USDA Natural Resources
Conservation Service

Ecological site R010XC075OR
SR Mountain Shallow 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.

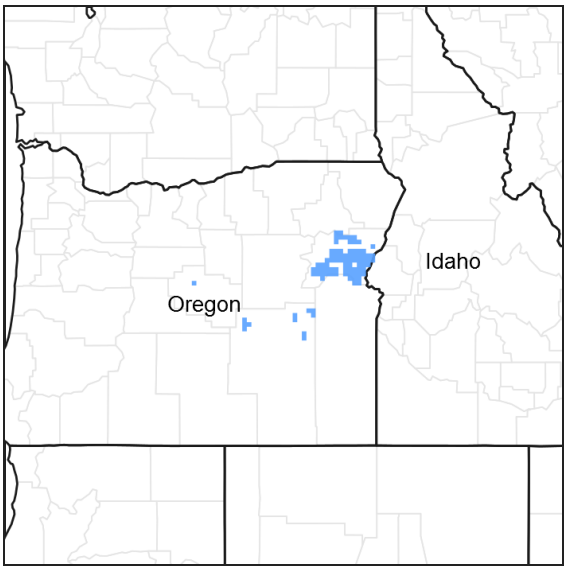


Figure 1. Mapped extent

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

R010XC032OR	**SR Mountain 12-16 PZ** Mountain Clayey 12-16" PZ

Similar sites

R010XC066OR	**SR Mountain North 12-16 PZ** Mountain North 12-16" PZ (deeper soils, higher production)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. vaseyana*
Herbaceous	(1) *Festuca idahoensis* (2) *Pseudoroegneria spicata*

Physiographic features

This site occurs on north aspects of upland and mountain sideslopes. Slopes typically range from 12 to 40% but may range to 60%. Elevations range from 3000 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	914–1,829 m
Slope	12–60%
Aspect	N

Climatic features

The annual perecipitation ranges from 12 to 16 inches, most of which occurs in the form of snow during the months of November through March. Localized, occasionally severe convection storms occur during the summer. The soil temperature regime is frigid to near frigid with a mean annual air temperature of 45 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost free period ranges from 30 to 70 days. The optimum period for plant growth is from April through June.

Table 3. Representative climatic features

Frost-free period (average)	70 days
Freeze-free period (average)	100 days
Precipitation total (average)	406 mm

Influencing water features

Soil features

The soils of this site are typically shallow and well drained. Typically the surface layer is a very stony silt loam about 6 inches thick. The subsoil is a very cobbly clay or silty clay over extremely cobbly or gravelly clay or clay loam about 11 inches thick. Depth to bedrock or an indurated pan is 10 to 20 inches. Permeability is moderate to moderately slow in the surface to slow in the subsoil. The available water holding capacity is about 1 to 2 inches for the profile. the potential for erosion is moderate to severe.

Table 4. Representative soil features

Surface texture	(1) Very stony loam (2) Extremely stony silt loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate to slow
Soil depth	25–51 cm
Surface fragment cover <=3"	12–15%
Surface fragment cover >3"	18–55%
Available water capacity (0-101.6cm)	2.79–5.59 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)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	10–22%
Subsurface fragment volume >3" (Depth not specified)	8–50%

Ecological dynamics

Bluebunch wheatgrass increases as the aspect changes to east or northwest. Sagebrush increases over fractured bedrock. Basin big sagebrush increases in proportion over mountain big sagebrush at the lower end of the precipitation zone and at lower elevations.

Disturbance Response:

If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases while big sagebrush and bluebunch wheatgrass increase. Idaho fescue is the preferred species during all seasons. With further deterioration, bluebunch wheatgrass decreases, Sandberg bluegrass increases and annuals invade. The percentage of squirreltail may also increase. As grass cover declines the potential for weed and juniper invasion increases.

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 increase in juniper cover, a decrease in sagebrush cover followed by a decrease in herbaceous cover and understory diversity. As juniper encroaches 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 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.

