

Ecological site R024XY010OR ARID BASIN 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.

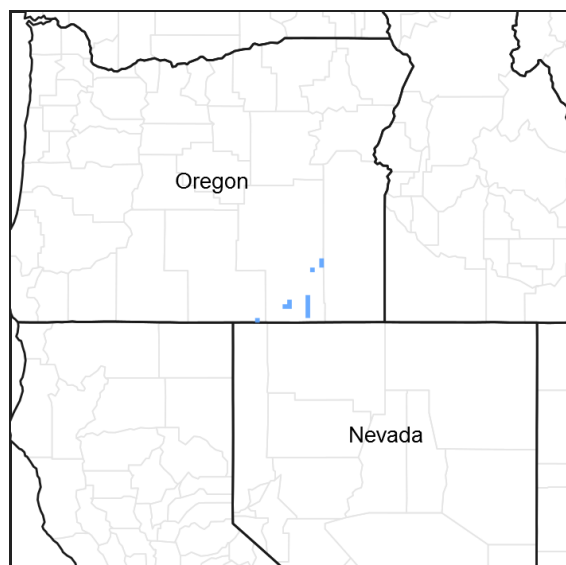


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Ecological site concept

ESC is inconclusive, it is mostly mapped in MLRA 23 with a poorly drained soil.

Associated sites

R024XY015OR	DESERT LOAM 6-10 PZ Desert Loam 6-10 PZ (lower sodic condition, well drained, shallow upland site, different composition – ATCO dominant, PIDE4 sub-dominant)
R024XY016OR	LOAMY 8-10 PZ Loamy 8-10 PZ (well drained, non-sodic upland site, different composition – ARTRW8 dominant)
R024XY017OR	SHALLOW LOAM 8-10 PZ Shallow Loam 8-10 PZ (well drained, non-sodic, shallow upland site, different composition – ARTRW8 dominant)
R024XY629OR	DRY PONDED BASIN 6-10 PZ Dry Poned Basin 6-10 PZ (slightly wetter drainage related site, higher production, different composition – GRSP dominant)

Similar sites

R024XY015OR	DESERT LOAM 6-10 PZ Desert Loam 6-10 PZ (not ponded, different composition--less spiny hopsage, big sagebrush and more bud sage))
R024XY629OR	DRY PONDED BASIN 6-10 PZ Dry Ponded Basin 6-10 PZ (slightly wetter drainage related site, higher production, different composition – GRSP dominant)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex confertifolia</i> (2) <i>Grayia spinosa</i>
Herbaceous	(1) <i>Elymus elymoides</i>

Physiographic features

This site typically occurs on small depressions located in basins, terraces and fan remnants. Slopes typically range from 0 to 2%. Elevations vary from 4,000 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Basin floor (2) Fan remnant (3) Terrace
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Rare to occasional
Elevation	1,219–1,372 m
Slope	0–2%
Water table depth	76–183 cm
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. An occasional short duration seasonal supply of ponded and subsurface moisture augments the precipitation. The soil temperature regime is mesic with a mean air temperature of 48 degrees F. Temperature extremes range from 100 to -20 degrees F. The frost-free period ranges from 90 to 120 days. The optimum growth period for plant growth is from April to early June.

Table 3. Representative climatic features

Frost-free period (average)	105 days
Freeze-free period (average)	0 days
Precipitation total (average)	203 mm

Influencing water features

Soil features

The soils of this site are typically fine textured, very deep and moderately well drained. The surface layer is a typically a silt loam over a silty to sandy clay loam subsoil. Salts and carbonates typically increase in the subsoil.

Substratums are lacustrine sediments. Permeability is moderately slow. The available water holding capacity (AWC) is about 6 to 8 inches for the profile. A seasonal water table is occasionally present at 30 to greater than 72 inches. The water erosion potential is slight due to the low elevation flat position of the site.

