USDA Natural Resources Conservation Service

Ecological site R072XY104KS
Saline Lowland

Accessed: 04/23/2024

General information

Approved. An approved ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model, enough information to identify the ecological site, and full documentation for all ecosystem states contained in the state and transition model.

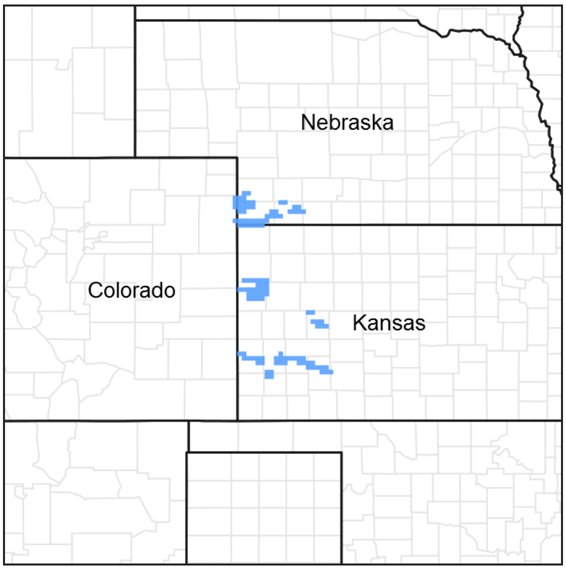


Figure 1. Mapped extent

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.

MLRA notes

Major Land Resource Area (MLRA): 072X–Central High Tableland

Major Land Resource Area (MLRA) 72--Central High Tableland. This area is in Kansas (54 percent), Nebraska (25 percent), and Colorado (21 percent). A very small part of the area is in Wyoming. The area makes up about 34,550 square miles (89,535 square kilometers). It includes the towns of Garden City, Goodland, and Colby, Kansas; Imperial, North Platte, Ogallala, and Sidney, Nebraska; and Holyoke and Wray, Colorado. Interstate 70 bisects the area, and Interstates 76 and 80 follow the south side of the South and North Platte Rivers, respectively. The Cimarron National Grasslands occur in the southwest corner of the MLRA.

Classification relationships

Major land resource area (MLRA): 072-Central High Tableland

Ecological site concept

This site occurs on somewhat poorly drained soils in alluvium, on flood plains, and low stream terraces. This site consists of alluvial soils that usually contain a high concentration of salts. A seasonal or perennial water table greater than 6 feet from the surface characterizes this site.

This ESD was developed using the existing ESDs developed in 2001: saline lowland North R072XA019KS, saline lowland South R072XB019KS and salt flat R072XY034CO. Changes were made in accordance with policy using the national ecological site handbook. Text changes were made in regards to clarity and style. Content was changed reflecting the range of variability of the site.

Associated sites

R072XY102KS	**Saline Subirrigated** Saline Subirrigated shares the same landform and parent material as Saline Lowland.
R072XY107KS	**Sandy Lowland** Sandy Lowland can be found adjacent to Saline Lowland site.

Similar sites

R072XY102KS	**Saline Subirrigated** Saline Subirrigated as a water table less than 6 feet from the surface and Saline Lowland has a water table greater than 6 feet. Plant communities can resemble one another.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Sporobolus airoides* (2) *Pascopyrum smithii*

Physiographic features

The Saline Lowland site occurs on nearly level to moderately sloping floodplains, and low terraces adjacent to streams and rivers. This site may also occur on a Dune Field interdune. Salts have accumulated within the root zone of this site. This site receives runoff from areas higher on the landscape. The soils of this site are typically subject to rare flooding. Some soils in this site are not in positions that flood (interdune, terrace). NOTE: Saline lowland ecological site is characterized by a water table >6 feet from the surface. Haigler soil series associated with saline lowland can have a water table at 36".

