

Ecological site R011XY022ID **Shallow Escarpment Complex 8-11 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

R011XY012OR	Silty 8-11 PZ Silty 8-11 PZ
R011XY018OR	Shallow Loam 8-11 PZ Shallow Loam 8-11 PZ
R011XY020OR	South Slopes 8-11 PZ South Slopes 8-11 PZ
R011XY021OR	Shallow South Slopes 8-11 PZ Shallow South Slopes 8-11 PZ
R011XY032OR	Silty North Slopes 8-11 PZ Silty North Slopes 8-11 PZ

Similar sites

R011XY021OR	Shallow South Slopes 8-11 PZ Shallow South Slopes 8-11 PZ Uniform site (not a complex) dominated by beardless wheatgrass and Thurber's needlegrass, higher production
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. wyomingensis</i> (2) <i>Grayia spinosa</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i> (2) <i>Elymus elymoides</i>

Physiographic features

This site occurs on south slopes of terrace escarpments and bluffs in the lower Malheur, Owyhee and adjacent Snake River drainages. Slopes can vary from south to southwest and typically range from 15 to 70%. Elevations vary from 2,100 to 3,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Escarpment
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Elevation	640–1,067 m
Slope	15–70%
Aspect	S, SW

Climatic features

The annual precipitation ranges from 8 to 11 inches, most of which occurs in the form of rain during the months of December through April. The soil temperature regime is mesic with a mean air temperature of 53 degrees F. Temperature extremes range from 110 to -10 degrees F. The frost free period ranges from 150 to 190 days. The optimum growth period for plant growth is late March through June.

Table 3. Representative climatic features

Frost-free period (average)	190 days
Freeze-free period (average)	0 days
Precipitation total (average)	279 mm

Influencing water features

Soil features

The soils of this site are typically very shallow silts and clays over compacted alluvial and lacustrine sediments. The soils are highly eroded with exposed sediments and severe on-going rill and gully erosion. Depth to compacted lacustrine or alluvial sediments is highly variable to a maximum of 10 inches. Permeability is very slow. The available water holding capacity (AWC) is about 2 to 4 inches for the profile. The erosion potential is severe. Bare ground and exposed sediments is typically greater than 70 percent.

Table 4. Representative soil features

Surface texture	(1) Silt (2) Clay (3) Clay loam
Drainage class	Poorly drained
Permeability class	Very slow
Soil depth	0–25 cm

Ecological dynamics

This complex site is composed of several distinct plant community components which interact through ecological processes, primarily the water flow and nutrient cycle processes. The site occurs on steep 15 to 70 percent south facing erosional surfaces. Soils are shallow over lacustrine and alluvial sediments. Severe, on-going, active, and geologic erosion is present.

The primary potential native plant community component on this complex site is dominated by Wyoming big sagebrush and spiny hopsage. Lesser amounts of Indian ricegrass, bottlebrush squirreltail, Thurber's needlegrass, beardless bluebunch wheatgrass are present. Sandberg bluegrass and a variety of forbs occur. Vegetative composition of this component is approximately 60 percent shrubs, 30 percent grasses and 10 percent forbs. Approximate ground cover is less than 30 percent (basal and crown). Production averages 200 lbs/acre in normal years. This component occurs on soils over fractured compact sediments and bedrock. These areas provide micro-sites suitable for establishment of deeper rooted plants. Bare ground is greater than 70 percent.

A secondary plant community components is a buckwheat /phlox plant association which occurs along narrow linear

seasonal seepage lines on the highly compacted sediments. A minor third related plant community component is a shadscale plant component which occurs on heavy clays at the lower end of the precipitation zone. Both of these components are very low in production averaging 50 lbs/acre in normal years. Bare ground is typically greater than 80 percent. Very few perennial grasses are present with only a scattering of perennial forbs.

There is an occasional fourth plant community component which includes four-wing saltbush and antelope bitterbrush in addition to spiny hopsage and Wyoming big sagebrush. This component occurs on highly fractured or porous sediments where available moisture accumulates for deep rooted shrubs. Production is higher on this component averaging 500 lbs/acre in normal years. Bare ground is typically greater than 50 percent. Various deep rooted perennial bunchgrasses are present along with a variety of forbs.

Range in Characteristics:

In the primary plant community component co-dominated by Wyoming big sagebrush and spiny hopsage, Wyoming big sagebrush increases at the upper end of the precipitation zone and spiny hopsage on droughtier sites at the lower end of the precipitation zone. Shrubs increase in all components over fractured and porous sediments. Indian ricegrass increases on sandy surfaces and on droughtier sites. Beardless wheatgrass increases on silty surfaces. Thurber's needlegrass increases on very fine sandy loam surfaces and in lower precipitation areas. The shadscale component increases on clayey droughty sites. On heavily compacted exposed sediments the buckwheat and phlox component increase along seep lines. Production of all components increase as soil remnants approach 10 inches depth, over fractured sediments and at the upper end of the precipitation zone.

Response to Disturbance:

Perennial bunchgrasses on this site complex site have very low resiliency and densities. With over-grazing, Sandberg bluegrass and perennial bunchgrasses rapidly decrease in all plant community components. Wyoming big sagebrush and spiny hopsage rapidly increase on deeper soil remnants in the primary plant community component. Cheatgrass, other annuals and biennial weeds sporadically invade on remnant soil surfaces. Seep lines along compacted sediments become a monoculture of buckwheat and phlox. Droughty clay components become a monoculture of shadscale. With continued deterioration on all components palatable shrubs decrease and bare eroded surfaces increase. In all components the exposed escarpment sediments have very rapid runoff and very low intake rates. Plant germination and survival are negligible on their droughty surfaces. Under deteriorated conditions, escarpments erosion is accelerated with excessive erosion contributing to downstream sedimentation.

