

Ecological site R024XY680OR **SHRUBBY ARID NORTH SLOPES 8-10 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.

Associated sites

R024XY016OR	LOAMY 8-10 PZ Loamy 8-10 PZ (non-aspect, different composition – ARTRW8 and ACTH7 dominant, PSSPS prominent)
R024XY030OR	LOAMY SLOPES 6-10 PZ Loamy Slopes 6-10 PZ (lower production, warmer south slope, different composition – ARTRW8 and ACHY dominant w/GRSP and ACTH7 present)
R024XY303OR	SANDY SLOPES 8-11 PZ Sandy Slopes 8-11 PZ (warmer west slope, shallow sandy loam, different composition – ARTRW8 and HECO26 dominant w/PUTR2 and ACHY present)
R024XY602OR	NORTH SLOPES 8-10 PZ North Slopes 8-10 PZ (cobbly ashy loam, substratum not highly fractured, different composition – ARTRW8 and PSSPS dominant, ACTH7 and POCU3 prominent, PUTR4 absent)
R024XY638OR	SOUTH SLOPES 8-10 PZ South Slopes 8-10 PZ (lower production, warmer south slope, different composition – ARTRW8 and PSSPS dominant w/ACTH7 near co-dominant)

Similar sites

R024XY033OR	ARID NORTH SLOPES 6-10 PZ Arid North Slopes 6-10 PZ (shallow to very shallow soil, different composition – ARTRW8 and PSSPS dominant)
R024XY303OR	SANDY SLOPES 8-11 PZ Sandy Slopes 8-11 PZ (warmer west slope, shallow sandy loam, different composition – ARTRW8 and HECO26 dominant w/PUTR2 and ACHY present)
R024XY602OR	NORTH SLOPES 8-10 PZ North Slopes 8-10 PZ (cobbly ashy loam, substratum not highly fractured, different composition – ARTRW8 and PSSPS dominant, ACTH7 and POCU3 prominent, PUTR4 absent)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Purshia tridentata</i> (2) <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i> (2) <i>Achnatherum hymenoides</i>

Physiographic features

This site occurs on north facing aspects of terraces, basin hills and escarpments. Slopes typically range from 15 to 40%. Elevation varies from 3,500 to 5000 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Hill (3) Escarpment
Elevation	1,067–1,524 m
Slope	15–40%
Aspect	N

Climatic features

The annual precipitation ranges from 8 to 10 inches, most of which occurs in the form of rain and snow during the months of December through March. The soil temperature regime is mesic to frigid near mesic with a mean air temperature of 48 degrees F. Temperature extremes range from 110 to -20 degrees F. The frost free period ranges from 80 to 110 days. The optimum growth period for plant growth is from April through June.

Table 3. Representative climatic features

Frost-free period (average)	110 days
Freeze-free period (average)	0 days
Precipitation total (average)	254 mm

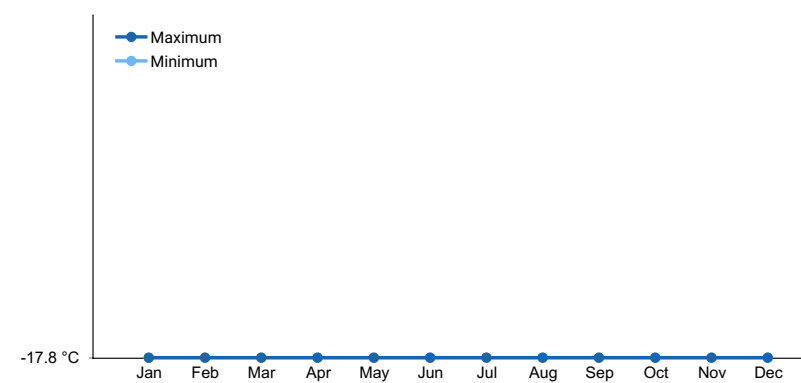


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

Soil features

The soils of this site are typically moderately deep over weathered bedrock and well drained. The surface texture is a gravelly ashy loam 3 inches thick over a clay loam to clay subsoil. Permeability is moderately slow. The available water holding capacity (AWC) is about 4 to 6 inches for the profile. The potential for erosion is moderate to severe.

Table 4. Representative soil features

Parent material	(1) Volcanic ash–rhyolite
Surface texture	(1) Gravelly loam (2) Ashy
Family particle size	(1) Clayey
Drainage class	Moderately well drained
Permeability class	Moderately slow
Soil depth	51–102 cm

Available water capacity (0-101.6cm)	10.16–15.24 cm
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Ecological dynamics

The potential native plant community is dominated by antelope bitterbrush, Wyoming big sagebrush, bluebunch wheatgrass and Indian ricegrass. Sandberg bluegrass, Thurber's needlegrass and needle and thread are common. Spiny hopsage and purple sage are present. Vegetative composition of the community is approximately 65 percent grasses, 10 percent forbs and 25 percent shrubs. The approximate ground cover is 50 to 60 percent (basal and crown).

