USDA Natural Resources
Conservation Service

Ecological site R010XC043OR
SR South 9-12 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.

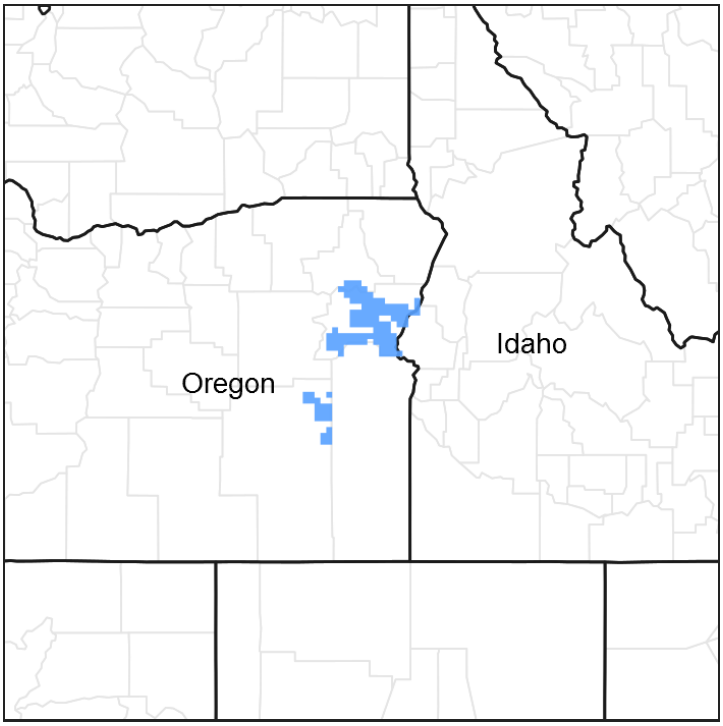


Figure 1. Mapped extent

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

R010XC021OR	**SR Clayey 9-12 PZ** SR Clayey 9-12" PZ
R010XC035OR	**SR Shallow 9-12 PZ** SR Shallow 9-12" PZ

R010XC038OR	**SR Very Shallow 9-12 PZ** SR Very Shallow 9-12" PZ
BX010X00C050	**Shallow South 9-12 PZ Snake River Warm Plains** SR Shallow South 9-12" PZ

Similar sites

BX010X00C050	**Shallow South 9-12 PZ Snake River Warm Plains** SR Shallow South 9-12" PZ (shallower soil, lower production)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata var. wyomingensis* (2) *Artemisia tridentata ssp. tridentata*
Herbaceous	(1) *Pseudoroegneria spicata ssp. spicata* (2) *Achnatherum thurberianum*

Physiographic features

This site occurs on canyon sideslopes and south exposures of terraces and tablelands. Slopes range from 12 to 70 percent. Elevations typically range from 2000 to 4500 feet.

Table 2. Representative physiographic features

Landforms	(1) Canyon (2) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	610–1,372 m
Slope	12–70%
Aspect	SE, S, SW

Climatic features

The annual precipitation ranges from 9 to 12 inches, most of which occurs in the form of rain and snow during the months of November through March. Localized, occasionally severe, convectional storms occur during the summer. The soil temperature regime is typically mesic with a mean annual air temperature of about 52 degrees F. Temperature extremes range from 100 to -20 degrees F. The frost-free period ranges from 120 to 160

days. The optimum period for plant growth is from April through June.

Table 3. Representative climatic features

Frost-free period (average)	160 days
Freeze-free period (average)	
Precipitation total (average)	305 mm

Influencing water features

Soil features

The soils of this site are typically moderately deep to deep and moderately well to well-drained. Typically the surface layer is a silt loam or gravelly clay loam about 3 to 10 inches thick. The subsoil is a clay loam, gravelly clay, or clay about 8 to 23 inches thick. Depth to bedrock or lacustrine or alluvial sediments is 20 to 40 inches. Permeability is very slow to moderately rapid. The available water holding capacity is about 4 to 6 inches. The potential for erosion is moderate to severe.

