

# Ecological site R006XB013OR Wet Pumice Meadow 14-26 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.

#### **Associated sites**

R006XB011OR	Meadow Knoll 14-26 PZ
R006XB012OR	<b>Dry Pumice Meadow 14-26 PZ</b> This site occurs in open, marshy areas usually surrounded by Lodgepole and/or Ponderosa pine forestlands. It may occupy large homogenous areas or will be in complexes of Dry Pumice Meadow, Meadow Swale, Marshy Swale, and Meadow Knoll. These complexes are often difficult to separate; changes in sites is gradual and there may be only slight micro relief between sites.
R006XB014OR	Meadow Swale 14-26 PZ
R006XB015OR	Marshy Swale 14-26 PZ

#### **Similar sites**

R006XB012OR	Dry Pumice Meadow 14-26 PZ
	The site is similar to Dry Pumice Meadow but has a higher water table (in the root zone of the grasses-
	within 36 inches) for a longer time during the period of rapid growth. There are similarities in plant community and hydrology to Tufted Hairgrass Prairies that are found infrequently in the Willamette Valley area (MLRA A2) of Oregon.

#### Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

### **Physiographic features**

#### Table 2. Representative physiographic features

Landforms	(1) Alluvial fan
Ponding duration	Long (7 to 30 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	4,000–6,000 ft
Slope	0–1%
Ponding depth	3–6 in
Water table depth	0–60 in
Aspect	Aspect is not a significant factor

### **Climatic features**

This site is characterized by relatively short, hot summers and cold, snowy winters. The site receives approximately 20 inches of precipitation per year, the bulk of which is snowfall. There are frequent thunderstorms in the summer months. There may be ground fogs in the morning during the gowing season which affect stomatal gas exchange and photosynthetic activity.

#### Table 3. Representative climatic features

Frost-free period (average)	20 days
Freeze-free period (average)	49 days
Precipitation total (average)	25 in







Figure 2. Monthly average minimum and maximum temperature

### Influencing water features

None (usually adjacent to seasonally ponded wetlands and marshes).

### Soil features

Soils for this site typically have a thin organic layer over loams, layers of coarse pumice over heavy clay loams. There is an apparent water table present for most of the year. These relatively young soils have been deposited over older, remnant fans and terraces. Variations and intergrades of soil characteristics are common.

Table 4. Representative soil features

Surface texture	(1) Mucky silt loam	
Family particle size	(1) Loamy	
Drainage class	Poorly drained	
Permeability class	Moderately slow to rapid	

Soil depth	60–150 in
Surface fragment cover <=3"	2%
Surface fragment cover >3"	2%
Available water capacity (0-40in)	4–7 in
Calcium carbonate equivalent (0-40in)	5%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	1–0
Soil reaction (1:1 water) (0-40in)	5
Subsurface fragment volume <=3" (Depth not specified)	2%
Subsurface fragment volume >3" (Depth not specified)	2%

# **Ecological dynamics**

This site occurs on alluvial fans leading to deper and lower marshy sites. It is intermediate between these wetter sites and adjacent Dry Pumice Meadow and Ponderosa Pine forest sites. The water table is apparently below the effective rooting depth for the grass species present for a portion of the growing season (depth to water table during the period of rapid growth appears to have a significant influence on the plant community). The water table (during the early portion of the growing season) lowers at a slower rate than the Dry Pumice Meadow site. Wet Pumice Meadows are occasionally ponded wetlands within larger complexes of wetland sites. The interpretative plant community for this site is the Historic Climax Plant Community (HCPC).

### State and transition model



Figure 3. Wet Pumice Meadow State and Transition Model:

#### State 1 HCPC: DECE- MUFI2

### Community 1.1 HCPC: DECE- MUFI2

This site is characterized by the abundance of Tufted Hairgrass and Pull-Up Muhly (the annual Muhly takes advantage of the more rapidly drying soil surface of this relatively wet site). Slender Cinquefoil (POGR9) may also be a significant component of this site.

#### Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2700	3350	4400
Forb	250	300	350
Tree	45	63	80
Total	2995	3713	4830



Figure 5. Plant community growth curve (percent production by month). OR1881, B6 Wet Pumice Meadow RPC. (DECD-MUFI2) B6 Wet Pumice Meadow RPC.

# State 2 State B: ALPR-CAAT

#### Community 2.1 State B: ALPR-CAAT

This site is dominated with a heavy and dense stand of Meadow Foxtail and Slenderbeaked Sedge. Past use by grazing animals and an increase in the influence of the water table through irrigation, combined with the introduction of the Meadow Foxtail formed this mildly compacted steady state.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	6200	7100	8000
Forb	450	625	800
Total	6650	7725	8800



Figure 7. Plant community growth curve (percent production by month). OR1882, B6 Wet Pumice Meadow B. Disturbance/ Compacted (ALPR-CAAT).

