USDA Natural Resources Conservation Service

Ecological site R055DY007SD
Saline Lowland

Last updated: 11/14/2024
Accessed: 05/12/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 055D–Glacial Lake Dakota

MLRA 55D is in South Dakota (92 percent) and southeastern North Dakota (8 percent). It makes up about 3,059 square miles (7,923 square kilometers). This area,
which is part of the glacial till plain region, consists of a large, glacial lake plain that was drained by the James River, which flows southward through the area. The MLRA is dominantly farmland converted from prairie, but some areas of grassland remain. Agricultural drainage practices have impacted shallow depressions in many areas.

MLRA 55D has distinct boundaries. Till plains are on all sides. MLRA 55B borders the area largely to the north and is also between the Lake Dakota Plain and two prominent coteaus—the Missouri Coteau on the west and the Prairie Coteau on the east. To the south is MLRA 55C (Southern Black Glaciated Plains), which has a mesic soil temperature regime.

This area is in the Central Lowland province of the Interior Plains. Elevation ranges from 1,250 to 1,330 feet (380 to 405 meters), generally increasing from south to north. The area is
characterized by mostly level to moderately sloping lake plains with many depressions and drainages. Much of the area has integrated drainage; drainage channels are poorly to moderately defined.

The glaciolacustrine sediments of the Lake Dakota Plain range from sandy to clayey and are commonly stratified. Some areas of the lake plain are mantled with wind-deposited materials, which are moderately coarse textured or sandy. Alluvial deposits and low terraces are common along the James River and its major tributaries but also occur in narrow and discontinuous strips along other streams.

Classification relationships

Major Land Resource Area (MLRA): Southern Black Glaciated Plains (55D) (USDA-NRCS, 2022)

USFS Sub-region: Located mainly within unit 332Bc and 332Ba (Cleland et al., 2007).

Ecological site concept

The Saline Lowland ecological site generally is located on flats and depressions on glaciated uplands, on flood plains, and in drainageways. The soil parent material is very deep; however, some poorly drained soils have a root-restrictive, dense, claypan subsoil. Salt accumulations are common throughout the rooting zone; soil salinity is moderate or higher (E.C. >8). Areas within this site can become nearly barren due to the accumulation of salts at the surface. Typically, the soils in this site are poorly drained or somewhat poorly drained with redoximorphic features within a depth of 30 inches. However, moderately well drained soils (saline seeps) are allowable; foot slopes of coarse-loamy till plains are particularly susceptible to seep formation. Soil salinity is the primary factor used in identifying this site. All textures are included in the site. Slopes range from 0 to 3 percent. On the landscape, this site is below the Loamy Overflow and Thin Claypan ecological sites and above the Shallow Marsh

sites. The Limy Subirrigated and Wet Meadow ecological sites occur on similar landscape positions as this site; but they are non-saline to slightly saline to a depth greater than 20 inches. On sandy lake plains, the Sandy Claypan site may also be associated; it is slightly above the Saline Lowland site.

Associated sites

R055DY001SD	**Shallow Marsh** This site occurs in deep depressions which have frequent ponding through most of the growing season. All textures are included in this site.
R055DY044SD	**Subirrigated Sands** This site occurs on slightly higher, better drained positions on sand plains and outwash plains. It is not highly calcareous in the surface or upper subsoil layers.
R055DY007SD	**Saline Lowland** This site occurs on similar and lower landscape positions. It has an accumulation of salts in the surface and subsoil layer (E.C. >8). A claypan is allowed in Saline Lowland sites if E.C. is >8 and the soil is poorly drained. All textures are included in this site.
R055DY010SD	**Loamy** This site occurs on somewhat higher, better drained positions on till plains and lake plains. The surface and upper subsoil are typically non-calcareous, but slight effervescence is allowed where the depth to strong or violent effervescence is >16 inches. The surface layer and subsoil form a ribbon 1 to 2 inches long. It is >30 inches to redoximorphic features.
R055DY003SD	**Subirrigated** This site occurs on concave flats and in shallow depressions which have occasional, brief ponding early in the growing season. It is >16 inches to a highly calcareous subsoil. All textures are included in this site.
R055DY004SD	**Wet Meadow** This site occurs in depressions and slightly below Limy Subirrigated on flats. It is poorly drained - a seasonal high water table is typically within a depth of 1.5 feet during the months of April through June; in depressions, it is frequently ponded (typically <1.5) in April and May. It typically has redoximorphic features within a depth of 18 inches. Some soils are highly calcareous. It is non-saline to slightly saline (E.C. <8) in the surface and subsoil layers. All textures are included in this site.