Table 4. Representative soil features

Surface texture	(1) Very cobbly silt loam (2) Very gravelly clay loam (3) Gravelly silty clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	51–152 cm
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–20%
Available water capacity (0-101.6cm)	10.16–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4

Subsurface fragment volume <=3" (Depth not specified)	0–50%
Subsurface fragment volume >3" (Depth not specified)	0–45%

Ecological dynamics

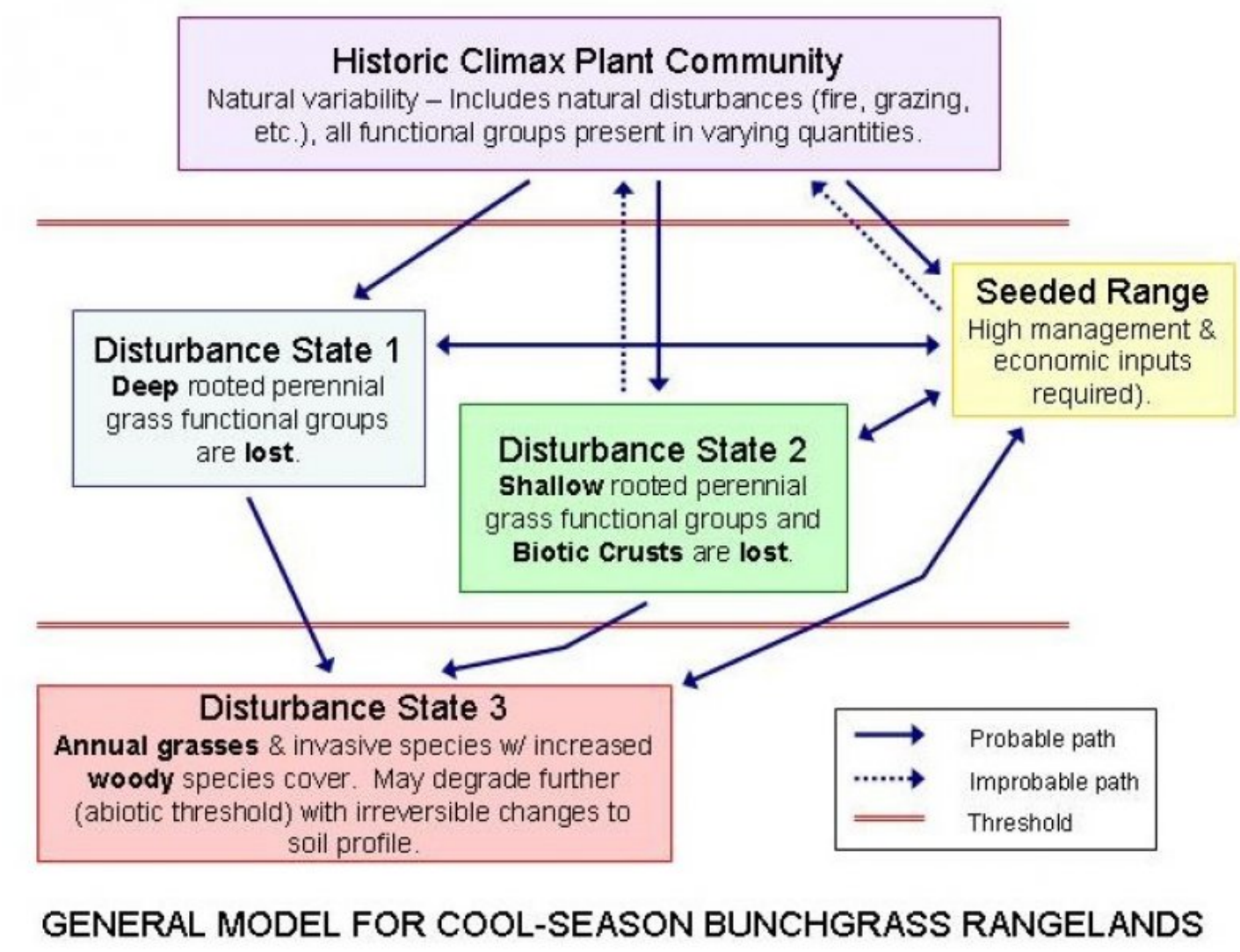
Range in Characteristics:

Gravels in the surface layer or a decrease in clay in the subsoil will favor the presence of Thurber needlegrass in the stand. Wyoming big sagebrush is the dominant shrub at the lower end of the precipitation range while basin big sagebrush increases at the higher end of the precipitation range. Production increases on deeper foot slope soils.

Response to Disturbance:

If the condition of the site deteriorates as a result of overgrazing, bluebunch wheatgrass and Thurber needlegrass decrease while sagebrush, rabbitbrush, and Sandberg bluegrass increase. Bluebunch wheatgrass is the preferred species during spring and summer. With further deterioration, annuals invade. Under deteriorated conditions, annual grasses and shrubs dominate the site.

