

Ecological site R010XC033OR

SR Cool 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

R010XC029OR	SR Shallow Cool 12-16 PZ SR Shallow Cool 12-16 PZ (stony loam surface texture, shallower soil depth, lower production)
R010XC039OR	SR Very Shallow 12-16 PZ SR Very Shallow 12-16 PZ (very shallow soil depth, lower production, different composition – ARRI2/POSE association)
R010XC047OR	SR Mountain South 12-16 PZ SR Mountain South 12-16 PZ (south aspect, lower production, different composition – higher proportion of PSSPS)
R010XC054OR	SR Mountain Shallow South 12-16 PZ SR Mountain Shallow South 12-16 PZ (south aspect, shallower soil depth, different composition – higher proportion of PSSPS)
R010XC068OR	SR Cool Mountain North 12-16 PZ SR Cool Mountain North 12-16 PZ (north aspect, higher production)
R010XC075OR	SR Mountain Shallow North 12-16 PZ SR Mountain Shallow North 12-16 PZ (north aspect, shallower soil depth, lower production)

Similar sites

R010XC075OR	SR Mountain Shallow North 12-16 PZ SR Mountain Shallow North 12-16 PZ (north aspect, shallower soil depth, lower production)
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R010XC066OR	SR Mountain North 12-16 PZ SR Mountain North 12-16 PZ (higher elevation, north aspect, higher production, different composition – higher proportion of ARTRV)
R010XC037OR	SR Mountain Shallow 12-16 PZ SR Mountain Shallow 12-16 PZ (higher elevation, stony loam surface texture, shallower soil depth, lower production, different composition – higher proportion of ARTRV)
R010XC032OR	SR Mountain 12-16 PZ SR Mountain 12-16 PZ (higher elevation, different composition – higher proportion of ARTRV)
R010XC068OR	SR Cool Mountain North 12-16 PZ SR Cool Mountain North 12-16 PZ (north aspect, higher production)
R010XC029OR	SR Shallow Cool 12-16 PZ SR Shallow Cool 12-16 PZ (shallower soil depth, lower production)

Table 1. Dominant plant species

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

Physiographic features

This site occurs on terraces, tablelands and rolling uplands. Slopes typically range from 2 to 12%. Elevations typically range from 3,000 to 3,800 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	910 – 1,160 m

Slope	0 – 10 %
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 December through March. Localized convection storms occasionally occur during the summer. The soil temperature regime is nescic near frigid to frigid with a mean air temperature of 45 degrees F. Temperature extremes range from 90 to -20 degrees F. The frost free period ranges from less than 50 to 90 days. The optimum growth period for plant growth is late April through June.

Table 3 Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	
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 loam to clay loam about 12 inches thick. The subsoil is a clay loam to clay about 22 inches thick. Depth to an indurated pan or bedrock ranges from 20 to 60 inches. Permeability is moderate. The available water holding capacity (AWC) is about 4 to 8 inches for the profile. The erosion potential is moderate.

Table 4. Representative soil features

Parent material	(1) Volcanic ash – rhyolite (2) Loess – basalt
Surface texture	(1) Loam (2) Clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderate
Soil depth	50 – 150 cm

Surface fragment cover <=3"	0 – 20 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.16 – 20.32 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)	0 – 20 %

Ecological dynamics

The potential native plant community is dominated by Idaho fescue and a complex of mountain, xeric and basin big sagebrush. Bluebunch wheatgrass and Sandberg bluegrass are common along with a variety of forbs. Thurber's needlegrasses, wild crab apple and antelope bitterbrush occur sporadically. Vegetative composition of the community is approximately 75 percent grasses, 10 percent forbs and 15 percent shrubs. Approximate ground cover is 70 to 80 percent (basal and crown).

Range in Characteristics:

Idaho fescue increases on silt loam surfaces. Needlegrasses increase on coarser surfaces and over shallower depths. Bluebunch wheatgrass increases on slight south and west exposures. 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.

