

Ecological site R010XY119OR

Dry Mountain Swale

12-16 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.

Associated sites

R010XY117OR	Mountain Swale 12-16 PZ Higher production, dominated by basin wildrye
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Similar sites

R010XC032OR	SR Mountain 12-16 PZ Lower production, upland position, higher forb and shrub component, clayey subsoil
R010XY117OR	Mountain Swale 12-16 PZ Higher production, dominated by basin wildrye
R010XY006OR	Mountain Loamy Bottom Perennial to near perennial subsurface flows, higher production, dominated by basin wildrye and willow

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Herbaceous	(1) <i>Festuca idahoensis</i> (2) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>

Physiographic features

This site occurs adjacent to and on the floodplains of ephemeral streams. It is often adjacent to woodland near the upper end of drainages occupying broad to narrow swale areas. Slopes range from 0 to 8 percent. Elevations range from 4000 to 5700 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Flooding frequency	None
Ponding frequency	None
Elevation	1,220 – 1,740 m
Slope	0 – 10 %
Water table depth	150 cm
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 12 to 16 inches, most of which occurs in the form of snow during the months of November through March. Emphemeral subsurface moisture flow augments the precipitation. Localized convection storms occasionally occur during the summer. The soil temperature regime is frigid with a mean annual air temperature of 44 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost-free period ranges from 30 to 90 days. Often the site occurs in cold pockets. The optimum growth period for native plants is from April through June.

Table 3 Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	140 days
Precipitation total (average)	410 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 gravelly loam about 10 inches thick. The subsoil is a gravelly 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 3 to 6 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 (2) Gravelly loam (3) Gravelly silt loam
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Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate to moderately slow
Soil depth	100 – 150 cm
Surface fragment cover <=3"	10 – 20 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	7.37 – 15.75 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	20 – 30 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

Ecological dynamics

Range in Characteristics:

Idaho fescue is dominant with dry sedges increasing along shallow channels. Production is dependent on the extent and duration of

lateral subsurface water flows. Flows are often minor and of short duration. This is particularly apparent on broad, high elevation depression areas. These areas often occur in cold pockets further limiting production. As a site susceptible to fire, the amount of mountain big sagebrush is influenced by fire frequency.

Response to Disturbance:

If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases. Bluegrasses invade. Mountain big sagebrush, squirreltail and sedges increase. With further deterioration mountain big sagebrush increases. As grass cover declines the potential for weed and juniper invasion increases.

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.

Fine fuel reduction from improper grazing and fire suppression has led to an increase in the historical fire return interval on many western rangelands. A reduction in fire frequency on these sites leads to an increase in juniper cover, a decrease in sagebrush cover followed by a decrease in herbaceous cover and understory diversity. As juniper encroaches on north facing aspects sagebrush declines with a subsequent decrease in forbs, bluebunch wheatgrass and needlegrass. Idaho fescue becomes the primary herbaceous species occurring under the canopy of the juniper trees. Sandberg's bluegrass increases in the plant community on lower elevation north slopes and warmer non-aspect sites while bare ground increases in the interspaces between trees. Bitterbrush is more resistant to juniper encroachment than sagebrush and maintains its presence in the community, however vigor and fitness (seed production) may be thwarted.

Erosion from concentrated flows reduces the site potential and contributes to downstream sedimentation. The potential for soil erosion increases as the juniper woodland matures and the understory plant community cover declines. The combined effect of overgrazing and juniper invasion increases the rate of decline in ecological function and the probability of crossing a threshold is high.

Treatment Response:

North facing aspects respond positively to juniper removal if soil erosion is not significant. Seeding may be necessary if there are less than 1-2 bunchgrass plants per meter square in the understory. Sagebrush and forbs may also need to be seeded if adult plants are no longer present in the understory.

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			1211-1412	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	1211-1412	–
2	Perennial, deep-rooted, sub-dominant			101-303	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	101-303	–
3	Perennial, deep-rooted, sub-dominant			101-202	
	sedge	CAREX	<i>Carex</i>	101-202	–
4	Perennial, shallow-rooted			40-81	
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	20-40	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	20-40	–
5	Other perennial grasses			0-81	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-40	–
	bluegrass	POA	<i>Poa</i>	0-40	–
Forb					
7	Perennial, dominant			20-40	
	buckwheat	ERIOG	<i>Eriogonum</i>	20-40	–
9	Other perennial forbs			0-81	

	common yarrow	ACMI2	Achillea millefolium	0-20	–
	white sagebrush	ARLU	Artemisia ludoviciana	0-20	–
	milkvetch	ASTRA	Astragalus	0-20	–
	tapertip hawksbeard	CRAC2	Crepis acuminata	0-20	–
	fleabane	ERIGE2	Erigeron	0-20	–
	stoneseed	LITHO3	Lithospermum	0-20	–
	desertparsley	LOMAT	Lomatium	0-20	–
	lupine	LUPIN	Lupinus	0-20	–
	bluebells	MERTE	Mertensia	0-20	–
	phlox	PHLOX	Phlox	0-20	–
	cinquefoil	POTEN	Potentilla	0-20	–
	buttercup	RANUN	Ranunculus	0-20	–
	deathcamas	ZIGAD	Zigadenus	0-20	–

Shrub/Vine

11	Evergreen, dominant			61-161	
	mountain big sagebrush	ARTRV	Artemisia tridentata ssp. vaseyana	61-161	–
12	Evergreen, subdominant			20-40	
	green rabbitbrush	ERTE18	Ericameria teretifolia	20-40	–
15	Other shrubs			0-121	
	antelope bitterbrush	PUTR2	Purshia tridentata	0-40	–
	wax currant	RICE	Ribes cereum	0-40	–
	common snowberry	SYAL	Symphoricarpos albus	0-40	–

Animal community

Livestock Grazing: This site is suited to use by cattle, sheep, and horses in late 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 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 Elk Hawks Songbirds Rodents This site will offer food and cover for mule deer, elk, antelope, rodents, and a variety of birds. It is an important wintering area for mule deer, elk, 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 good 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

BLM/SCS Team - Burns
Bob Gillaspy

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)	Jeff Repp and Bruce Franssen
Contact for lead author	NRCS Oregon State Rangeland Management Specialist
Date	04/24/2003
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills: None

2. Presence of water flow patterns: None

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): 0-10%

5. Number of gullies and erosion associated with gullies: 1 - 2 gullies associated with site, stable banks and bottoms with no erosion evident.

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

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: aggregate stability = 3-5

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Weak to moderate medium platy structure, Dry color value 4-5, 3-11 inches thick; Moderate OM (1-7%)

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Significant ground cover (70-80%) and gentle slopes (0-8%) effectively limit rainfall impact and overland flow. Seasonal subsurface flows from adjacent slopes augment available water.

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: Perennial, deep-rooted, bunch grasses

Sub-dominant: Evergreen shrubs

Other: Perennial Forbs = Other Perennial Grasses

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: 2200, Normal: 1800, Unfavorable: 1600 lbs/acre/year at high RSI

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: Western Juniper readily invades the site. Cheatgrass and Medusahead invade sites that have lost deep rooted perennial grass functional groups

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