USDA Natural Resources
Conservation Service

Ecological site R011XY004OR
Saline Flat 8-11 PZ

Last updated: 9/23/2020
Accessed: 06/30/2024

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.

MLRA notes

Major Land Resource Area (MLRA): 011X–Snake River Plains

Major Land Resource Area (MLRA): 011X–Snake River Plains

Major Land Resource Area (MLRA): 011X – Snake River Plains
Precipitation or Climate Zone: 8-11” P.Z.

Ecological site concept

Site does not receive additional moisture
Soils are:
saline or saline sodic
Deep to very deep, with <35% coarse fragments (by volume), not skeletal
May be strongly or violently effervescent in the surface mineral 10”
Textures range from fine sandy loam to clay loam in the surface mineral 4”
Slope is <30%
Clay content is =<35% in surface mineral 4”
Site does not have an argillic horizon with >35% clay

Associated sites

R011XY005OR	**Swale 8-11 PZ** Swale 8-11 PZ
R011XY012OR	**Silty 8-11 PZ** Silty 8-11 PZ
R011XY013OR	**Clayey 8-11 PZ** Clayey 8-11 PZ
R011XY020OR	**South Slopes 8-11 PZ** South Slopes 8-11 PZ
R011XY032OR	**Silty North Slopes 8-11 PZ** Silty North Slopes 8-11 PZ

Similar sites

R011XY012OR	**Silty 8-11 PZ** Silty 8-11 PZ (subsurface flows absent, lower production, different composition - beardless wheatgrass dominant)

R011XY005OR	**Swale 8-11 PZ** Swale 8-11 PZ (non-saline, higher production)
R010XY005OR	**Loamy Bottom** Loamy Bottom (longer subsurface flow duration, non-saline, higher production)

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Leymus cinereus* (2) *Pseudoroegneria spicata ssp. inermis*

Physiographic features

This site occurs on low elevation saline flats in the Malheur, Owyhee and Snake River drainages. Slopes typically range from 0 to 8%. Elevations vary from 2,100 to 2,600 feet.

Table 2. Representative physiographic features

Landforms	(1) Flat (2) Terrace
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Occasional to frequent
Elevation	2,100–2,600 ft
Slope	0–8%
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 8 to 11 inches, most of which occurs in the form of rain during the months of December through April. An ephemeral supply of subsurface moisture augments the precipitation. The soil temperature regime is mesic with a mean air temperature of 53 degrees F. Temperature extremes range from 110 to -10 degrees F. The frost free period ranges from 150 to 190 days. The optimum growth period for plant growth is late March through June.

Table 3. Representative climatic features

Frost-free period (average)	190 days
Freeze-free period (average)	
Precipitation total (average)	11 in

Influencing water features

Soil features

The soils of this site are typically very deep and poorly drained. Typically the surface layer is a silt loam 4 to 8 inches thick. The subsoil is a clay loam to clay over 40 inches thick. Depth to lacustrine and alluvial sediments ranges from 40 to over 60 inches. The surface is saline affected. Salt lenses are present at varying depths from 10 to 35 inches. Where slick spots are present salt lenses are closer to the surface. Surface pH’s are typically 7.6. Indicative of saline conditions pH’s do not increase significantly with pH’s of 7.3 at 40 inches. Permeability is

moderately slow to slow. The available water holding capacity (AWC) is about 4 to 6 inches for the profile. The erosion potential is moderate to severe.

Table 4. Representative soil features

Parent material	(1) Lacustrine deposits–rhyolite
Surface texture	(1) Silt loam (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Poorly drained to very poorly drained
Permeability class	Slow to very slow
Soil depth	60 in
Available water capacity (0-40in)	4–6 in
Soil reaction (1:1 water) (0-40in)	7.6–7.3

Ecological dynamics

The potential native plant community is dominated by basin wildrye, beardless wheatgrass and alkali bluegrass. Bluebunch wheatgrass, bottlebrush squirreltail and Sandberg bluegrass are common. Pursh seepweed is the dominant forb. Vegetative composition of the community is approximately 90 percent grasses, 5 percent forbs and 5 percent shrubs. The approximate ground cover is 60 to 70 percent (basal and crown).

Range in Characteristics:
Basin wildrye increases in less saline areas where deep late subsurface moisture is available. Pursh seepweed increases in areas with higher surface salinity. Beardless wheatgrass increases on non saline silty surfaces and in areas where the extent and duration of subsurface moisture decreases. Alkali bluegrass increases in areas with additional surface moisture. Production increases with increasing available subsurface moisture and at the upper end of the precipitation zone.

