

Ecological site R024XY009OR

DRY BASIN

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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.

Ecological site concept

ES only occur in MLRA 23

Associated sites

| | |
|--------------------|---|
| R010XY005OR | <p>Loamy Bottom</p> <p>Loamy Bottom (non-sodic soil, additional available subsurface moisture, adjacent to perennial/near perennial streams, greater production, different composition – LECI4 dominant, SAVE4 absent)</p> |
| R024XY003OR | <p>SODIC BOTTOM</p> <p>Sodic Bottom (higher sodic conditions, additional available subsurface moisture, different composition-SAVE4 dominant shrub, ARTRT minor)</p> |
| R024XY019OR | <p>SILT LOAM TERRACE 8-11 PZ</p> <p>Silt Loam Terrace 8-11 PZ (non-sodic soil, higher position, lower available subsurface moisture, lower production, different composition – PSSPS dominant grass, LECI4 prominent, SAVE4 absent)</p> |
| R024XY114OR | <p>SODIC LAKE TERRACE</p> <p>Sodic Lake Terrace (higher sodic conditions, lower position, additional available subsurface moisture, lower production, different composition-SAVE4/DISP-PUCCI association, LECI4 absent or minor, ARTRT absent)</p> |
| R024XY126OR | <p>FLOODED CLAY SWALE</p> <p>Flooded Clay Swale (clayey swale position, non-sodic soil, annual ephemeral flooding, different composition – ARCA13/PONE3 association, LECI4 minor, SAVE4 absent)</p> |

Similar sites

| | |
|--------------------|---|
| R024XY625OR | <p>ALKALINE BASIN 8-10 PZ</p> <p>Alkaline Basin 8-10 PZ (higher sodic conditions, silt loam over clayey subsoil, lower available sub-surface moisture, lower production, different composition – SAVE4 and LECI4 dominant, ARTRT and DISP prominent)</p> |
|--------------------|---|

| | |
|--------------------|---|
| R024XY632OR | DRY LAKE TERRACE 6-10 PZ Dry Lake Terrace 6-10 PZ (finer surface over clayey subsoil, lower available subsurface moisture, lower production, different composition – LETR5 strongly dominant, ARTRT prominent, SAVE4 minor, DISP absent) |
| R024XY004OR | DRY FLOODPLAIN 6-10 PZ Dry Floodplain (non-sodic soil, ephemeral flooding and increased available subsurface moisture, higher production, different composition –LECI4 dominant, SAVE4 absent) |
| R010XY005OR | Loamy Bottom Loamy Bottom (non-sodic soil, additional available subsurface moisture, adjacent to perennial/near perennial streams, greater production, different composition – LECI4 dominant, SAVE4 absent) |
| R024XY003OR | SODIC BOTTOM Sodic Bottom (higher sodic conditions, additional available subsurface moisture, different composition-SAVE4 dominant shrub, ARTRT minor) |
| R024XY645OR | SILTY ALKALINE BOTTOM 8-10 PZ Silty Alkaline Bottom 8-10 PZ (lower sodic conditions, deep ashy fine loamy often over diatomaceous earth, lower available subsurface moisture, lower production, different composition – LETR5 dominant, SAVE4. ARTRT and LECI4 prominent, DISP minor to absent) |
| R024XY112OR | DRY SODIC FLOODPLAIN Dry Sodic Floodplain (higher sodic conditions, gravelly loamy surface over stratified heavier subsoil, lower available sub-surface moisture, lower production, different composition – SAVE4 dominant, LECI4 and DISP prominent) |

Table 1. Dominant plant species

| | |
|------------|---|
| Tree | Not specified |
| Shrub | (1) <i>Artemisia tridentata subsp. tridentata</i> (2) <i>Sarcobatus vermiculatus</i> |
| Herbaceous | (1) <i>Leymus cinereus</i> (2) <i>Leymus triticoides</i> |

Physiographic features

This site typically occurs as extensive low terraces located on the floors of dry lake basins. It is formed in eolian, lacustrine, and/or alluvial deposits. Slopes typically range from 0 to 3 percent. Elevations vary from 4,000 to 4,500 feet.

