USDA Natural Resources
Conservation Service

Ecological site R025XY017OR
SHALLOW GRAVELLY CLAYPAN 11-13 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.

MLRA notes

Major Land Resource Area (MLRA): 025X–Owyhee High Plateau

MLRA 25 lies within the Intermontane Plateaus physiographic province. The southern half is in the Great Basin Section of the Basin and Range Province. This part of the MLRA is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River. The northern half of the area lies within the Columbia Plateaus geologic province. This part of the MLRA forms the southern boundary of the extensive Columbia Plateau basalt flows. Deep, narrow canyons drain to the Snake River which incise the broad volcanic plain. The Humboldt River, route of a major western pioneer trail, crosses the southern half of this area. Reaches of the Owyhee River in this area have been designated as National Wild and Scenic Rivers.

Associated sites

R025XY016OR	**SHALLOW CLAYPAN 11-13 PZ** Shallow Claypan 11-13 PZ
R025XY024OR	**SHALLOW SOUTH SLOPES 11-13 PZ** Shallow South Slopes 11-13 PZ
R025XY032OR	**NORTH SLOPES 11-13 PZ** North Slopes 11-13 PZ

Similar sites

R025XY016OR	**SHALLOW CLAYPAN 11-13 PZ** Shallow Claypan 11-13 PZ (shallow gravelly surface layer, different composition)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia arbuscula*
Herbaceous	(1) *Achnatherum thurberianum* (2) *Pseudoroegneria spicata subsp. spicata*

Physiographic features

This site occurs on plateaus and tablelands. Slopes range from 2 to 12%. Elevation varies from 5,500 to 6,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Plateau

Elevation	5,500–6,500 ft
Slope	2–12%
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 11 to 13 inches, most of which occurs in the form of snow during the months of December through March. Localized convection storms occasionally occur during the summer. The soil temperature regime is frigid with a mean annual air temerpature of 44 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost free period ranges from less than 30 to 60 days. The optimum growth period for native plants is from April through June.

Table 3. Representative climatic features

Frost-free period (average)	60 days
Freeze-free period (average)	0 days
Precipitation total (average)	13 in

Influencing water features

Soil features

The soils of this site are shallow over bedrock. the surface layer is a very gravelly loam 10 to 14 inches thick. The subsoil is a clay loam 6 to 10 inches thick. Depth to bedrock or an indurated pan is 10 to 20 inches. Permeability is moderate. The available water holding capacity is about 2 to 4 inches for the profile. The potential for erosion is moderate to sever.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam
Family particle size	(1) Clayey
Permeability class	Moderate
Soil depth	10–20 in
Available water capacity (0-40in)	2–4 in

Ecological dynamics

The potential native plant community is dominated by low sagebrush and Thurber needlegrass. Sandberg bluegrass is prominent in the stand. Bluebunch wheatgrass and Idaho fescue are present. Vegetative composition of the community is approximately 85 percent grasses, 5 percent forbs and 10 percent shrubs.

Thurber needlegrass and production will increase as the soils become deeper. Idaho fescue will increase as the surface clay content increases. Bluebunch wheatgrass increases on south aspects. Sandberg bluegrass will increase as the soil becomes more shallow.

If the condition of the site deteriorates as a result of overgrazing, Thurber needlegrass and Idaho fescue will decrease while low sagebrush, bottlebrush squirreltail and Sandberg bluegrass increase. With further deterioration, a small percentage of annuals will invade and bare ground will markedly increase. Excessive erosion in the bare soil interspaces reduces the site productivity and contributes to downstream sedimentation.

Fire Ecology:
Prior to 1897, mean fire return intervals for low sagebrush communities have been estimated to be from 35 to over

100 years. Fire most often occurs during wet years with high forage production.

Low sagebrush is very susceptible to fire damage. Low sagebrush is usually killed by fire and does not re-sprout. The recovery in burned areas is usually via small, light, wind-dispersed seed for all low sagebrush subspecies. Partially injured low sagebrush may re-grow from living branches, but sprouting does not occur.

Burning bluebunch wheatgrass may remove most of the aboveground biomass but does not usually result in plant mortality. Bluebunch wheatgrass is generally favored by burning. Burning stimulates flowering and seed production. However, season of burning affects mortality.