Response to Disturbance:
Disturbances that impact the condition of this site include overgrazing by large ungulates, fire, droughts that impact the hydrologic functions of these low-lying sites, and outside anthropogenic impacts that affect site hydrology which will impact water availability for the reference plants. Any disturbance that continues long enough or is of great enough severity will reduce reference plant vigor and cover rapidly.
When the condition of the site deteriorates as a result of over grazing basin wildrye, beardless wheatgrass and alkali bluegrass rapidly decrease. As a site subject to saline conditions bare saline and slick spot areas increase. The salinity and surface sealing is accentuated as organic matter is severely depleted with the lack of replenishment from roots of basin wildrye and other deep rooted perennial bunchgrasses. Pursh seepweed and bare areas rapidly increases under these conditions. Bulbous bluegrass, pepperweed and Russian thistle invade areas that are less affected by salinity. As surface cover is lost the erosion potential increases, incised channels form and the floodplain is disconnected. The subsequent drainage from channel incision and lack of floodplain connectivity reduces the availability of surface and subsurface moisture. This further dries the site and in combination with increasing salinity, reduces production and increases bare areas in a cyclic pattern. The excessive erosion and lack of production is most pronounced in drainage areas.

States:
SUCA2-slick spot –bare ground (degraded areas where salinity is increasing); POBU/annual forbs-bare ground (degraded low salinity areas)

**The State-and-Transition Model represents only the Reference Plant Community phase due to limited time, data, and literature support at the time of development. Future work will be needed to describe dynamics, alterative states and land use models.

State and transition model

Ecosystem states

1. Reference plant community

State 1 submodel, plant communities

1.1. Reference plant community

State 1
Reference plant community

Community 1.1
Reference plant community

The reference plant community is dominated by basin wildrye, beardless wheatgrass and alkali bluegrass. Bluebunch wheatgrass, bottlebrush squirreltail and Sandberg bluegrass are common. Pursh seepweed is the dominant forb. Vegetative composition of the community is approximately 90 percent grasses, 5 percent forbs and 5 percent shrubs. The approximate ground cover is 60 to 70 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	630	900	1350
Shrub/Vine	35	50	75
Forb	35	50	75
Total	**700**	**1000**	**1500**

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, deep rooted perennial bunchgrass**			500–700	
	basin wildrye	LECI4	*Leymus cinereus*	500–700	–
2	**Sub-dominant perennial grasses**			200–350	
	beardless wheatgrass	PSSPI	*Pseudoroegneria spicata ssp. inermis*	150–250	–
3	**Other perennial grasses**			80–220	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	30–80	–
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	20–50	–
	squirreltail	ELEL5	*Elymus elymoides*	10–30	–
	foxtail wheatgrass	PSSA2	×*Pseudelymus saxicola*	10–30	–
	Sandberg bluegrass	POSE	*Poa secunda*	10–20	–
Forb					
4	**Dominant perennial forb**			20–50	
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	20–50	–
Shrub/Vine					
5	**Dominant shrub**			20–50	
	rabbitbrush	CHRYS9	*Chrysothamnus*	20–50	–

Animal community

Livestock Grazing:
This site is suitable for livestock grazing use in the late fall and spring 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, beardless wheatgrass and alkali bluegrass. Deferred grazing or rest is recommended at least once every three years.

Native Wildlife Associated with the Potential Climax Community:
This site is commonly used by pronghorn antelope, mule deer, rabbits, rodents, upland birds and various predators. It provides excellent winter cover for sage grouse and other upland bird species. Antelope and mule deer make excellent use of the site for winter and early spring forage.

Hydrological functions

The soils of this site are typically in an upland topographic position. They have moderately high runoff potential and medium infiltration rates when the hydrologic cover is high. Hydrologic cover is high when the basin wildrye, beardless wheatgrass and alkali bluegrass deep rooted bunchgrass component is greater than 70 percent of potential. The soils are in hydrologic group B.

Other information

The soils of this site have excellent water holding capacities, accumulating off-site subsurface flows and providing late season water for plant growth. When incised channels are present, rehabilitation will markedly improve production and restore good hydrologic characteristics. On altered sites the reintroduction of desirable deep rooted plants may be needed to fully restore the site productivity.

Contributors

T.Bloomer, E.Petersen And A..Bahn
A.BAHN/T.BLOOMER/E.PETERSON

Approval

Kendra Moseley, 9/23/2020

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	06/30/2024
Approved by	Kendra Moseley
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:**

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

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

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

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

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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

---

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

---

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

---

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:

---

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

---

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:**