Table 2. Representative physiographic features

| | |
|-------------------|---|
| Landforms | (1) Basin floor (2) Lakebed (3) Terrace |
| Ponding duration | Brief (2 to 7 days) to very brief (4 to 48 hours) |
| Ponding frequency | Frequent to occasional |
| Elevation | 1,220 – 1,370 m |
| Slope | 0 % |
| Water table depth | 80 – 180 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 short duration supply of ephemeral ponded 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 70 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 very deep, medium textured and moderately well to well drained. The surface layer is typically a fine sandy loam over a silt loam subsoil. There is usually an intermittent restrictive thin clay loam layer in the subsoil. Substratums are lacustrine and alluvial sediments. Soils are mildly sodic in the surface with pH's increasing below the thin subsoil clay layer. Ponding in the spring for a short duration is frequent. Permeability is moderate to moderately slow. The available water holding capacity (AWC) is about 6 to 8 inches for the profile. A seasonal water table is frequently present at 30 to greater than 60 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) Fine sandy loam (2) Loam (3) Silt loam |
| Family particle size | (1) Loamy |
| Drainage class | Moderately well drained to well drained |
| Permeability class | Moderate to moderately slow |
| Soil depth | 180 cm |
| Available water capacity (0-101.6cm) | 15.24 – 20.32 cm |

Ecological dynamics

The reference native plant community is dominated by basin wildrye. Basin big sagebrush, greasewood and beardless (creeping) wildrye are prominent. Rabbitbrush, needle and thread, saltgrass and a variety of forbs are present. Vegetative composition of the community is approximately 75 percent grasses, 5 percent forbs and 20 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 the 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 increases with available subsurface moisture, decreasing alkalinity and the absence of an intermittent subsoil clay layer. Basin wildrye, a deep rooted species, increases with longer seasonal availability of ground water. Greasewood and saltgrass increase with increasing alkalinity. Creeping wildrye and needle and thread increase on sandier surfaces. With an increase in fire frequency basin big sagebrush will decrease and basin wildrye and rabbitbrush will increase.

Response to Disturbance - States

When the condition of the site deteriorates as a result of over grazing, basin wildrye decreases. Greasewood, basin big sagebrush, beardless wheatgrass, squirreltail, and saltgrass increase. With further deterioration soil organic matter decreases and alkalinity increases. Basin big sagebrush and squirreltail decrease. Annuals invade and areas of bare ground increase. As bare soil increases, soil alkalinity continues to increase. Greasewood and saltgrass increase. Production decreases and site deterioration continues to occur in a

cyclic pattern.

States: ARTRT-SAVE4/LETR5-ELEL5-DISP-bare ground; SAVE4-ARTRT/DISP-Annuals-bare ground

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 | Dominant, deep rooted bunchgrass | | | 673-1009 | |
| | basin wildrye | LECI4 | <i>Leymus cinereus</i> | 673-1009 | – |
| 2 | Sub-dominant, moderate rooted rhizomatous grass | | | 168-336 | |
| | beardless wildrye | LETR5 | <i>Leymus triticoides</i> | 168-336 | – |
| 3 | Common, moderate rooted bunchgrass | | | 50-135 | |
| | needle and thread | HECO26 | <i>Hesperostipa comata</i> | 50-135 | – |
| 4 | Common, moderate rooted rhizomatous grass | | | 34-84 | |
| | saltgrass | DISP | <i>Distichlis spicata</i> | 34-84 | – |
| 5 | Other perennial grasses | | | 34-101 | |
| | squirreltail | ELEL5 | <i>Elymus elymoides</i> | 17-34 | – |
| | prairie Junegrass | KOMA | <i>Koeleria macrantha</i> | 17-34 | – |
| | Sandberg bluegrass | POSE | <i>Poa secunda</i> | 17-34 | – |
| Forb | | | | | |
| 9 | Perennial forbs | | | 34-84 | |
| | milkvetch | ASTRA | <i>Astragalus</i> | 6-17 | – |
| | lupine | LUPIN | <i>Lupinus</i> | 6-17 | – |
| | scarlet globemallow | SPCO | <i>Sphaeralcea coccinea</i> | 3-11 | – |
| | nodding thelypody | THFL3 | <i>Thelypodium flexuosum</i> | 0-11 | – |
| | hawksbeard | CREPI | <i>Crepis</i> | 6-11 | – |
| | fleabane | ERIGE2 | <i>Erigeron</i> | 6-11 | – |
| | agosseris | AGOSE | <i>Agoseris</i> | 3-11 | – |
| Shrub/Vine | | | | | |
| 10 | Dominant, evergreen, non-sprouting shrub | | | 168-252 | |
| | basin big sagebrush | ARTRT | <i>Artemisia tridentata ssp. tridentata</i> | 168-252 | – |
| 11 | Sub-dominant, deciduous, non-sprouting shrub | | | 84-168 | |
| | greasewood | SAVE4 | <i>Sarcobatus vermiculatus</i> | 84-168 | – |
| 15 | Other shrubs | | | 34-101 | |
| | yellow rabbitbrush | CHVI8 | <i>Chrysothamnus viscidiflorus</i> | 11-34 | – |
| | rubber rabbitbrush | ERNAO | <i>Ericameria nauseosa ssp. consimilis var. oreophila</i> | 11-34 | – |
| | spiny hopsage | GRSP | <i>Grayia spinosa</i> | 11-34 | – |
| | littleleaf horsebrush | TEGL | <i>Tetradymia glabrata</i> | 11-34 | – |

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 and various predators. It provides excellent cover and winter spring forage for mule deer and antelope. Cover is excellent when ecological condition is high. Good nesting cover is provided for short eared owls and when near water nesting cover is excellent for ducks such as mallards and gadwall.

Hydrological functions

The soils of this site are typically on terraces near the lowest topographic position of basins. It accumulates little off-site surface flows and when ponded has low runoff potential. The soils have medium infiltration rates when vegetation cover is high. Hydrologic cover is high when the basin wildrye component is greater than 70 percent of potential. The soils are in hydrologic group C.

Other information

In fair condition this site rapidly responds to good management. Fire is an excellent tool for the control of big sagebrush and the improvement in vigor and seed production of basin wildrye. In poor condition where salt concentrations have not accumulated to a high degree this site has good potential for reseeding. Salt concentrations can reduce germination of basin wildrye. Soils are corrosive to steel.

Contributors

- C. Tackman
- J Joye (OSU)
- J.Joye(OSU)
- NRCS/BLM Team - Vale (up-date)
- SCS/BLM Team - Burns (1985 & 1994)

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 | 11/16/2016 |
| Approved by | |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

Indicators

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

2. **Presence of water flow patterns:** None. Minimal evidence of past or current soil deposition or erosion.

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):** 5-15%. Larger bare patches maybe associated with ant mounds, rodent, and/or other natural disturbances.

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

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

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.

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 fine subangular blocky to moderate medium granular. The A horizon has a dry color of 6 and is 3 - 7 inches thick. The Soil Organic Matter (SOM) content is low to moderate (0.2 to 3.0%).

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%) 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: Deep rooted bunchgrasses > evergreen shrubs

Sub-dominant: Other perennial grasses = perennial forbs = other 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.
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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):**
Low 1000 lbs/acre, Representative Value 1500 lbs/acre, High 1800 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: Annual forbs and grasses like Cheatgrass, Medusahead, Mustard, and Foxtail Barley 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.**
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