Ecological site R072XY116KS
Salt Flat

Accessed: 05/13/2025

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.

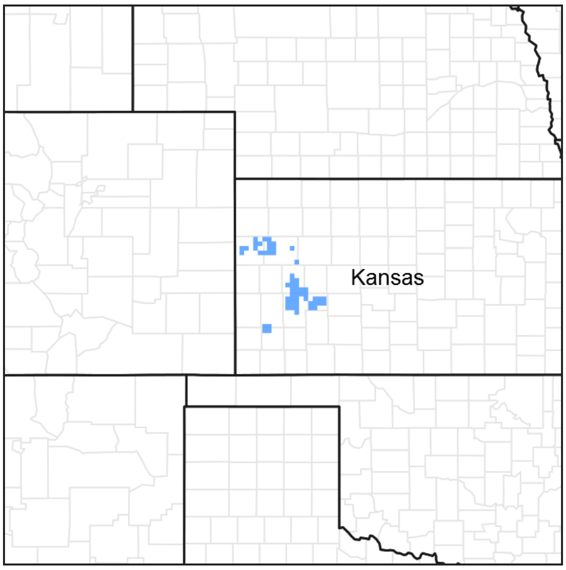


Figure 1. Mapped extent

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

The Salt Flat ecological site occurs on base and side slopes of closed depressions and alluvial fans. This site has saline and sodium affected soils. It has a relatively small spatial extent in the southern half of MRLA 72 in Finney, Grant, Kearny, Lane, Logan, Scott, and Wallace counties.

Associated sites

R072XY101KS	**Limy Slopes** This site can occur above the Salt Flat ecological site. The Limy Slopes ecological site is located on shoulders and backslopes on hillslopes on tableland landscapes. Soils correlated with this site are moderately deep to very deep and have a surface that is <8 inches (20cm). The soil surface texture ranges from silt loam to loam with the majority of the site surface texture silt loam. Soils that are correlated to Limy Slopes have free carbonates occurring within 4 inches (10cm) of the surface. This site is dominated by loess parent material.
R072XY115KS	**Closed Upland Depression** This site occurs below the Salt Flat ecological site. The Closed Upland Depression ecological site occurs on broad upland divides (Tablelands). This site occurs in small to large depressions called playas that have very slow permeability and high available water capacity. This site receives water runoff from areas higher on the landscape.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Sporobolus airoides* (2) *Bouteloua gracilis*

Physiographic features

The Salt Flat ecological site occurs on base and side slopes of very large closed depressions like the Scott-Finney Depression and the Whitewomen Basin of west central Kansas. It is also associated with areas along the Bear Creek fault in Grant and Kearny counties of Kansas and along Plum Creek in Logan Co., Kansas. These sites can also be found in receiving positions close to areas of exposed Pierre Shale. The slope is less than 3 percent and this site receives runoff from adjacent sites. Parent material is loess and alluvium.

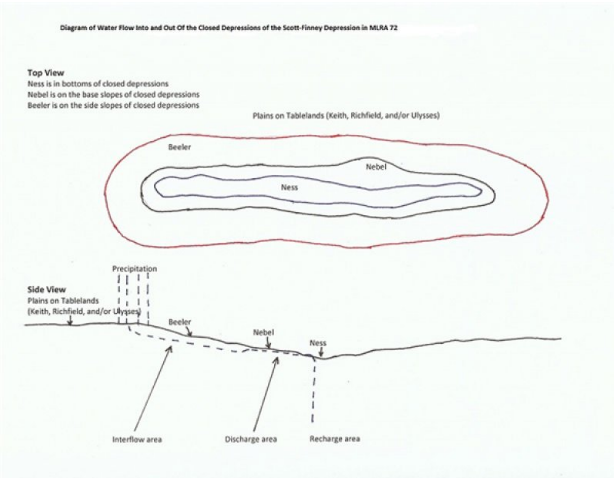


Figure 2. ESD and soil series diagram

Table 2. Representative physiographic features

Landforms	(1) Depression (2) Alluvial fan
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding duration	Brief (2 to 7 days)
Ponding frequency	None to rare
Elevation	838–1,676 m