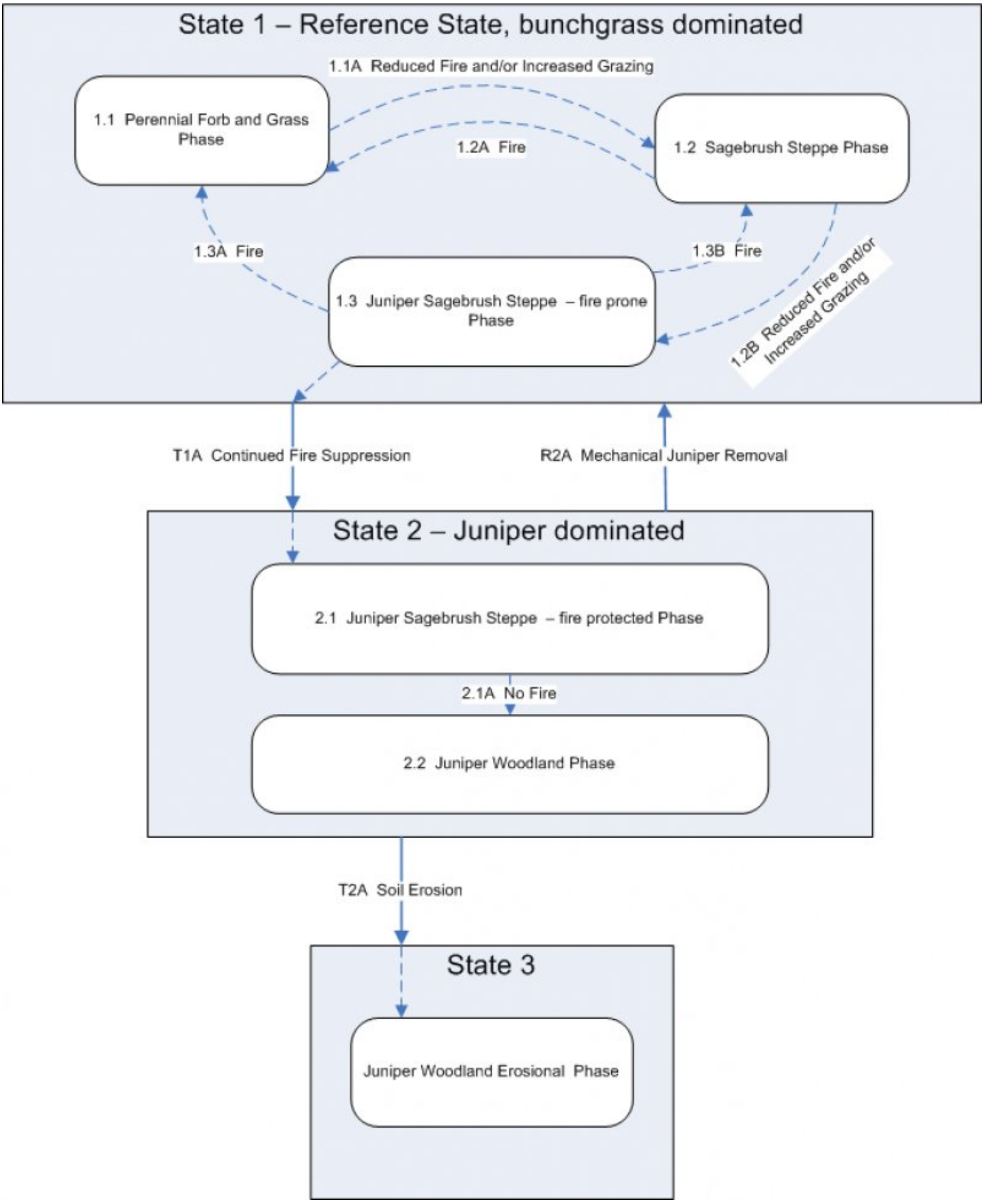
The potential for soil erosion increases as the juniper woodland matures and the understory plant community cover declines.
Under deteriorated conditions bare soil interspaces increase and excessive erosion markedly reduces the site productivity and contributes to downstream sedimentation.

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. Sagebrush and forbs may also need to be seeded if adult plants are no longer present in the understory.

State and transition model



State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The potential native plant community is dominated by Idaho fescue and mountain big sagebrush. Basin big sagebrush, bluebunch wheatgrass and Sandberg bluegrass are common in the stand. Vegetative composition of the community is approximately 80% grasses, 5% forbs, and 15% shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	538	807	1076
Shrub/Vine	101	151	202
Forb	34	50	67
Total	**673**	**1008**	**1345**

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**			404–807	
	Idaho fescue	FEID	*Festuca idahoensis*	404–807	–
2	**Perennial, deep-rooted, sub-dominant**			67–135	
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	67–135	–
4	**Perennial, shallow-rooted, sub-dominant**			34–67	
	Sandberg bluegrass	POSE	*Poa secunda*	34–67	–
5	**All other perennial grasses**			34–67	
	needlegrass	ACHNA	*Achnatherum*	0–27	–
	threadleaf sedge	CAFI	*Carex filifolia*	0–27	–
	squirreltail	ELEL5	*Elymus elymoides*	0–27	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–27	–
Forb					
7	**Perennial, dominant**			27–54	
	common yarrow	ACMI2	*Achillea millefolium*	7–13	–
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	7–13	–
	desertparsley	LOMAT	*Lomatium*	7–13	–
	lupine	LUPIN	*Lupinus*	7–13	–
9	**Other perennial forbs**			0–13	
	agoseris	AGOSE	*Agoseris*	0–13	–
	pussytoes	ANTEN	*Antennaria*	0–13	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	0–13	–
	larkspur	DELPH	*Delphinium*	0–13	–
	fleabane	ERIGE2	*Erigeron*	0–13	–
	buckwheat	ERIOG	*Eriogonum*	0–13	–
	phlox	PHLOX	*Phlox*	0–13	–
Shrub/Vine					
11	**Evergreen, dominant**			61–121	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	61–121	–
12	**Evergreen, subdominant**			13–27	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	13–27	–
15	**Other shrubs**			27–54	
	threetip sagebrush	ARTR4	*Artemisia tripartita*	0–27	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–27	–
	wild crab apple	PERA4	*Peraphyllum ramosissimum*	0–27	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	0–27	–
	wax currant	RICE	*Ribes cereum*	0–27	–
	horsebrush	TETRA3	*Tetradymia*	0–27	–

Animal community

This site provides food and cover for mule deer, elk, rodents and a variety of birds and their associated predators.

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

Hydrological functions

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

Other information

This site is generally not suited to seeding because of its shallow depth and stony surface.

Contributors

A Bahn, G Kuehl, H Barrett
E Ersch

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
Contact for lead author	NRCS Oregon State Rangeland Management Specialist
Date	04/24/2003
Approved by	Bob Gillaspy
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):** 0-10%

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):** Moderately resistant to erosion: aggregate stability = 3-5

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Moderate fine granular to subangular blocky structure, dry color value 4-5, 4-6 inches thick; moderate OM (1-2%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (70-80%) moderately to significantly limit rainfall impact and overland flow on these gentle to steep slopes (12-60%)

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: Perennial, deep-rooted, cool-season bunchgrasses

    Sub-dominant: Evergreen shrubs

    Other: Perennial forbs = other perennial grasses = other shrubs

    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: 1200, Normal: 900, Unfavorable: 600 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

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

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