

## Ecological site R023XY406OR SWALE 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.

### Associated sites

R023XY318OR	<b>LOAMY 12-16 PZ</b> Loamy 12-16" PZ
R023XY404OR	<b>DEEP NORTH 12-18 PZ</b> Deep North Slopes 12-18" PZ

### Similar sites

R023XY202OR	<b>SWALE 10-14 PZ</b> This site (Swale 10-14 PZ) is a warmer site with higher production due to the longer growing season.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> (2) <i>Symphoricarpos oreophilus</i>
Herbaceous	(1) <i>Leymus cinereus</i> (2) <i>Poa cusickii</i>

## Physiographic features

This site occurs as narrow stringers in bottoms and small basins in mountainous uplands. Slopes range from 2 to 12%. Elevation ranges from 6000 to 7000 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Mountain
Elevation	1,829–2,134 m
Slope	2–12%
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 December through March. Spring rains are common. The soil temperature regime is cryic. Extreme temperatures range from 90 degrees F. to -30 degrees F. The frost-free period is less than 50 to 90 days. The optimum period of plant growth is from early May through July.

**Table 3. Representative climatic features**

Frost-free period (average)	90 days
Freeze-free period (average)	0 days
Precipitation total (average)	406 mm

## Influencing water features

### Soil features

The soils of the site are medium textured, deep to bedrock and well drained. Permeability is moderate. The available water holding capacity (AWC) is 4 to 6 inches for the profile.

**Table 4. Representative soil features**

Parent material	(1) Residuum–basalt (2) Colluvium–andesite
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	102–152 cm
Surface fragment cover <=3"	5%
Surface fragment cover >3"	3%
Available water capacity (0-101.6cm)	9.65–15.75 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)	18%
Subsurface fragment volume >3" (Depth not specified)	6%

## Ecological dynamics

### Range in Characteristics:

Variability in plant composition and production result from variations in soil depth. Where soils are on the shallower extreme of the range, plant production decreases and grasses will dominate. As soils deepen, mountain big sagebrush and snowberry will increase.

Four states have been identified for this site: a reference state; a state with the presence of annuals; a state with a shrub/annual co-dominance; and a state with annual dominance. This site is dependent on extra moisture from adjacent upland sites.

Reference State: Community phase changes within the reference state are a function of fire and/or chronic drought. Fire has played a significant role in the community phase dynamics of this state; however, the time between fires is highly variable and dependent upon the location and productivity of the site. The introduction of invasive annual grasses and forbs transitions into state 2.

State 2: Compositionally similar to the reference state with the addition of a trace of annual weeds, primarily cheatgrass. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. The timing and/or intensity of grazing practices and/or chronic drought leads to a reduction in native grasses and an increase in sagebrush or greasewood dominance. Low-intensity fire combined with prescribed grazing can maintain the dynamics of this state. Improper grazing or a lack of fire will lead to state 3.

State 3: This site is co-dominated by decadent sagebrush and cheatgrass. A significant reduction/loss of basin wildrye and other native grasses is apparent. Bare ground is abundant. Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. Frequent fires promote the maintenance of state 4 (cheatgrass dominated).

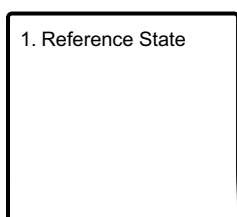
State 4: The site has crossed an abiotic threshold and ecological dynamics are determined by frequent fire, cheatgrass dominance, lack of shrubby plants, bare ground, and soil movement by wind and water erosion.

### Response to Disturbance:

If heavy grazing causes site deterioration, Cusick bluegrass, basin wildrye, and Idaho fescue decrease and big sagebrush and green rabbitbrush increase. With prolonged abuse, lupine, other unpalatable forbs, and gray horsebrush will increase and cheatgrass will invade this site.

## State and transition model

### Ecosystem states



## State 1 submodel, plant communities

1.1. Reference Plant Community
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## State 1 Reference State

### Community 1.1 Reference Plant Community

The potential native plant community is dominated by mountain big sagebrush, snowberry and basin wildrye, with lesser amounts of Idaho fescue, bluebunch wheatgrass and Cusick bluegrass. Vegetative composition is about 70 percent grass, 10 percent forbs, and 20 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	785	1098	1412
Shrub/Vine	224	314	404
Forb	112	157	202
<b>Total</b>	<b>1121</b>	<b>1569</b>	<b>2018</b>

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Perennial, Deep-rooted, Bunchgrass</b>			235–628	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	235–628	–
2	<b>Perennial, Shallow-rooted, Bunchgrass</b>			157–235	
	Cusick's bluegrass	POCU3	<i>Poa cusickii</i>	157–235	–
3	<b>Perennial, Moderately deep-rooted, Bunchgrass</b>			112–235	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	78–157	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	31–78	–
5	<b>Other Perennial Bunchgrass</b>			31–78	
	sedge	CAREX	<i>Carex</i>	0–31	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–31	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–31	–
<b>Forb</b>					
7	<b>Perennial Forbs</b>			39–157	
	agosaris	AGOSE	<i>Agoseris</i>	16–31	–
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	16–31	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	16–31	–
	sulphur-flower buckwheat	ERUM	<i>Eriogonum umbellatum</i>	16–31	–
	lupine	LUPIN	<i>Lupinus</i>	16–31	–
9	<b>Other Perennial Forbs</b>			20–81	
	arnica	ARNIC	<i>Arnica</i>	0–16	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–16	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–16	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–16	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–16	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0–16	–
	locoweed	OXYTR	<i>Oxytropis</i>	0–16	–
	silver cinquefoil	POAR8	<i>Potentilla argentea</i>	0–16	–
<b>Shrub/Vine</b>					
11	<b>Evergreen</b>			78–235	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	78–235	–
12	<b>Deciduous</b>			157–314	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	78–157	–
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	78–157	–
15	<b>Other Shrubs</b>			31–78	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	31–78	–

## Animal community

### Livestock Grazing:

This site is suited to livestock grazing during summer and fall. It is attractive to livestock; without adequate time control in the grazing system, the animals will concentrate on this site and damage both soil and plant resources.

#### Wildlife:

Sage grouse use this site extensively for food and cover.

Native Wildlife Associated With The Potential Climax Community:

Mule deer, pronghorn antelope, and sage grouse.

### Hydrological functions

The soils of the site have high infiltration rates and slow runoff potential. The hydrologic soil group is B.

### 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 Frannsen
Contact for lead author	State Rangeland Management Specialist for NRCS in Oregon
Date	08/17/2012
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

1. **Number and extent of rills:** None, Moderate sheet & rill erosion hazard

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

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-15%

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5. **Number of gullies and erosion associated with gullies:** None

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None, Moderate wind erosion hazard

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine - limited movement
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8. **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
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Deep well drained medium textured soils (loams); weak medium subangular blocky structure, 8 inches thick; dry color value 3: Moderate OM (3-8%)
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (80-90%) and gentle slopes (2-12%) effectively limit rainfall impact and overland flow
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None
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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: Basin wildrye > shrubs > other grasses > forbs
- Sub-dominant:
- Other:
- Additional:
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Normal decadence and mortality expected
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14. **Average percent litter cover (%) and depth ( in):**
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Favorable: 1800, Normal: 1400, Unfavorable: 1000 lbs/acre/year at high RSI (HCPC)
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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 invades sites that have lost deep rooted perennial grass functional groups.

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17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually

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