Slope	0–3%
Ponding depth	0–30 cm
Water table depth	0–152 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 159 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)	153 days
Freeze-free period (average)	173 days
Precipitation total (average)	508 mm

Climate stations used

- (1) LAKIN [USC00144464], Lakin, KS
- (2) SCOTT CITY [USC00147271], Scott City, KS
- (3) WINONA [USC00148988], Winona, KS
- (4) GARDEN CITY EXP STN [USC00142980], Garden City, KS
- (5) SHARON SPRINGS [USC00147397], Sharon Springs, KS

Influencing water features

The Salt Flat ecological site has no surface drainage outlet on the Nebel and Beeler soil series. This site is located in a receiving position from runoff water on side and base slopes of depressions. The water from this site escapes only by evaporation or subsurface drainage. The kinds and amounts of vegetation existing on this site is influenced by the amount and timing of precipitation events as well as duration of ponding. In areas where this site occurs on alluvial fans (Limon soil series), there is a surface drainage outlet.

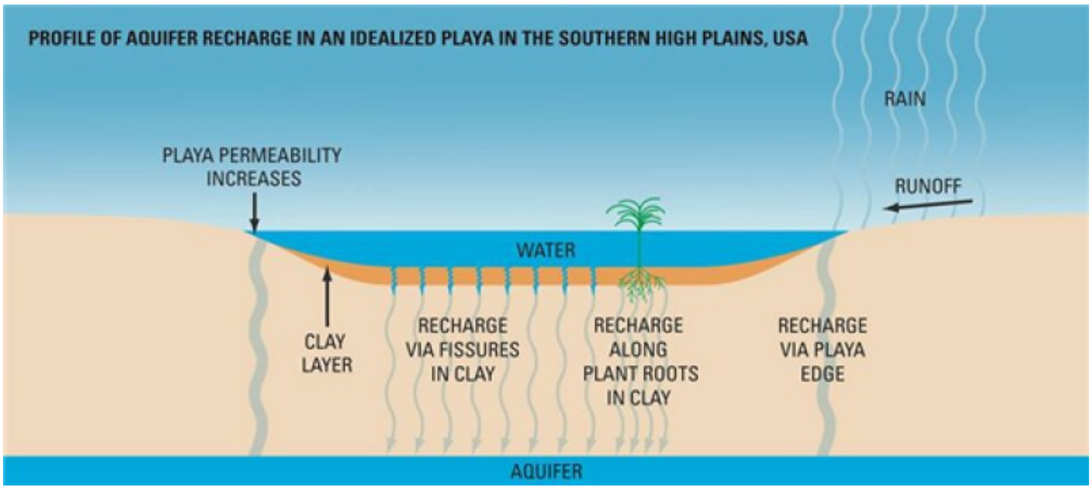


Figure 7. Aquifer recharge of playa

Soil features

The soils that make of the Salt Flat ecological site consists of very deep, moderately well to well drained soils that formed in loess and alluvium. These soils are located on side and base slopes of very large closed depressions and selected streams in the Central High Tableland (MLRA 72).

These soils have a very dark grayish brown (10YR 3/2) moist, surface layer color with a silt loam or silty clay loam texture. The Ap horizon depth ranges from 0 to 10 inches.

The Beeler and Limon soil series make up the majority of this site. Beeler soils are on the side slopes of the closed depressions and Limon soils are on alluvial fans. This series receives precipitation and is located in an interflow area between the tablelands and the closed upland depressions. These soils have an electrical conductivity (EC) that ranges from 1 to 6 mmhos/cm and and pH of 6.6 to 8.4 at the soil surface. These soils are considered saline.

