USDA Natural Resources
Conservation Service

Ecological site R021XY410OR
DEEP LOAMY 16-20 PZ

Accessed: 05/21/2024

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on terraces, benches and hills. Slopes range from 0 to 60%. Elevations range from 4000 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Hill
Elevation	1,219–1,829 m
Slope	0–60%
Water table depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 16 to 20 inches, most of which occurs in the form of snow during the months of October through May. The soil temperature regime is frigid with the mean annual air temperature of 45 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost free period ranges from 10 to 70 days. The optimum period for plant growth is from May through July.

Table 3. Representative climatic features

Frost-free period (average)	70 days
Freeze-free period (average)	0 days
Precipitation total (average)	508 mm

Influencing water features

Soil features

The soils of this site which occur on terraces, are well drained and very deep. The soils have loamy textures throughout the profile, and lack rock fragments. The available water holding capapcity is 8 to 11 inches. Runoff and erosion hazard is slight.

The soils of this site which occur on benches and hills, are well drained and moderately deep to bedrock. The soils typically contain over 35% rock fragments throughout the profile and have very stony surfaces. The available water holding capacity is 3 to 6 inches. Runoff is medium to rapid. Erosion hazard by water is moderate to high.

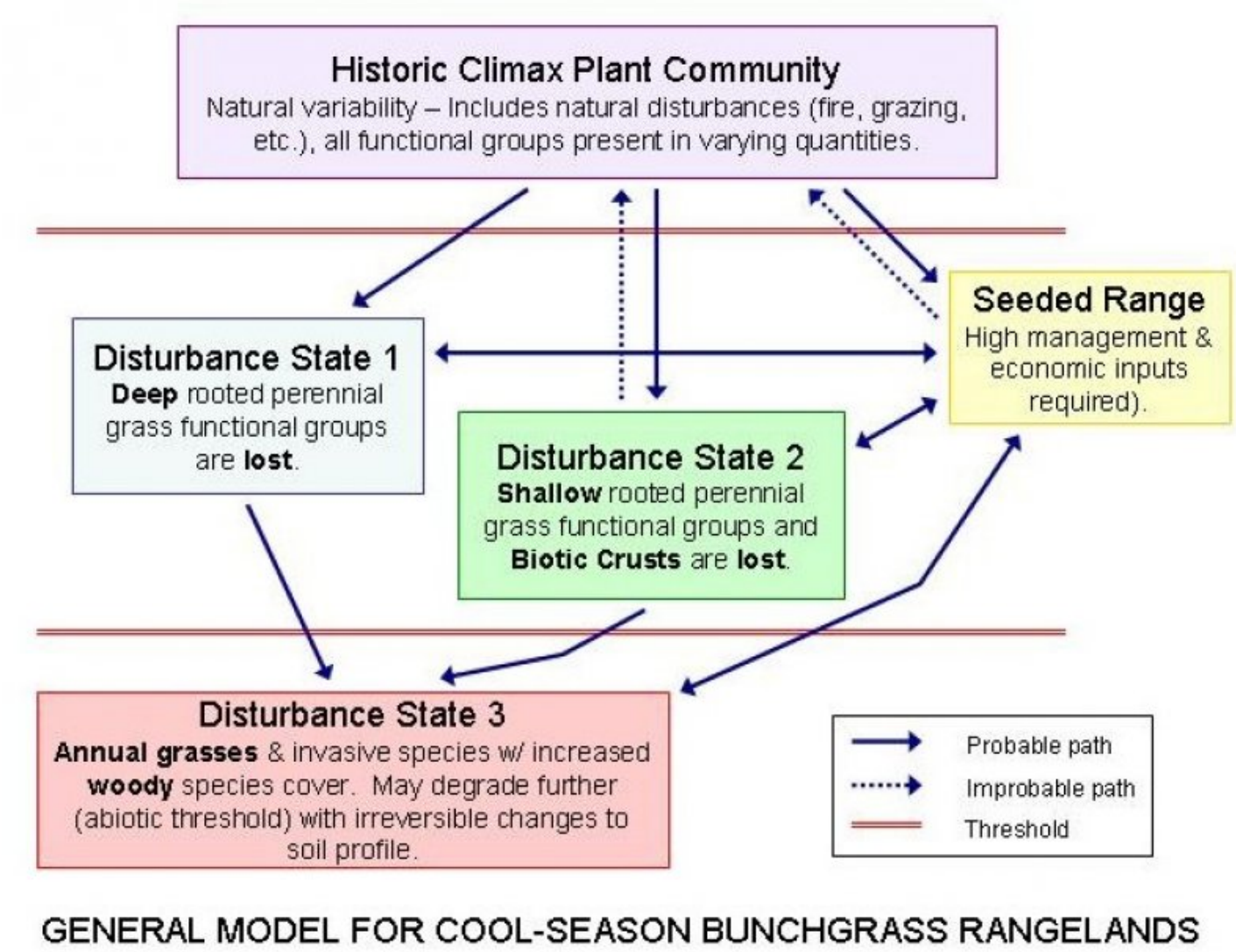
Table 4. Representative soil features

Drainage class	Well drained
Available water capacity (0-101.6cm)	7.62–27.94 cm

Ecological dynamics

This site generally occurs as an open, scattered stand of ponderosa pine in the overstory with a dense understory of Idaho fescue. As slopes become more northerly in aspect, the trees often become more dense and the understory production of grasses and shrubs may decrease. Where the soil surface has a high amount of coarse fragments, western juniper may invade or increase.
If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases in the stand and is replaced by Sandberg bluegrass and needlegrass. With further deterioration, bottlebrush squirreltail increaes, cheatgrass and annual weeds invade and big sagebrush, rabbitbrush, and western juniper can increase.

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Disturbance/overgrazed

Community 1.1
Disturbance/overgrazed

Disturbance/overgrazed: Dominated by ponderosa pine, curleaf mountain mahogany, mountain big sagebrush, western needlegrass, bottlebrush squirreltail, and Ross sedge.

State 2
Disturbance/continued overgrazed

Community 2.1
Disturbance/continued overgrazed

Disturbance/continued overgrazing: Dominated by ponderosa pine curleaf mountain mahogany, mountain big sagebrush, bottlebrush squirreltail and western needlegrass.

State 3
HCPC, FEID-PSSP6/PUTR2/PIPO

Community 3.1
HCPC, FEID-PSSP6/PUTR2/PIPO

The potential native plant community is dominated by ponderosa pine and Idaho fescue. Antelope bitterbrush can dominate the aspect of the understory. Vegetative composition of the community is approximately 80% grasses, 5% forbs, and 15% shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	565	762	958
Shrub/Vine	71	111	151
Tree	30	56	81
Forb	10	30	50
Total	**676**	**959**	**1240**

Figure 4. Plant community growth curve (percent production by month). OR5551, D21 Mid Elev., NA, Good Condtion. RPC Growth Curve.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	40	45	5	0	0	0	0	0

Additional community tables

Table 6. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant deep rooted perennial grasses**			454–706	
	Idaho fescue	FEID	*Festuca idahoensis*	303–454	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	151–252	–
2	**Sub-dominant deep rooted perennial grasses**			91–202	
	Ross' sedge	CARO5	*Carex rossii*	50–101	–
	western fescue	FEOC	*Festuca occidentalis*	20–50	–
	western needlegrass	ACOC3	*Achnatherum occidentale*	20–50	–
5	**Other perennial grasses**			20–50	
	mountain brome	BRMA4	*Bromus marginatus*	0–6	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–6	–
	Wheeler bluegrass	PONE2	*Poa nervosa*	0–6	–
Forb					
9	**Other perennial forbs**			10–50	
	common yarrow	ACMI2	*Achillea millefolium*	0–6	–
	strawberry	FRAGA	*Fragaria*	0–6	–
	white hawkweed	HIAL2	*Hieracium albiflorum*	0–6	–
	Scouler's woollyweed	HISC2	*Hieracium scouleri*	0–6	–
	Lewis flax	LILE3	*Linum lewisii*	0–6	–
	silver lupine	LUAL4	*Lupinus albifrons*	0–6	–
	woolly mule-ears	WYMO	*Wyethia mollis*	0–6	–
Shrub/Vine					
13	**Dominant deciduous (or 1/2 shrubs) shrubs**			50–101	
	antelope bitterbrush	PUTR2	*Purshia tridentata*	50–101	–
15	**Other shrubs**			20–50	
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–6	–
	curl-leaf mountain mahogany	CELE3	*Cercocarpus ledifolius*	0–6	–
	prostrate ceanothus	CEPR	*Ceanothus prostratus*	0–6	–
	rabbitbrush	CHRYS9	*Chrysothamnus*	0–6	–
	Klamath plum	PRSU2	*Prunus subcordata*	0–6	–
	common snowberry	SYAL	*Symphoricarpos albus*	0–6	–
Tree					
16	**Dominant evergreen trees**			30–81	
	ponderosa pine	PIPO	*Pinus ponderosa*	20–50	–
	western juniper	JUOC	*Juniperus occidentalis*	10–30	–

Animal community

Wildlife-This site provides nesting and feeding cover to a variety of wildlife species. Use should be managed in such a manner as to maintain or improve conditions for wildlife populations. This site is seasonally utilized by native ungulates (mule deer, elk, and antelope). Other animals that use this site are quail, coyotes, bobcats, and rabbits.

Hydrological functions

The soils are in hydrologic groups B and C.

Wood products

Ponderosa pine occurs throughout the stand adding to site diversity and productivity.

Other products

This site is suited to livestock grazing in the late spring, summer and fall under a planned grazing system.

Contributors

BLM ESI Team
E Ersch

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
Contact for lead author	Oregon NRCS State Rangeland Management Specialist
Date	09/05/2012
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 (on steeper slopes - to 60%), moderate to significant sheet & rill erosion hazard

2. **Presence of water flow patterns:** None to some (on steeper slopes - to 60%)

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, 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):** 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):** Moderately deep to very deep, well drained loams, stony loams, and sandy loams (>35% surface rock fragments on benches and hills, no rock fragments on terraces): Low OM (1-3%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate vegetative cover (60-70%), litter cover, and moderate to steep slopes (0-60%) effectively to moderately limit rainfall impact and overland flow; infiltration is moderate to rapid

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: Idaho fescue > Bluebunch wheatgrass > Ross sedge = Antelope bitterbrush > other dominant grasses = other grasses = forbs = other shrubs = Ponderosa pine > Western Juniper

    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: 700 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: Perennial brush species will increase with deterioration ofplant community. Western Juniper and Ponderosa Pine readily increase on the site (can be converted to woodland w/out fire). 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

---