USDA Natural Resources
Conservation Service

Ecological site R024XY014OR
SODIC TERRACE 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.

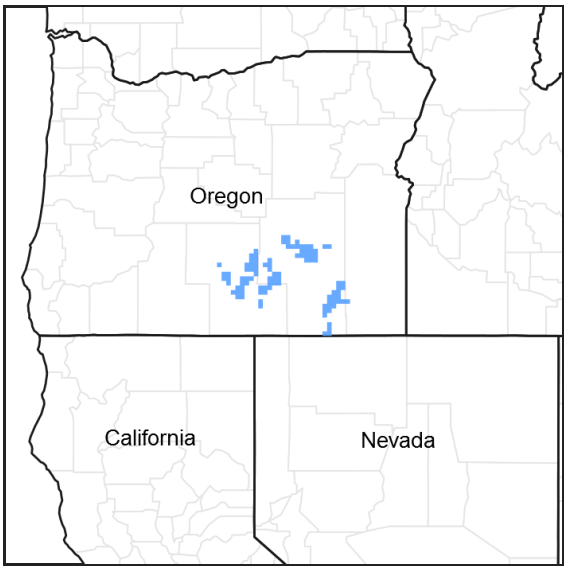


Figure 1. Mapped extent

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

This ecological site occurs on lake plains and basin floor remnants. Soil are very deep, well drained and formed in a thin layer of loess and alluvium derived from mixed parent material influenced by volcanic ash over lacustrine sediments. Soils are characterized by a very low infiltration, an ochric epipedon, moderate to very strong alkalinity, and SAR greater than 45 in the upper profile. The soil temperature regime is mesic and the soil moisture regime is typic aridic.
The plant community is characterized by the mixing of shadscale and black greasewood and approximate canopy cover is less than 15%. Approximate vegetative composition is 85% shrubs, 10% grasses, and 5% forbs.
This ESC will be field checked for correlation to similar concepts. This site has similar species composition and does not compete based on soil characteristic or abiotic factors with Sodic Terrace 8-10"PZ R024XY022NV, Sodic Terrace 6-8"PZ R024XY003NV, or Sodic Fan 6-10"PZ R024XY113OR.

Associated sites

R024XY013OR	**LOW SODIC TERRACE 6-10 PZ** Low Sodic Terrace 6-10 PZ (lower terrace, higher salts and carbonates, different composition – SAVE4 dominant in salt desert shrub association, ARTR minor to absent)
R024XY113OR	**SODIC FAN 6-10 PZ** Sodic Fan 6-10 PZ (fan position, lower salts and carbonates, higher production, different composition – ARTRT dominant, SAVE4, ACHY & LECI4 prominent)

Similar sites

R024XY629OR	**DRY PONDED BASIN 6-10 PZ** Dry Ponded Basin 6-10 PZ (located along infrequently flooded basin drainage systems, slightly lower salts and carbonates, different composition – GRSP dominant, ATCO prominent, SAVE4 absent)
R024XY010OR	**ARID BASIN 6-10 PZ** Arid Basin 6-10 PZ (droughty site, lower salts and carbonates, infrequent available deep subsurface moisture, different composition – ATCO dominant, GRSP prominent, SAVE4 absent)
R024XY113OR	**SODIC FAN 6-10 PZ** Sodic Fan 6-10 PZ (fan position, lower salts and carbonates, higher production, different composition – ARTRT dominant, SAVE4, ACHY & LECI4 prominent)
R024XY013OR	**LOW SODIC TERRACE 6-10 PZ** Low Sodic Terrace 6-10 PZ (lower terrace, higher salts and carbonates, different composition – SAVE4 dominant in salt desert shrub association, ARTR minor to absent)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata subsp. tridentata* (2) *Grayia spinosa*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

This site typically occurs on secondary low terraces adjacent to dry sodic lake basins and drainages. Slopes typically range from 0 to 3%. Elevations vary from 4,000 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Lake terrace (2) Basin-floor remnant (3) Drainageway
Ponding duration	Brief (2 to 7 days) to very brief (4 to 48 hours)
Ponding frequency	Occasional to rare
Elevation	4,000–4,500 ft
Slope	0–3%
Water table depth	60 in
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. 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)	120 days
Freeze-free period (average)	0 days
Precipitation total (average)	10 in