Similar sites

R055DY007SD	**Saline Lowland** This site occurs on similar and lower landscape positions. It has an accumulation of salts in the surface and subsoil layer (E.C. >8). A claypan is allowed in Saline Lowland sites if E.C. is >8 and the soil is poorly drained. All textures are included in this site.
R055DY003SD	**Subirrigated** This site occurs on concave flats and in shallow depressions which have occasional, brief ponding early in the growing season. It is >16 inches to a highly calcareous subsoil. All textures are included in this site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Pascopyrum* (2) *Spartina*

Physiographic features

This site typically occurs on flats and shallow depressions on uplands, on flood plains, and in drainageways; it also occurs on some lake shore areas. A few may occur on foot-slope seeps, particularly in areas of coarse-loamy till. As the landforms vary considerably, so do the parent materials.

Table 2. Representative physiographic features

Landforms	(1) Flat (2) Depression (3) Drainageway (4) Lakeshore
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	None to frequent
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	None to frequent
Elevation	930–2,130 ft
Slope	0–2%
Ponding depth	0–12 in
Water table depth	2–20 in
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation of MLRA 55D is 22 to 23 inches (549 to 594 millimeters). About 75 percent of the rainfall comes from high-intensity, convective thunderstorms during the growing season. Winter precipitation is typically snow. The average annual snowfall is 25 to 50 inches (635 to 1,270 millimeters). Strong winds commonly deposit the snow unevenly across the landscape. The average annual temperature is 43 to 45 degrees F (6 to 7 degrees C). The freeze-free period averages about 135 days and ranges from 120 to 150 days.

Table 3. Representative climatic features

Frost-free period (characteristic range)	114-117 days
Freeze-free period (characteristic range)	129-134 days
Precipitation total (characteristic range)	22-23 in
Frost-free period (actual range)	114-119 days
Freeze-free period (actual range)	127-134 days
Precipitation total (actual range)	22-23 in
Frost-free period (average)	116 days
Freeze-free period (average)	131 days
Precipitation total (average)	23 in

