

Ecological site R011XY008OR Arid Desert 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

| | |
|-------------|---|
| R011XY009OR | Arid Loam 6-10 PZ Arid Loam 6-10 PZ (lower salts and carbonates, different composition – ARTRW8-GRSP/PSSPI-ACTH7-POSE 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, greater production, different composition – ARTRW8-GRSP/PSSPI-ACTH7-POSE) |
| 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

| | |
|-------------|--|
| R024XY015OR | DESERT LOAM 6-10 PZ D24 Desert Loam 8-10 PZ (coarser surface with less silt, higher elevation, cooler site, different composition – less Sandberg bluegrass) |
|-------------|--|

Table 1. Dominant plant species

| | |
|------------|---|
| Tree | Not specified |
| Shrub | (1) <i>Atriplex confertifolia</i> (2) <i>Picrothamnus desertorum</i> |
| Herbaceous | (1) <i>Elymus elymoides</i> (2) <i>Poa sandbergii</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. Small playettes are usually present. The subsoil is a silt loam to silty clay loam 15 to 25 inches thick. Carbonates and sodium salts increase with depth. 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 | Well drained to moderately well drained |

| | |
|--------------------------------------|-----------------------------|
| Permeability class | Moderate to moderately slow |
| Soil depth | 51–152 cm |
| Available water capacity (0-101.6cm) | 5.08–10.16 cm |

Ecological dynamics

The potential native plant community is strongly dominated by shadscale saltbush and bud sagebrush. Sandberg bluegrass and bottlebrush squirreltail are prominent. Indian rice grass and a variety of forbs are present. Spiny hopsage, Wyoming big sagebrush, winterfat and horsebrush are scattered. Vegetative composition of the community is approximately 65% shrubs, 30% grass and 5 percent forbs. The approximate ground cover is 40-50% (basal and crown).

Range in Characteristics:

Shadscale saltbush and bud sagebrush will increase in uniformity and spacing as salts and carbonates increase and under droughty conditions at the lower end of the precipitation zone. Bottlebrush squirreltail, Sandberg bluegrass and beardless wheatgrass increase on a silty surface. Indian ricegrass, Thurber's needlegrass and needleand thread will increase on a sandy surface. Wyoming big sagebrush although minor increases at the upper end of the precipitation zone and on soils lower in salts and carbonates. Winterfat increases on deeper droughty silt soils. Production increases at the upper end of the precipitation zone and on soils with greater depth. Production decreases and shadscale saltbrush and bud sagebrush increase on slight south slopes.

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.

If the condition of the site deteriorates as a result of over grazing, bud sagebrush and Indian ricegrass will decrease in the stand. With further deterioration, shadscale saltbush, squirreltail and Sandberg bluegrass will decrease. Cheatgrass and other annuals invade, bare ground increases, vesicular crusts enlarge, erosion accelerates and site productivity decreases. The invasion of annuals and the reestablishment of perennials are limited in areas of strong vesicular crusts and heavier erosion pavement.

States:

ATCO-PIDE4/ELEL5-POSE-bare ground (ACHY absent); ATCO/annuals-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 strongly dominated by shadscale saltbush and bud sagebrush. Sandberg bluegrass and bottlebrush squirreltail are prominent. Indian rice grass and a variety of forbs are present. Spiny hopsage, Wyoming big sagebrush, winterfat and horsebrush are scattered. Vegetative composition of the community is approximately 65% shrubs, 30% grass and 5 percent forbs. The approximate ground cover is 40-50% (basal and crown).

Table 5. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Shrub/Vine | 291 | 364 | 510 |
| Grass/Grasslike | 135 | 168 | 235 |
| 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 | | | 39–129 | |
| | squirreltail | ELEL5 | <i>Elymus elymoides</i> | 28–84 | – |
| | Indian ricegrass | ACHY | <i>Achnatherum hymenoides</i> | 11–45 | – |
| 4 | Sub-dominant, perennial, shallow rooted grass | | | 28–56 | |
| | Sandberg bluegrass | POSE | <i>Poa secunda</i> | 28–56 | – |
| 5 | Other perennial grasses | | | 22–56 | |
| | Thurber's needlegrass | ACTH7 | <i>Achnatherum thurberianum</i> | 11–28 | – |
| | needle and thread | HECO26 | <i>Hesperostipa comata</i> | 0–28 | – |
| | beardless wheatgrass | PSSP1 | <i>Pseudoroegneria spicata</i> ssp. <i>inermis</i> | 11–28 | – |
| | foxtail wheatgrass | PSSA2 | × <i>Pseudelymus saxicola</i> | 0–11 | – |
| Forb | | | | | |
| 8 | Perennial forbs | | | 6–28 | |
| | common yarrow | ACMI2 | <i>Achillea millefolium</i> | 2–6 | – |
| | milkvetch | ASTRA | <i>Astragalus</i> | 0–6 | – |
| | fleabane | ERIGE2 | <i>Erigeron</i> | 2–6 | – |
| | buckwheat | ERIOG | <i>Eriogonum</i> | 0–6 | – |

