USDA Natural Resources
Conservation Service

Ecological site R024XY114OR
SODIC LAKE TERRACE

Accessed: 05/13/2025

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.

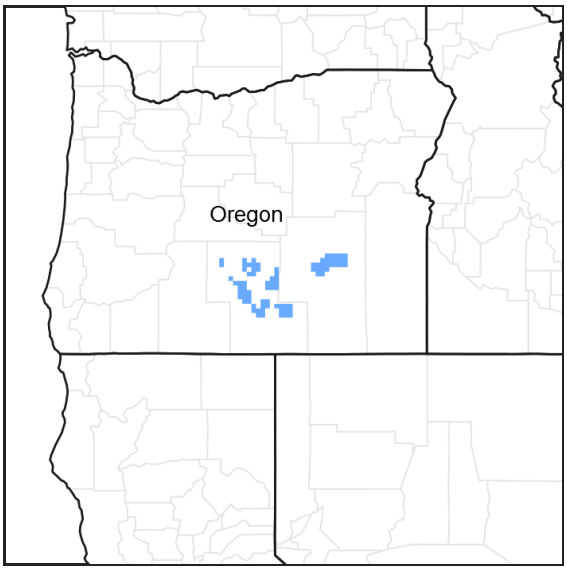


Figure 1. Mapped extent

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

No soils are correlated to this ecological site. Ecological site concept should be evaluated.

Associated sites

R024XY001OR	**SODIC FLAT** Sodic Flat (thin sodic surface layer over clayey subsoil, scattered small coppice mounds, lower production, different composition – SAVE4 & DISP dominant)
R024XY002OR	**SODIC MEADOW 6-10 PZ** Sodic Meadow (thin surface layer, located in ephemeral seepage areas along dry alkali lakebeds, different composition – SPAI-DISP dominant, SAVE4 & LECI4 minor)
R024XY003OR	**SODIC BOTTOM** Sodic Bottom (lower sodic conditions, additional available subsurface moisture, greater production, different composition – SAVE4 & LECI4 dominant, DISP common)
R024XY005OR	**SODIC DUNES** Sodic Dunes (very deep sandy soils, steeper short slopes, lower sodic conditions, less available subsurface moisture, lower production, different composition – ARTRT-SAVE dominant shrubs, LECI4-ACHY common)

R024XY009OR	**DRY BASIN** Dry Basin (lower salts and carbonates, additional available subsurface moisture, greater production, different composition - ARTRT & LECI4 dominant, SAVE4 common, DISP minor)

Similar sites

R024XY003OR	**SODIC BOTTOM** Sodic Bottom (lower sodic conditions, additional available subsurface moisture, greater production, different composition – SAVE4 & LECI4 dominant, DISP common)
R024XY002OR	**SODIC MEADOW 6-10 PZ** Sodic Meadow (thin surface layer, located in ephemeral seepage areas along dry alkali lakebeds, different composition – SPAI-DISP dominant, SAVE4 & LECI4 minor)
R024XY009OR	**DRY BASIN** Dry Basin (lower salts and carbonates, additional available subsurface moisture, greater production, different composition - ARTRT & LECI4 dominant, SAVE4 common, DISP minor)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Sarcobatus vermiculatus*
Herbaceous	(1) *Distichlis spicata* (2) *Puccinellia*

Physiographic features

This site occurs on the floors of sodic lake basins. Typically it occurs on the first low terrace above the basin floor. A large semi-permanent basin lake is often located in the vicinity. Slopes range from 0 to 3 percent. Elevations vary in a narrow range near 4100 feet.

Table 2. Representative physiographic features

Landforms	(1) Basin floor (2) Lakebed (3) Terrace
Ponding duration	Very brief (4 to 48 hours) to very long (more than 30 days)
Ponding frequency	Occasional to rare
Elevation	4,090–4,110 ft
Slope	0–3%
Water table depth	24–36 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 and snow during the months of December through April. A variable supply of ephemeral surface and subsurface moisture augments the precipitation. Ponding in the spring is rare but can be extensive from water level increases at nearby semi-permanent lakes. Ponding duration can be multi-year. 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 90 to 120 days. The optimum 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 of this site are medium to fine textured, very deep and somewhat poorly drained. The surface layer is typically an ashy silt loam to a loamy fine sand over a silty clay loam to a sandy clay loam subsoil. Substratums are lacustrine sediments. Soils are alkaline with surface pH's greater than 8.5 and increasing to above 9.0 in the subsoil. Ponding is rare, however infrequently it can be extensive and of long multi-year duration. 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 24 to 36 inches. The water erosion potential is slight due to the low elevation flat position of the site. The wind erosion potential is slight due to the ground cover.

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	Moderately well drained to somewhat poorly drained
Permeability class	Moderately slow to slow
Soil depth	72 in
Available water capacity (0-40in)	6–8 in

Ecological dynamics

The potential native plant community is dominated by a uniform stand of saltgrass and scattered greasewood. Nutatall's and Lemmon's alkaligrass are common. Alkali cordgrass, alkali sacaton, basin wildrye and a variety of salt tolerant forbs are present. Vegetative composition of the community is approximately 80 percent grasses, 5 percent forbs and 15 percent shrubs. The approximate ground cover is 60 to 80 percent (basal and crown).

Range in characteristics-
Typically the site is very uniform in appearance with very little variation. Soil surface characteristics and particularly the duration of infrequent ponding will influence the composition and production of the site. As surface alkalinity increases saltgrass and greasewood are strongly dominant. With a slight decrease in surface alkalinity production of Nuttall's and Lemmon's alkaligrass, alkali sacaton, and other taller salt tolerant grasses will increase. Basin wildrye increases under lower sodic conditions and increased available subsurface available moisture. Beardless (creeping) wildrye increases on coarser surfaces and lower pH's. Greasewood is temporary eliminated and other species are severely impacted with infrequent long duration ponding.

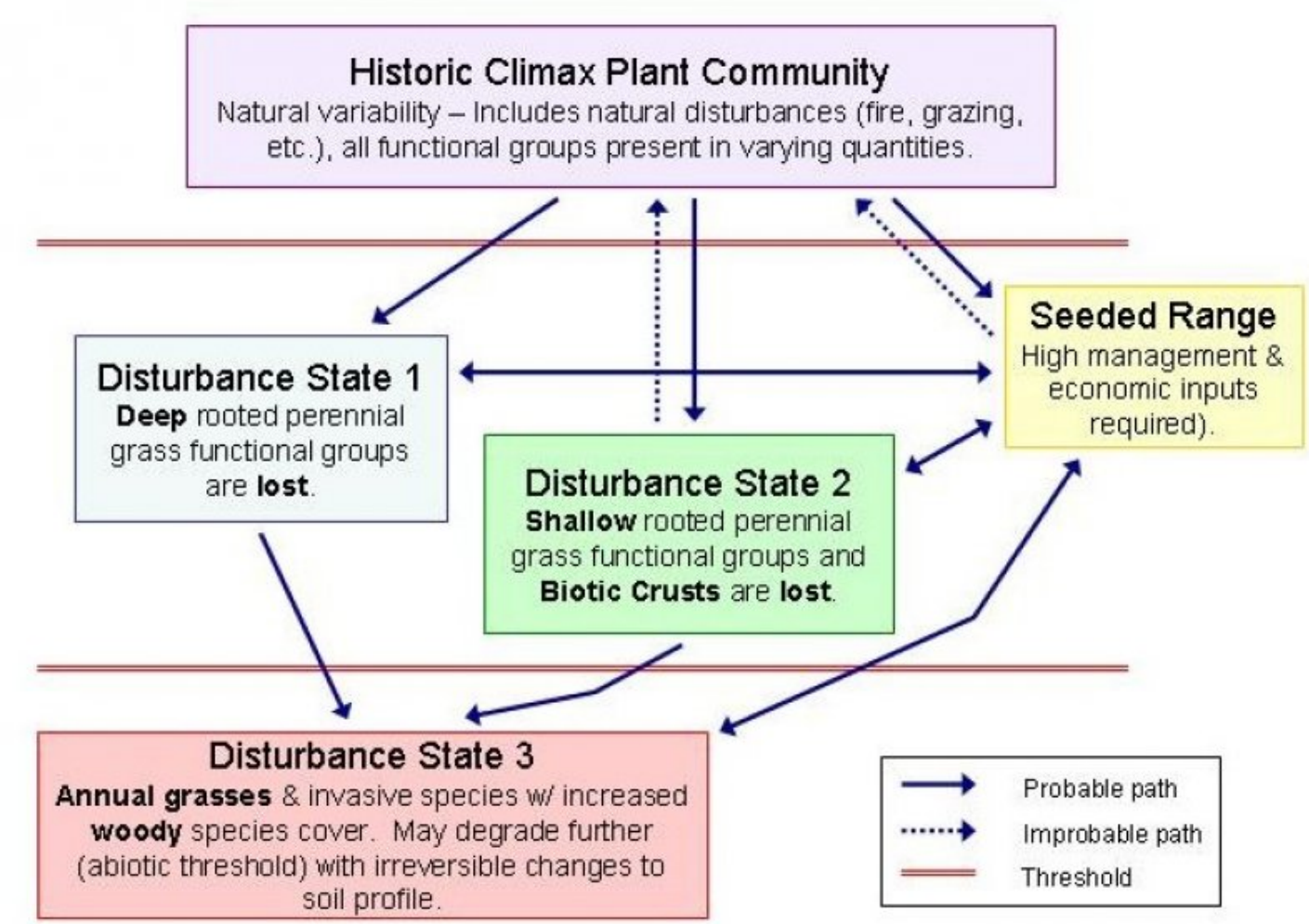
Response to Disturbance - States
When the condition of the site deteriorates as a result of over grazing, alkali sacaton and other taller salt tolerant grasses decrease. Saltgrass and greasewood increases. With further deterioration saltgrass decreases, seepweed and other salt tolerant forbs increase slightly and areas of salt incrusted bare ground increase significantly. As organic matter is depleted from loss of vegetation and root structure, sodic/saline conditions are accentuated. Production decreases and site deterioration continues to occur in a cyclic pattern.

In areas of infrequent extended lake inundation succession response follows a different pathway. Following lake inundation and draw-down surface sodic conditions are significantly reduced and the salt tolerant plant community is severely impacted. With bare soil surfaces and low surface alkalinity, kochia initially invades followed successively by smotherweed (bassia), red goosefoot and foxtail barley. As salts again increase under drier surface conditions, saltgrass, alkali grass, alkali aster and other salt tolerant species increase slowly returning the plant

community to pre-inundation conditions.

States: DISP- salt incrusted bare ground (degraded areas where sodic/salinity conditions are increasing); Kochia- Annual community following inundation

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference native plant community is dominated by a uniform stand of saltgrass and scattered greasewood. Nutatall's and Lemmon's alkaligrass are common. Alkali cordgrass, alkali sacaton, basin wildrye and a variety of salt tolerant forbs are present. Vegetative composition of the community is approximately 80 percent grasses, 5 percent forbs and 15 percent shrubs. The approximate ground cover is 60 to 80 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	480	640	800
Shrub/Vine	90	120	150
Forb	30	40	50
Total	**600**	**800**	**1000**

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, rhizomatous grass**			400–560	
	saltgrass	DISP	*Distichlis spicata*	400–560	–
2	**Sub-dominant, perennial, moderate deep bunchgrass**			120–200	
	alkaligrass	PUCCI	*Puccinellia*	120–200	–
3	**Scattered, deep rooted bunchgrass**			16–40	
	basin wildrye	LECI4	*Leymus cinereus*	16–40	–
5	**Other grasses**			25–120	
	beardless wildrye	LETR5	*Leymus triticoides*	5–25	–
	alkali sacaton	SPAI	*Sporobolus airoides*	5–25	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	5–20	–
	Sandberg bluegrass	POSE	*Poa secunda*	5–15	–
	teal lovegrass	ERHY	*Eragrostis hypnoides*	0–15	–
	alkali cordgrass	SPGR	*Spartina gracilis*	5–15	–
Forb					
9	**Forbs**			10–40	
	dock	RUMEX	*Rumex*	2–8	–
	povertyweed	IVAX	*Iva axillaris*	2–8	–
	ragwort	SENEC	*Senecio*	0–8	–
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	2–8	–
	short-rayed alkali aster	SYFR2	*Symphyotrichum frondosum*	0–4	–
	entireleaved thelypody	THIN	*Thelypodium integrifolium*	0–4	–
	small povertyweed	MOPU3	*Monolepis pusilla*	0–4	–
	boraxweed	NIOC2	*Nitrophila occidentalis*	0–4	–
	iodinebush	ALOC2	*Allenrolfea occidentalis*	0–4	–
	salt heliotrope	HECU3	*Heliotropium curassavicum*	0–4	–
	woad	ISATI	*Isatis*	0–4	–
	pickleweed	SALIC	*Salicornia*	0–4	–
Shrub/Vine					
11	**Dominant, deciduous, non-sprouting shrub**			80–160	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	80–160	–
12	**Scattered, deciduous, sprouting shrub**			15–40	
	rubber rabbitbrush	ERNAO	*Ericameria nauseosa ssp. consimilis var. oreophila*	15–40	–

Animal community

Livestock Grazing

This site is suitable for livestock grazing use in the summer, 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 to taller salt grasses, Lemmon’s and Nuttall’s alkaligrass and alkali sacaton. The site can be easily damaged if heavily grazed during periods of the taller salt grasses flowering and seed formation when root reserves are low. Deferred grazing or rest is recommended at least once every three years.

Wildlife
This site is used by mule deer, pronghorn antelope, rabbits, rodents, upland birds and various predators. It provides good winter/early spring forage for mule deer and antelope. Upland bird nesting cover is fair when the ecological condition is high. Visibility is good for antelope.

Hydrological functions

The soils of this site are typically on terraces near the lowest topographic position of basins. It accumulates little off-site surface flows and when ponded has virtually no runoff potential. The soils have low infiltration rates even when the vegetation cover is high. Hydrologic cover is high when the saltgrass and alkaligrass components 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 inhibit germination of presently 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)	Jeff Repp
Contact for lead author	State Rangeland Management Specialist for NRCS Oregon
Date	11/30/2016
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None.

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2. **Presence of water flow patterns:** None, except following extremely high intensity storms and/or ponding in the spring when short (less than 1 meter) flow patterns may appear. Minimal evidence of past or current soil deposition or erosion.

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3. **Number and height of erosional pedestals or terracettes:** None.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-15%.

5. **Number of gullies and erosion associated with gullies:** None.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Wind erosion hazard is slight to moderate.

7. **Amount of litter movement (describe size and distance expected to travel):** Litter size is Small/Fine. Litter movement is limited, minimal, and short, associated with water flow patterns following extremely high intensity storms. Litter also may be moved during intense wind storms.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Site is Slightly to Moderately resistant to erosion. Stability class (Herrick et al. 2001) anticipated to be 3-6 at surface under perennial vegetation. Stability class at surface in the interspaces is anticipated to be less than or equal to that under perennial vegetation.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface layer structure is moderate coarse granular to weak medium platy. The A horizon has a dry color of 4 - 7 and is 2 - 5 inches thick. The Soil Organic Matter (SOM) content is low (0.5 to 3.0%).

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant foliar cover and basal cover with small gaps between plants should reduce raindrop impact and slow overland flow, providing increased time for infiltration to occur. High herbaceous vegetation on this site will retain more water from precipitation. Significant ground cover (60-80%) and gentle slopes (0-3%) effectively limit rainfall impact and overland flow.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.

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: Rhizomatous grass > Moderate to deep rooted bunchgrasses

    Sub-dominant: Shrubs

    Other: Other perennial grasses > perennial forbs

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Grasses will nearly always show some mortality and decadence. Normal decadence and mortality expected on other plants.

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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):** Low 600 lbs/acre, Representative Value 800 lbs/acre, High 1000 lbs/acre

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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:** Annuals (Cheatgrass, Medusahead, Foxtail Barley, Mustards, and other forbs) invade sites that have lost deep rooted perennial grass functional groups. Perennial Pepperweed may also invade.

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17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually.