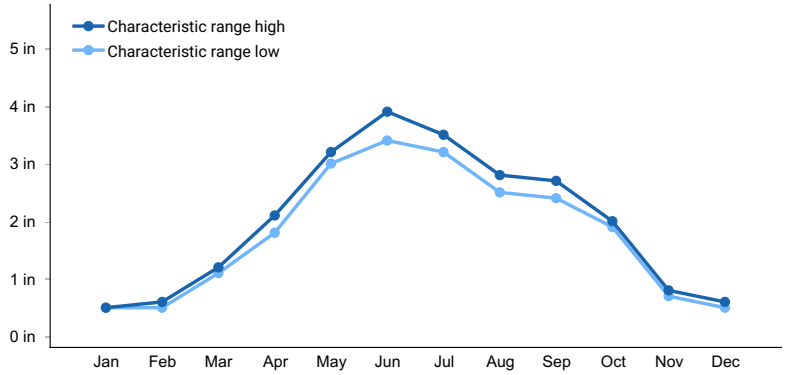


Figure 1. Monthly precipitation range

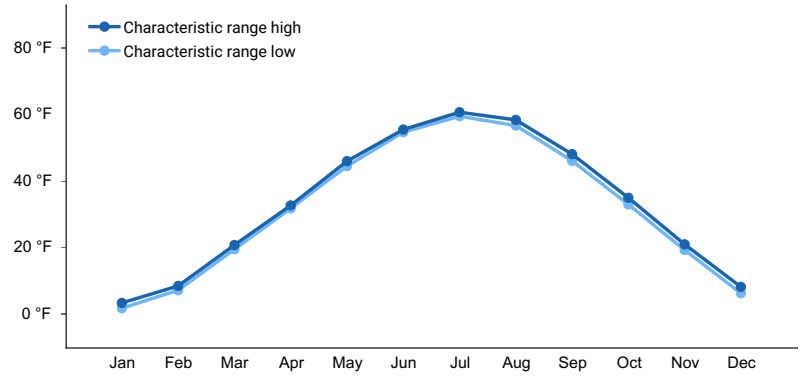


Figure 2. Monthly minimum temperature range

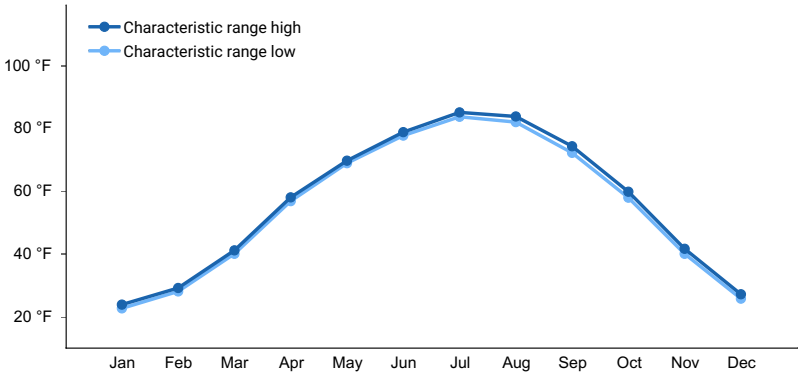


Figure 3. Monthly maximum temperature range

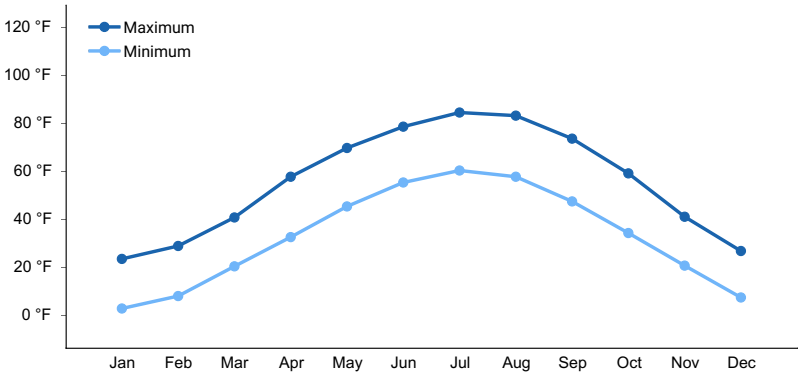


Figure 4. Monthly average minimum and maximum temperature

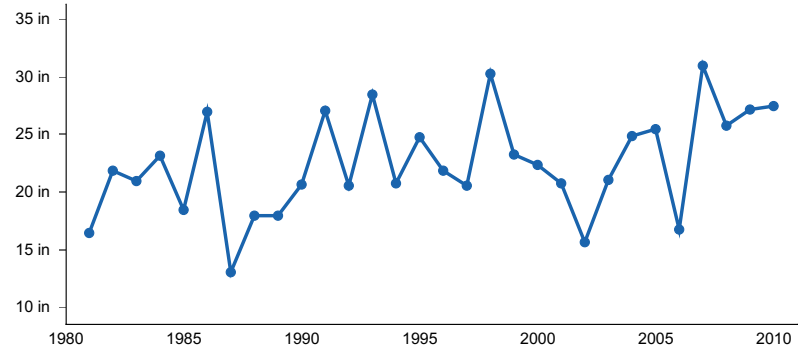


Figure 5. Annual precipitation pattern

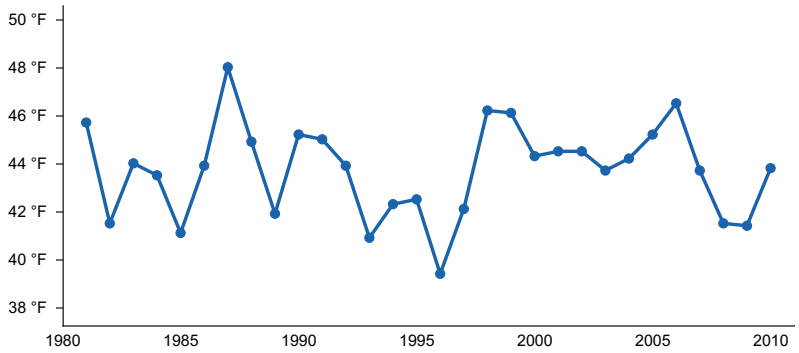


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BRITTON [USC00391049], Britton, SD
- (2) ANDOVER #2 [USC00390120], Andover, SD
- (3) TURTON [USC00398420], Turton, SD
- (4) CONDE [USC00391917], Conde, SD
- (5) REDFIELD [USC00397052], Redfield, SD
- (6) MELLETTE 4 W [USC00395456], Northville, SD
- (7) ABERDEEN [USW00014929], Aberdeen, SD
- (8) COLUMBIA 8 N [USC00391873], Columbia, SD

Influencing water features

This site most commonly occurs as a discharge site with evaporation during the growing season resulting in the accumulation of salts at or near the soil surface. Most areas of this site have endosaturation; however, areas of episaturation also occur. Surface infiltration rates range from very slow to moderately rapid; saturated hydraulic conductivity is moderately low to high. Water loss is through evapotranspiration and percolation below the root zone.

Some areas have wetland functions due to prolonged, near-surface saturation which supports salt-tolerant, hydrophytic vegetation. In other areas, under normal climatic conditions, soil saturation is not shallow enough to support hydrophytic vegetation.

Early in the growing season and after heavy rains, areas of this site on flats may pond as deep as 6 inches while areas in depressions pond as deep as 12 inches. On flood plains, this site has rare to frequent flooding of brief to long duration. Areas on lake shores may be inundated periodically for extended periods.