Range in Characteristics

The depth to a restrictive layer and aspect influences the composition and production of the site. Production will increase with greater soil depth, on steep due north slopes and at the upper end of the precipitation zone. On fractured bedrock, antelope bitterbrush increases. Bluebunch wheatgrass increases on a silty surface. Indian ricegrass and needle and thread increase on coarser surfaces. Spiny hopsage increases at the lower end of the precipitation zone and on droughty slopes.

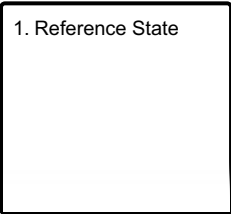
Response to Disturbance - States

If the condition of the site deteriorates as a result of over grazing, antelope bitterbrush, bluebunch wheatgrass, Indian ricegrass and needle and thread will decrease in the stand. Wyoming and basin big sagebrush, squirreltail and Sandberg bluegrass will increase. Annuals invade. With further deterioration, annuals continue to invade and bare ground increases. Excessive erosion in the bare interspaces reduces the site potential and contributes to downstream sedimentation.

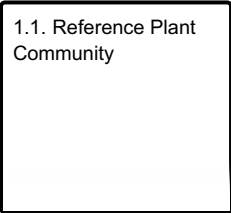
States: ARTRW8(T)-GRSP/ELEL5-POSE-bare ground with erosion pavement; Annuals-bare ground with erosion pavement

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1 Reference State

Community 1.1 Reference Plant Community

The reference native plant community is dominated by antelope bitterbrush, Wyoming big sagebrush, bluebunch wheatgrass and Indian ricegrass. Sandberg bluegrass, Thurber's needlegrass and needle and thread are common. Spiny hopsage and purple sage are present. Vegetative composition of the community is approximately 65 percent grasses, 10 percent forbs and 25 percent shrubs. The approximate ground cover is 50 to 60 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	437	583	729
Shrub/Vine	168	224	280
Forb	67	90	112
Total	672	897	1121

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, moderate rooted bunchgrass			224–359	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	224–359	–
2	Sub-dominant, moderate rooted bunchgrass			135–269	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	135–269	–
3	Common, moderate and shallow rooted bunchgrasses			45–179	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	18–90	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	18–45	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	9–45	–
4	Other perennial grasses			15–63	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	9–45	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	6–18	–
Forb					
5	Common, perennial forbs			56–90	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	9–27	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	9–18	–
	fleabane	ERIGE2	<i>Erigeron</i>	9–18	–
	buckwheat	ERIOG	<i>Eriogonum</i>	9–18	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	9–18	–
	phlox	PHLOX	<i>Phlox</i>	9–18	–
6	Other forbs			17–56	
	milkvetch	ASTRA	<i>Astragalus</i>	6–17	–
	lupine	LUPIN	<i>Lupinus</i>	6–17	–
	mariposa lily	CALOC	<i>Calochortus</i>	0–6	–
	Indian paintbrush	CAST12	<i>Castilleja</i>	0–6	–
	pussytoes	ANTEN	<i>Antennaria</i>	2–6	–
	rockcress	ARABI2	<i>Arabis</i>	0–6	–
Shrub/Vine					
7	Dominant, deciduous, sprouting shrub			45–135	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	45–135	–
8	Co-dominant, evergreen, non-sprouting shrubs			67–135	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	45–90	–
	basin big sagebrush	ARTRT	<i>Artemisia tridentata</i> ssp. <i>tridentata</i>	17–45	–
9	Other shrubs			17–45	
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	11–28	–
	slender buckwheat	ERMI4	<i>Eriogonum microthecum</i>	0–18	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0–17	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	6–17	–
	purple sage	SADO4	<i>Salvia dorrii</i>	0–17	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	0–17	–

Animal community

Livestock Grazing

This site is suitability for livestock grazing use in the late spring and fall under a planned grazing system. Use should be postponed until the soils are firm enough to prevent trampling damage and soil compaction. Care should be taken to avoid plant crown damage and soil movement when the soils are wet. Grazing management should be keyed to antelope bitterbrush, bluebunch wheatgrass and Indian ricegrass. The 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. Antelope bitterbrush can be severely damaged with heavy use of current and prior year's growth. Deferred grazing or rest is recommended at least once every three years.

Wildlife

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

Hydrological functions

Watershed-

The soils of this site have a moderate to high runoff potential. Hydrologic cover is good when the antelope bitterbrush, bluebunch wheatgrass and Indian ricegrass component is greater than 70 percent of potential. The soils are in hydrologic group C.

Other information

This site has limited potential for range seeding due to steepness and a usual stony surface. Extended drought can inhibit germination and establishment of available species.

Contributors

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C.Tackman,R.Williams, A Bahn Up-date

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):**

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:**
