

# 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.

#### Associated sites

|             |                                                                     |
|-------------|---------------------------------------------------------------------|
| R011XY012OR | <b>Silty 8-11 PZ</b><br>Silty 8-11 PZ                               |
| R011XY018OR | <b>Shallow Loam 8-11 PZ</b><br>Shallow Loam 8-11 PZ                 |
| R011XY020OR | <b>South Slopes 8-11 PZ</b><br>South Slopes 8-11 PZ                 |
| R011XY021OR | <b>Shallow South Slopes 8-11 PZ</b><br>Shallow South Slopes 8-11 PZ |
| R011XY032OR | <b>Silty North Slopes 8-11 PZ</b><br>Silty North Slopes 8-11 PZ     |

#### Similar sites

|             |                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R011XY021OR | <b>Shallow South Slopes 8-11 PZ</b><br>Shallow South Slopes 8-11 PZ Uniform site (not a complex) dominated by beardless wheatgrass and Thurber's needlegrass, higher production |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 1. Dominant plant species

|       |                                                                                       |
|-------|---------------------------------------------------------------------------------------|
| Tree  | Not specified                                                                         |
| Shrub | (1) <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i><br>(2) <i>Grayia spinosa</i> |

|            |                                                                  |
|------------|------------------------------------------------------------------|
| Herbaceous | (1) <i>Achnatherum hymenoides</i><br>(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<br>(2) Escarpment |
| Elevation | 640 – 1,070 m                 |
| Slope     | 20 – 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) | 280 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<br>(2) Clay<br>(3) Clay loam |
| Drainage class     | Poorly drained                        |
| Permeability class | Very slow                             |
| Soil depth         | 0 – 30 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

### Additional community tables

Table 5. Community 1.1 plant community composition

| Group                  | Common Name                                          | Symbol | Scientific Name                               | Annual Production () | Foliar Cover (%) |
|------------------------|------------------------------------------------------|--------|-----------------------------------------------|----------------------|------------------|
| <b>Grass/Grasslike</b> |                                                      |        |                                               |                      |                  |
| 1                      | <b>Dominant, perennial, deep rooted bunchgrasses</b> |        |                                               | 34-78                |                  |
|                        | Indian ricegrass                                     | ACHY   | <i>Achnatherum hymenoides</i>                 | 22-45                | –                |
|                        | squirreltail                                         | ELEL5  | <i>Elymus elymoides</i>                       | 11-34                | –                |
| 2                      | <b>Sub-dominant, perennial, deep rooted grasses</b>  |        |                                               | 9-29                 |                  |
|                        | beardless wheatgrass                                 | PSSPI  | <i>Pseudoroegneria spicata ssp. inermis</i>   | 4-18                 | –                |
|                        | Thurber's needlegrass                                | ACTH7  | <i>Achnatherum thurberianum</i>               | 4-11                 | –                |
| 3                      | <b>Dominant, perennial, shallow rooted grass</b>     |        |                                               | 4-11                 |                  |
|                        | Sandberg bluegrass                                   | POSE   | <i>Poa secunda</i>                            | 4-11                 | –                |
| 4                      | <b>Other perennial grasses</b>                       |        |                                               | 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 ssp. spicata</i>   | 0-4                  | –                |
| <b>Forb</b>            |                                                      |        |                                               |                      |                  |
| 5                      | <b>Dominant, perennial forbs</b>                     |        |                                               | 7-18                 |                  |
|                        | buckwheat                                            | ERIOG  | <i>Eriogonum</i>                              | 4-11                 | –                |
|                        | phlox                                                | PHLOX  | <i>Phlox</i>                                  | 2-7                  | –                |
| 6                      | <b>Other forbs</b>                                   |        |                                               | 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                                            | ASTRA  | <i>Astragalus</i>                             | 0-2                  | –                |
|                        | Douglas' dustymaiden                                 | CHDO   | <i>Chaenactis douglasii</i>                   | 0-1                  | –                |
|                        | beardtongue                                          | PENST  | <i>Penstemon</i>                              | 0-1                  | –                |
| <b>Shrub/Vine</b>      |                                                      |        |                                               |                      |                  |
| 7                      | <b>Dominant shrubs</b>                               |        |                                               | 67-112               |                  |
|                        | Wyoming big sagebrush                                | ARTRW8 | <i>Artemisia tridentata ssp. wyomingensis</i> | 45-67                | –                |
|                        | spiny hopsage                                        | GRSP   | <i>Grayia spinosa</i>                         | 22-45                | –                |
| 8                      | <b>Subdominant shrubs</b>                            |        |                                               | 4-18                 |                  |
|                        | shadscale saltbush                                   | ATCO   | <i>Atriplex confertifolia</i>                 | 4-18                 | –                |
| 9                      | <b>Other shrubs</b>                                  |        |                                               | 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

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## 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:

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2. Presence of water flow patterns:

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3. Number and height of erosional pedestals or terracettes:

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4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):

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5. Number of gullies and erosion associated with gullies:

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6. Extent of wind scoured, blowouts and/or depositional areas:

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7. Amount of litter movement (describe size and distance expected to travel):

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8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):

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9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):

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10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:

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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:

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