USDA Natural Resources
Conservation Service

Ecological site R010XC036OR
SR Shallow Cool 9-12 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.

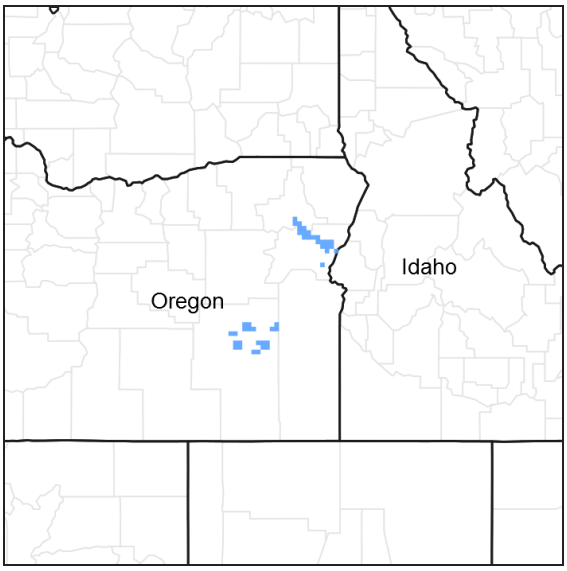


Figure 1. Mapped extent

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

R010XC030OR	**SR Cool 9-12 PZ** SR Cool 9-12 PZ
R010XC038OR	**SR Very Shallow 9-12 PZ** SR Very Shallow 9-12" PZ
R010XC043OR	**SR South 9-12 PZ** SD South 9-12 PZ
R010XC050OR	**SR Shallow South 9-12 PZ** SR Shallow South 9-12" PZ
R010XC065OR	**SR Cool North 9-12 PZ** SR Cool North 9-12 PZ

Similar sites

R010XC030OR	**SR Cool 9-12 PZ** SR Cool 9-12 PZ (deeper soil, higher production)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. wyomingensis*
Herbaceous	(1) *Festuca idahoensis*

Physiographic features

This site occurs on terraces, tablelands and rolling uplands. Slopes range from 2 to 12%. Elevations typically range from 3,500 to 4,200 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Hill
Elevation	3,500–4,200 ft
Slope	2–12%
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 December through March. Localized convection storms occasionally occur during the summer. The soil temperature regime is cool mesic with a mean air temperature of 45 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 plant growth is April through June.

Table 3. Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	0 days
Precipitation total (average)	12 in

Influencing water features

Soil features

The soils of this site are typically shallow and well drained. Typically the surface layer is a silt loam to stony clay loam about 6 inches thick. The subsoil is a silty clay loam to gravelly clay about 5 inches thick. Depth to bedrock or an indurated pan is 10 to 20 inches. Permeability is slow. The available water holding capacity (AWC) is about 2 to 4 inches for the profile. The erosion potential is moderate to severe.

Table 4. Representative soil features

Surface texture	(1) Gravelly silt loam (2) Stony clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow
Soil depth	10–20 in
Available water capacity (0-40in)	2–4 in