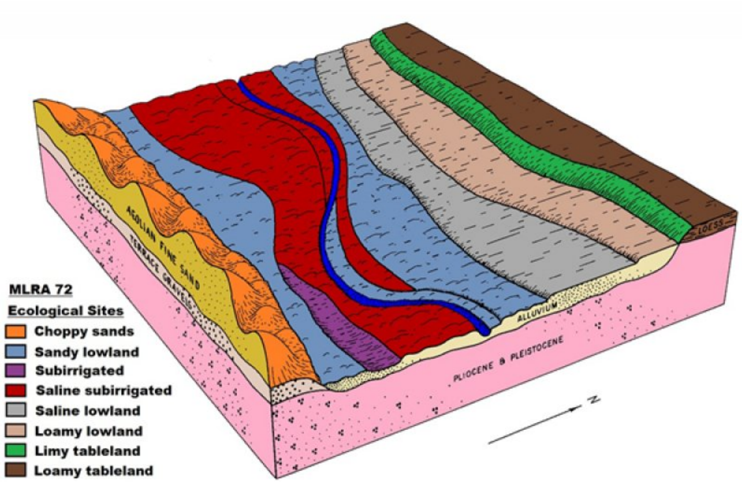


Figure 2. MLRA 72 block diagram

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Flood plain (3) Interdune
Flooding duration	Brief (2 to 7 days)

Flooding frequency	None to rare
Ponding frequency	None
Elevation	762–1,143 m
Slope	0–2%
Ponding depth	0 cm
Water table depth	91–203 cm

Climatic features

The average annual precipitation in this area is 14 to 25 inches (355 to 635 millimeters). It fluctuates widely from year to year. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. The maximum precipitation occurs from late spring through early autumn. Precipitation in winter occurs as snow. The annual snowfall ranges from about 16 inches (40 centimeters) in the southern part of the area, to 35 inches (90 centimeters) in the northern part. The average annual temperature is 46 to 57 degrees F (8 to 14 degrees C). The freeze-free period averages 161 days and ranges from 135 to 210 days, increasing in length from northwest to southeast. Climate data comes from the Natural Resources Conservation Service (NRCS) National Water and Climate Center. The data set is from 1981-2010.

Table 3. Representative climatic features

Frost-free period (average)	148 days
Freeze-free period (average)	167 days
Precipitation total (average)	508 mm

Climate stations used

- (1) SCOTT CITY [USC00147271], Scott City, KS
- (2) SHARON SPRINGS [USC00147397], Sharon Springs, KS
- (3) SYRACUSE 1NE [USC00148038], Syracuse, KS
- (4) HAIGLER [USC00253515], Haigler, NE
- (5) TRENTON DAM [USC00258628], Trenton, NE
- (6) GARDEN CITY EXP STN [USC00142980], Garden City, KS
- (7) CULBERTSON [USC00252065], Culbertson, NE

Influencing water features

A seasonal water table, (approximately greater than 6 feet) and adjacent perennial water table have influence on the kinds and amounts of vegetation on this site.

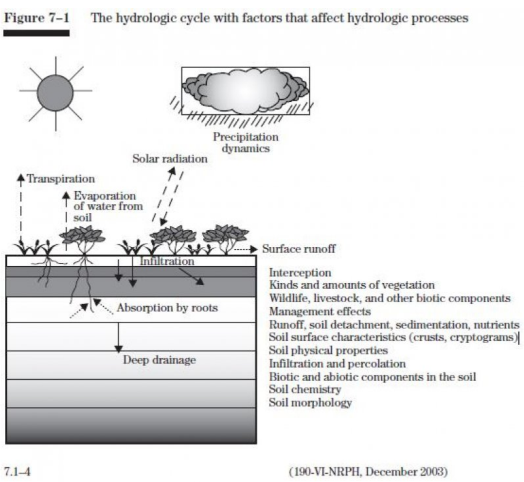


Figure 7. Fig. 7-1 from National Rangeland and Pasture Handb

Soil features

This site consists of very deep saline and saline-alkali soils. The high concentration of salts affect both the kind and amount of vegetation present. These soils generally do not have free water within 60 inches of the surface, but subsoil and underlying layers may have a seasonal high water table below a depth of about 36 inches in the Haigler series. Laird soils once had a higher water table, but presently the water table has dropped between 15 to 50 feet below the soil surface. The surface soil ranges from 3 to 20 inches thick. It is dark colored in some of these series and light colored in others. Texture of the surface soil ranges widely from silty clay loam to loamy fine sand. The underlying material is lighter colored than the surface soil, and occasionally has redoximorphic concentrations in the lower part. It ranges widely in texture. The soils in this site are commonly calcareous to the surface. The excessive saline and alkali salts present affect other soil properties such as available water capacity, soil structure, infiltration, and permeability. Soils in this site generally have low to moderate content of organic matter.

