USDA Natural Resources
Conservation Service

Ecological site R024XY004OR
DRY FLOODPLAIN 6-10 PZ

Accessed: 05/11/2025

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.

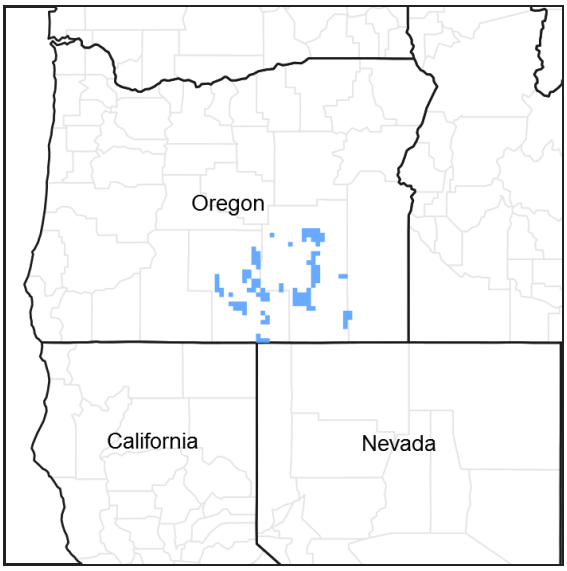


Figure 1. Mapped extent

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.

Associated sites

R024XY007OR	**DRY PONDED CLAY 6-10 PZ** Dry Ponded Clay 6-10 PZ (dry swale position, flooding infrequent, lower production, different composition-ARTRT/LETR5 association)
R024XY008OR	**CLAYEY PLAYETTE** Clayey Playette (thin surface over clay, droughty, different composition - ARTRW8/ELEL5-POSE association)
R024XY016OR	**LOAMY 8-10 PZ** Loamy 8-10 PZ (shallower soil depth, upland position, lower production, different composition-moderate rooted bunchgrasses dominant ACTH7-PSSPS-ACHY)
R024XY019OR	**SILT LOAM TERRACE 8-11 PZ** Silt Loam Terrace 8-11 PZ (well drained, lower production,different composition- ARTRW8/PSSPS-LECI4 association)
R024XY112OR	**DRY SODIC FLOODPLAIN** Dry Sodic Floodplain (shorter flooding duration, salt affected, lower production, different composition - SAVE4/DISP-LECI4 association)
R024XY123OR	**LOW CLAYEY TERRACE 8-10 PZ** Low Clayey Terrace 8-10 PZ (well drained, lower production, different composition - ARTRW8/PSSPS-POSE association)

R024XY126OR	**FLOODED CLAY SWALE** Flooded Clay Swale (lower swale and overflow channel position, longer flooding duration, somewhat poorly drained, lower production, different composition- ARCA13/PONE-LETR5 association)
R024XY608OR	**ARID BOTTOM 6-10 PZ** Arid Bottom 6-10 PZ (short duration surface and subsurface available water, lower production, different composition - LECI4 dominant with ACHY and GRSP prominent)
R024XY609OR	**DROUGHTY BOTTOM 6-10 PZ** Droughty Bottom 6-10 PZ (shorter duration surface and subsurface available water, lower production, different composition - LECI4 dominant with ELEL5 and ACHY present)

Similar sites

R024XY009OR	**DRY BASIN** Dry Basin (salt affected, lower production, different composition- ARTRT-SAVE4/LECI4 dominant)
R024XY609OR	**DROUGHTY BOTTOM 6-10 PZ** Droughty Bottom 6-10 PZ (shorter duration surface and subsurface available water, lower production, different composition –LEC4 dominant with ELEL5 and ACHY present)
R010XY005OR	**Loamy Bottom** Loamy Bottom (adjacent to perennial/near perennial streams, higher production)
R024XY608OR	**ARID BOTTOM 6-10 PZ** Arid Bottom 6-10 PZ (short duration surface and subsurface available water, lower production, different composition – LECI4 dominant with ACHY and GRSP prominent)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. tridentata*
Herbaceous	(1) *Leymus cinereus*

Physiographic features

This site occurs on the floodplains of drainage systems located in low elevation dry lake basins and valley bottoms. It typically occurs at the outlets of drainages where deposition processes form multiple channels. A seasonal water table is present. Slopes typically range from 0 to 3%. Elevations vary from 3,800 to 4,600 feet.

Table 2. Representative physiographic features

Landforms	(1) Lake terrace (2) Terrace (3) Alluvial fan
Flooding frequency	None
Ponding frequency	None
Elevation	1,158–1,402 m
Slope	0–3%
Water table depth	76–152 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 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 43-48 degrees F. Temperature extremes range from 110 to -20 degrees F. The frost-free period ranges from 80 to 100 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)	100 days
Freeze-free period (average)	0 days
Precipitation total (average)	254 mm

Influencing water features

Soil features

The soils of this site are typically medium textured, very deep and non-sodic. They are moderately well drained. The surface layer is typically a silt loam to a gravely sandy clay loam over a variable loam to sandy clay loam subsoil. Substratums are deep alluvial and lacustrine sediments. Permeability is moderately slow to moderate. The available water holding capacity (AWC) is about 3 to 8 inches for the profile. Limited seasonal surface and subsurface moisture augments the precipitation. The water erosion potential is moderate to low.

Table 4. Representative soil features

Parent material	(1) Lacustrine deposits–basalt (2) Alluvium–tuff
Surface texture	(1) Gravelly sandy clay loam (2) Silt loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderate
Soil depth	152 cm
Surface fragment cover <=3"	2–25%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	6.35–20.57 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–30 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–125
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	2–32%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The reference native plant community is strongly dominated by basin wildrye. Basin big sagebrush is common. Rabbitbrush, creeping wildrye and a variety of forbs are present. Greasewood is minor. 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).

Four states have been identified for this site: a reference state; a state with the presence of annuals; a state with a shrub/annual co-dominance; and a state with annual dominance. This site is dependent on extra moisture from adjacent upland sites.

Reference State: Community phase changes within the reference state are a function of fire and/or chronic drought. Fire has played a significant role in the community phase dynamics of this state; however, the time between fires is highly variable and dependent upon the location and productivity of the site. The introduction of invasive annual grasses and forbs transitions into state 2.

State 2: Compositionally similar to the reference state with the addition of a trace of annual weeds, primarily cheatgrass. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. The timing and/or intensity of grazing practices and/or chronic drought leads to a reduction in native grasses and an increase in sagebrush or greasewood dominance. Low-intensity fire combined with prescribed grazing can maintain the dynamics of this state. A lack of prescribed grazing or fire will lead to state 3.

State 3: This site is co-dominated by decadent sagebrush and cheatgrass. A significant reduction/loss of basin wildrye and other native grasses is apparent. Bare ground is abundant. Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. Frequent fires promote the maintenance of state 4 (cheatgrass dominated).

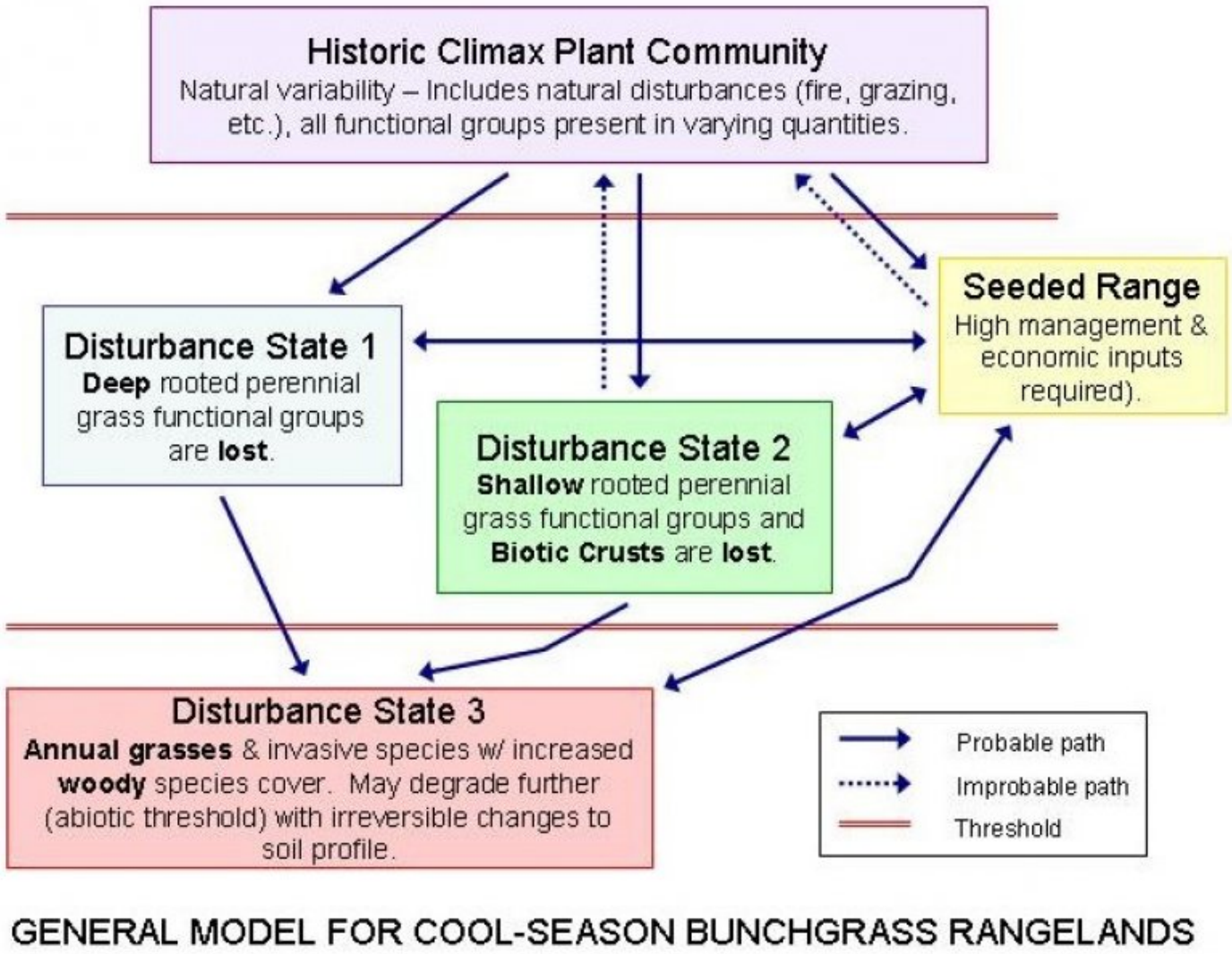
State 4: The site has crossed an abiotic threshold and ecological dynamics are determined by frequent fire, cheatgrass dominance, lack of shrubby plants, bare ground, and soil movement by wind and water erosion.

Range in Characteristics-
Production of basin wildrye increases with an increase in the duration of surface and subsurface flows. As the site becomes drier areas of beardless wildrye increases. Seasonally wet overflow channels have an increase in Nevada bluegrass and silver sagebrush. Slightly sodic areas have an increase in greasewood . With an increase in fire frequency basin big sagebrush decreases and basin wildrye increases.

Response to Disturbance-
When the condition of the site deteriorates as a result of improper grazing, basin wildrye will decrease while beardless wildrye, basin big sagebrush, gray rabbitbrush, and greasewood will increase. Annuals and biennials will invade. With further deterioration shrubs continue to increase, annuals continue to invade, and bare ground increases. Ephemeral channels actively degrade, deepening and widening. Flows are concentrated, overland flows decreases and water tables are lowered. Production decreases and site deterioration continues to occur in a cyclic pattern.

Extensive hydrologic alteration impacts can occur from a variety of on-site and off-site activities. These include upstream water withdrawals, channel straightening and realignment for intense agriculture use and transportation corridors, channel diversions and overflow channel blockage. Floodplain isolation typically occurs. The site becomes drier, production decreases and major changes in plant composition occur.

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 strongly dominated by basin wildrye. Basin big sagebrush is common. Rabbitbrush, creeping wildrye and a variety of forbs are present. Greasewood is minor. 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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1793	2690	4035
Shrub/Vine	336	504	757
Forb	112	168	252
Total	**2241**	**3362**	**5044**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial, deep-rooted bunchgrass**			2354–2690	
	basin wildrye	LECI4	*Leymus cinereus*	2354–2690	–
2	**Perennial, mod.-deep rooted, rhizomatous grass**			67–336	
	beardless wildrye	LETR5	*Leymus triticoides*	67–336	–
4	**Perennial, shallow rooted grass**			67–168	
5	**Other perennial grasses**			67–269	
	saltgrass	DISP	*Distichlis spicata*	0–168	–
	squirreltail	ELEL5	*Elymus elymoides*	17–67	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–67	–
	sedge	CAREX	*Carex*	17–67	–
	alkali sacaton	SPAI	*Sporobolus airoides*	0–34	–
Forb					
9	**Perennial forbs**			34–168	
	common yarrow	ACMI2	*Achillea millefolium*	6–34	–
	milkvetch	ASTRA	*Astragalus*	6–34	–
	hawksbeard	CREPI	*Crepis*	6–34	–
	lupine	LUPIN	*Lupinus*	6–34	–
	dock	RUMEX	*Rumex*	6–17	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	6–17	–
Shrub/Vine					
11	**Evergreen, non-sprouting shrub**			168–336	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	168–336	–
12	**Other shrubs**			67–269	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	67–168	–
	greasewood	SAVE4	*Sarcobatus vermiculatus*	67–168	–

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 . The site can be damaged if heavily grazed during periods of basin wildrye flowering and seed formation when root reserves are low. Basin wildrye provides 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 various predators. It provides excellent forage and cover when the ecological condition is high. The value of the site for dryland nesting waterfowl, including mallards and gadwalls, increases when it is near wet marshes, perennial streams, and open water areas.

Hydrological functions

Watershed-
This site is typically in or near the lowest topographic position accumulating off-site surface and subsurface flows. The soils have medium infiltration rates when vegetation cover is high. Hydrologic cover is high when basin wildrye is greater than 70 percent of potential. When the hydrologic cover is low ephemeral channels are subject to

degradation and incision. The soils are in hydrologic group B.

Other information

When the site is in a mid seral state basin wildrye vigor and seed production can rapidly be improved with prescribed burns as part of a prescribed grazing system. In a low altered seral state this site has good potential for reseeding.

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):** 5-15%

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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 slight to moderate.

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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 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.

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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 weak thin platy to moderate medium platy. The A horizon has a dry color of 4 - 7 and is 2 - 10 inches thick. The Soil Organic Matter (SOM) content is low to moderate (0.1 to 5.0%).

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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 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 (60-80%) and flat slopes (0-3%) significantly 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: Deep rooted bunchgrasses

    Sub-dominant: Other perennial grasses > = evergreen shrubs

    Other: Perennial forbs

    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 2000 lbs/acre, Representative Value 3000 lbs/acre, High 4500 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, Medusahead, Brassicas, Foxtail Barley, and other annuals invade sites that have lost deep rooted perennial grass functional groups.

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