USDA Natural Resources
Conservation Service

Ecological site R053AE072MT
Saline Overflow (Sov) (Legacy) RRU 53AE

Last updated: 6/14/2023
Accessed: 05/19/2024

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.

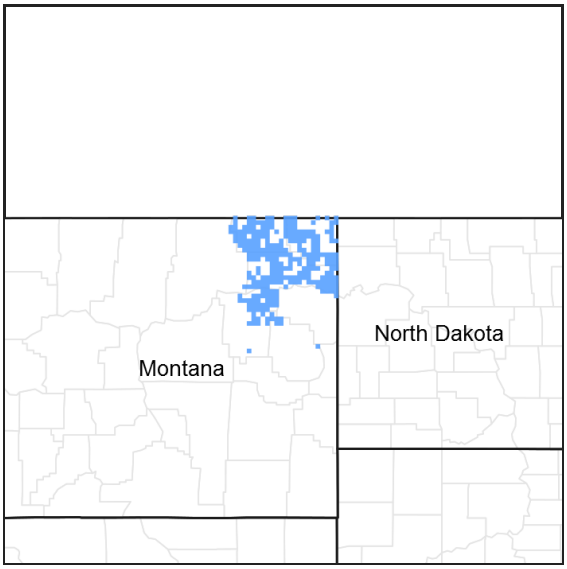


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on overflow lands (topography that receives run-in moisture from upland areas) where salt and/or alkali accumulations are apparent. The site is found in small bands and patches associated with alkali basins, and at isolated alkali seeps. It is also found at the base of badlands erosional sideslopes (such as along the floodplain of the Missouri River—just southeast of the Fred Robinson bridge).

The site has a seasonal water table that is within 42” of the surface. Slopes usually vary from 0 to 2 percent. Elevations normally vary from 2000 to 3500 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan (3) Swale
Flooding frequency	None to rare
Ponding frequency	None
Elevation	579–1,372 m
Slope	1–5%
Water table depth	107–183 cm
Aspect	Aspect is not a significant factor

Climatic features

A semi-arid, temperate climate characterizes the Glaciated Plains. The predominance of cool season species has evolved to take advantage of the precipitation regime that peaks in late spring-early summer (June). Seventy-five percent of the annual precipitation usually falls as steady, soaking, frontal system rains. Summer rains usually come with thunderstorms. Precipitation is the most important factor influencing production (Heitschmidt et al 2005). Severe drought occurs on average in two out of every ten years (Cooper, et al., 2001).

Table 3. Representative climatic features

Frost-free period (average)	129 days
Freeze-free period (average)	104 days
Precipitation total (average)	305 mm

Influencing water features

This site receives additional “run in” moisture from adjacent upland sites during snowmelt or precipitation events. It is not influenced by water from wetlands or perennial streams.

Soil features

The soils on this site are moderately to strongly saline, medium- to fine-textured, moderately deep to deep, but poorly developed. This site has a seasonal high water table that is deeper than 48 inches. Soils tend to be saline or sodic. Soluble salt accumulations are often apparent at or near the surface. Most herbaceous roots extend less than 20 inches below the soil surface. Surface textures are mainly silty clay, silt loam, silty clay loam, clay loam and loam. Permeability varies with surface texture and the amount of salt and/or sodium present. Soil ph varies from 7.9 – 9.0.

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Loam (3) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Permeability class	Slow
Soil depth	51–183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%

Available water capacity (0-101.6cm)	7.62–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	4–30 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	8–30
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This site developed through time under the influence of climate, herbivory, geological materials, fire, plants and animals. The plant communities associated with the site tend to have low species diversity.

The historic climax plant community (HCPC) is the basis for plant community interpretations. The HCPC has been determined by evaluating rangeland relic areas, and other areas protected from excessive disturbance.