The Nebel soil series makes up a small acreage of this site. These soils are on the base slopes of the closed depressions in and around water table discharge zones. This series is located below the Beeler soil series and directly above the Ness (Closed Upland Depression ESD) soil series. Nebel soils have an EC ranging from 0 to 3 mmhos/cm with a pH ranging from 6.0 to 8.4 at the soil surface. Below the surface, the EC ranges from 0 to 15 mmhos/cm and the pH ranges from 7.4 to 10.

These soils are salt affected and adversely affect plants to varying degrees depending on the type and concentration of salt present. The Beeler and Limon soils are in the saline salinity class and are mostly affected by gypsum salts. The Nebel soils are in the sodic salinty class and have enough sodium salt concentration to inhibit plant growth. The areas of Nebel soils are dominated by salt tolerant grasses. The areas of Beeler and Limon have varying degrees of salt tolerant grasses and some non-tolerant species.

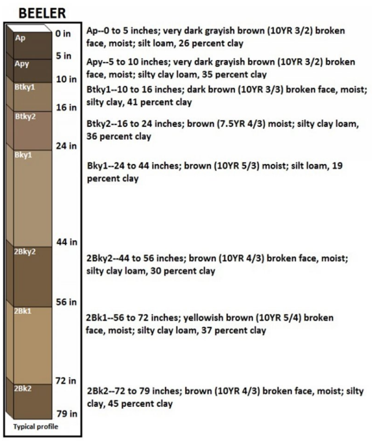


Figure 8. Typical profile of Beeler soil series

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Permeability class	Moderate
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	8.89–15.49 cm
Calcium carbonate equivalent (0-101.6cm)	0–35%

Electrical conductivity (0-101.6cm)	1–15 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–30
Soil reaction (1:1 water) (0-101.6cm)	6.1–10
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The plant communities for the Salt Flat ecological site are dynamic due to the complex interaction of many ecological processes. The interpretive plant community for this site is the Reference Plant Community. The Reference Community has been determined by the study of rangeland relic areas, areas protected from excessive disturbance, areas under long term rotational grazing strategies, literature of plant communities from the early 1900s, and local expertise. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

This ecological site is made up of a grassland state and a tillage state. The grassland state is characterized by non-broken land (no tillage), mostly salt tolerant species, both warm and cool season, rhizomatous, bunch, and sod-forming grasses, shrubs, and forbs. The tillage state has been mechanically disturbed (broken) by equipment and includes either a variety of early successional plants, a local seeding mix, or is farmed and planted to an annual crop.

Vegetation changes are expected within this ecological site and will be dependent upon the site's geographical location inside Major Land Resource Area (MLRA) 72. Variation in precipitation east and west is not as affected as is temperature north and south. The northern part of MLRA 72 is characterized by cooler temperatures and a shorter growing season in respect to the southern end. As a result, cool season bunchgrasses and sod formers proliferate. 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 (weather data from National Climate Data Center 1980-2010).

The Salt Flat ecological site developed with occasional fires being 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.

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.

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.

Drought cycles were part of the natural range of variability within the site and have historically had a major impact upon the vegetation. The species composition changes according to the duration and severity of the drought cycle (Albertson, F. W., Weaver, J. E.).

The Salt Flat ecological site occurs on side and base slopes of very large closed depressions or playas and alluvial fans. These soils are affected by the local flow of the water table, which has concentrations of salt from the local parent material. The area has long, gentle slopes (Beeler) toward the depression bottoms. The depression bottom

(Ness) perches water with a clay confining layer like the traditional playa concept, and any salt that is delivered to it is flushed back down to the water table because it is a recharge zone.

Rainfall at the top of the landscape flows through the soil toward the lowest point. Near the base slope (Nebel), the water tends to rise higher in the soil profile delivering salt concentrations higher in the soil profile and in stronger concentrations. These base slopes are considered discharge zones. The water table tends to fall slowly because there is a steady pressure toward the soil surface. The lingering of the ground water in the area promotes the precipitation of sodium salt compounds in the soil profile, causing the Nebel soil to be considered sodic. The salt content affects the kinds and amounts of vegetation present. Wind erosion can be a hazard if vegetation no longer exists due to sodium concentrations (Nebel soils).