Influencing water features

Soil features

The soils associated with this site are very deep, well drained and formed in a thin layer of loess and alluvium derived from mixed rocks influenced by volcanic ash over lacustrine sediments. The soil profile is characterized by a surface horizon with a platy soil structure, moderate to strong alkalinity and a SAR greater than 45.
Soil texture is a silt loam throughout. Many of these soils were formed under more poorly drained conditions than exist curently and relict redox concentrations can be found below 30cm. The surface horizon is violently effervescent and will normally crust and bake upon drying inhibiting water infiltration and seedling emergence.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–rhyolite
Surface texture	(1) Loam (2) Fine sandy loam
Family particle size	(1) Loamy
Permeability class	Moderate to moderately slow
Soil depth	60 in
Available water capacity (0-40in)	6–8 in

Ecological dynamics

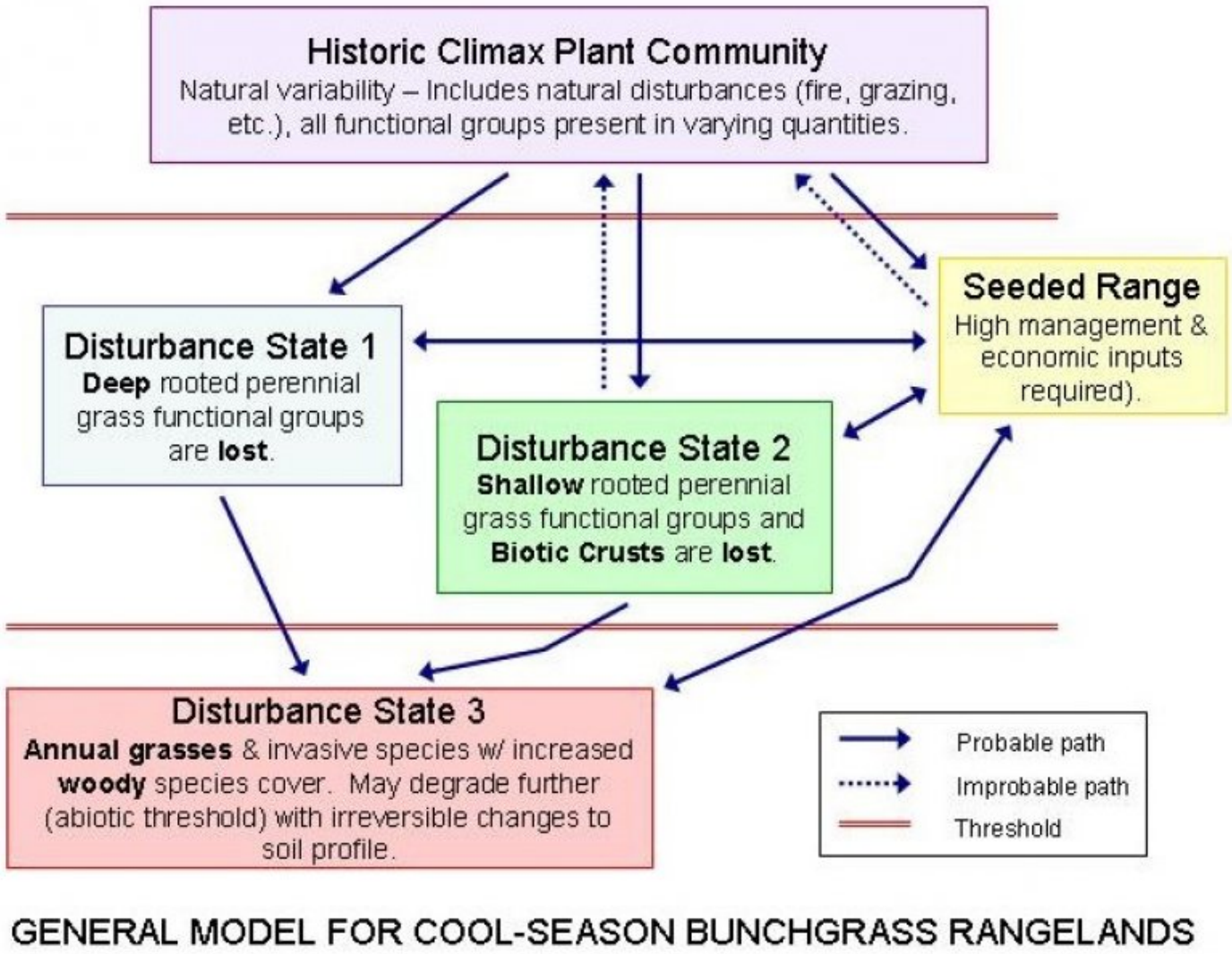
The potential native plant community is dominated by basin big sagebrush. Spiny hopsage, greasewood and Indian ricegrass are prominent. Bottlebrush squirreltail and basin wildrye are common. Shadscale saltbush, bud sagebrush, beardless wildrye (creeping), Sandberg bluegrass and a variety of forbs are present. Vegetative composition of the community is approximately 65 percent shrubs, 30 percent grasses and 5 percent forbs. The approximate ground cover is 40 to 50 percent (basal and crown).

Range in Characteristics-
Production increases at the upper end of the precipitation zone and in areas with increasing available subsurface moisture. Greasewood increases in sodic areas with deep subsurface moisture. Shadscale saltbush and bud sagebrush increases in drier calcareous soil areas. Spiny hopsage increases in areas of lower salinity and higher amounts of surface and subsurface seasonal moisture. Indian ricegrass, bottlebrush squirreltail and other bunchgrasses increase with precipitation and reduced sodic conditions. As the depth of over-blown fine sands increases Indian ricegrass and creeping wildrye will increase. 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 Indian ricegrass, basin wildrye and bud sagebrush will decrease. Big sagebrush, greasewood, shadscale and spiny hopsage will increase. With further deterioration, spiny hopsage, shadscale, squirreltail and Sandberg bluegrass will decrease. Greasewood and big sagebrush are impacted to a lesser extent. Minor amounts of annuals will invade and bare ground increases. Soil surface conditions become increasingly sodic and site deterioration continues to occur in a cyclic pattern.

States: ARTRT-GRSP-SAVE4-ATCO/ELEL5-POSE-bare ground (ACHY&LECl4 absent); ARTRT-GRSP-SAVE4/annuals-bare ground

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Reference State

Community 1.1
Reference Plant Community

The reference native plant community is dominated by basin big sagebrush. Spiny hopsage, greasewood and Indian ricegrass are prominent. Bottlebrush squirreltail and basin wildrye are common. Shadscale saltbush, bud sagebrush, beardless wildrye (creeping), Sandberg bluegrass and a variety of forbs are present. Vegetative composition of the community is approximately 65 percent shrubs, 30 percent grasses and 5 percent forbs. The approximate ground cover is 40 to 50 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	130	260	390
Grass/Grasslike	60	120	180
Forb	10	20	30
Total	**200**	**400**	**600**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant, perennial, moderate rooted bunchgrass**			40–60	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	40–60	–
2	**Sub-dominant, moderate and deep rooted bunchgrass**			80–140	
	squirreltail	ELEL5	*Elymus elymoides*	20–40	–
	basin wildrye	LECI4	*Leymus cinereus*	20–40	–
3	**Common, rhizomatous grass**			8–20	
	beardless wildrye	LETR5	*Leymus triticoides*	8–20	–
4	**Common, perennial, shallow rooted grass**			8–20	
	Sandberg bluegrass	POSE	*Poa secunda*	8–20	–
5	**Other perennial grasses**			4–16	
	saltgrass	DISP	*Distichlis spicata*	2–8	–
	needle and thread	HECO26	*Hesperostipa comata*	2–8	–
Forb					
9	**Perennial,forbs**			10–30	
	milkvetch	ASTRA	*Astragalus*	4–8	–
	lupine	LUPIN	*Lupinus*	4–8	–
	evening primrose	OENOT	*Oenothera*	0–6	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–4	–
	thelypody	THELY	*Thelypodium*	0–4	–
Shrub/Vine					
10	**Dominant, evergreen, non-sprouting shrubs**			80–140	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	40–80	–
	spiny hopsage	GRSP	*Grayia spinosa*	40–60	–
11	**Sub-dominant, deciduous, non-sprouting shrub**			20–60	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	20–60	–
12	**Common shrubs**			20–60	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	8–20	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	8–20	–
	bud sagebrush	PIDE4	*Picrothamnus desertorum*	8–20	–
15	**Other shrubs**			10–30	
	rubber rabbitbrush	ERNAO	*Ericameria nauseosa ssp. consimilis var. oreophila*	4–10	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–8	–
	littleleaf horsebrush	TEGL	*Tetradymia glabrata*	4–8	–
	shortspine horsebrush	TESP2	*Tetradymia spinosa*	4–8	–

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 Indian ricegrass and bud sagebrush (or squirreltail and spiny hopsage if ricegrass and bud sagebrush are absent). Heavy late winter/early spring grazing during periods of "bark slippage" can severely damage bud sagebrush, spiny hopsage and shadscale. Indian ricegrass, squirreltail and basin wildrye 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 cover and excellent winter and spring forage for mule deer and antelope.

Hydrological functions

The soils of this site are typically at a low terrace topographic position, accumulate little 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 high when the composition of shrubs and the dominant understory grasses, Indian ricegrass, bottlebrush squirreltail ricegrass and basin wildrye are greater than 70 percent of potential. The soils are in hydrologic group D.

Other information

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

Contributors

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SCS/BLM Team, Hines (1985 & 1993)

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:**

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:**