Thurber's needlegrass is classified as moderately resistant, but depending on season of burn, phenology, and fire severity, this perennial bunchgrass is moderately to severely damaged by fire. Burning has been found to decrease the vegetation and reproductive vigor. Early season burning is more damaging to this needlegrass than late season burning.

State and transition model

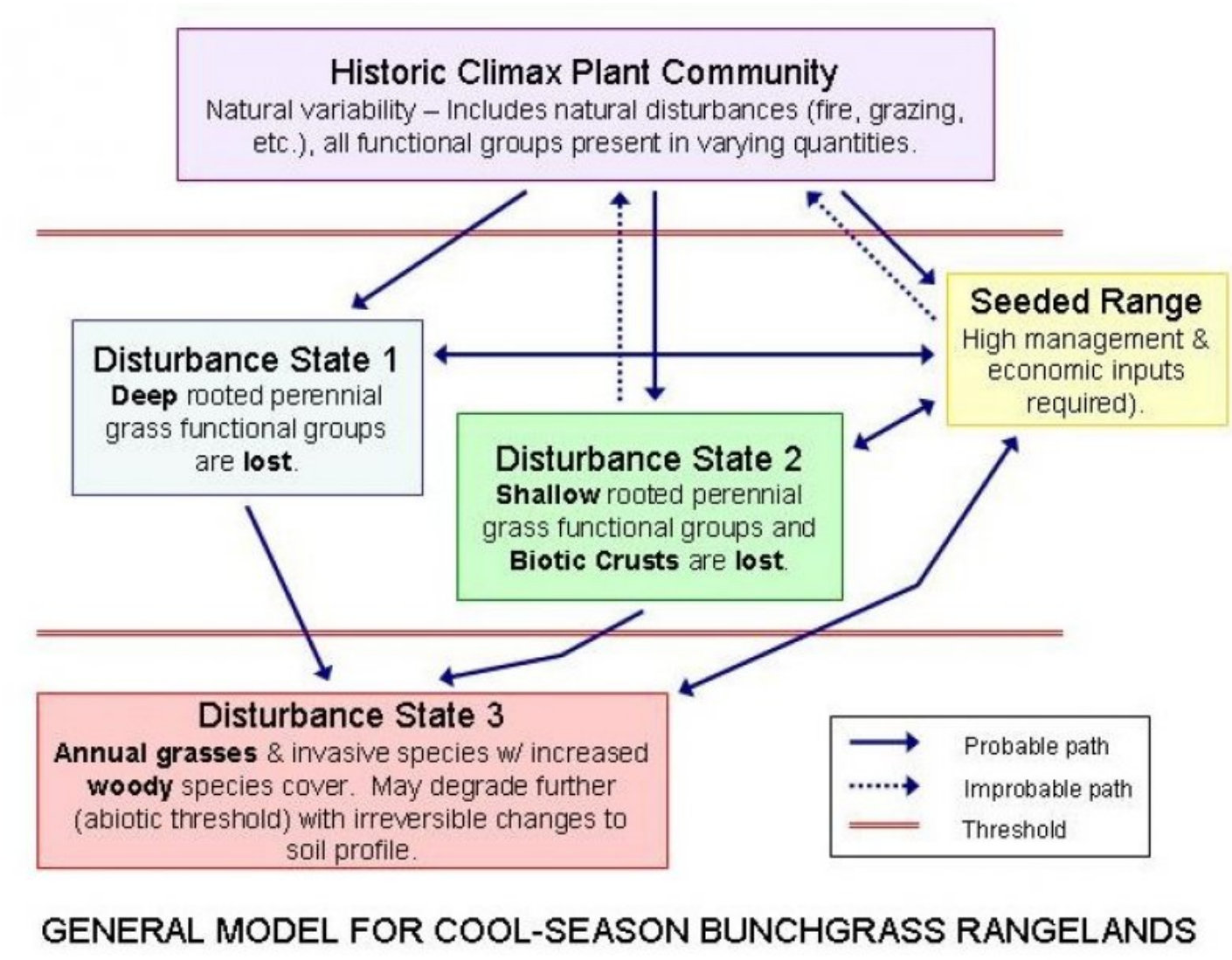

Figure 1. HCPC

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The potential native plant community is dominated by low sagebrush and Thurber needlegrass. Sandberg

bluegrass is prominent in the stand. Bluebunch wheatgrass and Idaho fescue are present. Vegetative composition of the community is approximately 85 percent grasses, 5 percent forbs and 10 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	340	510	680
Shrub/Vine	40	60	80
Forb	20	30	40
Total	**400**	**600**	**800**