Slick spots are high sodium areas that contain no vegetation. They are inherent to the site and are intermixed with areas of vegetation.

Major soil series correlated to this ecological site include Las, Haigler, Laird, Caruso, and Arvada.

Other soil series that have been correlated to this site include Craft, Las Animas, Lincoln, Bridgeport, Sanborn, and Saltine.

These attributes represent 0-40 inches in depth or to the first restrictive layer.

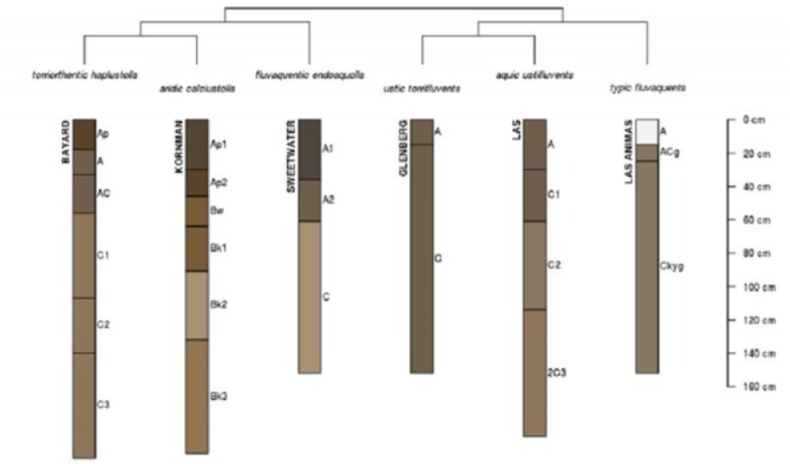


Figure 8. Las soil (OSD) dendrogram

Table 4. Representative soil features

Surface texture	(1) Silty clay loam (2) Silt loam (3) Loamy fine sand
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to moderately rapid
Soil depth	152–203 cm
Surface fragment cover <=3"	0–2%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	6.76–21.82 cm
Calcium carbonate equivalent (0-101.6cm)	0–40%

Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–125
Soil reaction (1:1 water) (0-101.6cm)	5.6–11
Subsurface fragment volume <=3" (Depth not specified)	0–3%
Subsurface fragment volume >3" (Depth not specified)	0–2%

Ecological dynamics

The plant community for this site is dynamic due to the complex interaction of many ecological processes. The interpretive plant community for this site is the Reference Plant Community. This community has been determined by the study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing strategies. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The Saline Lowland site developed with occasional fires as part of the ecological processes. Historically, it is believed that the fires were infrequent, randomly distributed, and started by lightning at various times throughout the season when thunderstorms were likely to occur. It is also believed that pre-European inhabitants may have used fire as a management tool for attracting herds of large migratory herbivores (bison, elk, deer, and pronghorn). The impact of fire over the past 100 years has been relatively insignificant due to the human control of wildfires, and the lack of acceptance of prescribed fire as a management tool in the semi-arid, High Plains area.

This site occurs on terraces adjacent to streams or rivers, floodplains, and the walls of closed depressions. Historically, the flooding potential on these sites range from none to rare.

Soils of this site are characterized by moderate to high salinity, or alkaline conditions. There will often be white or gray deposits on the soil surface early in the spring or following wet periods. Slick spots (bare exposed areas high in sodium) are an inherent characteristic occupying less than 3 percent of the community. The degree of salinity or alkali condition has a major influence on the plant community that will persist on this site. Plants that can tolerate these conditions include alkali sacaton, western wheatgrass, and inland saltgrass.

