

Ecological site R010XC068OR SR Cool Mountain North 12-16 PZ

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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

R010XC075OR	SR Mountain Shallow North 12-16 PZ SR Mountain Shallow 12-16 PZ
R010XC032OR	SR Mountain 12-16 PZ SR Mountain 12-16 PZ
R010XC033OR	SR Cool 12-16 PZ SR Cool 12-16 PZ
R010XC037OR	SR Mountain Shallow 12-16 PZ SR Mountain Shallow 12-16 PZ
R010XC039OR	SR Very Shallow 12-16 PZ SR Very Shallow 12-16 PZ
R010XC047OR	SR Mountain South 12-16 PZ SR Mountain South 12-16 PZ
R010XC066OR	SR Mountain North 12-16 PZ SR Mountain North 12-16 PZ

Similar sites

R010XC075OR	SR Mountain Shallow North 12-16 PZ Mountain Shallow North 12-16" PZ (shallower soil, lower production)
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R010XC066OR	SR Mountain North 12-16 PZ SR Mountain North 12-16 PZ (higher elevation, different composition -mountain big sagebrush strongly dominant big sagebrush)
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Table 1. Dominant plant species

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

Physiographic features

This site occurs on north aspects of terraces, tablelands and mountain plateaus. Slopes typically range from 12 to 60%. Elevations typically range from 3,500 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Plateau
Flooding frequency	None
Ponding frequency	None
Elevation	1,070 – 1,370 m
Slope	10 – 60 %
Aspect	N

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. Localized convection storms occasionally occur during the summer. The soil temperature regime is cool mesic to frigid with a mean air temperature of 45 degrees F.

Temperature extremes range from 90 to -30 degrees F. The frost free period ranges from less than 30 to 90 days. The optimum growth period for plant growth is May through July.

Table 3 Representative climatic features

Frost-free period (average)	90 days
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Freeze-free period (average)	100 days
Precipitation total (average)	410 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 silt loam to clay loam about 12 inches thick. The subsoil is a clay loam to clay about 22 inches. Depth to an indurated pan or bedrock ranges from 20 to 60 inches. Permeability is moderate. The available water holding capacity (AWC) is about 6 to 10 inches for the profile. The erosion potential is moderate to severe.

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Stony clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate to slow
Soil depth	50 – 150 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	15.24 – 25.4 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified

Sodium adsorption ratio (0-101.6cm)	Not specified
Subsurface fragment volume <=3" (Depth not specified)	10 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

Ecological dynamics

The potential native plant community is strongly dominated by Idaho fescue. Mountain big sagebrush is common. Xeric big sagebrush and basin big sagebrush are common. Wild crab apple and antelope bitterbrush occur sporadically. Bluebunch wheatgrass, Sandberg bluegrass and a variety of forbs are present. Vegetative composition of the community is approximately 80 percent grasses, 10 percent forbs and 10 percent shrubs. Approximate ground cover is 80 to 90 percent (basal and crown).

Range in Characteristics:

Idaho fescue is strongly dominant on north facing aspects. Bluebunch wheatgrass increases as the aspect changes to the east or northwest. Mountain big sagebrush increases in relationship to xeric and basin big sagebrush with elevation. Deciduous shrubs increase at the upper end of the precipitation zone and over gravelly and fractured substratums. Production increases with soil depth and precipitation.

Disturbance Response:

If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases while bluebunch wheatgrass increases. Big sagebrush (mountain, basin & xeric) rapidly increases and juniper invades from higher elevation rock outcrops. With continued overgrazing big sagebrush and juniper dominate the overstory and Sandberg bluegrass, a shallow rooted perennial dominates the understory. Annual invasion is limited unless ground disturbance occurs. With further deterioration and lack of fire juniper invasion continues, shrubs decrease and bare ground increases. With fire and heavy use or ground disturbance, annuals and Sandberg or bulbous bluegrass increase. Bare ground increases and excessive erosion contributes to downstream sedimentation.

States: ARTRV-X-T/POSE-Bare Ground;JUOC/ARTRV-X-T/POSE-Bare Ground;POSE-POBU-Annuals-Bare Ground

Juniper Response:

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 this site leads to an invasion of juniper, a decrease in sagebrush cover followed by a decrease in herbaceous cover and understory diversity. As juniper invades, 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 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.

The potential for soil erosion increases as the juniper woodland matures and the understory plant community cover declines. Excessive erosion in the bare soil interspaces markedly reduces the site productivity and contributes to downstream sedimentation. 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:

This site responds 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.

