USDA Natural Resources
Conservation Service

Ecological site R011XY032OR
Silty North Slopes 8-11 PZ

Last updated: 9/23/2020
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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.

MLRA notes

Major Land Resource Area (MLRA): 011X–Snake River Plains

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Precipitation or Climate Zone: 8-11” P.Z.

Ecological site concept

Site does not receive additional moisture
Soils are:
Not saline or saline sodic
moderately deep to very deep, with <35% coarse fragments (by volume), not skeletal
not strongly or violently effervescent in the surface mineral 10”
Textures are generally silt loams in the surface mineral 4”
Slope is <30%
Clay content is =<35% in surface mineral 4”
Site does not have an argillic horizon with >35% clay

Associated sites

R011XY012OR	**Silty 8-11 PZ** Silty 8-11 PZ
R011XY013OR	**Clayey 8-11 PZ** Clayey 8-11 PZ
R011XY016OR	**Sandy 8-11 PZ** Sandy 8-11 PZ
R011XY018OR	**Shallow Loam 8-11 PZ** Shallow Loam 8-11 PZ
R011XY034OR	**Sandy North Slopes 8-11 PZ** Sandy North Slopes 8-11 PZ

Similar sites

R011XY034OR	**Sandy North Slopes 8-11 PZ** Sandy North Slopes 8-11 PZ (sandy surface, different composition - needle and thread dominant)

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Artemisia tridentata ssp. wyomingensis* (2) *Grayia spinosa*
Herbaceous	(1) *Pseudoroegneria spicata ssp. inermis* (2) *Poa secunda*

Physiographic features

This site occurs on north aspects of low elevation terraces in the Malheur, Owyhee and Snake River drainages. Slopes typically range from 12 to 60%. Elevations vary from 2,100 to 2,600 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace
Elevation	640–792 m
Slope	12–60%
Aspect	N, NE, E

Climatic features

The annual precipitation ranges from 8 to 11 inches. It occurs primarily as rain during the months of December through April. Soil temperature regimes are mesic with a mean annual air temperatue of 53 degrees F. Temperature extremes range from 110 to -10 degrees F. The frost free period is 120 to 170 days. The optimum preriod of plant growth is from March through June.

Table 3. Representative climatic features

Frost-free period (average)	170 days
Freeze-free period (average)	
Precipitation total (average)	279 mm

Influencing water features

Soil features

The soils of this site are typically moderately deep to very deep and well drained. Typically the surface layer is a silt loam to a very fine sandy loam 10 to 16 inches thick. The subsoil is a silt loam to silty clay loam 15 to 25 inches thick. Depth to lacustrine or alluvial sediments ranges from 20 to greater than 60 inches. Permeability is moderate. The available water holding capacity (AWC) is about 4 to 8 inches for the profile. The erosion potential is moderate to severe.

Table 4. Representative soil features

Parent material	(1) Loess–rhyolite
Surface texture	(1) Silt loam (2) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	51–152 cm
Available water capacity (0-101.6cm)	10.16–20.32 cm

Ecological dynamics

The potential native plant community is dominated by Wyoming big sagebrush, spiny hopsage and beardless wheatgrass. Bluebunch wheatgrass, needle and thread, Sandberg bluegrass and a variety of forbs and shrubs are present. Vegetative composition of the community is approximately 80 percent grasses, 5 percent forbs and 15 percent shrubs. The approximate ground cover is 70 to 80 percent (basal and crown).

Range in Characteristics:
Wyoming big sagebrush and spiny hopsage are co-dominant with Wyoming big sagebrush increasing at the upper end of the precipitation zone and spiny hopsage on droughtier sites. Beardless wheatgrass increases on silty surfaces. Needle and thread is present on coarser surfaces and Thurber's needlegrass increases on very fine sandy loam surfaces. Sandberg bluegrass increases on silty surfaces in association with a strong microbiotic crust. Winterfat increases in lower precipitation areas on silts. Production increases at the upper end of the precipitation zone.

Response to Disturbance:
Disturbances that impact the condition of this site include overgrazing by large ungulates, fire, droughts that impact the hydrologic functions of these low-lying sites, and outside anthropogenic impacts that affect site hydrology which will impact water availability for the reference plants. Any disturbance that continues long enough or is of great enough severity will reduce reference plant vigor and cover rapidly.
When the condition of the site deteriorates as a result of over grazing beardless wheatgrass decreases. Wyoming big sagebrush, basin big sagebrush, squirreltail and Sandberg bluegrass increase. Cheatgrass, other annuals, biennial weeds and bulbous bluegrass invade. With fire and continued disturbance big sagebrush is severely impacted. Rabbitbrush increases slightly and annuals and noxious biennial forbs strongly invade. Bare ground increases and excessive erosion contributes to downstream sedimentation. The excessive erosion is most pronounced in drainage areas where deep incised gulley's form.