Continuous grazing without adequate recovery periods on this site will result in the loss of vigor and reproductive potential for such species as alkali sacaton and western wheatgrass. Inland saltgrass and blue grama will increase. Once the plant community has shifted to inland saltgrass/blue grama sod, it is very difficult to reverse the shift.

The degree of herbivory (feeding on herbaceous plants) has a significant impact on the dynamics of the site. Historically, periodic grazing by herds of large migratory herbivores was a primary influence. Secondary influences of herbivory by species such as prairie dogs, grasshoppers, gophers, and root feeding organisms impacted the vegetation historically, and continue to this day.

The management of herbivory by humans through grazing of domestic livestock and/or manipulation of wildlife populations has been a major influence on the ecological dynamics of the site. This management coupled with the High Plains climate largely dictates the plant communities for the site.

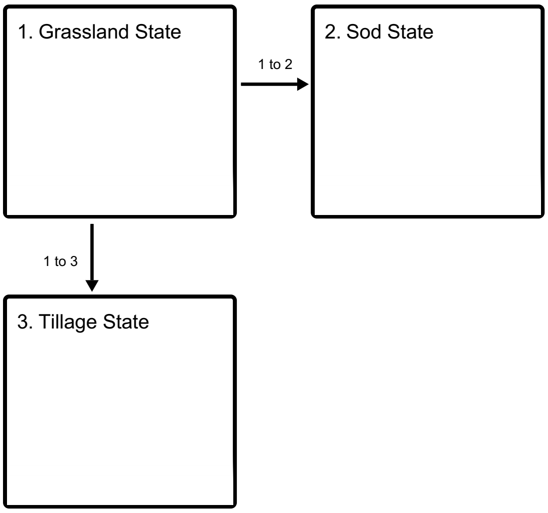
Typically, drought cycles have not had a major impact upon the vegetation due to the presence of a water table. Depletion of ground water reserves may change species composition and possibly cause a shift in ecological sites.

Growth of native cool season plants begins about April 15, and continues to about June 15. Native warm season plants begin growth about May 15, and continue to about August 15. Green up of cool season plants may occur in September and October if adequate moisture is available.

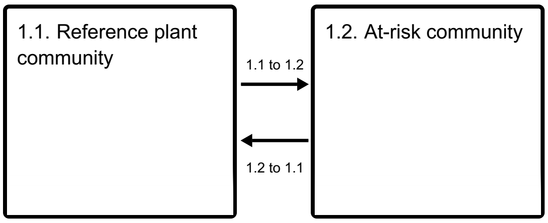
The following diagram illustrates the common plant communities that can occur on the site and the transition pathways (arrows) among communities. Bold lines surrounding each state represent ecological thresholds. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

State and transition model

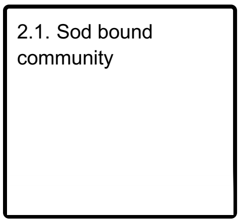
Ecosystem states



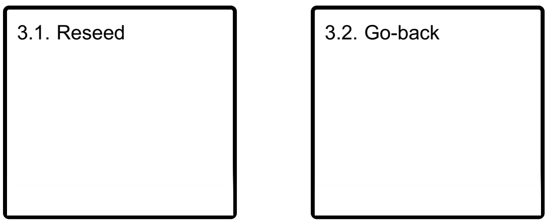
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Grassland State

The Grassland State is supported by empirical data, historical data, local expertise, and photographs. This state is defined by two native plant communities that are a result of periodic fire, drought and grazing. These events are part of the natural disturbance regime and climatic process. The plant communities within the Grassland State may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition table shown below has been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Community 1.1
Reference plant community

The interpretive plant community for this site is the Reference Plant Community. This site evolved over many years of grazing by large herbivores, and occasional random wildfires. The natural potential vegetation of this site is mixed grass prairie. Alkali sacaton, inland saltgrass, and western wheatgrass are the dominant species in this community. Combined they make up about 60 percent of the total annual yield. Secondary species include blue grama, switchgrass, and various sedges and rushes. This site has a diverse forb population most of which occur in small amounts. Forbs and shrubs such as American vetch, fourwing saltbush, and winterfat are significant in the western edge of the MLRA. Depending on the degree of alkalinity in the soil, this plant community can be diverse and productive. With proper management and adequate recovery periods, this site will remain diverse, productive, and functioning at a peak ecological level. The total average annual production of this site is approximately 2,200 pounds per acre (air-dry weight).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1009	2219	3026
Forb	78	173	235
Shrub/Vine	34	74	101
Total	**1121**	**2466**	**3362**

Figure 10. Plant community growth curve (percent production by month).
KS3972, Alkali Sacaton, Inland Saltgrass, Western Wheatgrass.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	30	35	15	5	5	0	0	0

Community 1.2
At-risk community

The At-risk Community developed with long term, continuous grazing with no forage and animal balance, and lack of adequate recovery periods between grazing events. With this type of management, alkali sacaton, switchgrass, and other preferred grasses rapidly lose productive capacity through loss of vigor and reproductive potential. Inland saltgrass has increased but has not yet developed into a sod bound condition. Blue grama remains on site. Alkali sacaton is scattered and in reduced amounts. Cool season grasses such as western wheatgrass and green needlegrass have been reduced. American vetch has also decreased. Fourwing saltbush and winterfat (western MLRA) are greatly reduced in abundance. Forbs and shrubs such as scarlet globemallow, Fremont goldenweed, rubber rabbitbrush, and broom snakeweed may have increased. Total aboveground carbon has been reduced due to a decreas in forage and litter production. Reduction of rhizomatous wheatgrass, nitrogen fixing forbs, and shrub component has begun to alter the biotic integrity of this plant community. Water and nutrient cycles may be impaired. Slick spots (bare high sodium areas) may be developing or increasing in size. The total average annual production of this site is approximately 1800 pounds per acre (air-dry weight).

Pathway 1.1 to 1.2
Community 1.1 to 1.2

This community pathway is triggered by continuous grazing without adequate recovery and rest. Continuous grazing without adequate recovery periods will convert the Reference Plant Community to an increased western wheatgrass and saltgrass plant community. Heavy grazing will accelerate this movement.

Pathway 1.2 to 1.1
Community 1.2 to 1.1

Prescription grazing, providing adequate rest and recovery, and a forage and animal balance.

State 2
Sod State

The Grassland State ecosystem has been driven beyond the limits of ecological resilience and has crossed a threshold into the Sod State. The designation of the Sod State denotes changes in plant community composition and soil property changes such as aggregate stability, and/or bulk density. This change in soil dynamic properties and species composition affect hydrologic function, biotic integrity, and soil site stability. This alternative state should be treated as a hypothesis that will be tested through long-term observation of ecosystem behavior, and repeated application of conservation and restoration practices. This state should be re-evaluated and refined on a continuous basis.

Community 2.1
Sod bound community

This plant community is defined as a Sod bound condition consisting primarily of inland saltgrass. Continuous, heavy grazing, no forage and animal balance, and no rest allows inland saltgrass to become the dominant species. Only remnant western wheatgrass, alkali sacaton, and other preferred warm season grasses remains. This site is very resistant to change and usable annual production is low. The restoration pathway has not been documented and needs further study before it is reflected in the state and transition model. It could take generations to bring this plant community back to the Reference State with management alone. Renovation (mechanical and/or chemical inputs) is not recommended due to high salt content of the soil and saltgrass persistence. Inland saltgrass becomes very thick and difficult to manage. Slick spots have increased in size, accelerated by blowing salt and soil, and may be interconnected by developing flow paths. The plant community exhibits an impaired water cycle.

State 3
Tillage State

The Grassland State ecosystem has been driven beyond the limits of ecological resilience and has crossed a threshold into the Tillage State. The designation of the Tillage State denotes changes in soil structure and plant community composition. This change in soil properties and plant species affects soil site stability, biotic integrity, and hydrologic function. The Tillage State consist of abandoned cropland that has been naturally revegetated (go-back) or has been planted/seeded to grassland. Many reseeded plant communities were planted with a local seeding mix or were planted to a monoculture of sideoats grama. Go-back communities are difficult to define due to the variability of plant communities that exist. Many of these communities are represented by the genus Aristida (three-awns). This is an alternative state because the ecological functions, i.e. dynamic soil properties, and plant communities are not fully restored to that of the Reference State. Tillage can destroy soil aggregation. Soil aggregates are an example of dynamic soil property change. Aggregate stability is critical for infiltration, root growth, and resistance to water and wind erosion (Brady and Weil, 2008). This alternative state should be treated as a hypothesis that will be tested through long-term observation of ecosystem behavior, and repeated application of conservation and restoration practices. This state should be re-evaluated and refined continually.

Community 3.1
Reseed

This plant community can vary considerably depending on how eroded the soil was, the species seeded, the stand that was established, how long ago the stand was established, and the management of the stand since establishment. A forage and animal balance, with adequate recovery periods will be necessary to maintain productivity, and desirable species. There are several factors that make seeded rangeland a different grazing resource than native rangeland. Factors such as species selected, stand density, varieties, and harvest efficiency all impact the production level and palatability. This results in uneven utilization when both seeded and native rangelands are in the same grazing unit. Therefore, the seeded rangeland should be managed as a separate grazing unit if possible. Species diversity on seeded rangeland is often lower and native forb species generally take longer to re-establish.

Community 3.2
Go-back

This plant community is created when the soil is tilled or farmed, and abandoned. All of the native plants are killed, soil organic matter/carbon reserves are reduced, soil structure is changed, and a plowpan or compacted layer can be formed causing a decrease in water infiltration. Synthetic chemicals may remain as a residual from farming operations. In early successional stages, this community is not stable. Erosion is a concern on this site. An annual plant community such as Russian thistle, kochia, foxtail barley, and other introduced annuals initially occupy the community. These plants give some protection from erosion. This plant community is gradually replaced by early perennial species such as inland saltgrass and western wheatgrass. Alkali sacaton and switchgrass can become established depending upon whether a remnant seed source is available. Eventually, other perennial warm and cool season species can establish. This successional process can take generations and will most likely need prescription grazing to promote quicker recovery.

Transition 1 to 2
State 1 to 2

Long-term, continuous grazing, with no forage and animal balance, providing inadequate rest and recovery of the dominant and sub-dominant Reference Plant Community.

Transition 1 to 3
State 1 to 3

This transition is triggered by a management action as opposed to a natural event. Tillage or breaking the ground with machinery for crop production will move the Grassland State to a Tillage State.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall-mid warm season Dominant 43%**			336–1059	
	alkali sacaton	SPAI	*Sporobolus airoides*	336–673	–
	saltgrass	DISP	*Distichlis spicata*	56–336	–
	switchgrass	PAVI2	*Panicum virgatum*	0–78	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–39	–
	alkali cordgrass	SPGR	*Spartina gracilis*	0–39	–
2	**Mid-short cool season grasses Sub-dominant 32%**			336–790	
	western wheatgrass	PASM	*Pascopyrum smithii*	336–673	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–56	–
	Canada wildrye	ELCA4	*Elymus canadensis*	0–39	–
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	0–22	–
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	0–22	–
	little barley	HOPU	*Hordeum pusillum*	0–22	–
	green needlegrass	NAVI4	*Nassella viridula*	0–22	–
3	**Short warm season Minor component 5%**			0–135	
	buffalograss	BODA2	*Bouteloua dactyloides*	0–73	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–73	–
	ring muhly	MUTO2	*Muhlenbergia torreyi*	0–22	–
4	**Mid warm season Minor component 3%**			0–78	