Ecological dynamics

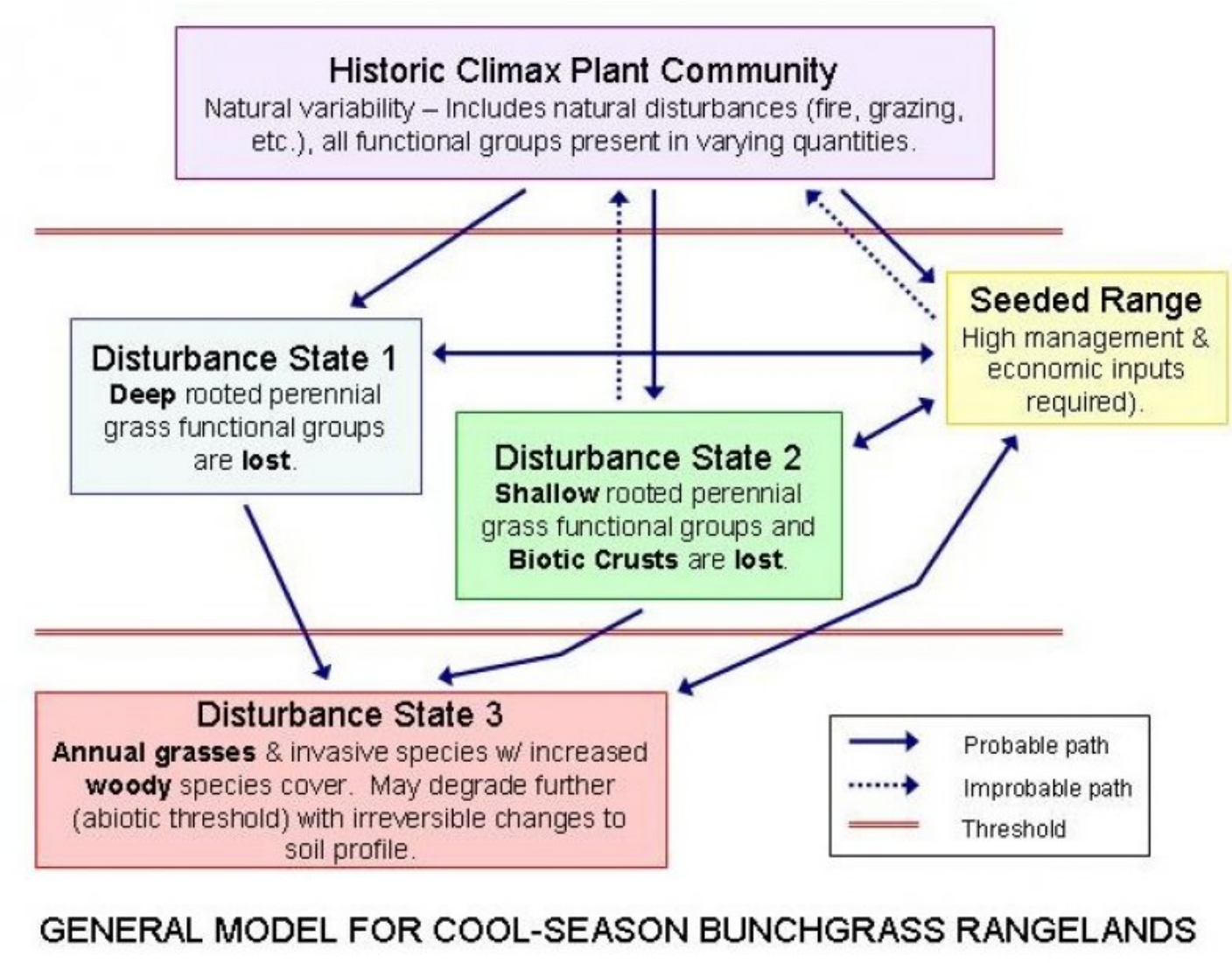
The potential native plant community is dominated by Wyoming big sagebrush and Idaho fescue. Bluebunch wheatgrass, Thurber needlegrass and Sandberg bluegrass are common. A variety of forbs and other shrubs are present. Vegetative composition of the community is approximately 70 percent grasses, 10 percent forbs and 20 percent shrubs. Approximate ground cover is 40-60 percent (basal and crown).

Range in Characteristics:
Idaho fescue dominance is marginal as it is near the edge of its ecological amplitude and has low site resiliency. Bluebunch wheatgrass increases on slight south and west exposures. Thurber needlegrass increases on shallower soils and soils with gravelly surfaces. Shrubs will increases over fractured substratums. Production will increase on deeper soils and at the upper end of the precipitation zone.

Response to Disturbance:
When the condition of the site deteriorates as a result of over grazing Idaho fescue rapidly decreases. Wyoming big sagebrush, Sandberg bluegrass and squirreltail increase. With continued overgrazing Wyoming big sagebrush and Sandberg bluegrass become dominant. When present, bulbous bluegrass invades. Annual invasion is limited unless major ground disturbance occurs. With further deterioration, bare ground increases and excessive erosion reduces the site productivity and contributes to downstream sedimentation.