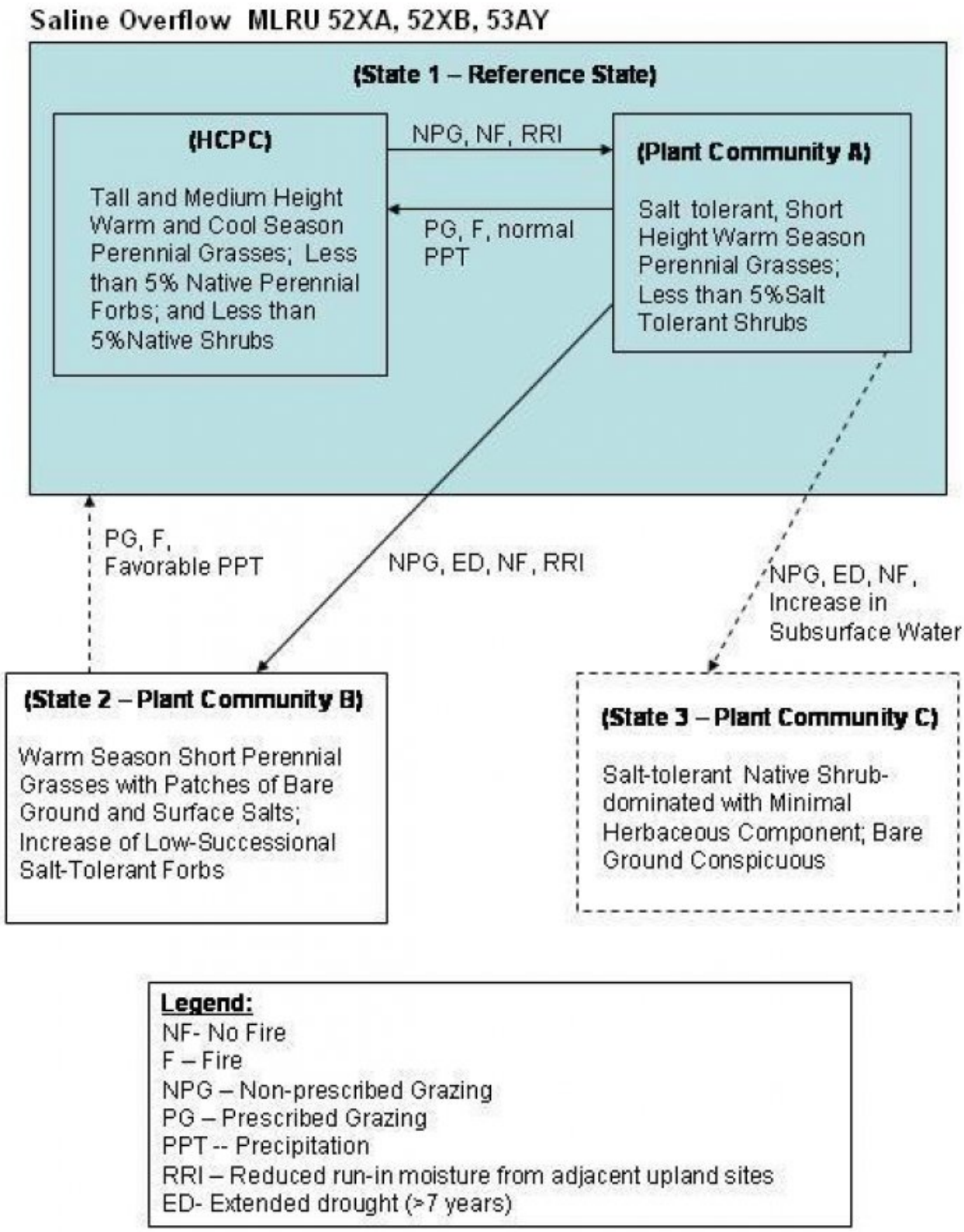
Departures from the HCPC generally result from management actions, drought, and/or a change in the natural fire regime, or from hydrological changes. Because the site is influenced by the receipt of “overflow” (run-in) moisture and by saline or sodic conditions, the plant communities in State #1 are not highly resistant to disturbance. The site is considered fragile in the sense that vegetative vigor and composition will rapidly decline with continued adverse impacts. Once regression to a lower state occurs, salts and/or sodium are more likely to accumulate on the soil surface. This makes it unlikely that the use of prescribed grazing and/or favorable precipitation will induce and facilitate succession to the HCPC (State #1). In comparison to the other ecological sites that encompass large acreages in the Glaciated Plains, this Saline Overflow 10-14” p.z. site occupies rather small portions of the landscape. The limited acreage may explain why very little research has been published on the site.

State and Transition Diagram

Successional pathways of the Saline Overflow 10-14” p.z. ecological site cannot be satisfactorily described using traditional theories of plant succession leading to a single climax community (Stringham et al. 2003). A threshold, lying somewhere between the mid and early seral stages is crossed as the HCPC regresses toward the early seral stage. The plant communities occurring below this threshold are in a steady state. Succession back to the HCPC does not occur within a reasonable length of time, and/or without a large input of energy.

Two common plant communities within the reference state (State #1) with associated successional pathways, and transitions from State #1 to States #2 and #3 are illustrated below for this ecological site. Ecological processes are discussed further in the plant community descriptions following the diagram.

State and transition model


Saline Overflow MLRU 52XA, 52XB, 53AY
(State 1 – Reference State)
(HCPC)
Tall and Medium Height Warm and Cool Season Perennial Grasses; Less than 5% Native Perennial Forbs; and Less than 5%Native Shrubs
NPG, NF, RRI
PG, F, normal PPT
(Plant Community A)
Salt tolerant, Short Height Warm Season Perennial Grasses; Less than 5%Salt Tolerant Shrubs
PG, F, Favorable PPT
NPG, ED, NF, RRI
NPG, ED, NF, Increase in Subsurface Water
(State 2 – Plant Community B)
Warm Season Short Perennial Grasses with Patches of Bare Ground and Surface Salts; Increase of Low-Successional Salt-Tolerant Forbs
(State 3 – Plant Community C)
Salt-tolerant Native Shrub-dominated with Minimal Herbaceous Component; Bare Ground Conspicuous
Legend:
NF- No Fire
F – Fire
NPG – Non-prescribed Grazing
PG – Prescribed Grazing
PPT -- Precipitation
RRI – Reduced run-in moisture from adjacent upland sites
ED- Extended drought (>7 years)

State 1

State #1: Historic Climax Plant Community

Community 1.1
State #1: Historic Climax Plant Community

The HCPC is comprised of a mixture of cool and warm season grasses, forbs and shrubs. About 90% of the annual production is from grasses and sedges, most of which is produced during the cool season. Forbs and shrubs each contribute about 5% to total annual production. Total vegetative production at HCPC averages 2500 lbs/ac in normal years, 3000 lbs/ac in favorable years, and 1750 lbs/ac in “unfavorable” years. The Saline Overflow 10-14” p.z. ecological site is not characterized by a precise assemblage of species that remains constant from place to place or from year to year. Variability is apparent in productivity and occurrence of individual species. Western/thickspike wheatgrasses, alkali sacaton, alkali cordgrass, Nuttall alkaligrass, inland saltgrass and sedges are the most common grasses and grasslike plants in this community. They account for about 90% percent of the total production. Prairie aster and slimleaf goosefoot are common forbs. Forbs usually make up about 5% of the total annual production. Greasewood and Nuttall saltbush are the most common shrubs. They should be present in the HCPC. However, all shrubs only account for about 5% of the total annual production. Plant basal cover is normally around 35%, while litter provides 65% cover. Therefore, plant cover and litter are adequate to efficiently utilize infiltration, minimize runoff and erosion, and provide good hydrologic conditions. Runoff and soil erosion normally increase as the HCPC regresses to earlier seral states. The HCPC is believed to have evolved with periodic fires occurring at intervals of 5-7 years. Fires temporarily reduce litter, thus allowing more runoff. However, fire favors the succession of grasses and forbs at the expense of half-shrubs and shrubs. The HCPC regresses to lower seral stages when subjected to grazing management strategies that do not allow adequate recovery periods between grazing events, drought, the disruption of the normal fire sequence, and or a change in the availability of run-in water. The above disturbances favor the replacement of alkali sacaton, alkali cordgrass, and western/thickspike wheatgrasses with blue grama, sandberg bluegrass, curlycup gumweed, western yarrow, and foxtail barley.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1715	2522	3026
Forb	95	140	168
Shrub/Vine	95	140	168
Tree	1	1	1
Total	**1906**	**2803**	**3363**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0-1%
Biological crusts	0-1%
Litter	60-65%
Surface fragments >0.25" and <=3"	0-1%
Surface fragments >3"	0-1%
Bedrock	0-1%
Water	0%
Bare ground	0-1%

