

Ecological site R010XC032OR SR Mountain 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.

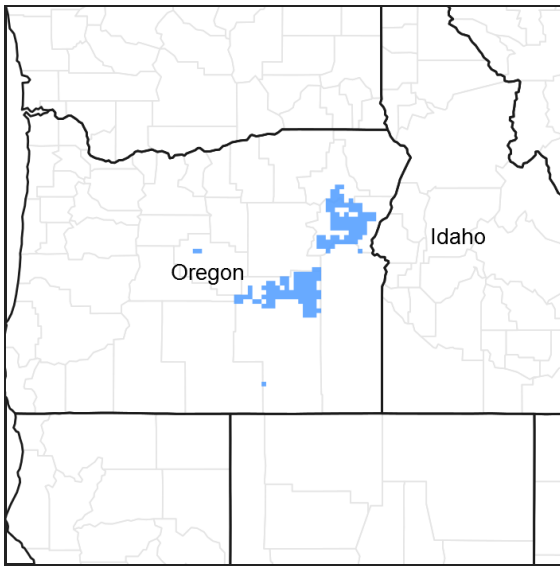


Figure 1. Mapped extent

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

R010XC037OR	SR Mountain Shallow 12-16 PZ SR Mountain Shallow 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)
R010XC066OR	SR Mountain North 12-16 PZ SR 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

R010XC029OR	SR Shallow Cool 12-16 PZ SR Shallow Cool 12-16 PZ (lower elevation, shallower soil depth, lower production, different composition - higher proportion of ARTRT-X)
R010XC068OR	SR Cool Mountain North 12-16 PZ SR Cool Mountain North 12-16 PZ (lower elevation, north aspect, higher production, different composition - higher proportion of ARTRT-X)
R010XC037OR	SR Mountain Shallow 12-16 PZ SR Mountain Shallow 12-16 PZ (stony loam surface texture, shallower soil depth, lower production)
R010XC066OR	SR Mountain North 12-16 PZ SR 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)
R010XC033OR	SR Cool 12-16 PZ SR Cool 12-16 PZ (lower elevation, different composition – higher proportion of ARTRT-X)

Table 1. Dominant plant species

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

Physiographic features

This site occurs on rolling uplands, tablelands, and mountain plateaus. Slopes typically range from 2 to 12%. Elevations typically range from 4,200 to 5,700 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Plateau (3) Mountain
Elevation	1,280–1,737 m
Slope	2–12%
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, occasionally severe, convection storms occur during the summer. The soil temperature regime is frigid with a mean annual air temperature of 43 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 period for plant growth is May through June.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	60 days
Precipitation total (average)	406 mm

Influencing water features

Soil features

The soils of this site are typically moderately deep and well drained. Typically, the surface layer is a silt loam to silty clay loam about 8 inches thick. The subsoil is a clay loam to clay about 20 inches thick. Depth to bedrock or an indurated pan ranges from 20 to 40 inches. Permeability is moderate. The available water holding capacity (AWC) is about 4 to 8 inches for the profile. The erosion potential is moderate to severe.

Table 4. Representative soil features

Parent material	(1) Volcanic ash–rhyolite (2) Loess–basalt
Surface texture	(1) Silt loam (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Well drained to moderately well drained
Permeability class	Moderate to moderately slow
Soil depth	51–102 cm
Surface fragment cover <=3"	0–20%
Surface fragment cover >3"	0–10%
Available water capacity (0-101.6cm)	10.16–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0

Ecological dynamics

The potential native plant community is strongly dominated by Idaho fescue and mountain big sagebrush. Sandberg bluegrass is the dominant shallow rooted perennial grass. Bluebunch wheatgrass, prairie junegrass, parsnip flower buckwheat and a variety of other grasses and forbs are present. Wax currant, mountain snowberry and other deciduous shrubs 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 silty clay loam surfaces. Bluebunch wheatgrass increases on slight south and west exposures. Needlegrasses increases on coarser surfaces and over shallower depths. Shrubs increase over gravelly and fractured substratums. Basin big sagebrush increases at lower elevations and as the precipitation zone approaches 12 inches. Production, antelope bitterbrush, serviceberry, snowberry and pine increase at the upper end of the precipitation zone.

Response to Disturbance - States:

If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases. Mountain big sagebrush rapidly increases. Sandberg bluegrass increases and juniper invades from isolated rocky areas. With continued overgrazing, mountain big sagebrush and juniper dominate the overstory. Sandberg bluegrass dominates the understory. Annual invasion is limited unless ground disturbance occurs. With further deterioration and lack of fire juniper dominates the site, shrubs decrease and bare ground increases. With fire and heavy use or ground disturbance Sandberg increases. Bulbous bluegrass and to a lesser extent annuals invade. Bare ground increases and excessive erosion reduces the site productivity and contributes to downstream sedimentation.