Wetland description

Not Applicable.

Soil features

Soils associated with Saline Lowland ES are in the Mollisol, Vertisol, and Entisol orders. The Mollisols are further classified as Aeric Calciaquolls, Typic Calciaquolls, Cumulic Endoaquolls, and Typic Natraquolls. The Vertisols are further classified as Typic Calciaquerts and Typic Endoaquerts. The Entisols are further classified as Vertic Fluvaquents. These soils were developed under prairie or wetland vegetation. They typically formed in glaciolacustrine sediments, till, or alluvium. The soils on this site are very deep. The common feature of these soils is the presence of soluble salts within the rooting zone.

Typically, the soils in this site are poorly drained or somewhat poorly drained with redoximorphic features within a depth of 30 inches. However, some moderately well drained soils are included where seeps have developed on foot slopes of uplands (particularly coarse-loamy till). Since soil salinity is the primary factor used in identifying this site; all textures are included. Therefore, soil physical properties associated with texture vary widely. Some poorly drained soils in this site also have a sodic claypan which restricts rooting depth.

Areas within this site can become nearly barren due to the accumulation of salts at the surface. Where vegetation is present, this site should show no evidence of rills, wind-scoured areas, or pedestaled plants. The soil surface is stable and intact. Sub-surface soil layers can be restrictive to water movement and root penetration. Salt accumulation strongly influences the soil/water/plant relationship.