States: ARTRW/POSE-BRTE (degraded without fire); POSE- BRTE/biennial forbs (following fire on degraded range)

**The State-and-Transition Model represents only the Reference Plant Community phase due to limited time, data, and literature support at the time of development. Future work will be needed to describe dynamics, alterative states and land use models.

State and transition model

Ecosystem states

1. Historic Climax Plant Community

State 1 submodel, plant communities

1.1. Reference Plant Community

State 1
Historic Climax Plant Community

Community 1.1
Reference Plant Community

The reference plant community is dominated by Wyoming big sagebrush, spiny hopsage and beardless wheatgrass. Bluebunch wheatgrass, needle and thread, Sandberg bluegrass and a variety of forbs and shrubs are present. Vegetative composition of the community is approximately 80 percent grasses, 5 percent forbs and 15 percent shrubs. The approximate ground cover is 70 to 80 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	628	807	986
Shrub/Vine	118	151	185
Forb	39	50	62
Total	**785**	**1008**	**1233**

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, deep rooted, perennial bunchgrass**			605–757	
	beardless wheatgrass	PSSPI	*Pseudoroegneria spicata ssp. inermis*	605–757	–
2	**Sub-dominant, deep rooted, perennial bunchgrasses**			40–101	
	needle and thread	HECO26	*Hesperostipa comata*	20–50	–
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	20–50	–
4	**Dominant, shallow-rooted, perennial grass**			30–81	
	Sandberg bluegrass	POSE	*Poa secunda*	30–81	–
5	**Other perennial grasses**			30–121	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–30	–
	basin wildrye	LECI4	*Leymus cinereus*	0–30	–
	foxtail wheatgrass	PSSA2	×*Pseudelymus saxicola*	0–30	–
	squirreltail	ELEL5	*Elymus elymoides*	6–20	–
Forb					
6	**Dominant, perennial forbs**			30–50	
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	20–30	–
	buckwheat	ERIOG	*Eriogonum*	10–20	–
8	**Other perennial forbs**			30–121	
	common yarrow	ACMI2	*Achillea millefolium*	3–10	–
	milkvetch	ASTRA	*Astragalus*	3–10	–
	hawksbeard	CREPI	*Crepis*	3–10	–
	fleabane	ERIGE2	*Erigeron*	3–10	–
	desertparsley	LOMAT	*Lomatium*	3–10	–
	western stoneseed	LIRU4	*Lithospermum ruderale*	3–10	–
	lupine	LUPIN	*Lupinus*	0–6	–
	common woolly sunflower	ERLA6	*Eriophyllum lanatum*	0–6	–
	phlox	PHLOX	*Phlox*	2–6	–

	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–3	–
	mariposa lily	CALOC	*Calochortus*	0–3	–
	bastard toadflax	COMAN	*Comandra*	0–3	–
	onion	ALLIU	*Allium*	1–3	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	0–3	–
	beardtongue	PENST	*Penstemon*	0–3	–
	woodland-star	LITHO2	*Lithophragma*	0–2	–
Shrub/Vine					
11	**Co-dominant shrubs**			40–101	
	spiny hopsage	GRSP	*Grayia spinosa*	20–50	–
12	**Other shrubs**			30–81	
	spiny hopsage	GRSP	*Grayia spinosa*	28–67	–
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	10–30	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–10	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	3–10	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–10	–
	horsebrush	TETRA3	*Tetradymia*	0–10	–
	green rabbitbrush	ERTE18	*Ericameria teretifolia*	3–7	–

Animal community

Livestock Grazing:
This site is suitable for livestock grazing use in the late fall, winter and early spring under a planned grazing system. Use should be postponed until the soils are firm enough to prevent trampling damage and soil compaction. Grazing management should be keyed for beardless wheatgrass. Deferred grazing or rest is recommended at least once every three years.

Native Wildlife Associated with the Potential Climax Community:
This site is commonly used by pronghorn antelope, mule deer, rabbits, rodents, upland birds and various predators. Antelope and mule deer make excellent use of the site for spring forage.

Hydrological functions

The soils of this site are typically in an upland topographic position. They have moderate runoff potential and medium infiltration rates when the hydrologic cover is high. Hydrologic cover is high when the beardless wheatgrass and other deep rooted bunchgrass component is greater than 70 percent of potential. The soils are in hydrologic groups B and C.

Contributors

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Approval

Kendra Moseley, 9/23/2020

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	05/13/2025
Approved by	Kendra Moseley
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):**

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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:

    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):**

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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):**

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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:**

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17. **Perennial plant reproductive capability:**