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Reference

Community 1.1
Reference Plant Community

The potential native plant community is dominated by Wyoming big sagebrush and bluebunch wheatgrass. Basin big sagebrush, Thurber needlegrass, and Sandberg bluegrass are common in the stand. Vegetative composition of the community is approximately 85 percent grasses, 5 percent forbs, and 10 percent shrubs. Approximate ground cover is 50 to 70 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	572	762	953
Shrub/Vine	67	90	112
Forb	34	45	56
Total	**673**	**897**	**1121**

Figure 3. Plant community growth curve (percent production by month). OR4501, B10 SR Souths & Shallows 9-12 pz. SR Souths & Shallows 9-12 pz RPC Growth Curve.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	40	30	5	5	5	0	0	0

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	**Perennial, deep-rooted, dominant**			538–717	
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	538–717	–
2	**Perennial, deep-rooted, sub-dominant**			45–179	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	45–179	–
4	**Perennial, shallow-rooted, sub-dominant**			27–72	
	Sandberg bluegrass	POSE	*Poa secunda*	27–72	–
5	**Other perennial grasses**			18–45	
	squirreltail	ELEL5	*Elymus elymoides*	0–18	–
	Idaho fescue	FEID	*Festuca idahoensis*	0–18	–
	basin wildrye	LECI4	*Leymus cinereus*	0–18	–
Forb					
6	**Perennial, all, dominant**			18–45	
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	18–45	–
7	**Perennial forb**			9–18	
	desertparsley	LOMAT	*Lomatium*	9–18	–

8	**Perennial forb**			9–18	
	lupine	LUPIN	*Lupinus*	9–18	–
9	**Other perennial forbs, all**			9–45	
	common yarrow	ACMI2	*Achillea millefolium*	0–9	–
	onion	ALLIU	*Allium*	0–9	–
	pussytoes	ANTEN	*Antennaria*	0–9	–
	milkvetch	ASTRA	*Astragalus*	0–9	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	0–9	–
	fleabane	ERIGE2	*Erigeron*	0–9	–
	buckwheat	ERIOG	*Eriogonum*	0–9	–
	stoneseed	LITHO3	*Lithospermum*	0–9	–
	tansyaster	MACHA	*Machaeranthera*	0–9	–
	phacelia	PHACE	*Phacelia*	0–9	–
	phlox	PHLOX	*Phlox*	0–9	–
	primrose	PRIMU	*Primula*	0–9	–
Shrub/Vine					
11	**Perennial, evergreen, dominant**			18–45	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	18–45	–
12	**Perennial, evergreen, sub-dominant**			27–63	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	9–27	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	9–18	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	9–18	–
14	**Perennial, deciduous, sub-dominant**			0–36	
	wild crab apple	PERA4	*Peraphyllum ramosissimum*	0–18	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	0–18	–
15	**Other perennial shrubs, all**			9–27	
	threetip sagebrush	ARTR4	*Artemisia tripartita*	0–9	–
	hackberry	CELTI	*Celtis*	0–9	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–9	–

	rabbitbrush		*viscidiflorus*		
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–9	–
	horsebrush	TETRA3	*Tetradymia*	0–9	–

Animal community

Livestock Grazing:

Warm temperatures and early maturing forage attract livestock to south-facing slopes in early spring. Without a grazing system that will give periodic deferment, there will be a decline in plant vigor and reproduction. Failure to manage livestock on these sites will lead to the rapid loss of any productive value.

Native Wildlife Associated with the Potential Climax Community:

Mule deer
Hawks
Rodents
Songbirds

The southerly aspect of this site offers warm temperatures and early spring growth that attracts several grazing and browsing forms of wildlife and gallinaceous birds in winter and spring.

Hydrological functions

The soils are in hydrologic group C. The soils of this site have moderate runoff potential and medium infiltration rates when the hydrologic cover is good. Hydrologic cover is good when the bluebunch wheatgrass 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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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	State Rangeland Management Specialist
Date	04/15/2005
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None.

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2. **Presence of water flow patterns:** None to few (on steeper slopes)

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3. **Number and height of erosional pedestals or terracettes:** None.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-20%

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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.

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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):** Moderate to significant resistant to erosion: aggregate stability = 3-6

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Moderate medium granular structure to weak medium platy structure, dry color value 3 - 6, 3 - 12 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 ground cover (50-70%) and moderate to steep slopes (12-70%) moderately limit rainfall 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: Deep rooted perennial bunchgrasses

    Sub-dominant: Evergreen shrubs >= perennial forbs

    Other: Shallow rooted perennial bunchgrasses

    Additional:

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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: 1000, Normal: 800, Unfavorable: 600 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:** Western Juniper readily invades the site. Cheatgrass and Medusahead invade sites that have lost deep rooted perennial grass functional group.

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