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 (%)
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Grass/Grasslike				
1	Dominant, perennial deep-rooted bunchgrass			1076-1255
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	1076-1255 –
2	Sub-dominant, perennial deep-rooted grass			179-359
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	179-359 –
5	Other perennial grasses			40-269
	basin wildrye	LECI4	<i>Leymus cinereus</i>	18-54 –
	Cusick's bluegrass	POCU3	<i>Poa cusickii</i>	0-36 –
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	0-36 –
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	0-36 –
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0-36 –
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	11-36 –
	squirreltail	ELEL5	<i>Elymus elymoides</i>	6-18 –
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	6-18 –
Forb				
7	Dominant, perennial forbs			90-179
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	36-72 –
	parsnipflower buckwheat	ERHE2	<i>Eriogonum heracleoides</i>	18-36 –
	lupine	LUPIN	<i>Lupinus</i>	18-36 –
	common yarrow	ACMI2	<i>Achillea millefolium</i>	18-36 –
9	Other forbs			63-214
	hawksbeard	CREPI	<i>Crepis</i>	6-18 –
	fleabane	ERIGE2	<i>Erigeron</i>	6-18 –
	Scouler's woollyweed	HISC2	<i>Hieracium scouleri</i>	6-18 –
	stoneseed	LITHO3	<i>Lithospermum</i>	6-18 –
	desertparsley	LOMAT	<i>Lomatium</i>	6-18 –
	ragwort	SENEC	<i>Senecio</i>	6-18 –
	phlox	PHLOX	<i>Phlox</i>	6-11 –
	woodland-star	LITHO2	<i>Lithophragma</i>	6-11 –
	Indian paintbrush	CASTI2	<i>Castilleja</i>	6-11 –
	bastard toadflax	COMAN	<i>Comandra</i>	0-11 –
	agoseris	AGOSE	<i>Agoseris</i>	6-11 –
	onion	ALLIU	<i>Allium</i>	2-6 –
	brodiaea	BRODI	<i>Brodiaea</i>	2-6 –
	mariposa lily	CALOC	<i>Calochortus</i>	0-6 –
	bushy bird's beak	CORA5	<i>Cordylanthus ramosus</i>	2-6 –
	larkspur	DELPH	<i>Delphinium</i>	2-6 –
	owl's-clover	ORTHO	<i>Orthocarpus</i>	0-6 –
	sagebrush buttercup	RAGL	<i>Ranunculus glaberrimus</i>	2-6 –
	stonecrop	SEDUM	<i>Sedum</i>	2-6 –
	deathcamas	ZIGAD	<i>Zigadenus</i>	2-6 –
Shrub/Vine				
11	Dominant, evergreen shrubs			56-269
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	54-143 –
	big sagebrush	ARTRX	<i>Artemisia tridentata ssp. xericensis</i>	36-90 –
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	36-90 –

13	Other shrubs			47-341	
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0-36	–
	threetip sagebrush	ARTR4	<i>Artemisia tripartita</i>	0-36	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	18-36	–
	wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>	0-36	–
	chokecherry	PRVI	<i>Prunus virginiana</i>	0-36	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0-36	–
	wax currant	RICE	<i>Ribes cereum</i>	18-36	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	11-36	–
	common snowberry	SYAL	<i>Symphoricarpos albus</i>	0-36	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	0-18	–
Tree					
16	Dominant, evergreen trees			0-36	
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	0-18	–

Animal community

Livestock Grazing: This site is suitable for livestock grazing use in the late spring, summer, and fall under a planned grazing system. Use should be postponed until the soils are firm enough to prevent trampling damage and soil compaction. Grazing management should be keyed for Idaho fescue. Deferred grazing or rest is recommended at least once every three years. **Native Wildlife Associated with the Potential Climax Community:** This site is commonly used by mule deer, elk, antelope, rabbits, rodents, upland birds and various predators. It is a preferred site for upland bird nesting and rearing areas. Mule deer and elk make excellent use of the site for summer and late fall forage.

Hydrological functions

The soils of this site are typically in an upland topographic position. They have moderate high runoff potential and medium infiltration rates when the hydrologic cover is good. Under frozen ground conditions runoff potential is significantly increased. This occurs for extended periods when deep rooted perennial bunchgrass cover is negligible. Hydrologic cover is good when the Idaho fescue deep rooted bunchgrass component is >70 percent of potential.

Other information

Juniper invasion is a major risk on this site. Control measures include prescribed burning and/or cutting followed by rest to improve vigor, density and seed production of existing deep rooted perennial bunchgrasses. Consider seeding following control measures if an inadequate stand of bunchgrass is present. Green rabbitbrush, when present, should be targeted in a herbicide brush control program. It can increase markedly.

Contributors

A Bahn, G Kuehl, H Barrett
T.Bloomer, B.Gillaspy, E.Petersen, A.Bahn

Approval

Kirt Walstad, 4/02/2025

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 Frannsen
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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 to some

2. Presence of water flow patterns: None to some

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

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):
0-5%

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

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):
Significantly resistant to erosion: aggregate stability = 5-6

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Weak fine granular to platy, to very fine subangular blocky structure, dry color value 4-5, 4-20 inches thick; 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 (80-90%) moderately to significantly limit rainfall impact and overland flow on these gentle to steep slopes (12-80%)

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: Deep-rooted, perennial, cool-season bunch-grasses

Sub-dominant: Evergreen shrubs > deciduous shrubs

Other: 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: 1600, Unfavorable: 1000 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
