

Ecological site R023XY302OR

SOUTH SLOPES 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.

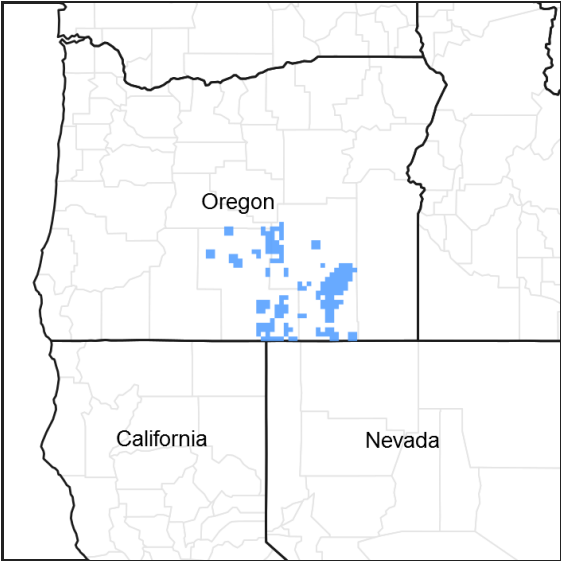


Figure 1. Mapped extent

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

| | |
|-------------|--|
| R023XY216OR | CLAYPAN 12-16 PZ Claypan 12-16" PZ |
| R023XY318OR | LOAMY 12-16 PZ Loamy 12-16" PZ |
| R023XY410OR | GRAVELLY RIDGE 12-16 PZ Gravelly Ridge 12-16" PZ |
| R023XY412OR | GRAVELLY RIDGE 16+ PZ Gravelly Ridge 16+ PZ |

Similar sites

| | |
|-------------|---|
| R023XY318OR | LOAMY 12-16 PZ Loamy 12-16" PZ (non-aspect) |
|-------------|---|

Table 1. Dominant plant species

| | |
|-------|--|
| Tree | Not specified |
| Shrub | (1) <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> |

| | |
|------------|--|
| Herbaceous | (1) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i> |
|------------|--|

Physiographic features

This site occurs on south exposures of mountain sideslopes. Slopes range from 15 to 80 percent, but slopes of 30 to 70 percent are most typical. Elevations range from 4000 to 7000 feet.

Table 2. Representative physiographic features

| | |
|-----------|--------------------|
| Landforms | (1) Mountain slope |
| Elevation | 4,000–7,000 ft |
| Slope | 15–70% |
| Aspect | S |

Climatic features

Annual precipitation is 12 to 16 inches, which mostly occurs in the form of snow during the months of December through March. Spring rains are common. The soil temperature regime is typically frigid or cryic at high elevations. Extreme air temperatures are 100 degrees F to -30 degrees F. The frost-free period is about 30 to 90 days. The optimum period for plant growth is from May to early July.

Table 3. Representative climatic features

| | |
|-------------------------------|---------|
| Frost-free period (average) | 90 days |
| Freeze-free period (average) | 0 days |
| Precipitation total (average) | 16 in |

Influencing water features

Soil features

These soils are shallow to deep over bedrock, well-drained, formed in colluvium and/or residuum. The soils typically have a medium textured surface which contains 20 to over 60 percent rock fragments, primarily stones and cobbles. The subsoil is medium textured and contains 30 to 80 percent rock fragments, primarily cobbles and stones. The horizons immediately above the bedrock contain the highest percent of rock fragments. Permeability is moderate. The available water holding capacity (AWC) is about 1 to 4.5 inches for the profile.

Table 4. Representative soil features

| | |
|-----------------------------------|---|
| Parent material | (1) Residuum–basalt (2) Colluvium–andesite |
| Surface texture | (1) Extremely gravelly sandy loam (2) Gravelly silt loam (3) Cobbly clay loam |
| Family particle size | (1) Clayey |
| Drainage class | Well drained |
| Permeability class | Moderately slow to moderately rapid |
| Soil depth | 14–40 in |
| Surface fragment cover <=3" | 14–25% |
| Surface fragment cover >3" | 2–26% |
| Available water capacity (0-40in) | 1–4.6 in |

| | |
|--|---------|
| Soil reaction (1:1 water) (0-40in) | 6.6–7.8 |
| Subsurface fragment volume <=3" (Depth not specified) | 13–35% |
| Subsurface fragment volume >3" (Depth not specified) | 18–50% |

Ecological dynamics

Range in Characteristics:

The reference plant community is dominated by bluebunch wheatgrass and Idaho fescue although mountain big sagebrush and antelope bitterbrush may be prevalent enough to dominate the aspect. Vegetative composition is about 70 percent grasses, 10 percent forbs, and 20 percent shrubs.