# State 3 State C: POPR-CAMI7

### Community 3.1 State C: POPR-CAMI7

This site, dominated with Kentucky Bluegrass and Small-winged Sedge may be the result of introduction of Kentucky Bluegrass, past grazing practices, and additional surface and sub-surface water from irrigation or drainage water from other sites.

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	3000	3500	4000
Forb	325	388	450
Shrub/Vine	75	113	175
Total	3400	4001	4625



OR1883, B6 Wet Pumice Meadow C. Disturbance/Moist (POPR-JUOR) .

## State 4 State D: CANE2-JUBA

# Community 4.1 State D: CANE2-JUBA

The wettest state of this site is dominated by Nebraska Sedge and Baltic Rush. This state has been the most disturbed by grazing pressure and a significant increase of surface and sub-surface water.

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2300	2900	3500
Forb	275	388	500
Total	2575	3288	4000



OR1884, B6 Wet Pumice Meadow D. Disturbance/ Wet (CANE2-JUBA).

# Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)	
Grass	Grass/Grasslike					
1				1949–2508		
	Sandberg bluegrass	POSE	Poa secunda	189–308	_	
2		<u>.</u>		409–748		
	pullup muhly	MUFI2	Muhlenbergia filiformis	220–440	_	
	meadow barley	HOBR2	Hordeum brachyantherum	189–308	-	
3				818–1496		
	Nebraska sedge	CANE2	Carex nebrascensis	220–440	-	
	analogue sedge	CASI2	Carex simulata	220–440	-	
	slenderbeak sedge	CAAT3	Carex athrostachya	189–308	-	
	smallwing sedge	CAMI7	Carex microptera	189–308	-	
4				409–616		
	Sierra rush	JUNE	Juncus nevadensis	189–308	-	
Forb						
5				132–176		
	Chamisso arnica	ARCHI4	Arnica chamissonis ssp. foliosa var. incana	132–176	_	
6			-	8–132		
	small camas	CAQU2	Camassia quamash	8–132	_	
	fleabane	ERIGE2	Erigeron	8–132	_	
	Virginia strawberry	FRVI	Fragaria virginiana	8–132	_	
	American bistort	POBI6	Polygonum bistortoides	8–132	_	
	slender cinquefoil	POGR9	Potentilla gracilis	8–132	_	
	buttercup	RANUN	Ranunculus	8–132	_	
	hooded lady's tresses	SPRO	Spiranthes romanzoffiana	8–132	l	
	western mountain aster	SYSPS	Symphyotrichum spathulatum var. spathulatum	8–132	_	
Tree		-				
7				45–80		
	greenleaf willow	SALUC	Salix lucida ssp. caudata	44–88		

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass	/Grasslike	-	·		
1				124–450	
	Sandberg bluegrass	POSE	Poa secunda	124–180	-
2		-		4984–6390	
	meadow foxtail	ALPR3	Alopecurus pratensis	4500–5400	-
	timothy	PHPR3	Phleum pratense	180–450	_
	Kentucky bluegrass	POPR	Poa pratensis	180–360	-
	meadow barley	HOBR2	Hordeum brachyantherum	124–180	-
3		-		1024–1530	
	slenderbeak sedge	CAAT3	Carex athrostachya	900–1350	-
	Nebraska sedge	CANE2	Carex nebrascensis	124–180	-
4		-		124–180	
Forb	•				
5				270–450	
	slender cinquefoil	POGRB	Potentilla gracilis var. brunnescens	270–450	-
6		-		9–450	
	Chamisso arnica	ARCHI4	Arnica chamissonis ssp. foliosa var. incana	9–180	_
	fleabane	ERIGE2	Erigeron	9–180	_
	Virginia strawberry	FRVI	Fragaria virginiana	9–180	_
	buttercup	RANUN	Ranunculus	9–180	_
	western mountain aster	SYSPS	Symphyotrichum spathulatum var. spathulatum	9–180	-