| | Common Name | Code | Scientific Name | Height | Notes |
|-------------------|--|---------|---|---------|-------|
| | granite prickly phlox | LIPU11 | <i>Linanthus pungens</i> | 0-6 | - |
| | desertparsley | LOMAT | <i>Lomatium</i> | 0-6 | - |
| | plains pricklypear | OPPO | <i>Opuntia polyacantha</i> | 0-6 | - |
| | phlox | PHLOX | <i>Phlox</i> | 2-6 | - |
| | scarlet globemallow | SPCO | <i>Sphaeralcea coccinea</i> | 0-4 | - |
| | beardtongue | PENST | <i>Penstemon</i> | 0-4 | - |
| | evening primrose | OENOT | <i>Oenothera</i> | 0-3 | - |
| | haplopappus | HAPLO11 | <i>Haplopappus</i> | 0-3 | - |
| | Indian paintbrush | CASTI2 | <i>Castilleja</i> | 0-3 | - |
| | pussytoes | ANTEN | <i>Antennaria</i> | 1-3 | - |
| | hawksbeard | CREPI | <i>Crepis</i> | 0-3 | - |
| | Douglas' dustymaiden | CHDO | <i>Chaenactis douglasii</i> | 0-2 | - |
| Shrub/Vine | | | | | |
| 11 | Dominant, non-sprouting, deciduous shrubs | | | 280-392 | |
| | shadscale saltbush | ATCO | <i>Atriplex confertifolia</i> | 168-224 | - |
| | bud sagebrush | PIDE4 | <i>Picrothamnus desertorum</i> | 112-168 | - |
| 12 | Sub-dominant, non-sprouting evergreen shrub | | | 22-56 | |
| | spiny hopsage | GRSP | <i>Grayia spinosa</i> | 22-56 | - |
| 15 | Other shrubs | | | 17-56 | |
| | Wyoming big sagebrush | ARTRW8 | <i>Artemisia tridentata ssp. wyomingensis</i> | 0-22 | - |
| | fourwing saltbush | ATCA2 | <i>Atriplex canescens</i> | 0-22 | - |
| | yellow rabbitbrush | CHV18 | <i>Chrysothamnus viscidiflorus</i> | 0-11 | - |
| | littleleaf horsebrush | TEGL | <i>Tetradymia glabrata</i> | 0-11 | - |
| | shortspine horsebrush | TESP2 | <i>Tetradymia spinosa</i> | 0-11 | - |
| | winterfat | KRLA2 | <i>Krascheninnikovia lanata</i> | 0-8 | - |

Animal community

Livestock Grazing:

This site is suitable for livestock grazing use in the early spring, fall and winter under a planned grazing system. The key species are bud sagebrush and Indian ricegrass or squirreltail if Indian ricegrass is not present. Heavy late winter/early spring grazing during periods of "bark slippage" can severely damage bud sagebrush and shadscale. Indian ricegrass and squirreltail can be severely damaged if heavily grazed during periods of grass seed formation before root reserves have accumulated and soil moisture is low. Care should be taken to avoid trampling damage and soil compaction when soils are wet. Rest is recommended at least once every three years.

Native Wildlife Associated with the Potential Climax Community:

This site offers food and cover for antelope, mule deer, sage grouse and a variety of other birds, rodents and their associated predators. It is an important spring, fall and winter use area for antelope, mule deer and desert bighorn sheep.

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. The hydrologic cover condition is fair to good when shadscale, bud sagebrush and the deep rooted bunchgrass components are greater than 70 percent of potential. The soils are in hydrologic group D.

Other information

This site has low potential for range seeding because of its very droughty nature and the present lack of available shadscale saltbush and bud sagebrush seed. The potential for natural seeding reestablishment is 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 | 05/09/2024 |
| 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:**
