

Ecological site R024XY644OR

SILTY DUNES

Accessed: 05/04/2026

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

R024XY006OR	<p>LAKE TERRACE</p> <p>Lake Terrace (mildly sodic, different composition - LETR5 strongly dominant, SAVE4 absent)</p>
R024XY120OR	<p>SILTY LOW SODIC TERRACE 6-10 PZ</p> <p>Silty Low Sodic Terrace 6-10 PZ (loam over silty clay loam subsoil, different composition - ATCO & GRSP prominent)</p>
R024XY625OR	<p>ALKALINE BASIN 8-10 PZ</p> <p>Alkaline Basin 8-10 PZ (loam over a heavier subsoil, different composition - SAVE4 & LECI4 dominant, DISP prominent)</p>
R024XY645OR	<p>SILTY ALKALINE BOTTOM 8-10 PZ</p> <p>Silty Alkaline Bottom 8-10 PZ (lower sodic condition, deep ashy fine loamy often over diatomaceous earth, different composition – ARTRT dominant, LECI4 prominent)</p>

Similar sites

R024XY645OR	<p>SILTY ALKALINE BOTTOM 8-10 PZ</p> <p>Silty Alkaline Bottom 8-10 PZ (lower sodic condition, deep ashy fine loamy often over diatomaceous earth, different composition – ARTRT dominant, LECI4 prominent)</p>
R024XY121OR	<p>SILTY SODIC TERRACE 6-10 PZ</p> <p>Silty Sodic Terrace 6-10 PZ (lower sodic conditions, loam over silty clay loam subsoil, different composition –ARTRT dominant, GRSP prominent)</p>
R024XY112OR	<p>DRY SODIC FLOODPLAIN</p> <p>Dry Sodic Floodplain (higher sodic conditions, gravelly loamy surface over stratified heavier subsoil, different composition - SAVE4 & DISP dominant)</p>

R024XY632OR	DRY LAKE TERRACE 6-10 PZ Dry Lake Terrace (lower sodic conditions, silt loam over clayey subsoil, different composition – ARTRT dominant)
R024XY625OR	ALKALINE BASIN 8-10 PZ Alkaline Basin 8-10 PZ (loam over a heavier subsoil, different composition - SAVE4 & LEC14 dominant, DISP prominent)
R024XY120OR	SILTY LOW SODIC TERRACE 6-10 PZ Silty Low Sodic Terrace 6-10 PZ (loam over silty clay loam subsoil, different composition - ATCO & GRSP prominent)
R024XY009OR	DRY BASIN Dry Basin (fine sandy loam over silt loam, longer available seasonal water table, higher production, different composition – ARTRT & LEC14 dominant)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Sarcobatus vermiculatus</i>
Herbaceous	(1) <i>Leymus triticoides</i>

Physiographic features

This site typically occurs as dunes on low elevation dry lake basins. They occur on the north and east edges of old lake shores and flats where windblown silts have accumulated. Slopes typically range from 2 to 15% with short reaches up to 30 percent on leeward dune faces. Elevations vary from 4,000 to 4,800 feet.

Table 2. Representative physiographic features

Landforms	(1) Dune (2) Basin floor
Elevation	1,220 – 1,460 m
Slope	0 – 20 %
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 and snow during the months of December through April. The soil temperature regime is mesic to frigid near 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 70 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)	120 days
Freeze-free period (average)	130 days
Precipitation total (average)	250 mm

Influencing water features

Soil features

The soils of this site are typically silty to loamy textured, very deep and well drained. The surface layer is a silt loam to ashy loamy fine sand. Subsoils are ashy fine sandy loams to silty clay loams over lacustrine sediments. Soils are sodic with pH's increasing in the subsoil. Permeability is moderately slow to slow. The available water holding capacity (AWC) is about 6 to 8 inches for the profile. A seasonal water table is present at 30 to greater than 72 inches. The water erosion potential is slight to moderate depending on slope. The potential for wind erosion is high.

Table 4. Representative soil features

Parent material	(1) Eolian deposits – rhyolite
Surface texture	(1) Ashy silt loam (2) Loamy fine sand
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderately slow to slow
Soil depth	150 cm
Available water capacity (0-101.6cm)	15.24 – 20.32 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified

Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	Not specified

Ecological dynamics

The potential native plant community is dominated by beardless wildrye (creeping). Greasewood is subdominant. Spiny hopsage, basin big sagebrush and a variety of other grasses and forbs are present. Vegetative composition of the community is approximately 55 percent grasses, 5 percent forbs and 40 percent shrubs. The approximate ground cover is 50 to 60 percent (basal and crown).

Range in Characteristics:

Production and beardless wildrye will increase in areas with additional available subsurface moisture and on north facing dune aspects. Greasewood increases in areas of higher salinity. Basin big sagebrush increases in areas of lower salinity. Higher salt concentrations reduce plant growth and inhibit seedling emergence.

Response to Disturbance - States:

When the condition of the site deteriorates as a result of over grazing beardless wildrye will decrease and areas of bare ground will increase. Greasewood, basin big sagebrush, rabbitbrush and unpalatable salt tolerant forbs increase. With further deterioration shrubs continue to increase, beardless wild rye continues to decrease and areas of bare ground enlarge. Exposed areas of silty soils are subject to water erosion on dune slopes. Soil surface conditions become increasingly sodic. Production decreases and site deterioration continues to occur in a cyclic pattern.

States - SAVE4/Bare ground

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, rhizomatous grass			314-392	
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	314-392	–
2	Other perennial grasses			6-78	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0-24	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	0-24	–
	saltgrass	DISP	<i>Distichlis spicata</i>	0-16	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	6-16	–
Forb					
3	Perennial forbs			31-47	
	milkvetch	ASTRA	<i>Astragalus</i>	16-24	–
	salt heliotrope	HECU3	<i>Heliotropium curassavicum</i>	16-24	–

Shrub/Vine					
4	Dominant, evergreen, sprouting shrub			157-235	
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	157-235	-
5	Other shrubs			37-165	
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	16-78	-
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	16-39	-
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	6-16	-
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-16	-
	shortspine horsebrush	TESP2	<i>Tetradymia spinosa</i>	0-16	-

Animal community

Livestock grazing: This site is suitable 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. Grazing management should be keyed for beardless wildrye. 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 cover and good spring forage for numerous species.

Hydrological functions

The soils of this site are typically in or near the lowest topographic position. As dunes, slopes are quite variable over short distances and subject to wind erosion when disturbed. They have medium infiltration rates when vegetation cover is high. Hydrologic cover is high when the beardless wildrye component is greater than 70 percent of potential. The soils are in hydrologic group B.

Other information

This site has limited suitability for reseeding. As dunes, slopes are quite variable over short distances and difficult to reseed. They are subject to severe wind erosion when disturbed. Salt concentrations can reduce the germination and establishment of beardless wildrye. Seed availability of beardless wildrye is limited. Soils are corrosive to steel.

Contributors

C. Tackman
C.Tackman,R.Williams,T.Bloomer,A.Bahn
JPR

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:
