

Ecological site R010XY114OR

Cool Swale

9-12 PZ

Last updated: 4/10/2025
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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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>tridentata</i>
Herbaceous	(1) <i>Leymus cinereus</i> (2) <i>Hesperostipa comata</i>

Physiographic features

This site occurs adjacent to and on the floodplains of ephemeral streams. It is at the upper end of drainages occupying broad to narrow swale areas. Slopes range from 2 to 12 percent. Elevations range from 2700 to 4000 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream (3) Swale
Elevation	820 – 1,220 m
Slope	0 – 10 %
Water table depth	150 cm
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 9 to 12 inches, most of which occurs in the form of snow during the months of November through March. Ephemeral subsurface moisture flow augments the precipitation. Localized convection storms occasionally occur during the summer. The soil temperature regime is near frigid to frigid with a mean annual air temperature of 47 degrees F. Temperature extremes range from 100 to -20 degrees F. The frost-free period ranges from 60 to 100 days. The optimum growth period for native plants is from

April through June.

Table 3 Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	
Precipitation total (average)	310 mm

Influencing water features

Soil features

The soils of this site are recent, deep to very deep and well-drained. Typically the surface layer is a silt loam about 10 inches thick. The subsoil is a silt loam to silty clay loam over 40 inches thick. The substratum varies from alluvium to bedrock. Permeability is moderate. The available water holding capacity (AWC) is about 8 to 10 inches for the profile. Seasonal subsurface flows from adjacent slopes augment the available water. The potential for erosion is moderate.

Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate
Soil depth	130 cm
Available water capacity (0-101.6cm)	20.32 – 25.4 cm

Ecological dynamics

Range in Characteristics:

The amount of basin wildrye depends on the extent and duration of lateral subsurface water flows. Basin wildrye decreases and needlegrasses increase on the upper ends of watersheds where drainage area is limited. Production follows a similar pattern increasing on swales with large drainage areas. As a site susceptible to fire, the amount of basin big sagebrush is influenced by fire frequency.

Response to Disturbance:

If the condition of the site deteriorates as a result of overgrazing basin wildrye, western needlegrass and Idaho fescue decrease. Needle-and-thread, western wheatgrass, basin big sagebrush, and green rabbitbrush increase. With further deterioration, needle-and-thread and western wheatgrass decrease. Sagebrush and green rabbitbrush continue to increase and annuals invade. Streambanks become unstable from loss of vegetation and channels degrade, becoming deeper and wider in the process. Subsurface flows are affected. Peak discharges increase, the water table drops and storage of water for late season use is reduced. Plants well adapted to a drier climatic

regime increase or invade and production drops.

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			135-404	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	135-404	–
2	Perennial, deep-rooted, sub-dominant			323-942	
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	67-202	–
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	67-202	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	67-202	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	67-202	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	27-67	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	27-67	–
4	Perennial, shallow-rooted, sub-dominant			40-108	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	27-67	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	27-67	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	13-40	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	13-40	–
5	Other perennial grasses, all			27-54	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0-27	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-27	–
Forb					
7	Perennial,all, dominant			40-81	
	fleabane	ERIGE2	<i>Erigeron</i>	13-27	–
	buckwheat	ERIOG	<i>Eriogonum</i>	13-27	–
	lupine	LUPIN	<i>Lupinus</i>	13-27	–
	fleabane	ERIGE2	<i>Erigeron</i>	13-27	–
	buckwheat	ERIOG	<i>Eriogonum</i>	13-27	–
	lupine	LUPIN	<i>Lupinus</i>	13-27	–
9	Other perennial forbs, all			13-54	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0-4	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0-4	–
	milkvetch	ASTRA	<i>Astragalus</i>	0-4	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	0-4	–
	stoneseed	LITHO3	<i>Lithospermum</i>	0-4	–
	desertparsley	LOMAT	<i>Lomatium</i>	0-4	–
	locoweed	OXYTR	<i>Oxytropis</i>	0-4	–
	phlox	PHLOX	<i>Phlox</i>	0-4	–
	sagebrush buttercup	RAGL	<i>Ranunculus glaberrimus</i>	0-4	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	0-4	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0-4	–

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	phlox	PHLOX	<i>Phlox</i>	0-4	–
	sagebrush buttercup	RAGL	<i>Ranunculus glaberrimus</i>	0-4	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	0-4	–
Shrub/Vine					
11	Perennial, evergreen, dominant			27-67	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	27-67	–
12	Perennial, evergreen, sub-dominant			27-54	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	13-27	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	13-27	–
15	Other perennial shrubs, all			13-54	
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-13	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0-13	–
	horsebrush	TETRA3	<i>Tetradymia</i>	0-13	–

Animal community

Livestock Grazing: This site is suited to use by cattle, sheep, and horses in spring, summer, and fall under a planned grazing system. Limitations in the 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 enough to allow the completion of the plant growth cycle. Improvement and/or maintenance of herbaceous bank protection should be considered during all seasons, particularly going into the winter for spring high flow periods. Native Wildlife Associated with the Potential Climax Community: Deer Antelope Hawks Songbirds Rodents This site will offer food and cover for mule deer, antelope, rodents, and a variety of birds. It is an important wintering area for mule deer and antelope.

Hydrological functions

The soils are in hydrologic group B. The soils of this site have moderately low 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 of this site have excellent water holding capacities providing late season water for plant growth and slow water releases to streams. When incised channels are present, rehabilitation will markedly improve production and restore good hydrologic characteristics. On altered sites the reintroduction of desirable deep rooted plants may be needed to fully restore the site potential.

Contributors

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Approval

Kirt Walstad, 4/10/2025

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)	
Contact for lead author	
Date	08/28/2026
Approved by	
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:
