-135	–
	timber oatgrass	DAIN	<i>Danthonia intermedia</i>	40-108	–
5	PPGG			81-242	
	Letterman's needlegrass	ACLE9	<i>Achnatherum lettermanii</i>	7-19	–
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	7-19	–
	bentgrass	AGROS2	<i>Agrostis</i>	7-19	–
	pinegrass	CARU	<i>Calamagrostis rubescens</i>	7-19	–
	onespike danthonia	DAUN	<i>Danthonia unispicata</i>	7-19	–
	bearded wheatgrass	ELCA11	<i>Elymus caninus</i>	7-19	–
	blue wildrye	ELGL	<i>Elymus glaucus</i>	7-19	–
	red fescue	FERU2	<i>Festuca rubra</i>	7-19	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	7-19	–
	pullup muhly	MUF12	<i>Muhlenbergia filiformis</i>	7-19	–
	tall trisetum	TRCA21	<i>Trisetum canescens</i>	7-19	–
	western fescue	FEOC	<i>Festuca occidentalis</i>	7-19	–
Forb					
9	PPFF			27-135	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	2-11	–
	agoseris	AGOSE	<i>Agoseris</i>	2-11	–
	twin arnica	ARSO2	<i>Arnica sororia</i>	2-11	–
	camas	CAMAS	<i>Camassia</i>	2-11	–
	larkspur	DELPH	<i>Delphinium</i>	2-11	–
	aster	EUCEP2	<i>Eucephalus</i>	2-11	–
	desertparsley	LOMAT	<i>Lomatium</i>	2-11	–
	lupine	LUPIN	<i>Lupinus</i>	2-11	–
	beardtongue	PENST	<i>Penstemon</i>	2-11	–
	yampah	PERID	<i>Perideridia</i>	2-11	–
	cinquefoil	POTEN	<i>Potentilla</i>	2-11	–
	ragwort	SENEC	<i>Senecio</i>	2-11	–

Animal community

Livestock Grazing: This site is well suited to late summer and fall use by livestock under a planned grazing system. The key species are California oatgrass and rush flowering and seed information when root reserves are low. Palatable rushes, sedge and bunchgrasses provide excellent standing forage during late summer and fall dormancy. Grazing system design and implementation should consider the improvement and maintenance of streambed and bank cover during all seasons. Use in late spring and early summer should be postponed until soils 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 Associated with the Potential Climax Community:** Elk, mule deer, whitetail deer, rodents and various 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 and depending on soil depth, provide limited late season water for plant growth and water release to streams. The hydrologic cover condition is good when the ecological condition is high. Under high ecological conditions the primary channel is shallow and not well defined. Adequate vegetative cover protects the swale from incision during runoff events. Flows are broad and shallow across vegetative cover which flattens, catches sediment and protects the soil surface from erosion.

Other information

In fair condition this site responds rapidly to good management. Periodic deferment allows seed production and rapid improvement of California oatgrass and rushes. If incised channels are present, periodic rest and/or deferment will restore good hydrologic characteristics.

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.

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Date	07/30/2012
Approved by	
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production
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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): 10-15%

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 = 2-4

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Shallow, somewhat poorly drained alluvium with a stony silt loam surface; low OM (1-2%)

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 (0-15%) 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: California oatgrass > rushes > other perennial grasses > sedges > Sandberg bluegrass > forbs > Timber oatgrass = spikegrass

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
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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: 1500, Normal: 1200, Unfavorable: 800 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 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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