States: ARTRV-T/POSE-*Bare Ground*; JUOC/ARTRV-T/POSE-*Bare Ground*; POSE-POBU -*Annuals-Bare Ground* (with fire)

Juniper Response:

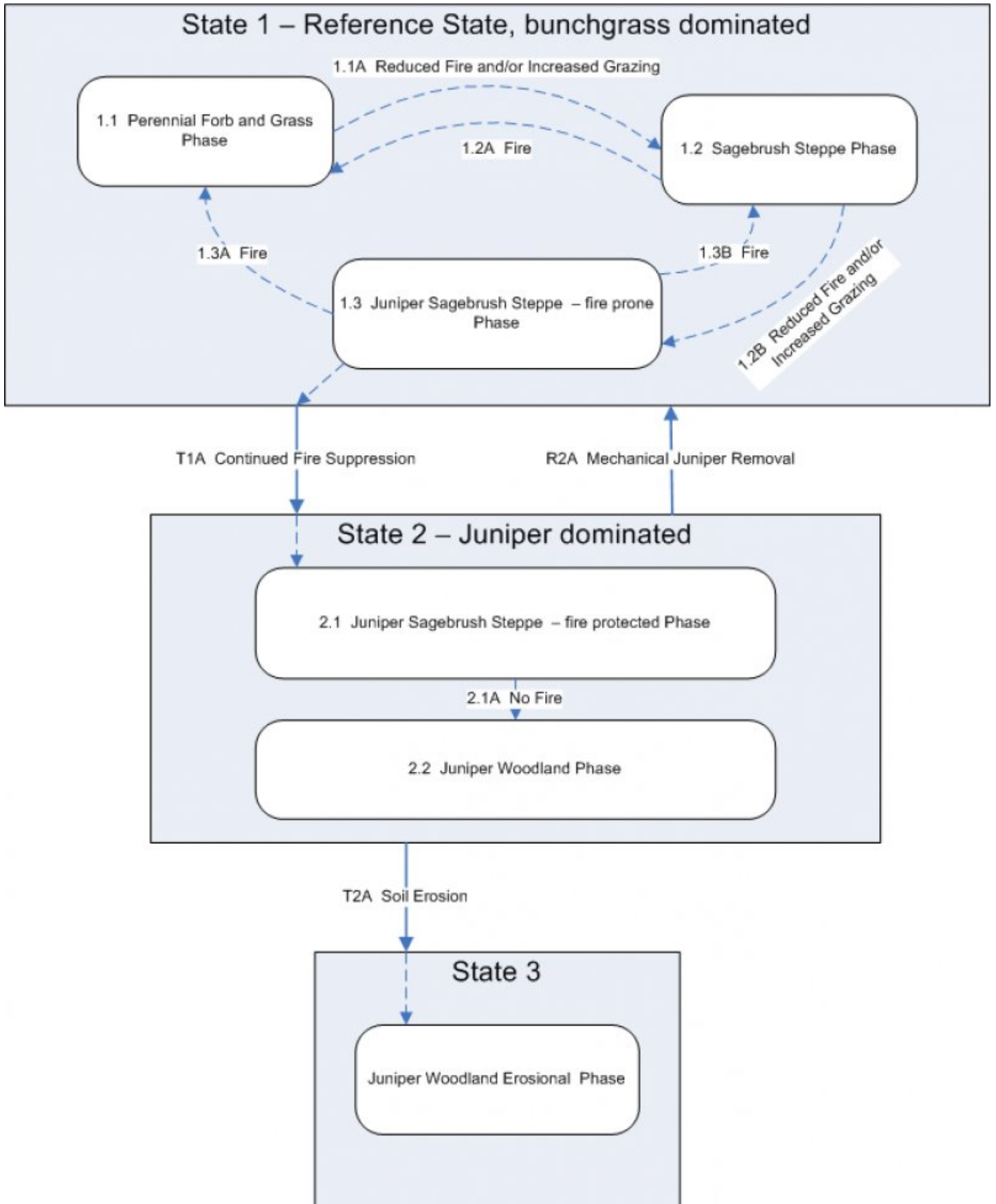
Fine fuel reduction from improper grazing and fire suppression has led to an increase in the historical fire return interval on many western rangelands. A reduction in fire frequency on these sites leads to an increase in juniper cover, a decrease in sagebrush cover followed by a decrease in herbaceous 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



State 1
Reference State

Community 1.1
Reference Plant Community



Figure 4. Representative Plant Community

The reference native plant community is strongly dominated by Idaho fescue and mountain big sagebrush. Sandberg bluegrass is the dominant shallow rooted perennial grass. Bluebunch wheatgrass, prairie junegrass, parsnip flower buckwheat and a variety of other grasses and forbs are present. Wax currant, mountain snowberry and other deciduous shrubs 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).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1009	1345	1681
Shrub/Vine	202	269	336
Forb	135	179	224
Total	1346	1793	2241

