USDA icon **Natural Resources Conservation Service**

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) *Purshia tridentata* (2) *Artemisia tridentata ssp. wyomingensis*
Herbaceous	(1) *Pseudoroegneria spicata ssp. spicata* (2) *Achnatherum hymenoides*

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	1,070 – 1,520 m
Slope	20 – 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)	250 mm

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	50 – 100 cm
Available water capacity (0-101.6cm)	10.16 – 15.24 cm

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

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant, moderate rooted bunchgrass**			224-359	
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	224-359	–
2	**Sub-dominant, moderate rooted bunchgrass**			135-269	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	135-269	–
3	**Common, moderate and shallow rooted bunchgrasses**			45-179	
	needle and thread	HECO26	*Hesperostipa comata*	18-90	–
	Sandberg bluegrass	POSE	*Poa secunda*	18-45	–
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	9-45	–
4	**Other perennial grasses**			15-63	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	9-45	–
	squirreltail	ELEL5	*Elymus elymoides*	6-18	–
Forb					
5	**Common, perennial forbs**			56-90	
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	9-27	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	9-18	–
	fleabane	ERIGE2	*Erigeron*	9-18	–
	buckwheat	ERIOG	*Eriogonum*	9-18	–
	granite prickly phlox	LIPU11	*Linanthus pungens*	9-18	–
	phlox	PHLOX	*Phlox*	9-18	–
6	**Other forbs**			17-56	
	milkvetch	ASTRA	*Astragalus*	6-17	–
	lupine	LUPIN	*Lupinus*	6-17	–
	mariposa lily	CALOC	*Calochortus*	0-6	–
	Indian paintbrush	CASTI2	*Castilleja*	0-6	–
	pussytoes	ANTEN	*Antennaria*	2-6	–
	rockcress	ARABI2	*Arabis*	0-6	–
Shrub/Vine					
7	**Dominant, deciduous, sprouting shrub**			45-135	
	antelope bitterbrush	PUTR2	*Purshia tridentata*	45-135	–
8	**Co-dominant, evergreen, non-sprouting shrubs**			67-135	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	45-90	–
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	17-45	–
9	**Other shrubs**			17-45	
	spiny hopsage	GRSP	*Grayia spinosa*	11-28	–
	slender buckwheat	ERMI4	*Eriogonum microthecum*	0-18	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0-17	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	6-17	–
	purple sage	SADO4	*Salvia dorrii*	0-17	–
	littleleaf horsebrush	TEGL	*Tetradymia glabrata*	0-17	–

Animal community

Livestock Grazing This site is suitabity 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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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:**
