USDA Natural Resources
Conservation Service

Ecological site R024XY013OR
LOW 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.

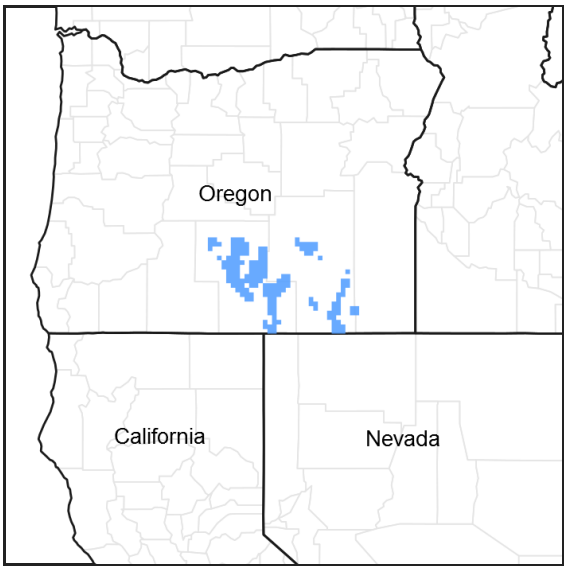


Figure 1. Mapped extent

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.

Associated sites

R024XY001OR	**SODIC FLAT** Sodic Flat (fine textured, spring ponding, different composition - SAVE4 and DISP dominant)
R024XY014OR	**SODIC TERRACE 6-10 PZ** Sodic Terrace 6-10 PZ (higher terrace, lower salts and carbonates, different composition – ARTRT dominant in salt desert shrub association, ACHY prominent)

Similar sites

R024XY629OR	**DRY PONDED BASIN 6-10 PZ** Dry Ponded Basin 6-10 PZ (along and near occasionally ponded basin drainages, slightly lower salts and carbonates, higher production, 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 deep subsurface moisture availability, different composition – ATCO dominant, GRSP prominent, SAVE4 absent)

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Sarcobatus vermiculatus* (2) *Atriplex confertifolia*
Herbaceous	(1) *Elymus elymoides*

Physiographic features

This site typically occurs on low terraces adjacent to dry sodic lake basins and intermittent 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	42–72 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)	105 days
Freeze-free period (average)	0 days
Precipitation total (average)	8 in

Influencing water features

Soil features

The soils of this site are typically very deep over alluvial and lacustrine sediments. They are sodium affected. Surface textures are loamy to fine loamy over loamy to clay loam subsoils. Soil pH increases with depth. Small playettes are usually present. They are moderately well drained. Permeability is moderate to moderate slow. The available water holding capacity (AWC) is about 6 to 8 inches for the profile. A seasonal water table is occasionally present at 40 to greater than 72 inches. The water erosion potential is slight due to the low elevation flat position of the site. Wind erosion potential is moderate.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–rhyolite
Surface texture	(1) Loam (2) Fine sandy loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained to somewhat poorly drained

Permeability class	Moderate to moderately slow
Soil depth	72 in
Available water capacity (0-40in)	6–8 in

Ecological dynamics

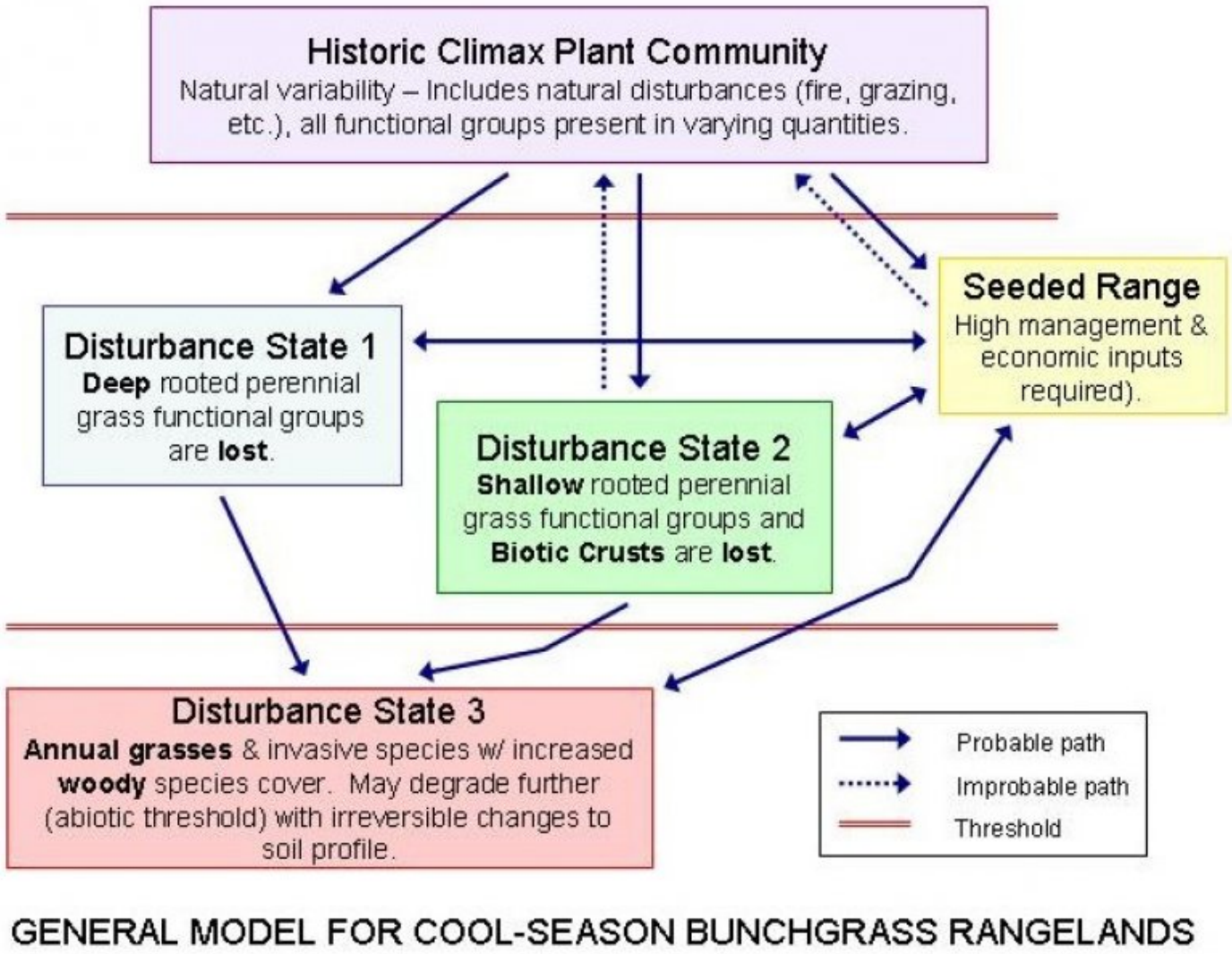
The potential native plant community is dominated by greasewood. Shadscale, spiny hopsage and bud sagebrush are prominent. Bottlebrush squirreltail is common. Saltgrass, beardless wildrye (creeping), basin wildrye, Indian ricegrass and a variety of forbs are present. Wyoming big sagebrush is minor. Vegetative composition of the community is approximately 75 percent shrubs, 20 percent grasses and 5 percent forbs. The approximate ground cover is 30 to 40 percent (basal and crown).

Range in Characteristics:
Production increases with increasing available subsurface moisture and at the upper end of the precipitation zone. Greasewood increases in areas with greater available deep subsurface moisture. Shadscale saltbush increases in drier calcareous soil areas. Spiny hopsage increases in areas of lower salinity and higher amounts of surface and subsurface seasonal moisture. Bud sagebrush increases in drier soil areas. Bottlebrush squirreltail and other bunchgrasses increase with precipitation and reduced sodic conditions. 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, other bunchgrasses and bud sagebrush will decrease. Greasewood, 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 spiny hopsage and shadscale decrease, particularly with heavy early spring grazing. Greasewood is impacted to a lesser extent. Bare ground increases significantly and soil surface conditions become increasingly sodic. Production decreases and site deterioration continues to occur in a cyclic pattern.

States: SAVE4-ATCO-GRSP/bare ground

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 greasewood. Shadscale, spiny hopsage and bud sagebrush are prominent. Bottlebrush squirreltail is common. Saltgrass, beardless wildrye (creeping), basin wildrye, Indian ricegrass and a variety of forbs are present. Wyoming big sagebrush is minor. Vegetative composition of the community is approximately 75 percent shrubs, 20 percent grasses and 5 percent forbs. The approximate ground cover is 30 to 40 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	150	225	300
Grass/Grasslike	40	60	80
Forb	10	15	20
Total	**200**	**300**	**400**

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**			15–30	
	squirreltail	ELEL5	*Elymus elymoides*	15–30	–
2	**Common, moderate and deep rooted bunchgrasses**			10–30	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	6–15	–
	basin wildrye	LECI4	*Leymus cinereus*	6–15	–
3	**Common, perennial, rhizomatous grasses**			10–30	
	saltgrass	DISP	*Distichlis spicata*	6–15	–
	beardless wildrye	LETR5	*Leymus triticoides*	6–15	–
4	**Other perennial grasses**			5–12	
	needle and thread	HECO26	*Hesperostipa comata*	0–6	–
	Sandberg bluegrass	POSE	*Poa secunda*	2–6	–
Forb					
5	**Perennial forbs**			10–25	
	lupine	LUPIN	*Lupinus*	2–6	–
	milkvetch	ASTRA	*Astragalus*	2–6	–
	cryptantha	CRYPT	*Cryptantha*	0–3	–
	povertyweed	IVAX	*Iva axillaris*	0–3	–
	niterwort	NITRO	*Nitrophila*	0–3	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–3	–
	princesplume	STANL	*Stanleya*	0–3	–
	wirelettuce	STEPH	*Stephanomeria*	0–3	–
	thelypody	THELY	*Thelypodium*	0–3	–
Shrub/Vine					
6	**Dominant, deciduous, non-sprouting shrub**			60–90	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	60–90	–
7	**Prominent,deciduous, non-sprouting shrub**			45–75	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	45–75	–
8	**Prominent, evergreen, non-sprouting shrub**			30–60	
	spiny hopsage	GRSP	*Grayia spinosa*	30–60	–
9	**Common, deciduous, non-sprouting shrub**			15–30	
	bud sagebrush	PIDE4	*Picrothamnus desertorum*	15–30	–
10	**Other shrubs**			10–30	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	0–10	–
	rubber rabbitbrush	ERNAO	*Ericameria nauseosa ssp. consimilis var. oreophila*	3–10	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–8	–
	shortspine horsebrush	TESP2	*Tetradymia spinosa*	2–6	–

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, Indian ricegrass and basin wildrye. Secondary key species are shadscale and bottlebrush squirreltail. Heavy late winter/early spring grazing during periods of "bark slippage" can severely damage bud sagebrush and shadscale. Indian ricegrass, basin wildrye and squirreltail, 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 good 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 moderately low infiltration rates when vegetation cover is high. Hydrologic cover is high when the composition of shrubs and the dominant understory grasses, bottlebrush squirreltail, Indian 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. Droughty conditions 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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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	11/18/2016
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None, moderate sheet & rill erosion hazard.

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2. **Presence of water flow patterns:** None, except following extremely high intensity storms 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.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20-40%

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

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

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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.

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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 4-6 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.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface layer structure is moderate medium granular to moderate medium subangular blocky. The A horizon has a dry color of 5 - 7 and is 1 - 9 inches thick. The Soil Organic Matter (SOM) content is low (0.1 to 2.0%).

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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 large gaps between plants limit any reduction in raindrop impact and overland flow, providing limited time for infiltration to occur. Herbaceous vegetation on this site will retain some water from precipitation. Moderately low ground cover (30-40%) and flat slopes (0-3%) somewhat limit rainfall impact and overland flow.

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

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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: Deciduous shrubs

    Sub-dominant: Perennial grasses > perennial forbs = > other shrubs

Other:

Additional:

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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 200 lbs/acre, Representative Value 300 lbs/acre, High 400 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:** Cheatgrass and Medusahead invade sites that have lost perennial grass functional groups.

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