USDA Natural Resources
Conservation Service

Ecological site R010XC053OR
SR High Mountain Loam 18+ PZ

Last updated: 5/13/2025
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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.

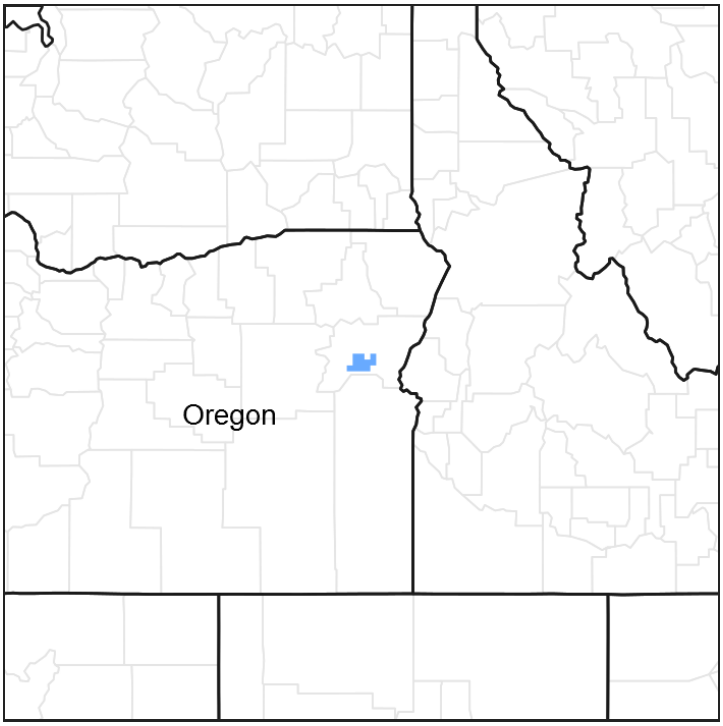


Figure 1. Mapped extent

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

R010XC051OR	**SR High Mountain South 16-20 PZ** High Mountain South 16-20" PZ

Similar sites

R010XC067OR	**SR Shrubby Mountain North 16-20 PZ** Shrubby Mountain North 16-20" PZ (higher production, tall shrubs present)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata var. vaseyana*
Herbaceous	(1) *Eriogonum* (2) *Festuca idahoensis*

Physiographic features

This site occurs adjacent to the forestland on the tops and shoulders of ridges and north facing mountain back slopes. Slopes typically range from 2 to 35% but may extend up to 60%. Elevations range from 5000 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Stack (geom.)
Elevation	1,524–1,829 m
Slope	2–60%
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 18 to 26 inches, most of which occurs in the form of snow during the months of November through April. Localized, occasionally severe, convectional storms occur during the summer. The soil temperature regime is frigid with a mean annual air temperature of 42 degrees F. Temperature extremes range from 80 to -30 degrees F. The frost free period ranges from 0 to 60 days. The optimum period for plant growth is from mid-May through July.

Table 3. Representative climatic features

Frost-free period (average)	60 days
Freeze-free period (average)	
Precipitation total (average)	660 mm

Influencing water features

Soil features

The soils of this site are typically moderately deep to deep and well drained. Typically the surface layer is a loam to very gravelly loam from 8 to 20 inches thick. The subsoil is a very gravelly loam to a gravelly sandy loam from 8 to 22 inches thick. Depth to granite or rhyolite bedrock ranges from 20 to 60 inches. Permability is moderate to moderately rapid. The available water holding capacity is about 4 to 8 inches for the profile. The potential for erosion is moderate to sever.