Figure 6. Plant community growth curve (percent production by month).
OR4481, B10 SR Mtn, Cool & No 12-16pz. SR Mtn, Cool & No 12-16pz RPC
Growth Curve.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	30	30	15	5	5	5	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	Dominant moderate rooted bunchgrass			1076–1435	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	1076–1435	–
2	Sub-dominant moderate rooted bunchgrass			34–359	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	34–359	–
3	Common, shallow rooted perennial grass			34–90	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	34–90	–
4	Other perennial grasses			67–392	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	36–143	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	18–54	–

	basin wildrye	LECI4	<i>Leymus cinereus</i>	18–54	–
	oniongrass	MEBU	<i>Melica bulbosa</i>	0–36	–
	mountain brome	BRMA4	<i>Bromus marginatus</i>	0–36	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	0–36	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	6–36	–
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	0–36	–
Forb					
7	Dominant perennial forbs			34–56	
	parsnipflower buckwheat	ERHE2	<i>Eriogonum heracleoides</i>	34–56	–
8	Common perennial forbs			101–202	
	milkvetch	ASTRA	<i>Astragalus</i>	18–36	–
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	18–36	–
	fleabane	ERIGE2	<i>Erigeron</i>	18–36	–
	desertparsley	LOMAT	<i>Lomatium</i>	18–36	–
	lupine	LUPIN	<i>Lupinus</i>	18–36	–
	phlox	PHLOX	<i>Phlox</i>	18–36	–
9	Other forbs			34–179	
	common yarrow	ACMI2	<i>Achillea millefolium</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>	0–6	–
	bushy bird's beak	CORA5	<i>Cordylanthus ramosus</i>	0–6	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	2–6	–
	buckwheat	ERIOG	<i>Eriogonum</i>	2–6	–
	Scouler's woollyweed	HISC2	<i>Hieracium scouleri</i>	0–6	–
	waterleaf	HYDRO4	<i>Hydrophyllum</i>	0–6	–
	woodland-star	LITHO2	<i>Lithophragma</i>	2–6	–
	stoneseed	LITHO3	<i>Lithospermum</i>	2–6	–
	bluebells	MERTE	<i>Mertensia</i>	0–6	–
	owl's-clover	ORTHO	<i>Orthocarpus</i>	0–6	–
	sagebrush buttercup	RAGL	<i>Ranunculus glaberrimus</i>	2–6	–
	stonecrop	SEDUM	<i>Sedum</i>	0–6	–
	ragwort	SENEC	<i>Senecio</i>	0–6	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0–6	–
Shrub/Vine					
11	Dominant, evergreen, non-sprouting shrub			56–146	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	56–146	–
15	Other shrubs			34–224	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata</i> ssp. <i>tridentata</i>	17–56	–

	big sagebrush	AR1RX	<i>Artemisia tridentata ssp. xericensis</i>	0–36	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–36	–
	wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>	0–36	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0–36	–
	wax currant	RICE	<i>Ribes cereum</i>	6–36	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	0–36	–
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	6–36	–
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0–36	–
	threetip sagebrush	ARTR4	<i>Artemisia tripartita</i>	0–36	–
	horsebrush	TETRA3	<i>Tetradymia</i>	0–18	–
	common snowberry	SYAL	<i>Symphoricarpos albus</i>	0–18	–
Tree					
16	Minor evergreen tree			0–34	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	17–34	–
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	17–34	–
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	0–34	–
	Douglas-fir	PSME	<i>Pseudotsuga menziesii</i>	0–34	–

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 to 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 spring and late fall forage.

Hydrological functions

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

Other information

Juniper invasion is a risk on this site. Increases in western juniper and the subsequent competition for moisture will lead to a reduction of available forage. Overgrazing can easily reduce ground cover and accelerate soil loss. Juniper 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.

When incised channels are present, rehabilitation will markedly improve production, reduce downstream sedimentation, and restore good hydrologic characteristics. On altered sites, the reintroduction of basin wildrye may be needed to fully restore the site potential.

Contributors

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Approval

Kirt Walstad, 12/13/2023

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, Bruce Frannsen
Contact for lead author	NRCS Oregon State Rangeland Management Specialist
Date	07/11/2007
Approved by	Kirt Walstad
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):** 5-15%

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None, Moderate 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):** Significantly resistant to erosion: aggregate stability = 4-6

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Granular to platy to sub-angular blocky structure; Dry color value 4-5; 3-9" thickness; Low to moderate OM (1-4%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate to significant ground cover (60-70%) 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: shrubs

Other: other grasses > forbs

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: 2000, Normal: 1500, Unfavorable: 1000 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
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17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually
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