USDA Natural Resources
Conservation Service

Ecological site R010XY008OR
Sodic Meadow

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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.
R010XY005OR	**Loamy Bottom** Loamy Bottoms.
R010XY007OR	**Sodic Bottom** Sodic bottom.

Similar sites

R010XY007OR	**Sodic Bottom** Sodic bottom (higher position, lower water table).

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Distichlis stricta* (2) *Puccinellia lemmonii*

Physiographic features

This site occurs on the low floodplains of perennial streams and rivers. Slopes range from 0 to 3%. Elevation varies from 500 to 4,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Flooding frequency	Occasional
Elevation	500–4,000 ft
Slope	0–3%
Water table depth	12–24 in
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 9 to 12 inches, most of which occurs in the form of snow during the months of November through March. A perennial supply of subsurface moisture augments the precipitation. Localized convection storms occasionally occur during the summer. The soil temperature regime is mesic with a mean annual air temperature of 51 degrees F. Temperature extremes range from 100 to -10 degrees F. The frost-free period ranges from 90 to 180 days. The optimum growth period is from April through August.

Table 3. Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	0 days
Precipitation total (average)	12 in

Influencing water features

Soil features

The soils of this site are recent, very deep and poorly drained. Typically the surface layer is a silt loam about 9 inches thick. The subsoil is a silt loam about 20 inches thick over a silt loam to sandy clay loam. The upper 30 inches of soil is moderate to very strongly alkaline (pH 8.2 to 9.9) with Sodium Absorption Ratios up to 71 in the upper 3 inches. Permeability is moderately slow. The available water holding capacity (AWC) is about 10 to 12 inches for the profile. Perennial to near perennial subsurface flows augment the available water. The high water table fluctuates between 12 and 24 inches from Febuary through may with occasional flooding. The potential for water erosion is high. See Appendix II for soils on which this site occurs.

Table 4. Representative soil features

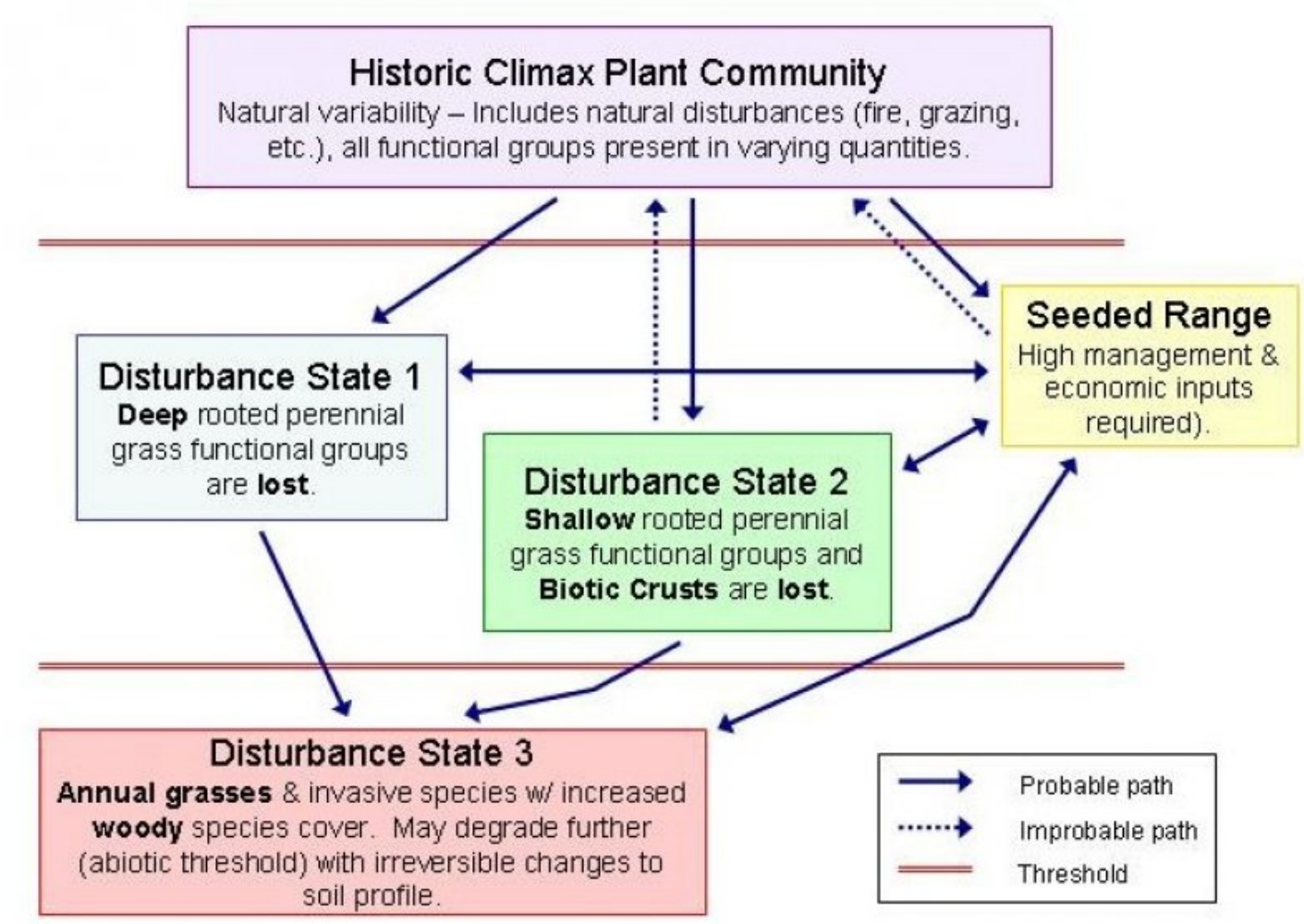
Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Permeability class	Moderately slow
Soil depth	0 in
Available water capacity (0-40in)	10–12 in
Sodium adsorption ratio (0-40in)	0–71

Ecological dynamics

Range in Characteristics-
Production of inland saltgrass and other salt and alkali tolerant grasses is dependent on depth to the water table, soil salinity and the quality and duration of subsurface water flows. Inland saltgrass increases and the quality of subsurface water flows decrease. Conversely, lemmon alkali-grass, other salt and alkali tolerant grasses and rushes increase along with production as soil salinity decreases where subsurface water flows are of higher quality and longer duration.

Response to Disturbance-
If the condition of the site deteriorates as a result of overgrazing, inland saltgrass increases while other more palatable grasses decrease. Rushes increase in wetter areas adn foxtail barley invades in areas of lower soil salinity. With further deterioration areas of bare ground increase and saline conditions are accentuated. Streambanks become unstable from loss of vegetation and channels may degrade, becoming deeper and wider in the process. Subsurface flows are affected. The water table drops and production decreases substantially.

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The potential native plant community is dominated by inland saltgrass and Lemmon alkali-grass. Alkali sacaton, rush and alkali cordgrass are common. Basin wildrye and black greasewood occur sporadically. Vegetative composition of the community is approximately 95 percent grasses and grasslike plants, 2 percent forbs and 3

percent shrubs. The approximate ground cover is 80-90 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	1140	1545	1950
Shrub/Vine	15	30	45
Forb	15	23	30
Total	**1170**	**1598**	**2025**

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	**Perennial, Deep-rooted, Dominant**			900–1350	
	saltgrass	DISP	*Distichlis spicata*	450–600	–
	Lemmon's alkaligrass	PULE	*Puccinellia lemmonii*	300–450	–
	alkali sacaton	SPAI	*Sporobolus airoides*	150–300	–
2	**Perennial, Deep-rooted, Sub-Dominant**			180–420	
	rush	JUNCU	*Juncus*	75–150	–
	alkali cordgrass	SPGR	*Spartina gracilis*	75–150	–
	basin wildrye	LECI4	*Leymus cinereus*	30–120	–
5	**Perennial, Other (PPGG), All**			30–120	
	squirreltail	ELEL5	*Elymus elymoides*	15–60	–
	bluegrass	POA	*Poa*	15–60	–
	clustered field sedge	CAPR5	*Carex praegracilis*	0–20	–
Forb					
9	**Perennial, Other (PPFF), ALL**			15–30	
	camas	CAMAS	*Camassia*	3–5	–
	aster	EUCEP2	*Eucephalus*	3–5	–
	iris	IRIS	*Iris*	3–5	–
	povertyweed	IVAX	*Iva axillaris*	3–5	–
	dock	RUMEX	*Rumex*	3–5	–
	ragwort	SENEC	*Senecio*	3–5	–
Shrub/Vine					
15	**Perennial, Other(SSSS), ALL**			15–45	
	rabbitbrush	CHRYS9	*Chrysothamnus*	8–23	–
	greasewood	SAVE4	*Sarcobatus vermiculatus*	8–23	–

Animal community

Wildlife-
This site offers food for mule deer, rodents and a variety of birds.

Livestock Grazing-
This site is suited to use by cattle, sheep and horses in the summer and fall. Limitations in the winter and spring are

saturated wet soils and unstable banks. Use should be postponed until the soils are firm enought to prevent trampling damage and soil compaction yet, while soil moisture is adequate to allow the completion of the plant growth cycle. Improvement and/or maintenance of bank protecting vegetation should be considered during all seasons, particularly in the fall and winter for spring high flow periods.

Hydrological functions

Watersed-
The soils are in hydrologic group D. The soils of this site have high runoff potential. This site is potentially subject to three high flow periods: low elevation snowmelt, high elevation snowmelt, and summer cloudburst flow.

Other information

The soils of this site have good water holding capacities providing late season water for plant growth and slow water release to streams. As a salinity affected site it is imperative to maintain vigorous plant growth. With a reduction of plant cover and organic matter, surface salts increase, soil particles become disperesed, water intake rates are reduced and production is affected. When incised channels are present rehabilitation wil improve production and restore good hydrologic characteristics. On altered sites the reintroduction of desirable plants may be needed to full restore the site potential.

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	Oregon NRCS State Rangeland Management Specialist
Date	08/07/2012
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

2. **Presence of water flow patterns:** Frequent flooding with seasonal high water table and ponding

3. **Number and height of erosional pedestals or terracettes:** None to some

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 resistant to erosion: aggregate stability = 3-4

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Deep, very deep, somewhat poorly drained with a silt loam surface about 9" thick - upper 30" of soil is moderately to very strongly alkaline (pH 8.2-9.9): Moderate OM (2-4%)

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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 (80-90%) 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: Inland saltgrass > Lemon alkaligrass > Alkali sacaton > rush >Alkali cordgrass > Basin wildrye > other grasses > Black greasewood > forbs

    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):** 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: 2500, Normal: 1500, Unfavorable: 1000 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:** Black greasewood will increase with deterioration of plant community. Inland saltgrass strongly increases on sites that have lost deep rooted perennial grass functional groups. Bare alkali areas will increase with loss of vegetation.

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

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