

Ecological site R024XY002OR
SODIC MEADOW
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.

Associated sites

R024XY001OR	<p>SODIC FLAT</p> <p>Sodic Flat (thin sodic surface layer often with small scattered coppice mounds, drier site, limited spring ponding, surface seepage absent, lower production, different composition – SAVE4 & DISP dominant)</p>
R024XY003OR	<p>SODIC BOTTOM</p> <p>Sodic Bottom (thicker surface, surface seepage absent, greater production, different composition - SAVE4 & LECI4 dominant, DISP common)</p>
R024XY005OR	<p>SODIC DUNES</p> <p>Sodic Dunes (very deep sandy soils, steeper short slopes, lower sodic conditions, surface seepage absent, lower production, different composition – ARTRT-SAVE dominant shrubs, LECI4-ACHY common)</p>
R024XY013OR	<p>LOW SODIC TERRACE 6-10 PZ</p> <p>Low Sodic Terrace 6-10 PZ (deeper loamy sodic surface, higher drier position, surface seepage absent, lower production, different composition – SAVE4 dominant, ATCO, GRSP, PIDE4 & ELEL5 prominent, DISP & LECI4 minor)</p>
R024XY114OR	<p>SODIC LAKE TERRACE</p> <p>Sodic Lake Terrace (thicker loamy sodic surface, low terrace position, surface seepage absent, lower production, different composition- SAVE4/DISP-PUCCI association)</p>

Similar sites

R024XY001OR	<p>SODIC FLAT</p> <p>Sodic Flat (thin sodic surface layer often with small scattered coppice mounds, drier site, limited spring ponding, surface seepage absent, lower production, different composition – SAVE4 & DISP dominant)</p>
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R024XY114OR	SODIC LAKE TERRACE Sodic Lake Terrace (thicker loamy sodic surface, low terrace position, surface seepage absent, lower production, different composition- SAVE4/DISP-PUCCI association)
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Sporobolus airoides</i> (2) <i>Distichlis spicata</i>

Physiographic features

This site occurs below springs and seeps located on the edges of dry sodic lake basins and floodplains of perennial and intermittent drainage systems. It typically occurs as ephemeral sodic seepage areas. Slopes typically range from 0 to 3 percent. Elevations vary from 4,000 to 4,600 feet.

Table 2. Representative physiographic features

Landforms	(1) Lake plain (2) Alluvial flat
Flooding frequency	None
Ponding duration	Long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	1,220 – 1,400 m
Slope	0 %
Ponding depth	0 – 30 cm
Water table depth	0 – 90 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 and snow during the months of December through April. A variable supply of ephemeral surface and subsurface moisture augments the precipitation. 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)	250 mm

Influencing water features

Soil features

The soils of this site are medium to fine textured, very deep and poorly drained. The surface layer is typically a shallow silt loam to very fine sandy loam over a clay subsoil over lacustrine sediments. Soils are sodic with surface pH's ranging from 7.4 to 11.0. Surface seepage augments spring ponding. Permeability is slow to moderately slow. The available water holding capacity (AWC) is about 0.5 to 6 inches for the profile. A seasonal water table is present at 0 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) Lacustrine deposits – basalt (2) Alluvium – tuff
Surface texture	(1) Silt loam (2) Very fine sandy loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Slow to moderately slow
Soil depth	180 cm
Available water capacity (0-101.6cm)	1.27 – 14.22 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 20 %

Electrical conductivity (0-101.6cm)	0 – 30 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 200
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10

Ecological dynamics

The potential native plant community is dominated by alkali sacaton and inland saltgrass. Sandberg (alkali) bluegrass and alkali cordgrass are common. Alkaligrass, scratchgrass (alkali muhly), other grasses, and a variety of forbs are present. Greasewood and other shrubs are minor. Vegetative composition of the community is approximately 90 percent grasses, 5 percent forbs and 5 percent shrubs. The approximate ground cover is 60 to 80 percent (basal and crown).

Range in Characteristics-

Soil surface characteristics and the duration of surface moisture strongly influence the composition and production of the site. In areas of greater surface soil depth, increased seepage and lower alkalinity, production of alkali sacaton, alkali bluegrass and other taller salt tolerant grasses (with deeper roots) will increase. With increasing surface alkalinity inland saltgrass becomes more dominant. As salts increase to high levels, areas of salt incusted bare ground increase and saltgrass and other salt tolerant species decrease. At lower elevations and with an increase of surface sands, alkali sacaton will increase.

Response to Disturbance - States

When the condition of the site deteriorates as a result of improper grazing, alkali sacaton and other taller salt tolerant grasses decrease while inland saltgrass increases. With continued grazing pressure, inland saltgrass decreases, seepweed and other salt tolerant forbs increase slightly and areas of salt incusted 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.

States: DISP- salt incusted bare ground (degraded areas where sodic/salinity conditions are increasing)

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	Moderately-deep rooted bunchgrass			336-448	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	336-448	–
2	Perennial, rhizomatous grass			224-336	
	saltgrass	DISP	<i>Distichlis spicata</i>	168-280	–
3	Shallow rooted bunchgrass			168-280	
4	Moderately-deep rooted bunchgrass			56-112	
	alkali cordgrass	SPGR	<i>Spartina gracilis</i>	56-112	–
5	Other grasses and grass-like			22-112	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	0-34	–

	beardless wildrye	LETR5	<i>Leymus triticoides</i>	0-22	-
	scratchgrass	MUAS	<i>Muhlenbergia asperifolia</i>	6-22	-
	Lemmon's alkaligrass	PULE	<i>Puccinellia lemmonii</i>	0-22	-
	Nuttall's alkaligrass	PUNU2	<i>Puccinellia nuttalliana</i>	0-22	-
	mountain rush	JUARL	<i>Juncus arcticus ssp. littoralis</i>	0-22	-
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0-11	-
	teal lovegrass	ERHY	<i>Eragrostis hypnoides</i>	0-6	-
Forb					
6	Common forbs			17-50	
	iodinebush	ALOC2	<i>Allenrolfea occidentalis</i>	6-17	-
	pickleweed	SALIC	<i>Salicornia</i>	6-17	-
	Pursh seepweed	SUCA2	<i>Suaeda calceoliformis</i>	6-17	-
8	Other perennial forbs			6-45	
	povertyweed	IVAX	<i>Iva axillaris</i>	0-9	-
	dock	RUMEX	<i>Rumex</i>	0-9	-
	short-rayed alkali aster	SYFR2	<i>Symphotrichum frondosum</i>	1-6	-
	entireleaved thelypody	THIN	<i>Thelypodium integrifolium</i>	0-6	-
	small povertyweed	MOPU3	<i>Monolepis pusilla</i>	0-6	-
	boraxweed	NIOC2	<i>Nitrophila occidentalis</i>	0-6	-
	salt heliotrope	HECU3	<i>Heliotropium curassavicum</i>	0-6	-
	woad	ISATI	<i>Isatis</i>	0-6	-
Shrub/Vine					
10	Shrubs			11-45	
	rubber rabbitbrush	ERNAO	<i>Ericameria nauseosa ssp. consimilis var. oreophila</i>	0-22	-
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	0-22	-
	silver buffaloberry	SHAR	<i>Shepherdia argentea</i>	0-22	-

Animal community

Livestock grazing- This site is suitable for livestock grazing use in the summer, fall and early 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 alkali sacaton, alkali bluegrass and other taller salt tolerant grasses. The site can be easily damaged if heavily grazed during periods of alkali sacaton and alkali bluegrass 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 limited cover and winter spring forage for mule deer and antelope. Cover is fair when the ecological condition is high. Visibility is good for antelope.

Hydrological functions

The soils of this site are typically at the lowest topographic position. It accumulates little off-site surface flows and when ponded has low runoff potential. The soils have low infiltration rates even when the vegetation cover is high. Hydrologic cover is high when the saltgrass and basin wildrye component is 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)	Bob Gillaspay
Contact for lead author	State Rangeland Management Specialist for NRCS Oregon
Date	11/10/2016
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

2. **Presence of water flow patterns:** None.

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 - 20%

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

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

7. Amount of litter movement (describe size and distance expected to travel): Limited movement of fine to moderately coarse litter.

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 weak thin platy to weak medium subangular blocky. The A horizon has a dry color of 4 - 6 and is 3 - 12 inches thick. The Soil Organic Matter (SOM) content is low to moderate (0 to 4%).

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. High ground cover (70-95%) and flat 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: Shallow rooted bunchgrass > Shallow rooted rhizomatous grass

Sub-dominant: Other Perennial Grasses = Forbs = Shrubs

Other:

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.

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): Low 700 lbs/acre, Representative Value 1000 lbs/acre, High 1200 lbs/acre

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: Kochia, bassia, and foxtail barley are frequent invaders of this site.

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