Table 4. Representative soil features

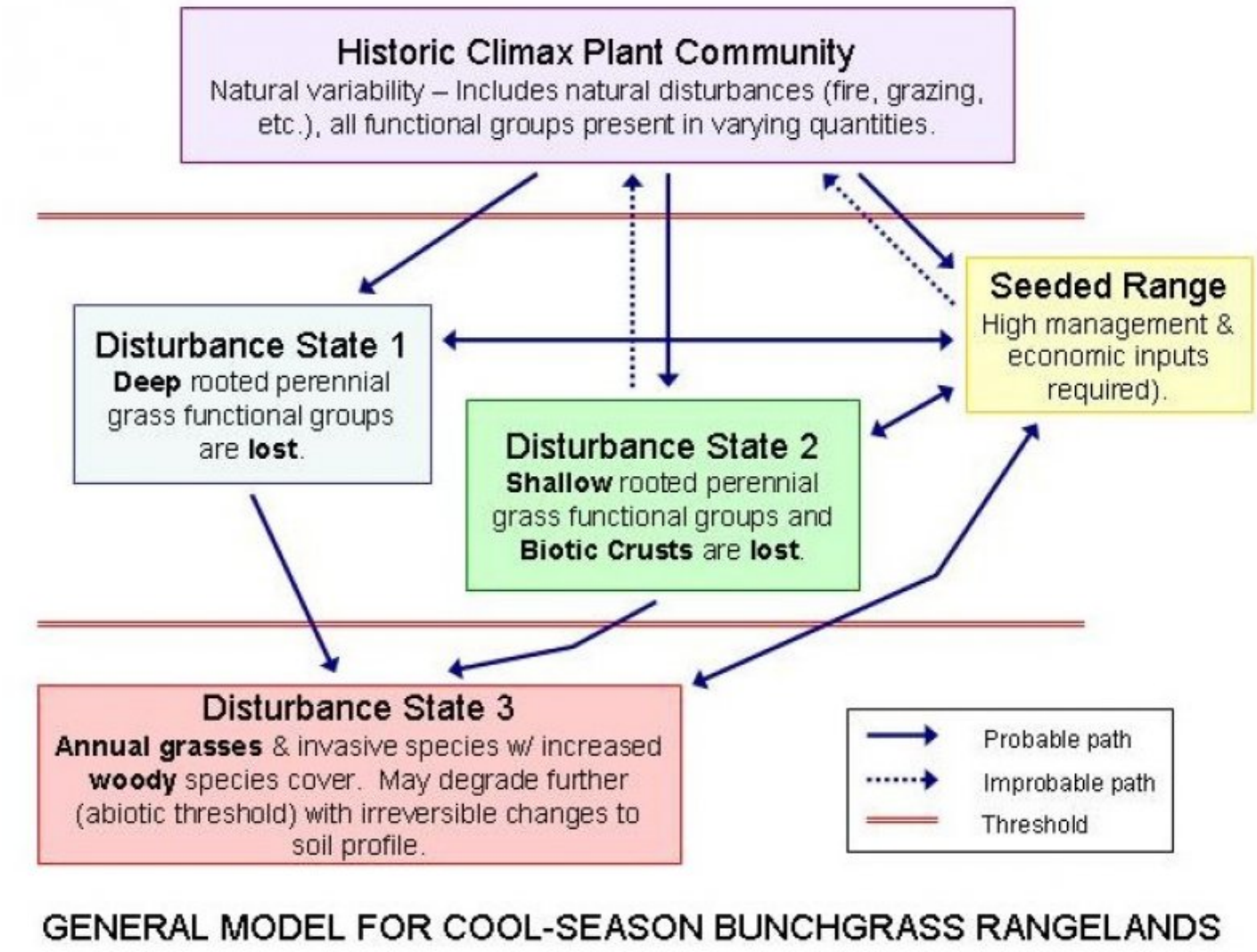
Surface texture	(1) Loam (2) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	51–152 cm
Available water capacity (0-101.6cm)	10.16–20.32 cm

Ecological dynamics

Needlegrasses and blue wildrye increase on more coarse textured soils on southerly aspects. Buckwheat increases on more coarse textured soils. Production increases with soil depth and on due north exposures.