States:

ARTRW-GRSP/BRTE-Forb-Bare Ground with lack of POSE-bunchgrasses (primary plant community component and fourth plant community component); ERIOG/PHLOX-Bare Ground with lack of POSE-bunchgrasses (secondary plant community component); ATCO-Bare Ground with lack of POSE-forbs (third plant community component)

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1

Historic Climax Plant Community

Community 1.1

Historic Climax Plant Community

This complex site is composed of several distinct plant community components which interact through ecological processes, primarily the water flow and nutrient cycle processes. The site occurs on steep 15 to 70 percent south facing erosional surfaces. Soils are shallow over lacustrine and alluvial sediments. Severe, on-going, active, and geologic erosion is present. The primary potential native plant community component on this complex site is dominated by Wyoming big sagebrush and spiny hopsage. Lesser amounts of Indian ricegrass, bottlebrush squirreltail, Thurber's needlegrass, beardless bluebunch wheatgrass are present. Sandberg bluegrass and a variety of forbs occur. Vegetative composition of this component is approximately 60 percent shrubs, 30 percent grasses and 10 percent forbs. Approximate ground cover is less than 30 percent (basal and crown). Production averages 200 lbs/acre in normal years. This component occurs on soils over fractured compact sediments and bedrock. These areas provide micro-sites suitable for establishment of deeper rooted plants. Bare ground is greater than 70 percent. A secondary plant community components is a buckwheat /phlox plant association which occurs along narrow linear seasonal seepage lines on the highly compacted sediments. A minor third related plant community component is a shadscale plant component which occurs on heavy clays at the lower end of the precipitation zone. Both of these components are very low in production averaging 50 lbs/acre in normal years. Bare ground is typically greater than 80 percent. Very few perennial grasses are present with only a scattering of perennial forbs. There is an occasional fourth plant community component which includes four-wing saltbush and antelope bitterbrush in addition to spiny hopsage and Wyoming big sagebrush. This component occurs on highly fractured or porous sediments where available moisture accumulates for deep rooted shrubs. Production is higher on this component averaging 500 lbs/acre in normal years. Bare ground is typically greater than 50 percent. Various deep rooted

perennial bunchgrasses are present along with a variety of forbs. NOTE: THE PRIMARY POTENTIAL PLANT COMMUNITY PRODUCTION AND COMPOSITION ONLY IS LISTED BELOW

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	67	135	269
Grass/Grasslike	34	67	135
Forb	11	22	45
Total	112	224	449

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Dominant, perennial, deep rooted bunchgrasses			34–78	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	22–45	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	11–34	–
2	Sub-dominant, perennial, deep rooted grasses			9–29	
	beardless wheatgrass	PSSPI	<i>Pseudoroegneria spicata</i> ssp. <i>inermis</i>	4–18	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	4–11	–
3	Dominant, perennial, shallow rooted grass			4–11	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	4–11	–
4	Other perennial grasses			0–22	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–4	–
	foxtail wheatgrass	PSSA2	* <i>Pseudelymus saxicola</i>	0–4	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	0–4	–
Forb					
5	Dominant, perennial forbs			7–18	
	buckwheat	ERIOG	<i>Eriogonum</i>	4–11	–
	phlox	PHLOX	<i>Phlox</i>	2–7	–
6	Other forbs			7–33	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	1–4	–
	lupine	LUPIN	<i>Lupinus</i>	1–4	–
	desertparsley	LOMAT	<i>Lomatium</i>	1–3	–
	phacelia	PHACE	<i>Phacelia</i>	1–2	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–2	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0–2	–
	fleabane	ERIGE2	<i>Erigeron</i>	1–2	–
	common woolly sunflower	ERLA6	<i>Eriophyllum lanatum</i>	0–2	–
	povertyweed	IVAX	<i>Iva axillaris</i>	0–2	–
	onion	ALLIU	<i>Allium</i>	0–2	–

	milkvetch	ASIRA	<i>Astragalus</i>	0–2	–
	Douglas' dustymaiden	CHDO	<i>Chaenactis douglasii</i>	0–1	–
	beardtongue	PENST	<i>Penstemon</i>	0–1	–
Shrub/Vine					
7	Dominant shrubs			67–112	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	45–67	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	22–45	–
8	Subdominant shrubs			4–18	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	4–18	–
9	Other shrubs			7–31	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–4	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	2–4	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–4	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0–4	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	2–4	–

Animal community

Livestock Grazing:

This site is not suitable for livestock grazing due to highly erodible steep slopes, very low resiliency and density of palatable bunchgrasses, very low ground cover and low production.

Native Wildlife Associated with the Potential Climax Community:

This site is used by pronghorn antelope, mule deer, rabbits, rodents, upland birds and various predators. Antelope and mule deer make good use of the shrubs on this site for winter and early spring forage.

Hydrological functions

The soils of this site are typically in an upland topographic position. They have high runoff potential and very low infiltration rates when the hydrologic cover is high. Hydrologic cover is high when the shrub and deep rooted bunchgrass component is greater than 70 percent of potential.

Other information

Threatened And Endangered Plants And Animals:

This site contains limited unique and rare plant communities. On site investigation is required for the determination of sensitive and T&E species.

Contributors

T.Bloomer, E.Petersen, A.Bahn

Travis Bloomer, Ed Petersen, Gwin Taylor, Alan Bahn, Bob Gillaspay

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):
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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:
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17. **Perennial plant reproductive capability:**
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