The areas of Beeler and Limon soils are not considered discharge zones. Water flows vertically and horizontally, at a quicker pace than the water in the Nebel soils. The sodium based salts do not precipitate in as large a concentration as they do in the Nebel. Beeler and Limon soils are dominated by gypsum based salt compounds and are considered saline.

The general response of the Salt Flat ecological site to long term continuous grazing pressure is to gradually lose the vigor and reproductive potential of the mid-grass species and shift the plant community toward short-grass species. This site is rarely managed as a separate unit for livestock grazing.

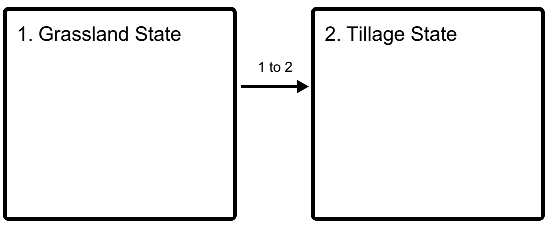
Western wheatgrass is a subdominant species of the Reference Plant Community, and is a preferred grass that responds as a decreaser or increaser depending on the time of grazing. When early and late season grazing is practiced annually, western wheatgrass tends to decrease. When cattle are put on late and pulled off early during the growing season, western wheatgrass tends to increase.

The use of grazing management that includes needed distribution tools, proper stocking, and adequate recovery periods during the growing season, helps to restore this site to its productive potential.

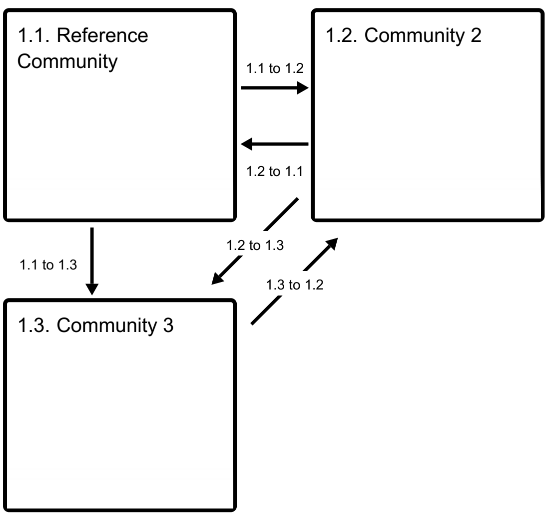
The following diagram illustrates pathways that the vegetation on this site may take from the Reference Plant Community as influencing ecological factors change. There may be other states or plant communities not shown in the diagram as well as noticeable variations within those illustrated and described in the following sections.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities

2.1. Go-back Community

2.2. Reseed Community

State 1
Grassland State

The grassland state is supported by empirical data, historical data, and local expertise. This state is defined by three 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 Reference Plant Community consists of salt tolerant, cool season sod forming grasses, warm season sod and bunchgrasses, shrubs, and a small amount of forbs. Plant Community 1.2 is dominated by alkali sacaton. Community 1.3 is white or black alkali, bare ground, and/or annuals. Salt accumulations are elevated.