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	**Dominant, perennial, deep rooted grasses**			240–300	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	240–300	–
2	**Sub-dominant, perennial, deep rooted grasses**			150–270	
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	120–180	–
	Idaho fescue	FEID	*Festuca idahoensis*	30–90	–
4	**Sub-dominant, perennial, shallow rooted grasses**			18–48	
	Sandberg bluegrass	POSE	*Poa secunda*	18–48	–
5	**All other perennial grasses**			24–54	
	squirreltail	ELEL5	*Elymus elymoides*	12–30	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	6–12	–
	Cusick's bluegrass	POCU3	*Poa cusickii*	6–12	–
Forb					
7	**Dominant, perennial forbs**			18–42	
	balsamroot	BALSA	*Balsamorhiza*	6–18	–
	buckwheat	ERIOG	*Eriogonum*	6–12	–
	lupine	LUPIN	*Lupinus*	6–12	–
9	**All other perennial forbs**			18–39	
	common yarrow	ACMI2	*Achillea millefolium*	3–6	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	3–6	–
	fleabane	ERIGE2	*Erigeron*	3–6	–
	desertparsley	LOMAT	*Lomatium*	3–6	–
	phlox	PHLOX	*Phlox*	3–6	–
	aster	EUCEP2	*Eucephalus*	1–3	–
	stoneseed	LITHO3	*Lithospermum*	1–3	–
	agoseris	AGOSE	*Agoseris*	1–3	–
Shrub/Vine					
11	**Dominant, evergreen shrubs**			30–90	
	little sagebrush	ARAR8	*Artemisia arbuscula*	30–90	–

Animal community

LIVESTOCK INTERPRETATIONS:
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 potponed until the soils are firm enough to prevent trampling damage and soil compaction. Grazing management should be keyed to Bluebunch wheatgrass and Thurber's needlegrass.

Bluebunch wheatgrass is considered one of the most important forage grass species on western rangelands for livestock. Although bluebunch wheatgrass can be a crucial source of forage, it is not necessarily the most highly preferred species.

Thurber’s needlegrass species begin growth early in the year and remain green throughout a relatively long growing season. This pattern of development enables animals to use Thurber’s needlegrass when many other grasses are unavailable. Cattle prefer Thurber’s needlegrass in early spring before fruits have developed as it becomes less palatable when mature. Thurber’s needlegrasses are grazed in the fall only if the fruits are softened by rain.

Domestic sheep and to a much lesser degree cattle consume low sagebrush, particularly during the spring, fall and winter.

Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year.

WILDLIFE INTERPRETATIONS:
This site offers food and cover for antelope, mule deer, rodents and a variety of birds. It is important spring, summer and fall use area for antelope and mule deer.

Low sagebrush is considered a valuable browse plant during the spring, fall and winter months. In some areas it is of little value in winter due to heavy snow. Mule deer utilize and sometimes prefer low sagebrush, particularly in winter and early spring.

Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. Open Wyoming sagebrush communities are preferred nesting habitat. Meadows surrounded by sagebrush may be used as feeding and strutting grounds. Sagebrush is a crucial component of their diet year-round, and sage-grouse select sagebrush almost exclusively for cover. Leks are often located on low sagebrush sites, grassy openings, dry meadows, ridgetops, and disturbed sites.

Bluebunch wheatgrass is considered one of the most important forage grass species on western rangelands for wildlife. Bluebunch wheatgrass does not generally provide sufficient cover for ungulates, however, mule deer were frequently found in bluebunch-dominated grasslands. Thurber needlegrass is valuable forage for wildlife.

Hydrological functions

The soils are in hydrologic group D. The soils of this site have high runoff 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)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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):**

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:**

17. **Perennial plant reproductive capability:**