

Ecological site R010XB080OR

JD Claypan 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.

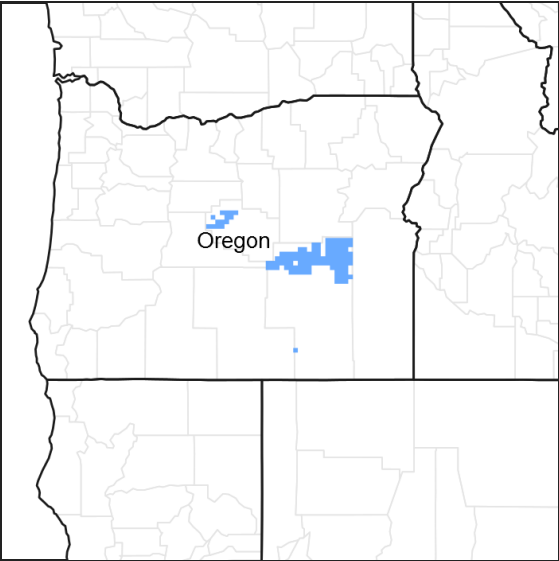


Figure 1. Mapped extent

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.

Similar sites

R010XB081OR	JD Claypan North 12-16 PZ North aspect > 20% slope
R010XB082OR	JD Shrubby Claypan 12-16 PZ fractured substratum w/ bitterbrush

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia arbuscula</i>
Herbaceous	(1) <i>Festuca idahoensis</i> (2) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>

Physiographic features

This site occurs predominantly on hills, mountain plateaus and ridges. Slopes typically range from 2 to 12 percent. Elevations typically range from 3000 to 5700 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Plateau (3) Ridge
Flooding frequency	None
Elevation	914–1,737 m
Slope	2–12%
Ponding depth	0 cm
Water table depth	152 cm
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 November through March. Localized, occasionally severe, convectional storms occur during the summer. The soil temperature regime is 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 90 days. The optimum period for plant growth is from April through June.

Table 3. Representative climatic features

Frost-free period (average)	62 days
Freeze-free period (average)	102 days
Precipitation total (average)	406 mm

Influencing water features

Soil features

The soils of this site are typically very shallow to an abrupt textural change. They are formed from colluvium or residuum over volcanic rock, primarily basalt, rhyolite and andesite. The surface layer is a loam, ashy loam or clay loam that is typically 3 to 6 inches thick. The soils are generally skeletal with cobbles or stones. Permeability is moderate to moderately slow in the surface and slow to very slow in the subsoil. The available water capacity (AWC) is typically 0.8 to 2.5 inches. The erosion potential is moderate to severe. The soil temperature regime is frigid and the moisture regime is xeric.

Table 4. Representative soil features

Surface texture	(1) Very stony loam (2) Very cobbly clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow to moderate
Soil depth	25–51 cm
Surface fragment cover ≤3"	15–30%
Surface fragment cover >3"	20–35%
Available water capacity (0-101.6cm)	2.03–6.35 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)	6.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	10–30%
Subsurface fragment volume >3" (Depth not specified)	10–30%

Ecological dynamics

Range in Characteristics:

One-spike Danthonia can be expected to be a greater percentage of the species composition in microsites that are intermittently ponded during the late winter and early spring and where the soil surface horizon is shallower. Sandberg bluegrass becomes a greater percentage of the species composition where the site occurs near the lower limits (12 inches) of the precipitation range of occurrence and on the shallower soils. Total production is proportional to surface soil depth, decreasing as the surface soil layer becomes shallower.

Response to Disturbance:

With improper grazing Idaho fescue and bluebunch wheatgrass will decrease. With continued improper grazing onespike danthonia decreases and low sagebrush and Sandberg bluegrass increase. With continued deterioration, annuals invade. Increased bare ground reduces site productivity and contributes to erosion on the steeper portions of the site. The historical fire frequency in State 1 is expected to be 60 to 80 years. This fire frequency minimizes juniper invasion into the site as very few if any juniper survive to maturity. Many occurrences of the site have no juniper.

Treatment Response:

Reference Plant Community

State 1 - reference state.

Three plant community phases occur in the reference state. They are phase 1.1, the Reference Plant Community Phase (RPCP) which is the perennial grass low sagebrush phase, phase 1.2 the low sagebrush or juniper low sagebrush phase and phase 1.3, the low sagebrush or juniper low sagebrush dominant phase.

Phase 1.1 is the reference plant community phase (RPCP), the perennial grass and low sagebrush phase which is expressed with normal fire frequency when low sagebrush is significantly reduced and any juniper seedlings and saplings that may be present are eliminated as well as a few of the old growth juniper if present. In this phase the density of low sagebrush and other shrubs are significantly reduced and the dominant visual aspect of the site is perennial grasses with few forbs and low sagebrush. Over time with the absence of fire and proper grazing the low sagebrush and other shrubs reestablish, annual forbs are reduced and the plant community pathway (CP 1.2A) moves back toward the low sagebrush or juniper low sagebrush plant community, Phase 1.2. With normal or reduced fire frequency the plant community pathway (CP1.1B) moves toward phase 1.3. The vegetative composition of the community is approximately 80 percent grasses, 8 percent forbs, and 12 percent shrubs. Any exotic plant species are usually maintained at very low levels by the healthy native plant community.

Phase 1.2, the low sagebrush or juniper low sagebrush phase is dominated by low sagebrush with or without juniper, Idaho fescue, and bluebunch wheatgrass, with Sandberg bluegrass and one-spike danthonia being common. Usually the juniper are widely scattered. A variety of forbs including buckwheat, serrate balsamroot, western yarrow and phlox are present. Fire in this community (1.2A) returns it to phase 1.1. With less than normal

fire frequency (1.2B) the low sagebrush and the juniper become dominant, improper grazing accelerates the change to the low sagebrush or juniper low sagebrush dominated phase (1.3).

Phase 1.3, is dominated by low sagebrush with decreased amounts of perennial grasses and if juniper is present there is an increase in juniper seedlings and saplings and a few old growth juniper may be present. This phase is a result of Phase 1.1 having an extended period of time without fire and with or without improper grazing (CP1.1B) or Phase 1.2 being improperly grazed with less than normal fire frequency (CP 1.2B). With fire at normal frequency and proper grazing this phase can be returned to Phase 1.1 by a community pathway CP1.3A. Phase 1.3 is the plant community “at risk” of transitioning across the threshold to another state. With continued improper grazing management and lack of fire, it may transition (IRT1A) to State 2 with abundant juniper seedlings, saplings and a few mature trees. If exotics such as cheatgrass are present in sufficient quantity in Phase 1.3 and fire occurs more often than the expected frequency the plant community may begin a transition (IRT1B) with or without proper grazing to an annual grass dominated state, state 3.

State 2 is a state dominated by low sagebrush and other shrubs and/or western juniper with severely decreased amounts of perennial grasses. The transition (IRT1) from state 1 phase 1.3 is driven by no fire with improper grazing and/or drought as it crosses a biotic threshold where low sagebrush and/or juniper control all of the site’s ecological processes. Over time on the steeper slopes (10-12%), an edaphic threshold can also be crossed. Where juniper is present and it matures it fully occupies the site. The repair pathway (RP1) from state 2 back to state 1 is generally not economically feasible and requires mechanical and/or chemical treatment of sagebrush, other shrubs, juniper and exotic annual grasses and may also require seeding of desired forbs and grasses. The sites’s ecological processes are controlled by the low sagebrush or juniper in this state.

State 3 is a state dominated by exotic annuals such as cheatgrass and/or medusahead and may have a few scattered old growth juniper. This state results from a transition (IRT2A), driven by fires from state 2 crossing a biotic threshold or a transition (IRT1B) from phase 1.3, state 1 by frequent fires with or without proper grazing. The repair pathway (RP2) from state 3 back to state 1 is generally not economically feasible requiring chemical and/or mechanical treatment of annual grasses along with seeding of perennial grasses and shrubs. In this state the ecological processes are controlled by annual grasses.

State 4 is the eroded state resulting from frequent fires in states 2 (IRT 2B) or 3 (IRT3A) that exposes the soil to accelerated erosion. The ecological processes in this state are controlled by abiotic conditions.

State and transition model

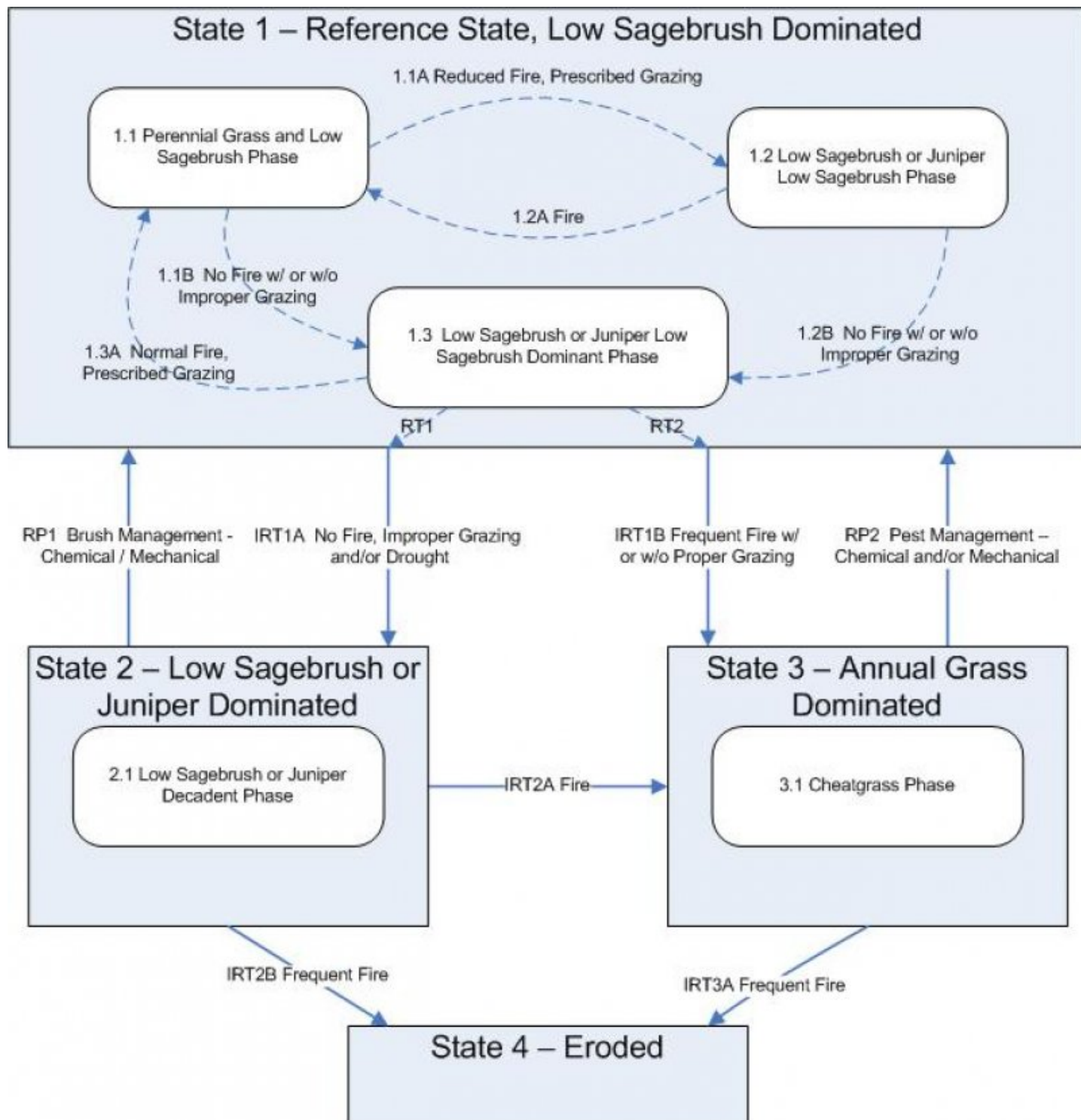


Figure 4. JD Mountain Claypan 12-16 PZ - R010XB080OR

State 1 Reference Plant Community

Community 1.1 Reference Plant Community

The reference plant community phase is dominated by low sagebrush, Idaho fescue, and bluebunch wheatgrass. Sandberg bluegrass and one spike oatgrass are common. A variety of forbs including buckwheat, serrate balsamroot, and phlox are present. The vegetative composition of the community is approximately 80 percent grasses, 8 percent forbs, and 12 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	269	448	628
Shrub/Vine	36	59	84
Forb	28	45	62
Tree	3	8	11
Total	336	560	785

Figure 6. Plant community growth curve (percent production by month).
 OR4201, B10 JD Very Shallow RPC. JD Very Shallow RPC Growth Curve.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	15	30	35	5	0	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	Perennial, deep-rooted, dominant			219–510	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	168–392	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	50–118	–
2	Perennial, deep-rooted			6–17	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	3–9	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	2–8	–
4	Perennial, shallow-rooted, sub-dominant			45–101	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	28–62	–
	onespike danthonia	DAUN	<i>Danthonia unispicata</i>	17–39	–
Forb					
7	Perennial, all, dominant			11–22	
	buckwheat	ERIOG	<i>Eriogonum</i>	9–16	–
	phlox	PHLOX	<i>Phlox</i>	3–8	–
8	Perennial forbs			7–17	
	serrate balsamroot	BASE2	<i>Balsamorhiza serrata</i>	3–8	–
	largehead clover	TRMA3	<i>Trifolium macrocephalum</i>	3–8	–
9	Other perennial forbs			10–22	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	1–2	–
	onion	ALLIU	<i>Allium</i>	1–2	–
	pussytoes	ANTEN	<i>Antennaria</i>	1–2	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	1–2	–
	bushy bird's beak	CORA5	<i>Cordylanthus ramosus</i>	1–2	–
	fleabane	ERIGE2	<i>Erigeron</i>	1–2	–
	desertparsley	LOMAT	<i>Lomatium</i>	1–2	–
	ragwort	SENEC	<i>Senecio</i>	1–2	–
Shrub/Vine					
11	Deep rooted, evergreen			30–73	
	little sagebrush	ARAR8	<i>Artemisia arbuscula</i>	30–73	–
12	Perennial deciduous			0–6	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0–6	–
15	Other shrubs			0–6	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–6	–
Tree					
16	Evergreen			3–11	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	3–11	–

Animal community

Livestock Grazing:

This site is suited to use by cattle, sheep, and horses in late spring, summer, and fall under a planned grazing system. Use should be postponed until the soils are firm enough to avoid trampling damage and soil compaction.

Native Wildlife Associated with the Potential Climax Plant Community:

Deer
Antelope
Elk
Hawks
Songbirds
Rodents

This site will offer food and cover for mule deer, antelope, elk, rodents, and a variety of birds and their associated predators. It is an important late fall, winter, and spring use area for big game.

Hydrological functions

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

Wood products

This site is susceptible to increase in western juniper. Where this has occurred, the site will yield fence posts, firewood, and specialty products.

Other information

The soils in this site have good water holding capacities providing late season water for plant growth and slow water releases to streams. Increase 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. Improving infiltration and permeability, and reducing runoff should be the immediate goal of juniper control. 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.

Other references

Stringham, Tamzen, 2007. Final Report for USDA Ecological Site Description. Oregon State University, Corvallis, Oregon.

USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; Version 4-2005.

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)	James A. Cornwell, State Rangeland Management Specialist, NRCS, Idaho (Retired) Lee Brooks, Assistant State Conservationist, NRCS, Idaho (Retired)
Contact for lead author	State Rangeland Management Specialist for NRCS – Oregon
Date	09/01/2009
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None. Slight to moderate sheet and rill erosion hazard on slopes > 10%.

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

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

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.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine Litter movement, typically would be < 1 foot.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values are expected to range from 4 to 5, but need to be validated.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A horizon is typically 3 to 6 inches thick. Structure ranges from weak to moderate very fine granular and thin platy. Soil organic matter (SOM) ranges from 1 to 4 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate to significant plant cover (50-60%) and gentle slopes (2-12%) effectively limit rainfall impact and overland flow. The root mass of perennial bunchgrasses provides significant soil

stability.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** A compaction layer does not occur but a claypan or bedrock does occur on this site within 6-10" of the surface.
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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, cool season bunchgrasses>>

Sub-dominant: Shallow-rooted shrubs=shallow rooted, perennial, cool season bunchgrasses=forbs>>

Other: tall shrubs

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Expect some decadence and mortality in low sagebrush.
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14. **Average percent litter cover (%) and depth (in):** Needs to be verified.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Favorable 700, Normal 500, Unfavorable 300.
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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:** Cheatgrass and medusahead.
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17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually.
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