Community 1.1
Reference Community

The plant community upon which interpretations are primarily based is the Reference Plant Community. This community evolved with grazing by large herbivores, occasional prairie fires, and periodic flooding events, and can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. The vegetation on this site is highly variable due to the amount of salts in the soil and fluctuations of ponding in the adjacent depressional areas. The potential vegetation is approximately 90 percent grasses, 8 percent shrubs, and a trace amount (2 percent) of forbs. Dominant grasses include alkali sacaton, blue grama, western wheatgrass, alkaligrass, and saltgrass. Significant shrubs include fourwing saltbush, winterfat, and rabbitbrush. The most noticeable forbs include Nuttall’s poverty weed and twogrooved milkvetch. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle, and energy flow are functioning at this sites potential in the Reference Plant Community. When present, plant litter is properly distributed with very little movement off-site. Natural plant mortality can be significant following periods of below average precipitation. The diversity in plant species allows for both the fluctuation of ponding as well as the occurrence of randomly occurring drought. The growth curve for this plant community varies. The total annual production (air-dry weight) of this plant community ranges from 500 to 1,800 pounds/acre and will average 1,000 pounds.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	504	1009	1821
Shrub/Vine	45	95	168
Forb	11	17	28
Total	**560**	**1121**	**2017**

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
Community 2

This community occurs as a result of continuous heavy grazing with no forage and animal balance. The plant community is made up of alkali sacaton, blue grama, and buffalograss. More field visits and clipping data is necessary to further define this community.

Community 1.3
Community 3

This community occurs as a result of prolonged high water table (surface) and the adjacent closed upland depression site backing water on the discharge area, creating salt-affected (sodium) soils (Nebel soil series). Sodium is concentrated at elevated levels (sodium absorption ration >13) that affect plant growth. The ponding depth, frequency, and duration dictates the type of plant community on the Salt Flat ecological site. Extended ponding events can drown out the vegetation, leaving bare soil, and/or sparse annual or lower successional perennials plants. This condition can also be accelerated by heavy continuous grazing and hoof action on moist soil. Total production is highly variable and is dependent on precipitation, ponding frequency, duration, and management of livestock to these areas.

Pathway 1.1 to 1.2
Community 1.1 to 1.2

Management that includes heavy continuous grazing, and no forage and animal balance.

Pathway 1.1 to 1.3
Community 1.1 to 1.3

Management that includes long-term heavy grazing, no forage and animal balance, no rest, and/or the discharge area (Nebel soils) receive elevated concentration of salts. The soil is sodic and vegetation response is highly visible.

Pathway 1.2 to 1.1
Community 1.2 to 1.1

Management that includes prescription grazing, a forage and animal balance and periodic rest and recovery.

Pathway 1.2 to 1.3
Community 1.2 to 1.3

Long periods of ponding water on adjacent depressions and extended periods of high water table.

Pathway 1.3 to 1.2
Community 1.3 to 1.2

Periods of dry up and flushing of salts. Management that includes a forage and animal balance, and periodic rest and recovery.

State 2
Tillage State

The tillage state consists of abandoned cropland that has been naturally revegetated (go-back), planted/seeded to grassland or annual crops. Many reseeded plant communities were planted with a local seeding mix under the Conservation Reserve Program (CRP) 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, Weil).

Community 2.1
Go-back Community

This plant community is created when the soil is tilled or farmed (sodbusted), and abandoned. Generally land that has been used for purposes other than rangeland or hayland will start to revegetate when left undisturbed. Due to tillage activity there are no native plants, soil organic matter and carbon reserves are reduced, soil structure is changed and a plow pan or compacted layer can be formed decreasing water infiltration. Many times, synthetic chemicals remain as a residual from farming operations. Erosion is a concern. The initial ground cover will primarily consist of kochia, annual bromes, pigweed, foxtail (bristlegrass), Russian thistle, witchgrass, and tumblegrass as well as other annuals. These plants give some protection from erosion and start to rebuild organic matter. The next succession of plants will be grasses such as sand dropseed, threeawn, silver bluestem, and annuals. Eventually blue grama, and buffalograss will come back. These species will not regain in proportions to that of the Reference State. Soil structure, aggregate stability and organic matter will not recover to levels of the Reference cCommunity. Range seeding can accelerate the process of species composition and possibly production, but will be at a high cost. Bare ground If this site (Nebel soils) has extended periods of high water tables, it could drown out vegetation and end up leaving bare soil or sparse annuals, or lower successional perennials. This condition can accelerate from heavy continuous grazing and hoof action on moist soil.