If the condition of the site deteriorates as a result of overgrazing, Idaho fescue will decrease while mountain big sagebrush, buckwheat, blue wildrye, needlegrasses and bluegrasses increase. With further deterioration, needlegrasses decrease and annuals invade. Bare ground markedly increases under the shrub overstory and erosion is accelerated. Excessive erosion in the bare soil interspaces markedly reduces site productivity and contributes to downstream sedimentation.

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 dominated by mountain big sagebrush, buckwheat and Idaho fescue. Needlegrasses and sedges are common in the stand. Vegetative composition of the community is approximately 70% grasses, 10% forbs, and 20% shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	901	1163	1426
Shrub/Vine	94	175	256
Forb	67	114	161
Total	**1062**	**1452**	**1843**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant, deep-rooted, perennial grasses**			673–942	
	Idaho fescue	FEID	*Festuca idahoensis*	673–942	–
2	**Sub-dominant, deep-rooted, perennial grasses**			175–377	
	sedge	CAREX	*Carex*	67–135	–
	needlegrass	ACHNA	*Achnatherum*	67–108	–
	basin wildrye	LECI4	*Leymus cinereus*	13–67	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	27–67	–
4	**Sub-dominant, shallow-rooted, perennial grasses**			27–67	
	Sandberg bluegrass	POSE	*Poa secunda*	27–67	–
5	**All other perennial grasses**			27–40	
	mountain brome	BRMA4	*Bromus marginatus*	13–20	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	13–20	–
	mountain brome	BRMA4	*Bromus marginatus*	13–20	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	13–20	–
Forb					
7	**All dominant, perennial forbs**			27–67	
	buckwheat	ERIOG	*Eriogonum*	27–67	–
8	**All sub-dominant, perennial forbs**			27–67	
	phlox	PHLOX	*Phlox*	13–40	–
	avens	GEUM	*Geum*	13–27	–
9	**All other perennial forbs**			13–27	
	common yarrow	ACMI2	*Achillea millefolium*	1–2	–
	agoseris	AGOSE	*Agoseris*	1–2	–
	pussytoes	ANTEN	*Antennaria*	1–2	–
	sandwort	ARENA	*Arenaria*	1–2	–
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	1–2	–
	tapertip	CRAC2	*Crepis acuminata*	1–2	–

	hawksbeard				
	shootingstar	DODEC	*Dodecatheon*	1–2	–
	alumroot	HEUCH	*Heuchera*	1–2	–
	lupine	LUPIN	*Lupinus*	1–2	–
	purslane	PORTU	*Portulaca*	1–2	–
	cinquefoil	POTEN	*Potentilla*	1–2	–
Shrub/Vine					
11	**Dominant, evergreen, perennial shrubs**			67–202	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	67–202	–
12	**Sub-dominant, evergreen, perennial shrubs**			13–27	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	13–27	–
14	**Sub-dominant, deciduous, perennial shrubs**			13–27	
	wax currant	RICE	*Ribes cereum*	13–27	–

Animal community

This site offers food and cover for mule deer and elk.

Hydrological functions

The soils are in hydrologic group C. The soils of this site have moderately high runoff potential.

Other products

This site is suited to use by cattle, sheep and horses during the summer and fall under a planned grazing system. Use should be postponed until soils are firm enough to withstand trampling damage and soil compaction.

Contributors

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E Ersch

Approval

Kirt Walstad, 5/13/2025

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	08/07/2012
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 to severe sheet & rill erosion hazard

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2. **Presence of water flow patterns:** None to some

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3. **Number and height of erosional pedestals or terracettes:** None to very few (some frost heaving)

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-15%

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5. **Number of gullies and erosion associated with gullies:** None

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None, moderate 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: aggregate stability = 3-5

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Moderately deep to deep and well drained loam to very gravelly loam (8-20 inches thick): 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:** Moderate to significant ground cover (60-70%) and gentle to moderately steep slopes (2-35%) moderately to significantly limit 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: Idaho fescue > other grasses > shrubs > forbs

    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: 1600, Normal: 1200, Unfavorable: 900 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:** Perennial brush species will increase with deterioration of plant community. 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