

Ecological site R011XY009OR Arid Loam 6-10 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.

MLRA notes

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

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Precipitation or Climate Zone: 6-10" P.Z.

Ecological site concept

Site does not receive additional moisture

Soils are:

Not saline or saline sodic

Very deep, with <35% coarse fragments (by volume), not skeletal

not strongly or violently effervescent in the surface mineral 10"

Surface textures range from fine sandy loam to silt loam 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

R011XY008OR	Arid Desert Loam 6-10 PZ Arid Desert Loam 6-10 PZ (higher salts and carbonates, different composition – ARTCO-PIDE4/POSE-ELEL5 association)
R011XY016OR	Sandy 8-11 PZ Sandy 8-11 PZ (higher precipitation, less salts and carbonates, sandy surface, greater production, different composition – ARTRW8-ATCA2/HECO26-PSSPI)
R011XY020OR	South Slopes 8-11 PZ South Slopes 8-11 PZ (south aspect, higher precipitation, greater production)
R011XY032OR	Silty North Slopes 8-11 PZ Silty North Slopes 8-11 PZ (north aspect, greater production, different composition – ARTRW8-GRSP/PSSPI-POSE)

Similar sites

R024XY016OR	LOAMY 8-10 PZ D24 Loamy 8-10 PZ (coarser surface with less silt, higher elevation, cooler site, greater production)
R011XY012OR	Silty 8-11 PZ Silty 8-11 PZ (higher precipitation, less salts and carbonates, greater production)

R024XY017OR	SHALLOW LOAM 8-10 PZ D24 Shallow Loam 8-10 PZ (coarser surface with less silt, higher elevation, cooler site, different composition – less Sandberg bluegrass)
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> (2) <i>Grayia spinosa</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i> ssp. <i>inermis</i> (2) <i>Achnatherum thurberianum</i>

Physiographic features

This site occurs on low elevation terraces and fan remnants in the lower Succor Creek and adjacent Snake River drainage. It is typically found on topography with gentle slopes. Slopes typically range from 0 to 12%. Elevations vary from 2,100 to 2,800 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan remnant
Elevation	640–853 m
Slope	0–12%
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 6 to 10 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 170 to 210 days. The optimum growth period for plant growth is early March through May.

Table 3. Representative climatic features

Frost-free period (average)	210 days
Freeze-free period (average)	
Precipitation total (average)	254 mm

Influencing water features

Soil features

The soils of this site are typically shallow to moderately deep over a weakly to strongly cemented duripan. They are well drained. Typically the surface layer is a silt loam to a very fine sandy loam 8 to 16 inches thick. The subsoil is a silt loam to silty clay loam 15 to 25 inches thick. Depth to an indurated pan or compacted alluvial and lacustrine sediments ranges from 10 to 40 inches. Permeability is moderate. The available water holding capacity (AWC) is about 2 to 4 inches for the profile. The potential for water and wind erosion is moderate.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–rhyolite
Surface texture	(1) Silt loam (2) Very fine sandy loam

Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderate
Soil depth	51–152 cm
Available water capacity (0-101.6cm)	5.08–10.16 cm

Ecological dynamics

The potential native plant community is dominated by Wyoming big sagebrush, spiny hopsage and beardless wheatgrass. Sandberg bluegrass is prominent. Thurber's needlegrass and squirreltail are common. Indian ricegrass, needleand thread and a variety of forbs are present. Shadscale saltbush, bud sagebrush and winterfat occur occasionally. Vegetative composition of the community is approximately 70 percent grasses, 5 percent forbs and 25 percent shrubs. The approximate ground cover is 60 to 70 percent (basal and crown).

Range in Characteristics:

Wyoming big sagebrush increases at the upper end of the precipitation zone and on soils which are lower in salts and carbonates. Spiny hopsage increases on droughtier sites. Beardless wheatgrass and Sandberg bluegrass increases on silty surfaces in association with a strong microbiotic crust. Thurber's needlegrass increases on very fine sandy loam surfaces and on droughtier sites. Needle and thread is present on coarser surfaces. Shadscale saltbush and bud sagebrush increases in low precipitation areas and on soils higher in salts and carbonates. Winterfat increases on deep droughty silt soils. Production increases at the upper end of the precipitation zone and on slight north aspects.