Thurber's needlegrass is more prevalent at the lower elevations and lower precipitation ranges of this site. Idaho fescue, mountain brome, oniongrass, and big bluegrass increase in the plant community with an increase in elevation and higher annual precipitation.

Five states have been identified for this site: a reference state; a state with the presence of annuals; a state that has Juniper dominating site resources; a state that is Juniper dominant; and a state with annual dominance.

Reference State: Plant community phase change is driven by fire. Mountain and basin big sagebrush declines after fire while Idaho fescue, Thurber's needlegrass and other grasses increase. Rabbitbrush may temporarily increase after fire. Time facilitates the reintroduction of sagebrush. The introduction of invasive annual grasses and forbs transitions into state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and annual weeds. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Prescribed grazing maintains state dynamics. Mismanagement of grazing favors sagebrush and Sandberg's bluegrass. Cheatgrass increases. Prescribed grazing can reverse the trend. Reduction in fire frequency facilitates juniper encroachment in both poor and good condition communities. Fire reduces or eliminates juniper and with time sagebrush reestablishes. With drought, improper grazing, or without fire, juniper out-competes sagebrush and the herbaceous plant community which brings the site to state 3.

State 3: Juniper dominates site resources. Sagebrush is dead or dying and any existing bitterbrush lacks vigor. Sandberg bluegrass is the dominant species in the interspace and bare ground is significant. The perennial grass component is significantly reduced in both density and productivity. Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. Juniper woodland development is complete and soil loss and erosion drive site processes as the site goes into state 4.

State 4: Juniper dominated state. Soil loss is evident and erosion is active. All ecological processes, hydrologic cycle, nutrient cycle and energy capture have been significantly changed preventing the establishment of perennial plants. An abiotic threshold has been crossed. With catastrophic wildfire, state 5 is achieved.

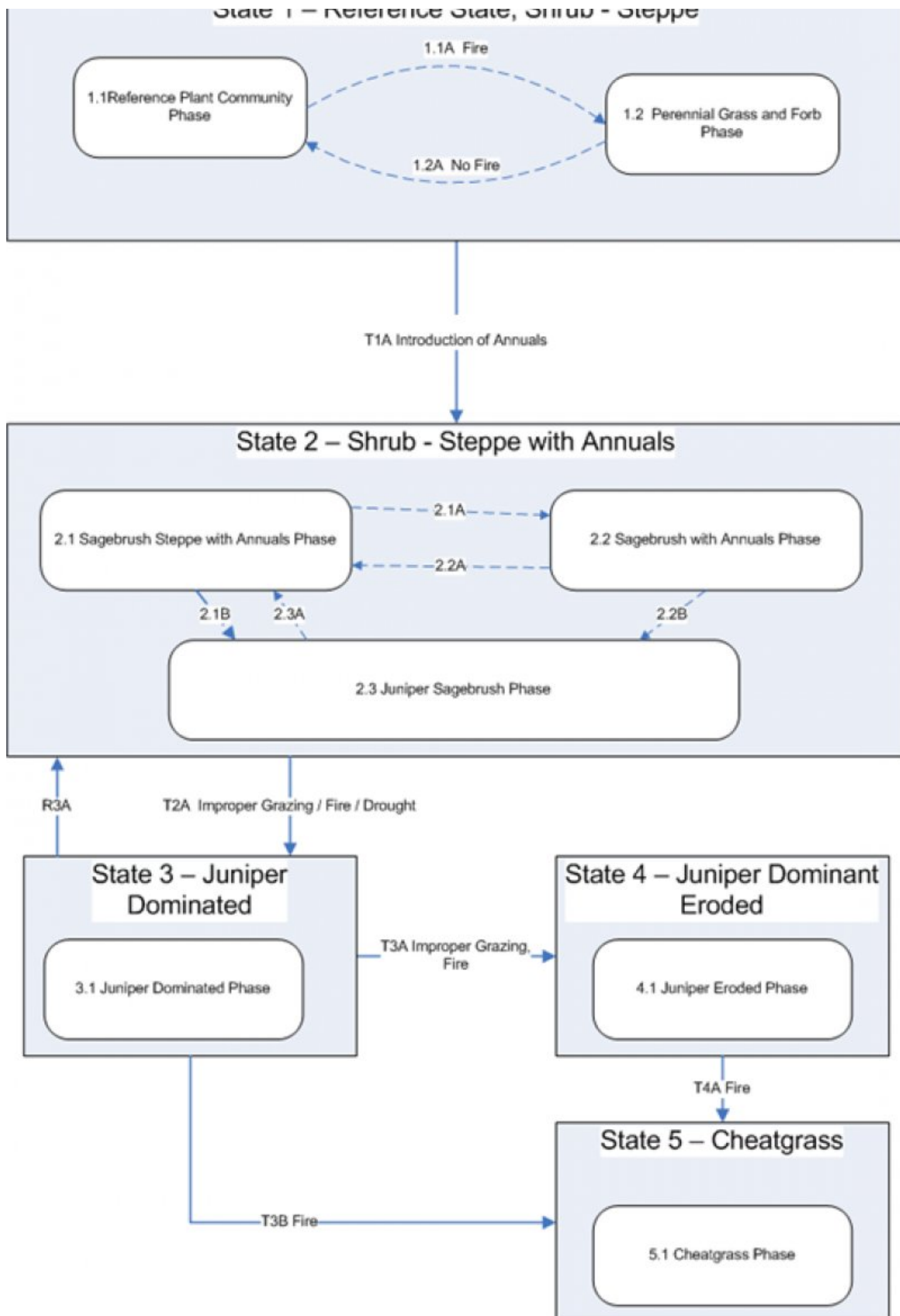
State 5: Cheatgrass dominated plant community with limited to no shrub or perennial grass component. Soil erosion and redistribution along with changes in dynamic soil properties affect the hydrologic cycle and thus the nutrient cycle. Harsh environmental factors increase state resiliency to change.

Response to Disturbance:

If heavy grazing causes site deterioration, mountain big sagebrush increases and will become dominant along with rabbitbrush and arrowleaf balsamroot. Cheatgrass and western juniper are plants likely to invade this site.

State and transition model

State 1 – Reference State Shrub – Steppe



State 1

Reference State

Community 1.1

Reference Plant Community

The potential plant community is dominated by bluebunch wheatgrass and Idaho fescue although mountain big sagebrush and antelope bitterbrush may be prevalent enough to dominate the aspect. Vegetative composition is about 70 percent grasses, 10 percent forbs, and 20 percent shrubs. Approximate ground cover is 40 to 50 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 | 420 | 630 | 840 |
| Shrub/Vine | 114 | 171 | 228 |
| Forb | 60 | 90 | 120 |
| Tree | 6 | 9 | 12 |
| Total | 600 | 900 | 1200 |

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 | Perennial, deep-rooted, dominant | | | 305–585 | |
| | bluebunch wheatgrass | PSSP6 | <i>Pseudoroegneria spicata</i> | 270–450 | – |
| | Idaho fescue | FEID | <i>Festuca idahoensis</i> | 45–135 | – |
| 2 | Perennial, deep-rooted, sub-dominant | | | 9–18 | |
| | Thurber's needlegrass | ACTH7 | <i>Achnatherum thurberianum</i> | 9–18 | – |
| 4 | Perennial, shallow-rooted, sub-dominant | | | 18–45 | |
| | Sandberg bluegrass | POSE | <i>Poa secunda</i> | 18–45 | – |
| 5 | Other perennial grasses, all | | | 18–135 | |
| | Lemmon's needlegrass | ACLE8 | <i>Achnatherum lemmonii</i> | 0–19 | – |
| | western needlegrass | ACOC3 | <i>Achnatherum occidentale</i> | 0–19 | – |
| | California brome | BRCA5 | <i>Bromus carinatus</i> | 0–19 | – |
| | squirreltail | ELEL5 | <i>Elymus elymoides</i> | 0–19 | – |
| | prairie Junegrass | KOMA | <i>Koeleria macrantha</i> | 0–19 | – |
| | basin wildrye | LECI4 | <i>Leymus cinereus</i> | 0–19 | – |
| | bluegrass | POA | <i>Poa</i> | 0–19 | – |
| | Lemmon's needlegrass | ACLE8 | <i>Achnatherum lemmonii</i> | 0–18 | – |
| | western needlegrass | ACOC3 | <i>Achnatherum occidentale</i> | 0–18 | – |
| | California brome | BRCA5 | <i>Bromus carinatus</i> | 0–18 | – |
| | squirreltail | ELEL5 | <i>Elymus elymoides</i> | 0–18 | – |
| | prairie Junegrass | KOMA | <i>Koeleria macrantha</i> | 0–18 | – |
| | basin wildrye | LECI4 | <i>Leymus cinereus</i> | 0–18 | – |