Table 4. Representative soil features

Parent material	(1) Lacustrine deposits–rhyolite
Surface texture	(1) Silt loam (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Well drained to moderately well drained
Permeability class	Moderate to moderately slow
Soil depth	183 cm

Ecological dynamics

The potential native plant community is dominated by shadscale. Spiny hopsage and bottlebrush squirreltail are common. Sandberg bluegrass, bud sagebrush, big sagebrush and a variety of forbs are present. Vegetative composition of the community is approximately 75 percent shrubs, 20 percent grasses and 5 percent forbs. The approximate ground cover is 20 to 30 percent (basal and crown).

Range in Characteristics:

Production increases with increasing available subsurface moisture and in areas with greater surface soil depth over the clayey subsoil. Shadscale increases on droughtier sites and on drier calcareous soil areas. Bud sagebrush increases on drier site that is rarely ponded. Spiny hopsage increases in areas of lower salinity and higher amounts of surface and subsurface seasonal moisture. Basin and Wyoming big sagebrush increases with decreasing soil sodic conditions. Indian ricegrass increases over slightly sandy surfaces. Higher salt concentrations reduce plant growth and inhibits seedling emergence.

Response to Disturbance - States:

When the condition of the site deteriorates as a result of over grazing bottlebrush squirreltail, Indian ricegrass and bud sagebrush will decrease. Shadscale and spiny hopsage will increase. With further deterioration understory forbs and grasses continue to decrease and areas of bare ground increase. Under deteriorated conditions shadscale and spiny hopsage decrease, particularly with heavy early spring grazing. Bare ground increases significantly and soil surface conditions become increasingly sodic. Production decreases and site deterioration continues to occur in a cyclic pattern.

States: ATCO-GRPS/bare ground

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1 Reference Plant Community

Community 1.1 Reference Plant Community 1.1

The reference native plant community is dominated by shadscale. Spiny hopsage and bottlebrush squirreltail are common. Sandberg bluegrass, bud sagebrush, big sagebrush and a variety of forbs are present. Vegetative composition of the community is approximately 75 percent shrubs, 20 percent grasses and 5 percent forbs. The approximate ground cover is 20 to 30 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	252	336	504
Grass/Grasslike	67	90	135
Forb	17	22	34
Total	336	448	673

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 buchgrass			45–90	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	45–90	–
2	Perennial, moderately deep rooted, bunchgrass			9–45	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	9–45	–
3	Other Perennial Grasses			9–22	
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	0–9	–
Forb					
5	Perennial Forbs			4–13	
	niterwort	NITRO	<i>Nitrophila</i>	0–4	–
	thelypody	THELY	<i>Thelypodium</i>	0–4	–
Shrub/Vine					
7	Dominant, deciduous, non-sprouting shrub			224–314	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	224–314	–
8	Sub-dominant, evergreen, non-sprouting shrub			45–90	
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	45–90	–
9	Common, deciduous, non-sprouting shrub			22–45	
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	22–45	–
10	Common, evergreen, non-sprouting shrubs			11–28	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	9–22	–
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	2–9	–
11	Other shrubs			6–17	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–9	–
	shortspine horsebrush	TESP2	<i>Tetradymia spinosa</i>	0–9	–

Animal community

Livestock Grazing:

This site is suitable for livestock grazing use in the late spring, fall and winter 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 bud sagebrush, bottlebrush squirreltail and Indian ricegrass. Heavy late winter/early spring grazing during periods of "bark slippage" can severely damage bud sagebrush, shadscale and spiny hopsage. Squirreltail and Indian ricegrass can be severely damaged if heavily grazed during periods of 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.

Wildlife:

This site is used by pronghorn antelope, mule deer, rabbits, rodents, upland birds and various predators. It provides good visibility and spring forage for antelope.

Hydrological functions

The soils of this site are typically in or near the lowest topographic position, accumulate limited off-site surface flows and when ponded have virtually no runoff potential. They have moderate infiltration rates when vegetation cover is high. Hydrologic cover is fair when the composition of shrubs and the dominant understory grasses, bottlebrush squirreltail and Indian ricegrass are greater than 70 percent of potential. The soils are in hydrologic group D.

Other information

This site is not suitable for reseeding. Salt concentrations that develop under low seral conditions and droughtiness reduce the germination and establishment of available species. Soils are corrosive to steel.

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:

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:**