States: ARTRW/POSE-Bare Ground

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 Wyoming big sagebrush and Idaho fescue. Bluebunch wheatgrass, Thurber needlegrass and Sandberg bluegrass are common. A variety of forbs and other shrubs are present. Vegetative composition of the community is approximately 70 percent grasses, 10 percent forbs and 20 percent shrubs. Approximate ground cover is 40-60 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	280	490	770
Shrub/Vine	80	140	220
Forb	30	70	110
Total	**390**	**700**	**1100**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant, perennial deep-rooted bunchgrass**			350–490	
	Idaho fescue	FEID	*Festuca idahoensis*	350–490	–
2	**Sub-dominant, deep rooted perennial grasses**			49–126	
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	35–70	–
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	14–56	–
4	**Dominant, perennial shallow-rooted grass**			21–56	
	Sandberg bluegrass	POSE	*Poa secunda*	21–56	–
5	**Other perennial grasses**			15–63	
	threadleaf sedge	CAFI	*Carex filifolia*	0–21	–
	squirreltail	ELEL5	*Elymus elymoides*	10–21	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	5–21	–
Forb					
7	**Dominant, perennial forbs**			27–77	
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	7–21	–
	fleabane	ERIGE2	*Erigeron*	5–14	–
	buckwheat	ERIOG	*Eriogonum*	5–14	–
	desertparsley	LOMAT	*Lomatium*	5–14	–
	phlox	PHLOX	*Phlox*	5–14	–
9	**Other perennial forbs**			27–83	
	common yarrow	ACMI2	*Achillea millefolium*	3–7	–
	milkvetch	ASTRA	*Astragalus*	3–7	–
	stoneseed	LITHO3	*Lithospermum*	3–7	–
	lupine	LUPIN	*Lupinus*	3–7	–
	brittle pricklypear	OPFR	*Opuntia fragilis*	0–7	–

	tapertip hawksbeard	CRAC2	*Crepis acuminata*	3–7	–
	larkspur	DELPH	*Delphinium*	0–5	–
	bitter root	LERE7	*Lewisia rediviva*	2–5	–
	sagebrush buttercup	RAGL	*Ranunculus glaberrimus*	2–5	–
	brodiaea	BRODI	*Brodiaea*	2–5	–
	agoseris	AGOSE	*Agoseris*	2–5	–
	onion	ALLIU	*Allium*	2–5	–
	pussytoes	ANTEN	*Antennaria*	2–5	–
	bushy bird's beak	CORA5	*Cordylanthus ramosus*	0–3	–
	rough eyelashweed	BLSC	*Blepharipappus scaber*	0–3	–
Shrub/Vine					
11	**Dominant evergreen shrub**			70–140	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	70–140	–
15	**Other shrubs**			21–112	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	14–35	–
	wild crab apple	PERA4	*Peraphyllum ramosissimum*	7–21	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	0–14	–
	horsebrush	TETRA3	*Tetradymia*	0–7	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–7	–
	spiny hopsage	GRSP	*Grayia spinosa*	0–7	–
	granite prickly phlox	LIPU11	*Linanthus pungens*	0–7	–
	scabland sagebrush	ARRI2	*Artemisia rigida*	0–7	–
	threetip sagebrush	ARTR4	*Artemisia tripartita*	0–7	–

Animal community

Livestock Grazing:
This site is suitable for livestock grazing use in the spring, early 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 pronghorn antelope, mule deer, rabbits, rodents, upland birds and various predators. It is a preferred site for sage grouse leks, nesting, rearing and wintering. Antelope and mule deer make excellent use of the site for winter and spring forage.

Hydrological functions

The soils of this site are typically in an upland topographic position. They have moderate runoff potential and medium infiltration rates when the hydrologic cover is high. Hydrologic cover is high when the Idaho fescue deep rooted bunchgrass component is >70 percent of potential. Under lower seral conditions runoff potential is high. This occurs when deep rooted perennial bunchgrass cover is low and bare ground increases.

Contributors

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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)	Bruce Frannsen and Jeff Repp
Contact for lead author	State Rangeland Management Specialist for NRCS in Oregon.
Date	08/07/2012
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** none, moderate to severe sheet & rill erosion hazard

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

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):** 10-25%

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None, slight wind erosion hazard

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 to significant resistance to erosion: aggregate stability = 4=6

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Shallow well drained gravelly clay loam (6 inches thick): Low to moderate OM (0-2%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate ground cover (30-50%) and gentle slopes (0-15%) moderately 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: Idaho fescue > Wyoming big sagebrush > Bluebunch wheatgrass > other grasses > forbs > other shrubs

    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):** Faorable: 1100, Normal: 600, Unfavorable: 300 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:** 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