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, Thurber's needlegrass and other bunchgrasses rapidly decrease. Wyoming big sagebrush, bottlebrush squirreltail and Sandberg bluegrass increase. Cheatgrass, other annuals and biennial weeds invade. With continued disturbance spiny hopsage, Wyoming big sagebrush, spiny hopsage, shadscale, bud sagebrush and winterfat decrease. Rabbitbrush increases slightly and annuals and noxious forbs continue to invade. Bare ground increases and excessive erosion contributes to downstream sedimentation. The excessive erosion is most pronounced in drainage areas where incise gully's form.

States:

ARTRW-GRSP/POSE-BRTE; POSE-BRTE–bare ground

**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, alternative 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 native plant community is dominated by Wyoming big sagebrush, spiny hopsage and beardless wheatgrass. Sandberg bluegrass is prominent. Thurber's needlegrass and squirreltail are common. Indian ricegrass, needle and thread and a variety of forbs are present. Shadscale saltbush, bud sagebrush and winterfat occur occasionally. Vegetative composition of the community is approximately 70 percent grasses, 5 percent forbs and 25 percent shrubs. The approximate ground cover is 60 to 70 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	314	392	549
Shrub/Vine	112	140	196
Forb	22	28	39
Total	448	560	784

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, moderate rooted bunchgrasses			224–364	
	beardless wheatgrass	PSSPI	<i>Pseudoroegneria spicata</i> ssp. <i>inermis</i>	168–252	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	56–112	–
2	Sub-dominant, perennial, shallow rooted grass			11–28	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	11–28	–
4	Common, perennial, moderate rooted bunchgrasses			17–101	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	11–28	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–28	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	0–22	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	6–22	–
5	Other perennial grasses			11–28	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	0–17	–
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	0–11	–
	foxtail wheatgrass	PSSA2	* <i>Pseudelymus saxicola</i>	0–11	–
Forb					

8	Dominant, perennial forbs			22–45	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	6–11	–
	buckwheat	ERIOG	<i>Eriogonum</i>	6–11	–
	desertparsley	LOMAT	<i>Lomatium</i>	6–11	–
	phlox	PHLOX	<i>Phlox</i>	2–6	–
	fleabane	ERIGE2	<i>Erigeron</i>	2–6	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	2–6	–
9	Other perennial forbs			17–45	
	milkvetch	ASTRA	<i>Astragalus</i>	2–6	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0–6	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	2–6	–
	western stoneseed	LIRU4	<i>Lithospermum ruderale</i>	0–4	–
	lupine	LUPIN	<i>Lupinus</i>	0–4	–
	hoary tansyaster	MACA2	<i>Machaeranthera canescens</i>	0–3	–
	bastard toadflax	COMAN	<i>Comandra</i>	0–3	–
	hawksbeard	CREPI	<i>Crepis</i>	1–3	–
	haplopappus	HAPLO11	<i>Haplopappus</i>	0–3	–
	onion	ALLIU	<i>Allium</i>	1–3	–
	pussytoes	ANTEN	<i>Antennaria</i>	1–3	–
	beardtongue	PENST	<i>Penstemon</i>	0–3	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–3	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0–3	–
	woodland-star	LITHO2	<i>Lithophragma</i>	0–2	–
Shrub/Vine					
11	Dominant, non-sprouting, evergreen shrubs			78–135	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	56–90	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	11–45	–
15	Other shrubs			22–90	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	0–22	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	6–17	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–17	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	0–17	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	6–17	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–17	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–11	–

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 and Thurber's needlegrass. These bunchgrasses can be severely damaged if heavily grazed during periods of flowering and grass seed formation before root reserves have accumulated and soil moisture is low. 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. It is a preferred site for sage grouse wintering. Antelope and mule deer make excellent use of the site for winter and early spring forage.

Hydrological functions

The soils of this site are typically in a relatively low terrace/fan remnant 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 Thurber's needlegrass moderately deep rooted bunchgrass component is greater than 70 percent of potential. The soils are in hydrologic group C.

Other information

This site has low potential for range seeding because of its very droughty nature. Similarly, the potential for natural seeding reestablishment is also low due to the low frequency of good seedling establishment years.

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	05/02/2024
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):

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:**