Table 7. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	1-5%
Grass/grasslike basal cover	25-30%
Forb basal cover	1-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 8. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	0-5%	25-35%	25-35%
>0.15 <= 0.3	–	20-30%	25-35%	35-45%
>0.3 <= 0.6	–	45-55%	35-45%	15-25%
>0.6 <= 1.4	–	20-30%	5-10%	15-25%
>1.4 <= 4	–	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Community 1.2
Plant Community A (State #1)

*Successional Pathway to Plant Community A Non-prescribed grazing and reduced run-in moisture from adjacent upland sites will cause regression from HCPC to Community A. Plant Community A (State #1): In contrast to the HCPC, total vegetation production may be 1000 lbs/ac lower in Community A. Selective grazing and increasing salinity adversely affect the competitiveness of alkali sacaton, alkali cordgrass, wheatgrasses and Nuttall's alkaligrass. Thus, these taller warm and cool season grasses are replaced by inland saltgrass and other low-growing grasses and grasslike palnts. The lower-stature plants tend to produce less forage than the mid- grasses that they replaced, use less ground water for total vegetative production, and produce less litter to protect the surface of the soil. As the ground water rises to the surface during the summer and evaporates, salt crystals form on the surface. Thus the amount of bare ground increases, in comparison to the HCPC. Greasewood tends to increase and the total shrub production in Community A is >5%. Shrub composition also shifts, favoring chenopod species. Plant Community A is considered the pre-threshold community. It can be recognized because annual production is reduced by about 40% from the HCPC. The percentage of short, warm season perennial grasses and forbs has increased at the expense of the taller warm and cool season perennial grasses. Litter amount is moderately reduced from site potential and amount of bare ground is moderately to much higher than expected. This community remains resilient and succession can move the plant community toward the HCPC. However, Plant Community A is only moderately resistant to disturbance. Without proper management it can readily regress to a lower state. *Successional Pathway from Community A to HCPC: The implementation of prescribed grazing, or periodic fire will move Plant Community A to the HCPC. Under non-drought conditions, this succession can occur within a few years. *Transition from State #1 to States #2 & #3: The reference state (State #1) will regress to States #2 and #3 under non-prescribed grazing, prolonged drought, and an extended period of no fire. The rate of

regression varies with the kind, intensity, frequency and duration of the disturbances. The transition may end up as a warm season short grass dominated community (State #2) or as a salt-tolerant shrub-dominated community (State #3). The shrub dominated community is depicted within the dashed lines (in the state and transition diagram) because its ecological characteristics are not presently fully understood.

State 2
Plant Community B (State #2) - Shortgrass-dominated

Community 2.1
Plant Community B (State #2) - Shortgrass-dominated

Plant Community B (State #2) – Shortgrass-dominated: Inland saltgrass, sand dropseed, sandberg bluegrass, bottlebrush squirreltail, foxtail barley, and sedges dominate this community. In contrast to the HCPC, the mid and tall warm season perennial grasses (alkali sacaton, western/thickspike wheatgrasses, alkali cordgrass, etc.) are either significantly reduced or absent. Poverty weed, knotweed, seepweed, curlycup gumweed and other forbs account for about 10% of the annual production. Amount of bare ground is moderately higher than expected. Surface salts are quite extensive. Most of the study sites examined on the Saline Overflow 10-14” p.z site during the range inventory of the Fort Peck and Fort Belknap Reservations (2001-2004) had similarity indices of 0-25%. A lack of species diversity also characterizes the data. In most plots, fewer than 8-9 species were recorded. Shrubs were recorded at 3 of the 15 sampling locations. In these inventories, which took place during a prolonged drought, the annual production varied from 53 to 1043 lbs/ac, and averaged 600 lbs/ac. The amount of bare ground was much higher than expected for the site. This plant community is resistant to change. The short warm season perennial grasses are well-adapted to the salinity. It is believed that the seeds of native HCPC species are scarce or absent in the seedbank. Succession is not expected to occur within a reasonable length of time.

State 3
Plant Community C (State #3) - Shrub-dominated

Community 3.1
Plant Community C (State #3) - Shrub-dominated

Plant Community C (State #3) – Shrub-dominated: Greasewood is the dominant plant is this community, which is less than fully understood at this time (dash lines mark its boundary in the S&T diagram). Other shrubs include Nuttall saltbush, rabbitbrush, fringed sagewort and silver sagebrush. Inland saltgrass, foxtail barley, Nuttall alkali grass, and other herbaceous species usually produce less than 50% of the total annual production. Poverty weed, curlycup gumweed, arrowgrass, knotweed and other weedy forbs are usually present in small amounts. Total annual production is usually less than 500 lbs/ac. The amount of bare ground is much higher than expected for the site. In addition, litter cover averages about 30%, a significant reduction relative to site potential. This plant community is resistant to change. Greasewood is well adapted to the salinity. This community may not be resilient. Succession is not expected to occur within a reasonable length of time. *Transition from States #2 and #3 to the Reference state (State #1) The implementation of prescribed grazing is not expected to move these plant communities toward a higher successional state. In comparison to the HCPC, annual production is about 25% of the site potential. It is theorized that the salinity of the site increased during the regression from the “Reference state” to early seral states. Thus, the lower-successional plants occurring on the site may be better-adapted than some of the original climax species. Because of the soil limitations, mechanical treatments and range seeding are not normally recommended.

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Native perennial grasses**			280–560	
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	140–280	–
	western wheatgrass	PASM	*Pascopyrum smithii*	140–280	–
2	**Native perennial grasses and grasslikes**			140–2522	
	alkali sacaton	SPAI	*Sporobolus airoides*	560–1121	–
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	560–1121	–
	alkali cordgrass	SPGR	*Spartina gracilis*	280–560	–
	Grass, perennial	2GP	*Grass, perennial*	140–280	–
	sedge	CAREX	*Carex*	140–280	–
	slimstem reedgrass	CASTS5	*Calamagrostis stricta ssp. stricta*	140–280	–
	saltgrass	DISP	*Distichlis spicata*	140–280	–
	spikerush	ELEOC	*Eleocharis*	140–280	–
	bulrush	SCIRP	*Scirpus*	140–280	–
Forb					
3	**Native perennial forbs**			1–140	
	Forb, perennial	2FP	*Forb, perennial*	1–28	–
	common yarrow	ACMI2	*Achillea millefolium*	1–28	–
	pussytoes	ANTEN	*Antennaria*	1–28	–
	slimleaf goosefoot	CHPA5	*Chenopodium pallescens*	1–28	–
	povertyweed	IVAX	*Iva axillaris*	1–28	–
	knotweed	POLYG4	*Polygonum*	1–28	–
	herbaceous seepweed	SUMA	*Suaeda maritima*	1–28	–
	white prairie aster	SYFA	*Symphyotrichum falcatum*	1–28	–
	sea clover	TRSQ	*Trifolium squamosum*	1–28	–
Shrub/Vine					
4	**Native shrubs and half-shrubs**			28–140	
	Shrub, broadleaf	2SB	*Shrub, broadleaf*	28–56	–
	Nuttall's saltbush	ATNU2	*Atriplex nuttallii*	28–56	–
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	28–56	–
	greasewood	SAVE4	*Sarcobatus vermiculatus*	28–56	–

Animal community

Livestock Management

The Saline Overflow 10-14” p.z. ecological site is suited for livestock grazing. The HCPC (or reference state) is highly productive and has a high carrying capacity. Livestock are often attracted to the site because of the level terrain and the high potential for livestock water developments within the adjacent areas. Species composition and soils are susceptible to heavy stocking and season long grazing. Therefore, prescribed grazing is needed to maintain the high seral state and/or to prevent further deterioration. This site may also be attractive to livestock and wildlife because of the increase salt accumulations in the plants.

It is important to understand site limitations. A site in an early seral state is not likely to successionally respond solely to the implementation of a prescribed grazing management system. Furthermore, seeding and/or mechanical treatment are usually not recommended on the Saline Overflow 10-14” p.z. ecological site. Landowners may have to learn to live with a site that is in an early seral state.

Wildlife Interpretations

The HCPC associated with the Saline Overflow 10-14” p.z. ecological site provides diverse and valuable wildlife habitat. This site often occurs as a minor component of a large, dry landscape. The uniqueness of the site makes it extremely critical habit for many species of wildlife.

This ecological site becomes less valuable for wildlife when plant diversity is loss. For example, the disappearance of either the tall warm season grasses or cool season grasses reduces the amount of cover available for wildlife.

Plant Preferences by Animal Kind

Refer to NRCS Field Office Technical Guide, Section IIE, General Information, for tables displaying plant preferences by livestock and wildlife.

Hydrological functions

Soils characterizing this ecological site have a moderately high runoff potential, with hydrologic runoff curves of 74 to 86. These soils fall into Hydrologic Group C. Field investigations are needed to adjust the runoff curves when plant communities deteriorate from the HCPC. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff.

Recreational uses

This site is aesthetically appealing for its natural beauty. Recreational potential is somewhat limited by the relatively small areas.

Wood products

This site has no significant value for wood products.

Other information

The Saline Overflow 10-14” p.z. ecological site is not highly resistant to disturbances in State #1. Species diversity is adversely affected by season long continuous grazing and by heavy stocking. Mid and tall cool season perennial grasses are replaced by short warm season perennial grasses, or by a shrub-dominated community in more extreme cases. The number of structural/ functional groups is reduced with retrogression, which adversely affects the amount of solar energy that is captured and converted to carbohydrates for plant growth. A reduction in total vegetative growth results in less potential vegetation that can be transformed into litter. Less soil water use by plants combined with reduced ground cover may cause salinity or alkalinity to increase.

Inventory data references

SCS-Range-417

ECS-1
Modified Double Sampling 34 2001-2004 MT Blaine, Phillips, Valley, Roosevelt, Daniels, Sheridan

USDA-SCS-MT 1981 Technical Range Site Description

Other references

Stringham, Tamzen K., William C. Krueger, and Patrick L. Shaver. (2003). State and transition modeling: an ecological process approach. J. Range Manage. 56:2(106-113).

Approval

Kirt Walstad, 6/14/2023

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)	Dr. John Lacey, Maxine Rasmussen, Jon Siddoway & Rick Bandy
Contact for lead author	
Date	03/30/2005
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills should not be present in HCPC or in plant community A.

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2. **Presence of water flow patterns:** Water flow patterns should not be observable in HCPC or in plant community A.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals or terracettes would essentially be nonexistent in HCPC and in plant community A.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground would essentially be nonexistent in HCPC. Bare ground should be less than 2” in diameter. If in plant community A, less than 5% of the soil surface can be exposed.

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5. **Number of gullies and erosion associated with gullies:** Gullies are not associated with either of the State 1 reference plant communities.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind scoured, blowouts and/or depositional areas are not associated with either of the State 1 reference plant communities.

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement is not expected with HCPC or plant community A.

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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):** Stability class anticipated to be 5 or 6 under plant canopy.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface layer is 0-7" deep. The color ranges from light brownish gray to gray. Surface textures include loam, silt loam, clay loam, silty clay loam or silty clay. Soil organic matter ranges from 2-4% with a high of 5% and a low of 1%.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** In HCPC, 90-95% plant canopy and 80-85% basal cover with small gaps between plants should reduce raindrop impact and slow overland flow, providing increased time for infiltration to occur. Healthy, deep rooted native grasses enhance infiltration and reduce runoff. Infiltration rate is moderate to very slow. If in plant community A, 90-95% plant canopy and 70-80% basal cover with small gaps between plants will still reduce raindrop impact and decrease 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):** No compaction layer or soil surface crusting should be evident in either of the State 1 plant communities.

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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: HCPC: Tall, warm season bunch grasses = mid-stature, cool season bunch grasses> mid-stature cool season rhizomatous grasses > sedges and rushes > short, warm season rhizomatous grasses >forbs =shrubs. Plant community A: Short, warm season rhizomatous grasses > mid-stature, cool season rhizomatous grasses> sedges and rushes > mid-stature cool season bunch grasses > shrubs > 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):** Plant mortality and decadence very low in HCPC and Plant community A. In periods of drought, shrubs would exhibit decadence in the state 1 reference communities.

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14. **Average percent litter cover (%) and depth (in):** Litter cover is in contact with soil surface. Litter decreases in Plant community A to 40-50% and depth is reduced to 0.5 inch.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1700 - 3000 #/acre from Plant community A to HCPC in the State 1 reference community.

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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:** Foxtail barley, inland saltgrass, knotweeds, poverty weed, curly cup gumweed, and greasewood.

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17. **Perennial plant reproductive capability:** All species are capable of reproducing in HCPC. In Plant community A, plant seedlings will be weighed in favor of marginal and undesirable species. Replacement of desirable species will be very few.