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)	
Grass	Grass/Grasslike					
1				690–1150		
	smallwing sedge	CAMI7	Carex microptera	460–690	-	
	clustered field sedge	CAPR5	Carex praegracilis	230–460	-	
2				60–138		
	Kentucky bluegrass	POPR	Poa pratensis	1150–2300	-	
	pullup muhly	MUFI2	Muhlenbergia filiformis	46–230	-	
	Cusick's bluegrass	POCU3	Poa cusickii	60–92	-	
	meadow barley	HOBR2	Hordeum brachyantherum	60–92	-	
	Sandberg bluegrass	POSE	Poa secunda	60–92	-	
3			•	46–230		
	onespike danthonia	DAUN	Danthonia unispicata	46–230	-	
4			•	60–92		
Forb						
5				230–368		
	slender cinquefoil	POGRB	Potentilla gracilis var. brunnescens	138–230	-	
	pussytoes	ANTEN	Antennaria	92–138	-	
6				7–184		
	common yarrow	ACMI2	Achillea millefolium	7–92	-	
	agoseris	AGOSE	Agoseris	7–92	-	
	aster	ASTER	Aster	7–92	-	
	fleabane	ERIGE2	Erigeron	7–92	_	
	falsegold groundsel	PAPSP2	Packera pseudaurea var. pseudaurea	7–92	-	
	western dock	RUAQ	Rumex aquaticus	7–92	_	
Shrub	/Vine	-	·			
7				75–150		
	silver sagebrush	ARCA13	Artemisia cana	92–184	_	

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass	/Grasslike				
1				600–1000	
2				276–480	
	American sloughgrass	BESY	Beckmannia syzigachne	69–120	
	meadow barley	HOBR2	Hordeum brachyantherum	69–120	-
	prairie Junegrass	KOMA	Koeleria macrantha	69–120	_
	mat muhly	MURI	Muhlenbergia richardsonis	69–120	_
3		·		1138–2040	
	Nebraska sedge	CANE2	Carex nebrascensis	1000–1800	-
	analogue sedge	CASI2	Carex simulata	69–120	-
	straightleaf rush	JUOR	Juncus orthophyllus	69–120	_
4				669–1520	
	Sierra rush	JUNE	Juncus nevadensis	69–120	
Forb					
5				200–480	
	slender cinquefoil	POGR9	Potentilla gracilis	80–200	
	plantainleaf buttercup	RAALA2	Ranunculus alismifolius var. alismifolius	80–160	
	Chamisso arnica	ARCHI4	Arnica chamissonis ssp. foliosa var. incana	40–120	
6				6–120	
	silverweed cinquefoil	ARAN7	Argentina anserina	6–80	_
	aster	ASTER	Aster	6–80	
	falsegold groundsel	PAPSP2	Packera pseudaurea var. pseudaurea	6–80	_

# **Animal community**

Several grazing animals seasonally use the site. Mule deer, elk, and antelope use the site for grazing. Elk are perhaps the most frequent animals on the site. Mule deer and elk use the site in the late winter and early spring. The proximity of pine forest (for cover and shelter) makes these sites desirable for grazing by elk and mule deer. The position of the site makes it attractive to grazing animals when the adjacent sites are wet; or adjacent forage is coarse and/or unpalatable. It is used as a resting and ruminating area when drier sites are not present. The site is marginal for nesting birds but may be seasonally used by waterfowl which nest in the adjacent meadow and marsh sites. The site is an important source of invertebrates for foraging birds. The site provides important habitat for grazing animals, shorebirds, raptors, and waterfowl. Lesser Sandhill Cranes may use the site in their search for food. The cranes scratch or till the ground to find and consume invertebrates. Larger grazing animals use the site for resting, ruminating, and grazing.

# Hydrological functions

The site has a moderate potential in low seral condition to produce run-off to receiving waters. In some years, the site may be flooded with water backed up in the adjacent wetter sites. There are usually fingers of wetter and lower sites threading throughout the site providing extra ground water that may move laterally through the Wet Pumice Meadow Site. In good condition, the site provides stability to adjacent streambanks and floodplains; vegetation is usually resistant to flows.

# **Recreational uses**

There is moderate recreational use on this site. Big game hunting, bird watching (especially for Lesser Sandhill Cranes), and trout fishing in adjacent streams are popular activities.

#### Wood products

None

#### **Other products**

None

#### **Other information**

The site is frequently used for grazing by domestic livestock and wildlife (mule deer, elk, and antelope). There are several species that are preferred that are available for most of the growing season. The site is highly productive and produces desirable and preferred forages for livestock throughout the growing season. Forages stay green (and presumable high in protein and digestible organic matter) well into the fall each year. The site can be heavily used because the slightly higher elevation and convex shape of this site makes it drier than adjacent marshy sites and therefore more attractive for resting, ruminating, and grazing.

The Tufted Hairgrass sites have evolved under frequent fire events. Fire may even be necessary for maintaining the dense stand of this grass (and its associated desirable forage and habitat qualities). If natural fire has been excluded from this site in the recent past, a program of rapid, moderately cool prescribed burns may be desirable to reduce litter and invigorate the grasses.

### 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 annualproduction):
- 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: