USDA Natural Resources
Conservation Service

Ecological site R024XY112OR
DRY SODIC FLOODPLAIN

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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.

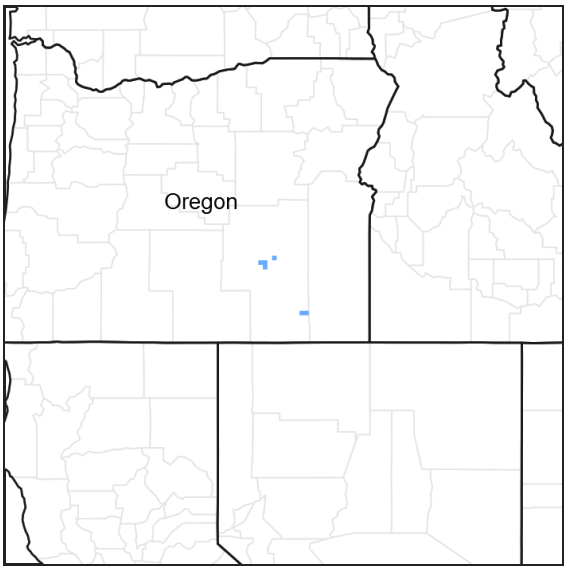


Figure 1. Mapped extent

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 alluvial flats. Soils are deep, poorly to somewhat poorly drained, and formed in alluvium derived from mixed rocks with a component of volcanic ash. The soil profile is characterized by an ochric epipdeon, a pH greater than 8.0 throughout, sodicity (SAR) greater than 30 and a water table between 90 to 150cm at some point during the spring. Soil textures are fine sandy loam or silt clay loam.
Important abiotic factors include crusting & baking of the surface layer upon drying, inhibiting water infiltration and seedling emergence. High salt concentrations reduce seed viability, germination and the available water capacity of these soils. Full consideration should be given to combining this ecological site concept with Sodic Flat 6-8" PZ (024XY011NV), Sodic Flat 8-10" (024XY008NV) and Sodic Flat (024XYXY001OR). These site do not compete on soil characteristics, abiotic factors or species composition.

Associated sites

R024XY003OR	**SODIC BOTTOM** Sodic Bottom (greater available subsurface moisture, higher production, different composition – SAVE4/LECI4-DISP association w/greater amount of LECI4)
R024XY004OR	**DRY FLOODPLAIN 6-10 PZ** Dry Floodplain (longer flooding duration and greater available surface and subsurface moisture, lower salts and carbonates, higher production, different composition– ARTRT/LECI4-LETR5 association)

R024XY015OR	**DESERT LOAM 6-10 PZ** Desert Loam 6-10 PZ (upland position, typically a shallow soil, lack of additional subsurface moisture, different composition – ATCO-PIDE4/ELEL5 association)
R024XY016OR	**LOAMY 8-10 PZ** Loamy 8-10 PZ (upland position, lower salts and carbonates, different composition–ARTRW8/ACTH7-PSSPS-ACHY association)
R024XY017OR	**SHALLOW LOAM 8-10 PZ** Shallow Loam 8-10 PZ (upland position, shallow soil, lower salts and carbonates, lack of additional subsurface moisture, different composition– ARTRW8/ACTH7-ACHY-PSSPS association)

Similar sites

R024XY625OR	**ALKALINE BASIN 8-10 PZ** Alkaline Basin 8-10 PZ (lower salts and carbonates, different composition– SAVE4-ARTRT/LECI4-DISP association w/higher amount of ARTRT and LECI4)
R024XY003OR	**SODIC BOTTOM** Sodic Bottom (greater available subsurface moisture, higher production, different composition – SAVE4/LECI4-DISP association w/greater amount of LECI4)

Table 1. Dominant plant species

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

Physiographic features

This site occurs on low elevation dry lake basins and valley bottoms. It typically occurs on lower flood plain outlets of ephemeral drainage systems where deposition processes form multiple channels. A seasonal water table is present. Slopes range from 0 to 3 percent. Elevation varies from 3800 to 4500 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Basin floor (3) Valley floor
Flooding duration	Brief (2 to 7 days) to very brief (4 to 48 hours)
Flooding frequency	Occasional to rare
Elevation	3,800–4,500 ft
Slope	0–3%
Water table depth	40–60 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 and snow during the months of December through April. An infrequent 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 110 to -20 degrees F. The frost-free period ranges from less than 90 to 120 days. The optimum growth period for plant growth is from the first of April through 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 deep to very deep, poorly to somewhat poorly drained, and formed in alluvium derived from mixed rocks with a component of volcanic ash. The soil profile is characterized by an ochric epipdeon, a pH greater than 8.0 throughout and a water table between 90 to 150cm at some point during the spring. Sodicity (SAR) is greater than 30 and soil surface will crust on drying. Soil textures are fine sandy loam or silt clay loam.
The upper portion of these soils is strongly salt and sodium affected due to capillary movement of dissolved salts upward from the ground water. Effective rooting depths are limited by a fluctuating water table. Ponding from run-on water is common. Potential for sheet and rill erosion is slight to moderate.

Table 4. Representative soil features

Parent material	(1) Alluvium–rhyolite
Surface texture	(1) Gravelly silt loam (2) Fine sandy loam
Family particle size	(1) Clayey
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Moderately slow to moderate
Soil depth	60 in
Available water capacity (0-40in)	6–8 in

Ecological dynamics

The potential native plant community is dominated by a sparse stand of greasewood. Minor amounts of saltgrass and basin widlrye occur under the greasewood and on the bare gravelly interspace playette areas. Small amounts of basin big sagebrush rabbitbrush and forbs are present. Shadscale, spiny hopsage, bottlebrush squirreltail, creeping wildrye and forbs are scattered. Vegetative composition of the community is approximately 30 percent grasses, 5 percent forbs and 65 percent shrubs. The approximate ground cover is 40 to 50 percent (basal and crown).

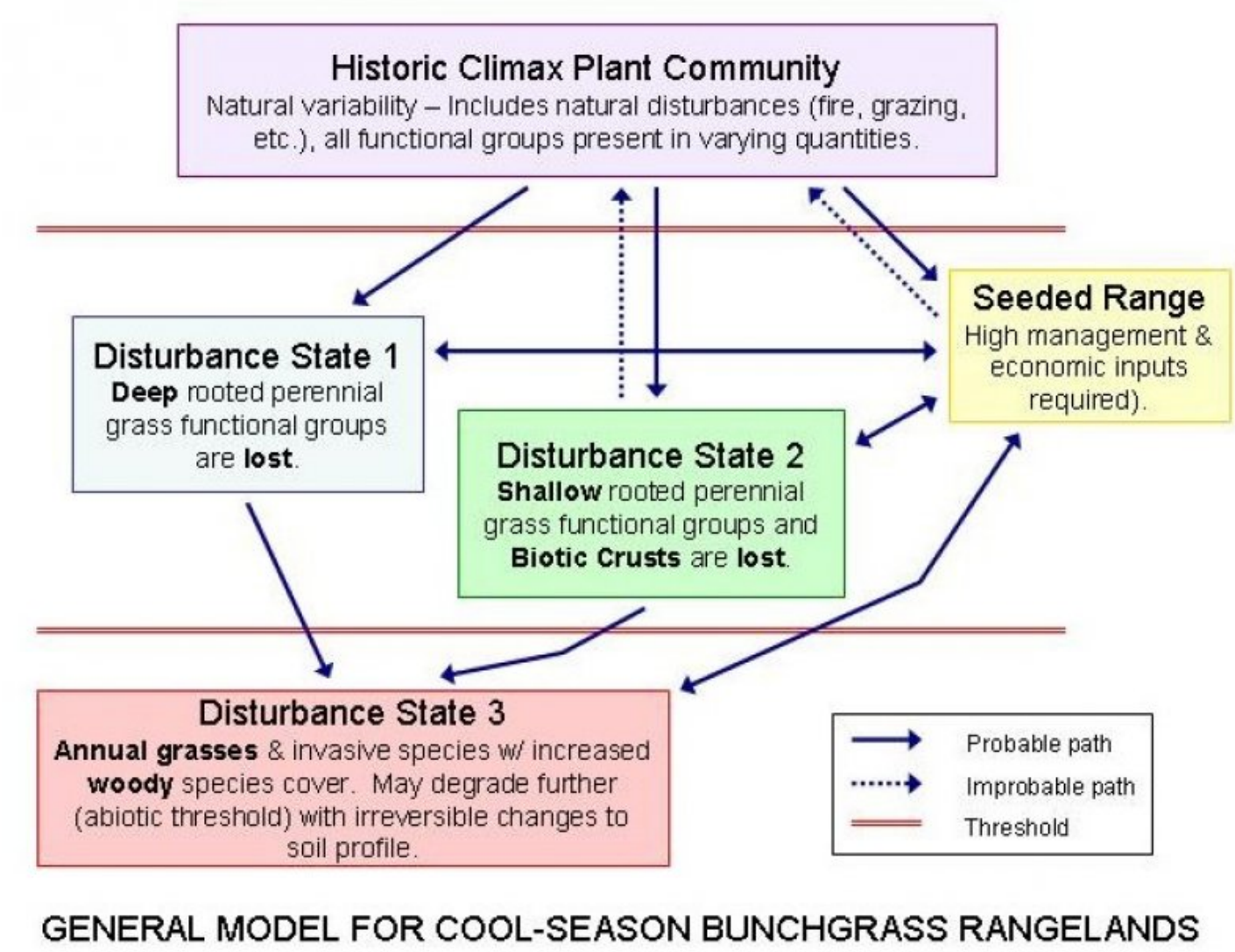
Range in Characteristics:
Production of greasewood and basin wildrye increases with an increase in the duration of surface and subsurface flows. Greasewood and saltgrass increase in moist sodic areas. Other salt tolerant shrubs increase with droughtiness and on soils higher in salts and carbonates. Basin wildrye and big sagebrush increase with decreasing sodic conditions, particularly in areas along primary and secondary overflow channels receiving additional flows.

Response to Disturbance - States
When the condition of the site deteriorates as a result of over grazing, basin wildrye decreases. Greasewood, big sagebrush, salt tolerant shrubs, saltgrass, and squirreltail shrubs increase. With further deterioration, basin big sagebrush, and squirreltail decrease. Salt tolerant shrubs continue to increase. Annuals invade sparingly and areas of bare ground become extensive. As bare soil increases, soil surface conditions become increasingly sodic, production decreases and site deterioration continues to occur in a cyclic pattern.

Hydrologic impacts can occur from a variety of on-site and off-site activities. Upstream water withdrawals in particular, affect the site along with channel straightening and realignment for intense agriculture use and transportation corridors. With these activities the site becomes drier, production decreases and major changes in plant composition occur.

States: SAVE4-ARTRT/DISP2-ELEL5-bare ground;
SAVE4-GRSP-ATCO/DISPS(minor),extensive
bare ground;
Altered land use changes

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 sparse stand of greasewood. Minor amounts of saltgrass and basin widlrye occur under the greasewood and on the bare gravelly interspace playette areas. Small amounts of basin big sagebrush rabbitbrush and forbs are present. Shadscale, spiny hopsage, bottlebrush squirreltail, creeping wildrye and forbs are scattered. Vegetative composition of the community is approximately 30 percent grasses, 5 percent forbs and 65 percent shrubs. 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	195	325
Grass/Grasslike	60	90	150
Forb	10	15	25
Total	**200**	**300**	**500**

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	**Co-dominant, deep rooted bunchgrass**			30–60	
	basin wildrye	LECI4	*Leymus cinereus*	30–60	–
3	**Co-dominant, perennial, shallow rooted grass**			30–60	
	saltgrass	DISP	*Distichlis spicata*	30–60	–
5	**Other perennial grasses**			9–15	
	squirreltail	ELEL5	*Elymus elymoides*	3–9	–
	beardless wildrye	LETR5	*Leymus triticoides*	3–9	–
	alkali sacaton	SPAI	*Sporobolus airoides*	3–9	–
Forb					
9	**Perennial forbs**			6–15	
	povertyweed	IVAX	*Iva axillaris*	2–6	–
	seepweed	SUAED	*Suaeda*	2–6	–
	short-rayed alkali aster	SYFR2	*Symphyotrichum frondosum*	2–6	–
Shrub/Vine					
11	**Dominant, deciduous, non-sprouting shrub**			120–150	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	120–150	–
12	**Sub-dominant, evergreen, non-sprouting shrub**			15–40	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	10–25	–
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	5–15	–
13	**Deciduous, sprouting shrub**			6–15	
	rabbitbrush	CHRYS9	*Chrysothamnus*	6–15	–
15	**Other shrubs**			10–30	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	5–10	–
	spiny hopsage	GRSP	*Grayia spinosa*	5–10	–
	bud sagebrush	PIDE4	*Picrothamnus desertorum*	2–10	–
	littleleaf horsebrush	TEGL	*Tetradymia glabrata*	2–8	–

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 basin wildrye. This site can be damaged if heavily grazed during periods of basin

wildrye flowering and seed formation when root reserves are low. Basin wildrye can provide excellent standing dried forage during winter dormancy. 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, waterfowl and associated predators. It provides cover and limited winter/spring forage for mule deer and antelope when the ecological condition is high.

Hydrological functions

The soils of this site are typically in or near the lowest topographic position accumulating limited off-site surface and subsurface flows. Because of the sites relatively sparse ground cover the hydrologic cover condition is only fair, even when the ecological condition is high. Hydrologic cover is at its highest when the basin wildrye component is greater than 70 percent of potential. The soils have medium infiltration rates under these conditions. When the hydrologic cover is low ephemeral overflow channels are subject to degradation. The soils are in hydrologic group C.

Other information

This site can be difficult to reseed when in poor soil condition. Salt and carbonate concentrations can reduce germination of basin wildrye. 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)	
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:**

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

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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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:**