| | | | | | |
|-------------------|-------------------------------------|--------|--|-------|---|
| | bluegrass | POA | <i>Poa</i> | 0–18 | – |
| Forb | | | | | |
| 7 | Perennial, all, dominant | | | 18–45 | |
| | arrowleaf balsamroot | BASA3 | <i>Balsamorhiza sagittata</i> | 18–45 | – |
| 8 | Perennial, all, sub-dominant | | | 18–54 | |
| | tapertip hawksbeard | CRAC2 | <i>Crepis acuminata</i> | 9–27 | – |
| | lupine | LUPIN | <i>Lupinus</i> | 9–27 | – |
| 9 | Other perennial forbs, all | | | 9–45 | |
| | common yarrow | ACMI2 | <i>Achillea millefolium</i> | 0–9 | – |
| | pussytoes | ANTEN | <i>Antennaria</i> | 0–9 | – |
| | milkvetch | ASTRA | <i>Astragalus</i> | 0–9 | – |
| | naked mariposa lily | CANU2 | <i>Calochortus nudus</i> | 0–9 | – |
| | Indian paintbrush | CASTI2 | <i>Castilleja</i> | 0–9 | – |
| | buckwheat | ERIOG | <i>Eriogonum</i> | 0–9 | – |
| | oneflower helianthella | HEUN | <i>Helianthella uniflora</i> | 0–9 | – |
| | desertparsley | LOMAT | <i>Lomatium</i> | 0–9 | – |
| | phacelia | PHACE | <i>Phacelia</i> | 0–9 | – |
| | phlox | PHLOX | <i>Phlox</i> | 0–9 | – |
| | goatsbeard | TRAGO | <i>Tragopogon</i> | 0–9 | – |
| | woolly mule-ears | WYMO | <i>Wyethia mollis</i> | 0–9 | – |
| Shrub/Vine | | | | | |
| 11 | Evergreen Shrubs | | | 45–90 | |
| | mountain big sagebrush | ARTRV | <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> | 45–90 | – |
| 12 | Deciduous Shrubs | | | 18–90 | |
| | antelope bitterbrush | PUTR2 | <i>Purshia tridentata</i> | 18–90 | – |
| 15 | Other perennial shrubs, all | | | 18–90 | |
| | Saskatoon serviceberry | AMAL2 | <i>Amelanchier alnifolia</i> | 0–18 | – |
| | basin big sagebrush | ARTRT | <i>Artemisia tridentata</i> ssp. <i>tridentata</i> | 0–18 | – |
| | yellow rabbitbrush | CHVI8 | <i>Chrysothamnus viscidiflorus</i> | 0–18 | – |
| | rubber rabbitbrush | ERNA10 | <i>Ericameria nauseosa</i> | 0–18 | – |
| | Klamath plum | PRSU2 | <i>Prunus subcordata</i> | 0–18 | – |
| | currant | RIBES | <i>Ribes</i> | 0–18 | – |
| | spineless horsebrush | TECA2 | <i>Tetradymia canescens</i> | 0–18 | – |
| Tree | | | | | |
| 16 | Perennial, evergreen | | | 0–18 | |
| | western juniper | JUOC | <i>Juniperus occidentalis</i> | 0–18 | – |

Animal community

Livestock Grazing:

This site is suitable for livestock grazing use in spring, summer, and fall. Deferred grazing is recommended at least once every three to five years. At slopes greater than 50 percent, cattle use will be reduced.

Native Wildlife Associated with the Climax Community:

Coyote
Mountain lion
Bobcat
Mule deer
Elk
Pronghorn antelope
Bighorn sheep

Heavily utilized winter and spring range of bighorn sheep and mule deer. Preferred habitat of chukar when in lower condition.

Hydrological functions

The soils of this site have medium infiltration rates and rapid to very rapid runoff potential. The hydrologic soil groups are B, C, or D.

Recreational uses

The diversity of vegetation and native wildlife associated with this site provide many opportunities of enjoyment for recreationists, photographers, and hunters.

Wood products

Where western juniper has invaded, this site yields fence posts, firewood, and specialty products.

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) | Jeff Repp and Bruce Frannsen |
| Contact for lead author | State Rangeland Management Specialist for NRCS - OR |
| Date | 08/17/2012 |
| 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, Moderate to severe sheet & rill erosion hazard
-

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

-
3. **Number and height of erosional pedestals or terracettes:** None to some terracettes
-
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-20%
-
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):** 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):** Shallow to deep well drained stony loams, stony clay loams, and gravelly silt loams with a weak fine granular to thin platy structure and dry color value of 5 (3-10 inches thick): Low OM (1-2%)
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Low to moderate ground cover (40-50%) and moderate to very steep slopes (30-70%) slightly to 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: Bluebunch wheatgrass > other grasses > shrubs > forbs > trees
- 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):** Favorable: 1200, Normal: 900, Unfavorable: 600 lbs/acre/year at high RSI (RPC)

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
