

Ecological site R023XY516OR

STONY LOAM

10-12 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

R023XY211OR	PUMICE CLAYPAN 10-12 PZ
R023XY221OR	GRAVELLY TERRACE 10-12 PZ
R023XY508OR	PUMICE FLAT 10-12 PZ
R023XY514OR	Pumice 8-10 PZ

Similar sites

R023XY210OR	PUMICE 10-12 PZ
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Purshia tridentata</i> (2) <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Herbaceous	(1) <i>Festuca idahoensis</i> (2) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>

Physiographic features

This site occurs on nearly level to sloping ridges and buttes. Slopes range from 2 to 30 percent. Elevations range from 4,300 to 5,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Lava plateau (2) Mountain slope (3) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	1,310 – 1,680 m
Slope	0 – 30 %
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 10 to 12 inches which occurs mainly between the months of November and June, mostly in the form of snow and spring-fall rains. The soil temperature regime is frigid. The average annual air temperature is 44 degrees F with extreme temperatures ranging from -20 to 103 degrees F. The frost free period is 50 to 90 days. The optimum period for plant growth is from April through early July.

Table 3 Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	0 days
Precipitation total (average)	310 mm

Influencing water features

Soil features

The soils of this site generally have a stony loam surface layer and skeletal loam to clay loam subsoils. They are moderately deep to deep and well drained. They are generally formed from volcanic ash and the underlying bedrock. Permeability is moderate and the available water holding capacity (AWC) is 2 to 6.5 inches for the profile. The potential for water or wind erosion is moderate.

Table 4. Representative soil features

Parent material	(1) Volcanic ash – basalt (2) Colluvium – welded tuff (3) Residuum – basalt
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Surface texture	(1) Very cobbly sandy loam (2) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderate
Soil depth	40 – 100 cm
Surface fragment cover <=3"	10 – 20 %
Surface fragment cover >3"	20 – 30 %
Available water capacity (0-101.6cm)	4.83 – 17.27 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 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	10 – 20 %
Subsurface fragment volume >3" (Depth not specified)	10 – 20 %

Ecological dynamics

Range in Characteristics:

The reference native plant community is dominated by Idaho fescue, bitterbrush, and big sagebrush. Bluebunch wheatgrass, western needlegrass, Thurber needlegrass, and Sandberg bluegrass are common. Some juniper may be present, especially on stony areas and on southerly slopes. The vegetative composition of the community is approximately 75 percent grasses, 5 percent forbs, and 25 percent shrubs.

Juniper and bluebunch wheatgrass are more abundant on south aspects and/or stony areas than elsewhere. Some cold north aspects and flat areas have little or no potential for Juniper.

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 eroded with juniper dominant; and a state with annual dominance.

Reference State: Plant community phase change is driven by fire. Mountain big sagebrush and bitterbrush decline after fire while Idaho fescue, Thurber needlegrass and other grasses increase. Rabbitbrush may temporarily increase 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 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 and can lead to an increase in cheatgrass. 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. As juniper dominates the site resources and is out-competing sagebrush and the herbaceous plant community, the site transitions to state 3.

State 3: Juniper dominates site resources. Sagebrush is dead or dying and bitterbrush lacks vigor. Sandberg 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 transitions 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:

Mismanagement of grazing is a significant factor in the decline of Idaho fescue and bluebunch wheatgrass. Heavy fall grazing and heavy deer use may reduce the stand of bitterbrush and increase big sagebrush. Fire will reduce the cover of juniper, bitterbrush, and big sagebrush.

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			404-448	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	404-448	–
2	Perennial, moderately-deep rooted, bunchgrass			90-135	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	45-90	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	45	–
4	Perennial, shallow-rooted, bunchgrass			45	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	45	–

5	Other perennial grasses			18-63	
	western needlegrass	ACOC3	Achnatherum occidentale	0-18	–
	Ross' sedge	CARO5	Carex rossii	0-18	–
	squirreltail	ELEL5	Elymus elymoides	0-18	–
	thickspike wheatgrass	ELLAL	Elymus lanceolatus ssp. lanceolatus	0-18	–
	prairie Junegrass	KOMA	Koeleria macrantha	0-18	–
Forb					
9	Other perennial forbs			9-45	
	common yarrow	ACMI2	Achillea millefolium	0-9	–
	western pearly everlasting	ANMA	Anaphalis margaritacea	0-9	–
	rockcress	ARABI2	Arabis	0-9	–
	basalt milkvetch	ASFI	Astragalus filipes	0-9	–
	woollypod milkvetch	ASPU9	Astragalus purshii	0-9	–
	buckwheat	ERIOG	Eriogonum	0-9	–
	Lewis flax	LILE3	Linum lewisii	0-9	–
	stoneseed	LITHO3	Lithospermum	0-9	–
	desertparsley	LOMAT	Lomatium	0-9	–
	lupine	LUPIN	Lupinus	0-9	–
	phlox	PHLOX	Phlox	0-9	–
Shrub/Vine					
10	Deciduous shrub			90-135	
	antelope bitterbrush	PUTR2	Purshia tridentata	90-135	–
11	Evergreen shrub			45-90	
	mountain big sagebrush	ARTRV	Artemisia tridentata ssp. vaseyana	45-90	–
15	Other shrubs			27-36	
	yellow rabbitbrush	CHVI8	Chrysothamnus viscidiflorus	9-18	–
	granite prickly phlox	LIPU11	Linanthus pungens	0-9	–
	spineless horsebrush	TECA2	Tetradymia canescens	0-9	–
Tree					
16	Evergreen tree			9-45	
	western juniper	JUOC	Juniperus occidentalis	9-45	–

Animal community

Livestock Grazing: Natural water is not generally available on-site. Excessive fall use by cattle should be avoided when there may be a conflict with wildlife over use of bitterbrush. Wildlife: Deer, rabbits, and rodents

Hydrological functions

Watershed: The soils of this site have high infiltration rates and moderately low runoff potential.

Wood products

Juniper firewood and posts may be produced on some areas. Care should be taken to avoid cutting old-growth juniper.

Other information

Adapted species for seedings include crested wheatgrass, siberian wheatgrass, intermediate wheatgrass, sheep fescue, and big bluegrass.

Contributors

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:
