USDA Natural Resources
Conservation Service

Ecological site R010XY005OR
Loamy Bottom

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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.

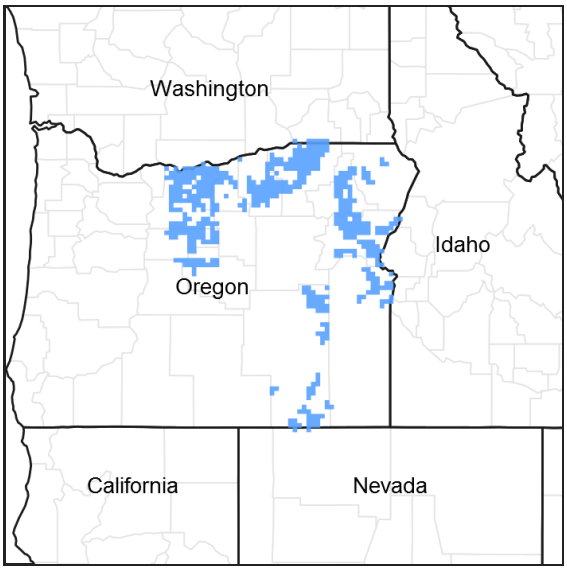


Figure 1. Mapped extent

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

R010XY003OR	**Wet Meadow** Wet Meadow (hydric soil, long duration seasonal water table at or near the surface, different composition - CAREX-DECE-JUNCU association)
R010XY004OR	**Meadow** Meadow (hydric soil, longer duration seasonal water table near the surface, different composition – DECE-CAREX-JUNCU association)
R010XY007OR	**Sodic Bottom** Sodic Bottom (salt affected, lower production, different composition - SAVE4/LECI4-DISP association)
R010XY010OR	**Coyote Willow Riparian** Willow Riparian Complex (narrowleaf {coyote}Willow) – (stream channel & bank position, early succession state, mesic to frigid near mesic temperature regime, different omposition – SAEX/CAREX complex)
R010XY012OR	**Booth-Yellow Willow Riparian** Willow Riparian Complex (Booth-Yellow Willow) - (stream channel & bank position, mesic near frigid temperature regime, different composition – SABO2-SALU2/CAREX complex)

Similar sites

R010XY009OR	**Sandy Bottom** Sandy Bottom (deep sandy soil, lower production, different composition – LECI4-HECO26-ELLAL association)
R010XY116OR	**Swale 12-16 PZ** Swale 12-16 PZ (swale position, deeper short duration water table, lower production, different composition – ARTRT/LECI4-PSSPS-FEID)
R010XY007OR	**Sodic Bottom** Sodic Bottom (salt affected, lower production, different composition - SAVE4/LECI4-DISP association)
R010XY113OR	**Swale 9-12 PZ** Swale 9-12 PZ (swale position, deeper short duration water table, lower production, different composition - ARTRT/LECI4-PSSPS-HECO26 association)
R010XY014OR	**Clayey Bottom** Clayey Bottom (deep clayey soil, lower production)
R010XY114OR	**Cool Swale 9-12 PZ** Cool Swale 9-12 PZ (swale position, deeper short duration water table, lower production, mesic near frigid to frigid temperature regime, different composition - ARTRT/LECI4-HECO26-FEID association)

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Leymus cinereus*

Physiographic features

This site occurs on deposition floodplain areas in river valley bottoms and along stream corridors. The site typically occurs on secondary and higher terrace floodplain positions. In original or high seral states the floodplain is well connected to a primary channel with a depth to the channel bottom of two feet or less on small streams and greater on larger streams and rivers. Overflow channels and cut-off meanders are present. Spring flooding of the site is occasional on lower terrace positions to rare on higher older terraces. During inundation, sediment deposition is prevalent. A long duration seasonal water table is present. Historically, the hydrology, soil formation and biotic processes were often influenced by the presence of beaver. Slopes typically range from 0 to 4 percent. Elevations vary from 500 to 4,700 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Terrace (3) Valley
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	500–4,700 ft
Slope	0–4%
Water table depth	20–60 in
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 9 to 16 inches, most of which occurs in the form of rain and snow during the months of November through March. Occasional to rare overland flows and sub-surface flows from adjacent perennial and ephemeral streams augment the precipitation. The soil temperature regime is mesic to frigid near

mesic with a mean air temperature of 50 degrees F. Temperature extremes range from 110 to -10 degrees F. The frost free period ranges from 90 to 150 days. The optimum growth period for plant growth is April through July.

Table 3. Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	0 days
Precipitation total (average)	16 in

Influencing water features

Soil features

The soils of this site are recent, very deep and well drained. They are medium textured. The surface layer is typically a silt loam about 24 inches thick over a variable silt loam to silty clay loam subsoil. Substratums are deep alluvial and/or lacustrine sediments. Permeability is moderate. The available water holding capacity (AWC) is about 6 to 10 inches for the profile. Seasonal surface and subsurface moisture augments the precipitation. Flooding is occasional to rare. The water erosion potential is moderate to low.

Table 4. Representative soil features

Parent material	(1) Volcanic ash–basalt (2) Alluvium–metavolcanics
Surface texture	(1) Silt loam (2) Loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderate to moderately slow
Soil depth	10–60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5.8–10 in
Calcium carbonate equivalent (0-40in)	0–8%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0–3%

Ecological dynamics

The potential native plant community is strongly dominated by basin wildrye. Basin big sagebrush is common. Rabbitbrush, willows and a variety of forbs are present. Vegetative composition of the community is approximately 90 percent grasses, 2 percent forbs and 8 percent shrubs. The approximate ground cover is 90 to 100 percent

(basal and crown).

Range in Characteristics:
Production is dependent on the extent and duration of surface and subsurface water flows. Basin wildrye is strongly dominant and responds well to available subsurface moisture at varying depths. Production is highest along perennial streams and overflow channels where subsurface flows are closer to the surface and of long duration. Production decreases on higher terraces and upper ends of watershed where subsurface flows are limited. Moderate rooted bunchgrasses, bluebunch wheatgrass and/or Idaho fescue increase in these more droughty areas. As a site with a high fire frequency, the amount of basin big sagebrush decreases with fire frequency. Willows increase where the water table is high, particularly on sites near streams and overflow channels. When the site is periodic flooded, sedimentation retention is enhanced by adequate overwinter standing residue. The erosive forces of high spring flows are reduced with good vegetation roughness and shallow water depths as flows spread across the floodplain.

Response to Disturbance - States:
When the condition of the site deteriorates as a result of overgrazing, basin wildrye decreases. Quackgrass invades along with sod bluegrasses in areas with higher water tables. In drier areas basin big sagebrush increases and annuals invade. With a loss of vegetation on adjacent streambanks channels incise, becoming deeper and wider as flows are concentrated. Floodplain connectivity and deposition functions are lost except in periods of rare high flood events. As the water table drops subsurface flows and storage of water for late season flows are reduced. The site becomes drier. Basin big sagebrush, rabbitbrush, annuals and other plants well adapted to a drier climatic regime increase or invade and production drops. Along narrow corridors western juniper will invade if a seed source from adjoining uplands is present. When basin big sagebrush is eliminated under deteriorated conditions scotch thistle, white top, mustards and other forbs invade. Deep rooted biennials such as scotch thistle are well adapted to a similar bottomland environment as basin wildrye and basin big sagebrush. Under higher seral conditions basin wildrye and basin big sagebrush out compete scotch thistle.

Land use changes effect hydrology and site vegetation. On lower elevation bottomlands channel straightening and deepening often occur to utilize the excellent floodplain soils for intense agriculture activities, transportation corridors and urban development. The hydrology effect is the conversion of a deposition reach with an active floodplain to a sediment transportation reach. With a narrowed steeper reach, stabilization practices are needed in combination with natural processes to promote the development of an entrenched stable narrow floodplain. The goal is to reduce the erosive force of high flood flows and contain flows within the channel. Upstream water storage and withdrawals for irrigation are usually part of these activities.

In upland areas where intense agriculture practices are not feasible or desired the restoration of natural flood plain functional processes is an excellent alternative. Natural progression of the system with good management includes the development of a vegetated stable entrenched floodplain followed by slow aggregation and channel narrowing. The aggregation sequence occurs naturally after initial down cutting and widening. With proper use willows recover and adequate fall herbaceous cover remains to protect alluvial bars and banks. Sediment is retained during spring run-off. In time and with adequate upstream sediment delivery the initial higher wide floodplain is reconnected. Basin wildrye production recovers. If absent reseeding of basin wildrye is an excellent stabile alternative.

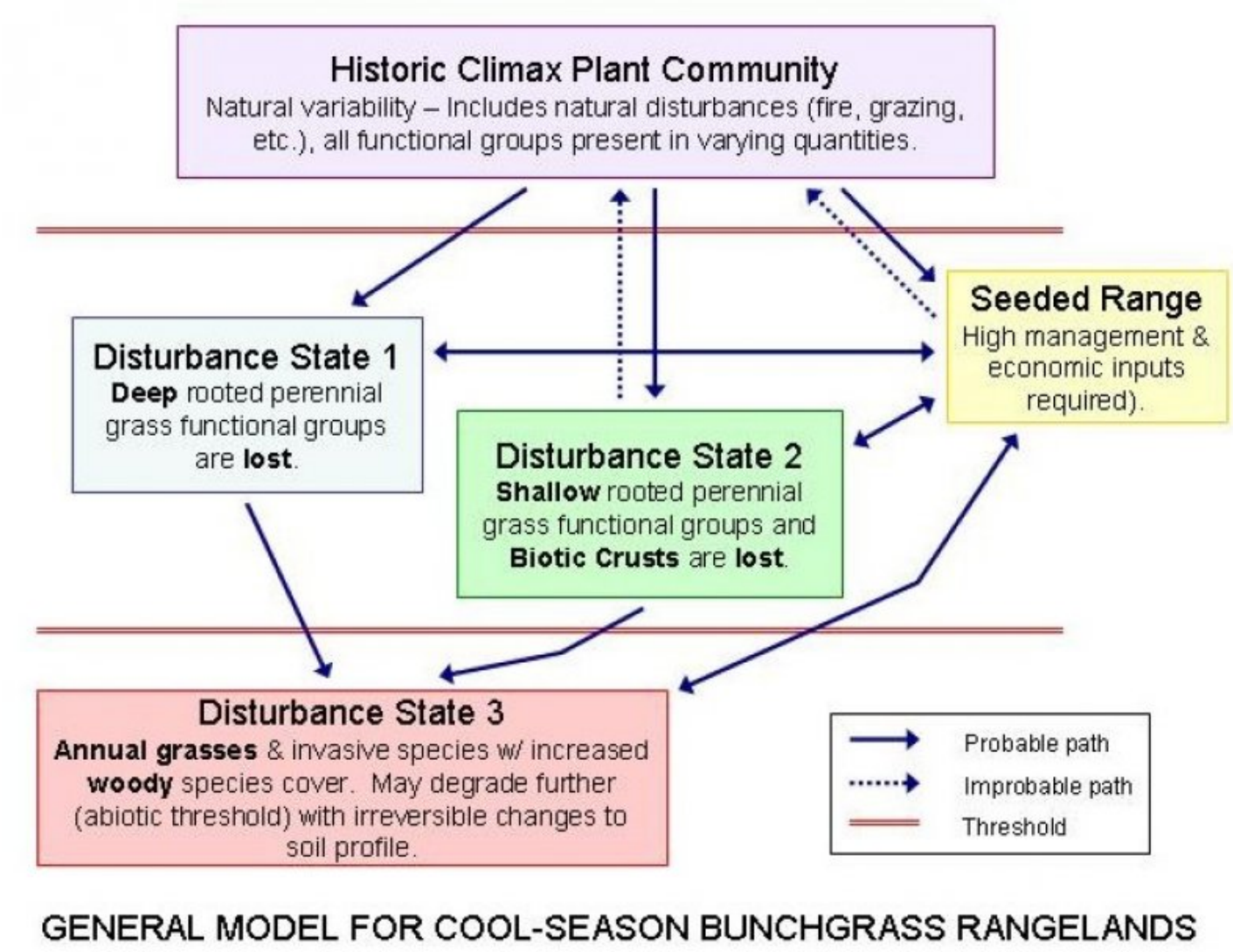
States:
ELRE4-POPR (higher water table, floodplain connected)

ARTRT/Annuals (water table lowered, floodplain disconnected)

Annuals-Deep rooted biennial & perennial forbs (water table lowered)

Altered land use changes

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Historic Climax Plant Community

Community 1.1
Reference Plant Community

The reference native plant community is strongly dominated by basin wildrye. Basin big sagebrush is common. Rabbitbrush, willows and a variety of forbs are present. Vegetative composition of the community is approximately 90 percent grasses, 2 percent forbs and 8 percent shrubs. The approximate ground cover is 90 to 100 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	3600	4500	6300
Shrub/Vine	320	400	560
Forb	80	100	140
Total	**4000**	**5000**	**7000**

Figure 3. Plant community growth curve (percent production by month). OR4701, B10 Meadows & Bottoms. B10 Meadows & Bottoms RPC Growth Curve.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	20	25	20	10	5	5	0	0

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, deep rooted bunchgrass**			4000–4750	
	basin wildrye	LECI4	*Leymus cinereus*	4000–4750	–
4	**Other perennial grasses**			100–500	
	bluegrass	POA	*Poa*	100–250	–
Forb					
6	**Perennial forbs**			50–100	
	cinquefoil	POTEN	*Potentilla*	10–30	–
	common yarrow	ACMI2	*Achillea millefolium*	5–20	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	0–20	–
	milkvetch	ASTRA	*Astragalus*	0–20	–
	hawksbeard	CREPI	*Crepis*	5–20	–
	Rocky Mountain iris	IRMI	*Iris missouriensis*	5–20	–
	lupine	LUPIN	*Lupinus*	5–20	–
Shrub/Vine					
10	**Dominant, evergreen, non-sprouting shrub**			100–400	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	100–400	–
12	**Occasional, deciduous, sprouting shrubs**			150–400	
	willow	SALIX	*Salix*	0–300	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–150	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–150	–
14	**Other, deciduous shrubs**			50–100	
	wax currant	RICE	*Ribes cereum*	0–50	–
	Woods' rose	ROWO	*Rosa woodsii*	0–50	–

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. A safe grazing height for basin wild rye during the growing season is above the growing points, 16 to 18 inches. Basin wildrye provides excellent standing dried forage during winter dormancy. Deferred grazing or rest is recommended at least once every three years. Adequate grass and grass-like fall residue (6 to 10 inches) should be left on adjacent alluvial bars and bank sites to prevent erosion and retain sediments during spring flow events.

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

The soils of this site are located on a depositional floodplain. When in good hydrologic condition the floodplain is well connected to a primary channel. During inundation, high flows spread at shallow depths. With good vegetative cover velocities are further reduced and sediment deposition occurs. With low vegetative cover velocities are accelerated, erosion increases and channels degrade, becoming wider and deeper. Water tables are lowered and soil moisture available for plant growth is reduced. With good vegetative cover soils have medium infiltration rates. Hydrologic cover is high under native the basin wild rye component is greater than 70 percent of potential. 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 altered or low seral state the site has good potential for reseeding. At an elevation of greater than 2700 feet broadcast seeding works well using basin wildrye as the base in the mix. Extra caution should be used when deep rooted introduced species such as tall wheatgrass are added to the mix as competition can inhibit the establishment and spread of basin wildrye.

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, Bruce Frannsen
Contact for lead author	State Rangeland Management Specialist for NRCS - Oregon.
Date	07/11/2007
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:** Occasional flooding with seasonal high water table

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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):** 0-10%

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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, slight wind erosion hazard

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine to moderately coarse - limited movement

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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):** Moderately to significantly resistant to erosion: aggregate stability = 3-6

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Granular to sub-angular blocky structure; Dry color value 4-5; 2-12" thickness; low to high OM (1-6%)

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (90-100%) and very gentle slopes (0-3%) effectively 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: Basin wildrye > other grasses

    Sub-dominant: willow > basin big sagebrush

Other: other shrubs > forbs

Additional:

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

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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):** Favorable: 7000, Normal: 5000, Unfavorable: 4000 lbs/acre/year at high RSI (HCPC)

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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:** Perennial forb and brush species will increase with deterioration of plant community. Kentucky bluegrass and quackgrass invade sites that have lost deep rooted native perennial grass functional groups.

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

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