	sideoats grama	BOCU	*Bouteloua curtipendula*	0–45	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	0–17	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–17	–
5	**Sedges-rushes Trace component 2%**			0–56	
	sun sedge	CAINH2	*Carex inops ssp. heliophila*	0–28	–
	sedge	CAREX	*Carex*	0–28	–
	rush	JUNCU	*Juncus*	0–28	–
Forb					
6	**Forbs Minor component 10%**			22–252	
	white heath aster	SYERE	*Symphyotrichum ericoides var. ericoides*	0–22	–
	common dandelion	TAOF	*Taraxacum officinale*	0–22	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–22	–
	white sagebrush	ARLUM2	*Artemisia ludoviciana ssp. mexicana*	0–22	–
	twogrooved milkvetch	ASBI2	*Astragalus bisulcatus*	0–22	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	0–22	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–22	–
	scarlet beeblossom	OESU3	*Oenothera suffrutescens*	0–22	–
	leafy false goldenweed	OOFOF	*Oonopsis foliosa var. foliosa*	6–17	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	6–17	–
	American vetch	VIAM	*Vicia americana*	6–17	–
	desert princesplume	STPIP	*Stanleya pinnata var. pinnata*	0–11	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	0–11	–
	lacy tansyaster	MAPIP4	*Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida*	0–11	–
	hairy false goldenaster	HEVI4	*Heterotheca villosa*	0–11	–
	broadleaf milkweed	ASLA4	*Asclepias latifolia*	0–11	–
	scrambled eggs	COAU2	*Corydalis aurea*	0–11	–
	purple prairie clover	DAPUP	*Dalea purpurea var. purpurea*	0–11	–
	fetid marigold	DYPA	*Dyssodia papposa*	0–11	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–11	–
Shrub/Vine					
7	**Shrubs Minor component 5%**			0–112	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–45	–
	devil's-tongue	OPHU	*Opuntia humifusa*	0–45	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	0–45	–
	fragrant sumac	RHAR4	*Rhus aromatica*	0–22	–
	willow	SALIX	*Salix*	0–22	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–22	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–22	–
	rubber rabbitbrush	ERNAG	*Ericameria nauseosa ssp. nauseosa var. glabrata*	0–22	–

Animal community

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangelands in this area provide yearlong forage under prescribed grazing for cattle, sheep, horses, and other herbivores. During the dormant period, livestock may need supplementation based on reliable forage analysis.

Grazing Interpretations
Calculating safe stocking rates: Proper stocking rates should be incorporated into a grazing management strategy that protects the resource, maintains, or improves rangeland health, and is consistent with management objectives. In addition to usable forage, safe stocking rates should consider ecological condition, trend of the site, past grazing use history, season of use, stock density, kind and class of livestock, forage digestibility, forage nutritional value, variation of harvest efficiency based on desirability preference of plant species, and/or grazing system and site grazability factors (such as steep slopes, site inaccessibility, or distance to drinking water).

Often the current plant community does not entirely match any particular community phase as described in this ecological site description. Because of this, a resource inventory is necessary to document plant composition and production. Proper interpretation of inventory data will permit the establishment of a safe initial stocking rate.

No two years have exactly the same weather conditions. For this reason, year-to-year and season-to season fluctuations in forage production are to be expected on grazing lands. Livestock producers must make timely adjustments in the numbers of animals or in the length of grazing periods to avoid overuse of forage plants when production is unfavorable, and to make advantageous adjustments when forage supplies are above average.

Initial stocking rates should be improved through the use of vegetation monitoring and actual use records that include number and type of livestock, the timing and duration of grazing, and utilization levels. Actual use records over time will assist in making stocking rate adjustments based on the variability factors.

Average annual production must be measured or estimated to properly assess usable forage production and stocking rates.

Hydrological functions

Water is the principal factor limiting forage production on this site. Infiltration is moderate to slow and runoff potential for this site varies from moderate to high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. Areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff. (Refer to NRCS Section 4, National Engineering Handbook (NEH-4) for runoff quantities and hydrologic curves).

Recreational uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood products

No appreciable wood products are present on the site.

Other products

None noted.

Other information

Site Development and Testing Plan.
Future work (for approved ESD) includes field visits to verify ecological site concepts with field staff. Field staff include but not limited to project office leader, area soil scientist, state soil scientist, ecological site specialist, state

rangeland conservationist, area rangeland management specialist, and local field personnel. This site includes collaboration between Kansas, Colorado and Nebraska. Field visits are to be determined by spatial extent of the site as well as personal knowledge of the site. Activity during field visits will include but not limited to: identifying the soil, landform, plant community, and verifying existing site concepts.

