

Ecological site R023XY314OR GRAVELLY NORTH SLOPES 12-16 PZ

Accessed: 04/20/2026

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

R023XY302OR	SOUTH SLOPES 12-16 PZ South Slopes 12-16" PZ
R023XY310OR	NORTH SLOPES 12-16 PZ North Slopes 12-16" PZ
R023XY312OR	SHALLOW NORTH 12-16 PZ Shallow North 12-16" PZ
R023XY318OR	LOAMY 12-16 PZ Loamy 12-16" PZ
R023XY321OR	DEEP LOAMY 12-16 PZ Deep Loamy 12-16" PZ

Similar sites

R023XY310OR	NORTH SLOPES 12-16 PZ North Slopes 12-16" Pz (less stones)
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tripartita</i>
Herbaceous	(1) <i>Festuca idahoensis</i>

Physiographic features

This site occurs on north exposures of mountain side slopes. Slopes range from 20-50%. Elevation ranges from 5200 to 6400 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,590 – 1,950 m
Slope	20 – 50 %
Aspect	N

Climatic features

The annual precipitation is 12 to 16 inches but typically occurs in the lower end of the precipitation range. Most of the precipitation occurs as snow during the months of October through April. The soil temperature regime is frigid. Extreme air temperatures can range from 100 degrees F. to -30 degrees F. The frost-free period is 50 to 90 days. The optimum period for plant growth is from late April to July.

Table 3 Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	0 days
Precipitation total (average)	410 mm

Influencing water features

Soil features

The soils are moderately deep to bedrock, medium textured and well drained formed in colluvium. The soil is dark colored throughout the profile. Rock fragments range from 15 to 35 percent in the surface and 35 to 50 percent in the subsoil or substratum. Permeability is moderate. The available water holding capacity (AWC) is about 1.5 to 3 inches for the profile.

Table 4. Representative soil features

Parent material	(1) Residuum – basalt (2) Colluvium – andesite
Surface texture	(1) Very stony loam

Drainage class	Well drained
Permeability class	Moderate
Soil depth	50 – 100 cm
Surface fragment cover <=3"	0 – 20 %
Surface fragment cover >3"	0 – 30 %
Available water capacity (0-101.6cm)	4.32 – 6.35 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 30 %

Ecological dynamics

Range in Characteristics:

The reference native plant community is dominated by Idaho fescue and three-tip sagebrush. Cusick bluegrass and bluebunch wheatgrass occur in significant amounts. Numerous forbs are present. Mountain snowberry, shrubby buckwheat, and mountain big sagebrush are common. Vegetative composition is about 65 percent grasses, 10 percent forbs, and 25 percent shrubs.

Variability in plant composition results from changes in precipitation and aspect. Bluebunch wheatgrass increases in proportion at lower precipitation range and on westerly slopes.

Five states have been identified for this site: a reference state; a state with the presence of annuals; a state that has juniper dominating site resources; a state that is juniper dominant; and a state with annual dominance.

Reference State: Plant community phase change is driven by fire. Mountain big sagebrush declines after fire while Idaho fescue and other grasses increase. May see a temporary increase in rabbitbrush after fire. Time facilitates the reintroduction of sagebrush. The introduction of invasive annual grasses and forbs transitions into state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and other annual weeds. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Prescribed grazing maintains state dynamics. Mismanagement of grazing favors sagebrush and Sandberg's bluegrass. Cheatgrass increases. Prescribed grazing can reverse the trend. Reduction in fire frequency facilitates juniper encroachment in both poor and good condition communities. Fire reduces or eliminates juniper and with time sagebrush reestablishes. Juniper can out-compete sagebrush and the herbaceous plant community which brings the site to state 3.

State 3: Juniper dominates site resources. Sagebrush is dead or dying and bitterbrush lacks vigor. Sandberg's bluegrass is the dominant species in the interspace and bare ground is significant. The perennial grass component is significantly reduced in both density and productivity. Idaho fescue may be present under the canopy of trees (north slope typically). Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. Juniper woodland development is complete and soil loss and erosion drive site processes as the site goes into state 4.

State 4: Juniper dominated state. Soil loss is evident and erosion is active. All ecological processes, hydrologic cycle, nutrient cycle and energy capture have been significantly changed preventing the establishment of perennial plants. An abiotic threshold has been crossed. With catastrophic wildfire, state 5 is achieved.

State 5: Cheatgrass dominated plant community with limited to no shrub or perennial grass component. Soil erosion and redistribution along with changes in dynamic soil properties affect the hydrologic cycle and thus the nutrient cycle. Harsh environmental factors increase state resiliency to change.

Response to Disturbance:

If mismanaged grazing causes site deterioration, Idaho fescue and Cusick bluegrass decline. The shrub component and Sandberg bluegrass become more dominant, and western juniper can invade. If the site is burned, three-tip sagebrush, rabbitbrush, and gray horsebrush increase in density.

State and transition model

Figure 3. Group 8, STM

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Perennial, moderately-deep rooted, bunchgrass			504-605	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	504-605	–
2	Perennial, moderately-deep rooted, bunchgrass			10-50	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	10-50	–
5	Perennial, shallow-rooted, bunchgrass			101-252	
	Cusick's bluegrass	POCU3	<i>Poa cusickii</i>	50-151	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	50-101	–
6	Other Perennial Grasses			10-50	
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	0-10	–
	California brome	BRCA5	<i>Bromus carinatus</i>	0-10	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-10	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	0-10	–
Forb					
7	Perennial Forbs			50-151	
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	10-30	–

	avens	GEUM	<i>Geum</i>	10-30	-
	western stoneseed	LIRU4	<i>Lithospermum ruderale</i>	10-30	-
	lupine	LUPIN	<i>Lupinus</i>	10-30	-
	spreading phlox	PHDI3	<i>Phlox diffusa</i>	10-30	-
9	Other Perennial Forbs			10-30	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0-10	-
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	0-10	-
	mariposa lily	CALOC	<i>Calochortus</i>	0-10	-
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0-10	-
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0-10	-
Shrub/Vine					
12	Deciduous Shrubs			101-151	
	threetip sagebrush	ARTR4	<i>Artemisia tripartita</i>	101-151	-
13	Evergreen Shrubs			20-50	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	20-50	-
15	Other Shrubs			10-50	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-10	-
	buckwheat	ERIOG	<i>Eriogonum</i>	0-10	-
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0-10	-
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	0-10	-
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0-10	-

Animal community

Livestock Grazing: This site is best suited for mid-summer and fall grazing. Without periodic deferment spring grazing will decrease forage plant vigor. Wildlife: This site is used by mule deer for food in spring, summer and fall. Native Wildlife Associated With The Potential Climax Community: Mule deer.

Hydrological functions

The soils of this site have medium infiltration rates and medium to rapid runoff potential. The hydrologic soil group is B.

Wood products

This site is susceptible to invasion by western juniper. In this event, the site will produce fence posts and firewood.

Other information

Reseeding of this site with a range drill is not feasible due to slope steepness and stoniness of the soil.

Contributors

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SCS/BLM ESI Team, Hines, OR 1994

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	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-35%

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None, Moderate 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):** 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):** Moderately deep well drained very stony loam soils with 2-25% surface fragments; weak fine granular structure, dry color value 4, 12 inches thick; moderate OM (2-3%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Low ground cover (25-35%) and gentle to moderately steep slopes (20-50%) slightly 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

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 > other grasses > shrubs > forbs

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: 600 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:** Western Juniper will invade with lack of fire. Cheatgrass invades sites that have lost deep rooted perennial grass functional groups.

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