

Ecological site R010XB082OR JD Shrubby 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

R010XB080OR	JD Claypan 12-16 PZ
	substratum not highly fractured, lower production, little to no antelope bitterbrush

Table 1. Dominant plant species

Tree	Not specified	
Shrub	(1) Purshia tridentata (2) Artemisia arbuscula	
Herbaceous	(1) Festuca idahoensis(2) Pseudoroegneria spicata	

Physiographic features

This site occurs on terraces, tablelands, and mountain plateaus. Slopes range from 2 to 12 percent. Elevations range from 4000 to 5700 feet.

Landforms	(1) Plateau(2) Hill(3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	1,219–1,737 m
Slope	2–12%
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)	90 days
Freeze-free period (average)	40 days
Precipitation total (average)	406 mm

Influencing water features

Soil features

The soils of this site are shallow with a strongly developed clay pan over bedrock. The surface layer is a loam to clay loam 5 to 10 inches thick. Variable amounts of coarse fragments are present. An abrupt boundary occurs at the interface of the surface and subsoil. The subsoil is clay. Permeability is moderately slow to slow in the surface layer and slow to very slow in the subsoil. The available water holding capacity (AWC) is 2 to 4 inches for the profile. The potential for erosion is moderate to severe.

Surface texture	(1) Very cobbly loam(2) Ashy sandy loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow to slow
Soil depth	25–51 cm
Surface fragment cover <=3"	10–13%
Surface fragment cover >3"	2–32%
Available water capacity (0-101.6cm)	5.08–11.18 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm

Table 4. Representative soil features

Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–7.8
Subsurface fragment volume <=3" (Depth not specified)	4–22%

Ecological dynamics

Range in Characteristics:

Antelope bitterbrush increases with fracturing of the substratum and precipitation. One-spike oatgrass increases on late-winter ponded areas and as the surface depth decreases. Sandberg bluegrass increases at the lower end of the precipitation zone. Bluebunch wheatgrass increases as the aspect varies to the south. Thurber needlegrass increases with gravelly surfaces. Production is directly related to surface soil depth, decreasing as the surface becomes more shallow.

Response to Disturbance:

Overgrazing may cause a decrease in deep-rooted perennial bunchgrass, primarily Idaho fescue and bluebunch wheatgrass. Unpalatable species such as sagebrush and juniper increase and the percentage of squirreltail may also increase. As grass cover declines the potential for weed invasion and expansion of juniper 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 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 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 warmer 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

North facing aspects respond 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 antelope bitterbrush, low sagebrush, ldaho fescue, and bluebunch wheatgrass. Sandberg bluegrass and onespike danthonia are common. A variety of forbs including buckwheat and phlox are common. The vegetative composition of the community is approximately 65 percent grasses, 5 percent forbs, and 30 percent shrubs. Approximate ground cover is 50-60 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	437	656	874
Shrub/Vine	202	297	392
Forb	34	50	67
Tree	-	6	11
Total	673	1009	1344

Figure 5. 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		303–404		
	Idaho fescue	FEID	Festuca idahoensis	303–404	-
2	Perennial, deep-roote	d, sub-do	minant	202–303	
	bluebunch wheatgrass	PSSP6	Pseudoroegneria spicata	202–303	-
3	Perennial, deep-roote	d, sub-do	minant	30–81	
	onespike danthonia	DAUN	Danthonia unispicata	30–81	-
4	Perennial, shallow-roo	oted		20–50	
	Sandberg bluegrass	POSE	Poa secunda	20–50	-
5	Perennial, deep-roote	d, sub-do	minant	20–40	
	squirreltail	ELEL5	Elymus elymoides	10–20	_
	prairie Junegrass	KOMA	Koeleria macrantha	10–20	-
6	Other perennial grass	es		0–40	
	Thurber's needlegrass	ACTH7	Achnatherum thurberianum	0–20	_
	threadleaf sedge	CAFI	Carex filifolia	0–20	_
Forb					
7	Perennial, dominant			20–40	
	buckwheat	ERIOG	Eriogonum	10–20	_
	phlox	PHLOX	Phlox	10–20	_
9	Other perennial forbs			0–30	
	common yarrow	ACMI2	Achillea millefolium	0–10	_
	pussytoes	ANTEN	Antennaria	0–10	
	serrate balsamroot	BASE2	Balsamorhiza serrata	0–10	
	Indian paintbrush	CASTI2	Castilleja	0–10	
	bushy bird's beak	CORA5	Cordylanthus ramosus	0–10	
	fleabane	ERIGE2	Erigeron	0–10	
	desertparsley	LOMAT	Lomatium	0–10	_
	ragwort	SENEC	Senecio	0–10	
	largehead clover	TRMA3	Trifolium macrocephalum	0–10	
Shrub	/Vine				
13	Deciduous, dominant			151–202	
	antelope bitterbrush	PUTR2	Purshia tridentata	151–202	-
14	Evergreen, subdomin	ant		101–151	
	little sagebrush	ARARA	Artemisia arbuscula ssp. arbuscula	101–151	-
	little sagebrush	ARARL	Artemisia arbuscula ssp. longiloba	101–151	-
15	Other shrubs			0–10	
	green rabbitbrush	ERTE18	Ericameria teretifolia	0–10	_
Tree					
16	Evergreen trees			0–10	
	western juniper	JUOC	Juniperus occidentalis	0–10	-

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 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.

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 Franssen
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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
- 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): 10-15%
- 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 limited movement
- 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 medium granular structure to strong thick platy structure parting to weak thin platy structure, dry color value 5-6, 6 to 10 inches thick; moderate organic matter (1-4% SOM)
- 10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Moderate ground cover (50-60%) 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

foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):

Dominant: Deep-rooted, perennial, cool-season bunchgrasses

Sub-dominant: Deciduous shrub > low evergreen shrub

Other: Other perennial grasses > perennial forbs > other shrubs and trees

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 annualproduction): Favorable: 1200, Normal: 900, 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: 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