Community 2.2
Reseed Community

This plant community is created when the soil is tilled or farmed (sodbusted) and abandoned. All of the native plants are killed, soil organic matter and carbon reserves are reduced, soil structure is changed, and a plow pan or compacted layer can be formed, which decreases water infiltration. Synthetic chemicals may remain as a residual in the soil from farming operations. In early successional stages, this community is not stable. Wind and water erosion is a concern. 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 needed to maintain productivity and desirable species. Selection of grass species by grazing animals on seeded rangeland sites can be significantly different from native range sites. Typically there is a reduced production level on seeded sites compared to native sites with similar species composition. Species diversity is lower and forb species generally take longer to re-establish. Seeded rangeland should be managed separately due to the natural ecological differences.

Transition 1 to 2
State 1 to 2

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	**Dominant grasses 90%**			588–1009	
	alkali sacaton	SPAI	*Sporobolus airoides*	224–392	–
	blue grama	BOGR2	*Bouteloua gracilis*	112–224	–
	western wheatgrass	PASM	*Pascopyrum smithii*	84–168	–
	James' galleta	PLJA	*Pleuraphis jamesii*	56–112	–
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	56–112	–
	saltgrass	DISP	*Distichlis spicata*	56–112	–
	vine mesquite	PAOB	*Panicum obtusum*	0–56	–
	buffalograss	BODA2	*Bouteloua dactyloides*	0–56	–
Forb					
2	**Trace component 2%**			0–17	
	twogrooved milkvetch	ASBI2	*Astragalus bisulcatus*	0–17	–
	Nuttall's povertyweed	MONU	*Monolepis nuttalliana*	0–17	–
Shrub/Vine					
3	**Minor component 8%**			28–95	
	fourwing saltbush	ATCA2	*Atriplex canescens*	22–112	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	11–56	–
	rabbitbrush	CHRYS9	*Chrysothamnus*	0–34	–

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 graze ability 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.

Hydrological functions

In progress.

Recreational uses

None

Wood products

None

Other products

None

Other information

Site Development and Testing Plan.

Future work (for approved ESD) includes field visits to verify ES site concepts with field staff. Field staff include, but are 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. 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 are 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 trained personnel was used extensively to develop this ecological site description.

Range site description for Colorado, Salt Flat, USDA-Soil Conservation Service, December 1975.

Other references

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Contributors

Chris Tecklenburg

Acknowledgments

The ecological site development process is a collaborative effort, conceptual in nature, dynamic and is never considered complete. I thank all those who set the foundational work in the early 2000s in regards to this ESD. I thank all those who contributed to the development of this site. In advance, I thank those who would provide insight, comments and questions about this ESD in the future.

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.

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Date	01/05/2017
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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.

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

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.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

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

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.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Ap--0 to 5 inches; very dark grayish brown (10YR 3/2) broken face, moist; silt loam, 26 percent clay; weak fine subangular blocky parting to weak medium granular structure; very friable, soft, moderately sticky, moderately plastic.
   Apy--5 to 10 inches; very dark grayish brown (10YR 3/2) broken face, moist; silty clay loam, 35 percent clay; weak coarse subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic.

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.

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

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Grasses dominant component 90%. alkali sacaton 200-350, blue grama 100-200, western wheatgrass 75-150, Nuttall's alkaligrass 50-100, galleta 50-100, saltgrass 50-100, vine mesquite 0-50, buffalograss 0-50

    Sub-dominant: No sub-dominant species that when combined make up roughly 10-40% of the plant composition.

    Other: Shrubs minor component 8.5%. fourwing saltbush 20-100, winterfat 10-50, rabbitbrush 0-30

    Additional: Forbs trace component 1.5%. Nuttall's poverty weed 0-15, twogrooved milkvetch 0-15.

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.

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): 500 lbs./ac. low precipitation years, 1000 lbs./ac. average precipitation years, 1800 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.

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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:** 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.

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