Inventory data references

Information presented here has been derived from NRCS clipping data, numerous ocular estimates, and other inventory data. Field observations from experienced range personnel was used extensively to develop this ecological site description.

Those involved in developing the Saline Lowland ecological site North include Harvey Sprock from Colorado; Carol Eakins, Chuck Markley, Jeff Nichols, and Mary Schrader from Nebraska; Joan Gienger and Ted Houser from Kansas.

Those involved in developing Saline Lowland South include: Tim Watson, Amanda Shaw, Susan Francis, Jon Deege, Harvey Sprock, Robert Schiffner, and Josh Saunders.

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Contributors

Chris Tecklenburg

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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)	Update 3-08-2016 Chris Tecklenburg. Original authors Feb 2005 David Kraft, John Henry, Doug Spencer, and Dwayne Rice and from Harvey Sprock, Dan Nosal, Blake Hendon on ES formerly known as Salt Flat 1-19-2005.
Contact for lead author	Chris Tecklenburg chris.tecklenburg@ks.usda.gov and David Kraft david.kraft@ks.usda.gov
Date	03/08/2016
Approved by	David Kraft
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

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2. **Presence of water flow patterns:** None where vegetation is continuous. Slick spots (high sodium areas) can pond water and concentrate overland flow. Flow paths should be short in length and disconnected.

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3. **Number and height of erosional pedestals or terracettes:** There is no evidence of pedestaled plants or terracettes or the site.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Less than 5% bare ground is found on this site. Bare areas can range from 3-4 inches in diameter. Extended drought may cause bare ground to increase up to 10%. Slick spots occur on the site and support some vegetation.

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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

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7. **Amount of litter movement (describe size and distance expected to travel):** None

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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):** Plant canopy is large enough to intercept the majority of raindrops. A soil fragment will not “melt” or lose its structure when immersed in water for 30 seconds. There is no evidence of pedestaled plants or terracettes. Soil stability scores will range from 3-4.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** SOM ranges from 1-3 %. Soils are deep well drained, sodic, saline, and strongly alkaline. Surface texture ranges from clay loam to sandy loam. A-horizon color is grayish brown (10YR 4/2) moist at 0-12 inches in depth. Weak granular structure.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** There is no negative effect on water infiltration and/or runoff due to plant composition or distribution. Diverse grass, forb, shrub functional/structural groups and diverse root structure/patterns reduces raindrop impact that slows overland flow providing increased time for infiltration to occur.

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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: Two groups of sub-dominant when combined make up 64% of the plant community

    Sub-dominant: tallgrass warm season (alkali sacaton 300-600) = mid-short cool season (western wheatgrass300-600) > midgrass warm season (inland saltgrass 50-300)

    Other: Minor—Forbs > shortgrass warm season (blue grama, buffalograss) = Shrubs > sedges and rushes

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** The majority of plants are alive and vigorous. Some mortality and decadence is expected for the site. This in part is due to drought, unexpected wildfire or a combination of the two events. This would be expected for both dominant and sub-dominant groups.

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14. **Average percent litter cover (%) and depth (in):** Plant litter is distributed evenly throughout the site. When prescribed burning is practiced there will be little litter the first half of the growing season. 35-50% litter cover at 0.25-0.50 inch depth. Litter cover during and following extended drought ranges from 25-35%.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1000 lbs./ac. low precipitation years, 2200 lbs./ac. average precipitation years, 3000 lbs./ac. high precipitation years. After extended drought or the first growing season following wildfire, production may be significantly reduced by 500 – 700 lbs./ac.

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:** Invasive plants should not occur in reference plant community. However Russian thistle, kochia or other non-native alkali tolerant species may invade following extended drought assuming a seed source is available. Inland saltgrass is the major native (non-invasive) increaser on this site, but rabbitbrush and the muhlys may also increase.

17. **Perennial plant reproductive capability:** The only limitations are weather-related, wildfire, natural disease, and insects that may temporarily reduce reproductive capability.