Response to Disturbance - States:

If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases. Needlegrasses maintain a presence, big sagebrush (mountain, basin & xeric) rapidly increases and juniper invades from higher elevation rock outcrops. With continued overgrazing, needlegrasses decrease, big sagebrush dominates 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 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. 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:

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. 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	Dominant, moderate rooted bunchgrass			673-1009	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	673-1009	–
2	Sub-dominant, moderate rooted bunchgrasses			252-757	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	168-504	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	84-252	–
3	Common, perennial, shallow rooted grass			34-84	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	34-84	–
4	Other perennial grasses			56-202	
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	17-50	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	17-50	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	17-50	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	17-50	–
	basin wildrye	LEC14	<i>Leymus cinereus</i>	17-50	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	17-34	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	11-34	–
	slender wheatgrass	ELTRT	<i>Elymus trachycaulus ssp. trachycaulus</i>	11-34	–
Forb					
5	Dominant, perennial, forbs			146-224	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	34-50	–
	parsnipflower buckwheat	ERHE2	<i>Eriogonum heracleoides</i>	34-50	–
	milkvetch	ASTRA	<i>Astragalus</i>	17-34	–
	desertparsley	LOMAT	<i>Lomatium</i>	17-34	–
	lupine	LUPIN	<i>Lupinus</i>	17-34	–
	phlox	PHLOX	<i>Phlox</i>	11-22	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	11-22	–
	fleabane	ERIGE2	<i>Erigeron</i>	11-22	–
6	Other forbs			34-135	
	hawksbeard	CREPI	<i>Crepis</i>	6-17	–
	buckwheat	ERIOG	<i>Eriogonum</i>	6-17	–
	stoneseed	LITHO3	<i>Lithospermum</i>	6-17	–
	stonecrop	SEDUM	<i>Sedum</i>	0-11	–
	bastard toadflax	COMAN	<i>Comandra</i>	2-11	–

	bushy bird's beak	CORA5	<i>Cordylanthus ramosus</i>	0-6	–
	woodland-star	LITHO2	<i>Lithophragma</i>	2-6	–
	agoseris	AGOSE	<i>Agoseris</i>	2-6	–
	onion	ALLIU	<i>Allium</i>	2-6	–
	pussytoes	ANTEN	<i>Antennaria</i>	2-6	–
	brodiaea	BRODI	<i>Brodiaea</i>	2-6	–
	mariposa lily	CALOC	<i>Calochortus</i>	2-6	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	2-6	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	2-6	–
	owl's-clover	ORTHO	<i>Orthocarpus</i>	0-6	–
	sagebrush buttercup	RAGL	<i>Ranunculus glaberrimus</i>	2-6	–

Shrub/Vine

7	Dominant, evergreen, non-sprouting shrubs			112-303	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	50-135	–
	big sagebrush	ARTRX	<i>Artemisia tridentata ssp. xericensis</i>	34-84	–
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	34-84	–
8	Other shrubs			56-280	
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0-50	–
	threetip sagebrush	ARTR4	<i>Artemisia tripartita</i>	0-50	–
	wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>	0-50	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0-50	–
	wax currant	RICE	<i>Ribes cereum</i>	0-34	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	0-34	–
	snowberry	SYMPH	<i>Symphoricarpos</i>	0-34	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	6-34	–
	milkvetch	ASTRA	<i>Astragalus</i>	17-34	–
	buckwheat	ERIOG	<i>Eriogonum</i>	17-34	–
	desertparsley	LOMAT	<i>Lomatium</i>	17-34	–
	lupine	LUPIN	<i>Lupinus</i>	17-34	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	0-17	–

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. **Wildlife Associated with the Site:** 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 spring 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 more frequently when perennial bunchgrass cover is negligible. Hydrologic cover is good when the Idaho fescue and other moderate rooted bunchgrass components are greater than 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 perennial bunchgrasses. Consider seeding following control measures if an inadequate stand of bunchgrass is present.

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)	Jeff Repp and Bruce Frannsen
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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):
2-12%

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):
Moderate 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 fine to medium granular to subangular blocky structure, dry color value 4-5, 8-16 inches thick; moderate SOM (1-4%)

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Significant ground cover (60-80%) and gentle slopes (2-12%) 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: Deep-rooted, perennial, cool-season bunchgrasses

Sub-dominant: Evergreen shrubs > deciduous shrubs

Other: Forbs > other grasses > trees

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: 1800, Normal: 1500, Unfavorable: 1200 lbs/acre/year

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: 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