Major soil series correlated to the Saline Lowland site are: Arveson, Bearden, Borup, Colvin, Doran, Easby, Fram, Glyndon, Hamerly, Harriet, Hegne, Holmquist, Lamoure, Lowe, Ludden, Oldham, Playmoor, Ryan, Stirum, and Vallers.

Access Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) for specific local soils information.

Table 4. Representative soil features

Parent material	(1) Till (2) Alluvium (3) Glaciolacustrine deposits (4) Glaciofluvial deposits
Surface texture	(1) Loam (2) Clay loam (3) Silt loam (4) Silty clay loam (5) Silty clay (6) Fine sandy loam
Drainage class	Very poorly drained to somewhat poorly drained
Permeability class	Slow to moderately rapid
Depth to restrictive layer	2–7 in
Soil depth	80 in
Surface fragment cover <=3"	0–4%
Surface fragment cover >3"	0–1%
Available water capacity (0-60in)	3–6 in
Calcium carbonate equivalent (0-40in)	5–32%
Electrical conductivity (0-40in)	5–17 mmhos/cm
Soil reaction (1:1 water) (0-40in)	7.4–8.7
Subsurface fragment volume <=3" (0-40in)	0–4%
Subsurface fragment volume >3" (0-40in)	0%

Ecological dynamics

The site developed under Northern Great Plains climatic conditions, and included natural influence of large herding herbivores and occasional fire. Changes will occur in the plant communities due to weather fluctuations and/or management actions. Under adverse impacts, a relatively rapid decline in vegetative vigor and composition can occur. Under favorable conditions the site has the potential to resemble the Reference State. Interpretations for this site are based primarily on the Wheatgrass/Cordgrass/Alkaligrass Plant Community Phase (1.1). This community phase and the Reference State has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been

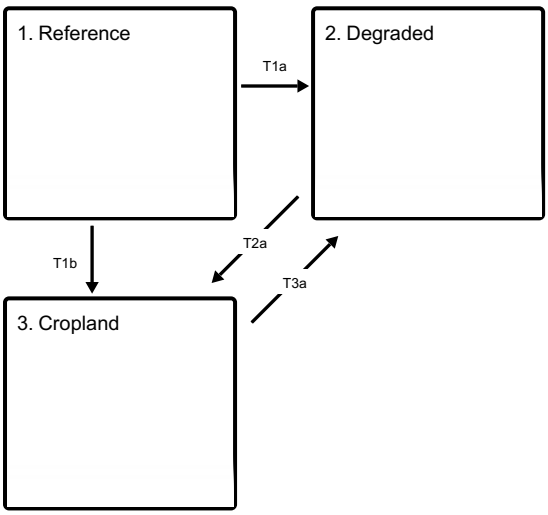
considered. Community phases and pathways, states, transitions, thresholds and restoration pathways have been determined through similar studies and experience.

The natural disturbance regime consisted of occasional fires caused both by natural and Native American ignition sources. Large ungulate grazing was heavy and occurred often, but usually for short durations. Grazing may have been severe when occurring after a fire event, or in areas near water sources. This ecological site has been grazed by domestic livestock since introduced into the area. The introduction of domestic livestock and the use of fencing and reliable water sources have radically changed the disturbance regime of this site. Heavy continuous grazing and/or continuous seasonal (spring) grazing, without adequate recovery periods following each grazing occurrence causes this site to depart from the Reference State. Species such as western wheatgrass and inland saltgrass will initially increase. Alkali cordgrass and Nuttall's alkaligrass will decrease in frequency and production. Heavy continuous grazing causes foxtail barley, inland saltgrass, and unpalatable forbs such as silverweed cinquefoil and dock species to increase and western wheatgrass to decrease. Inland saltgrass can eventually form into a patchy sod and bare ground will typically increase around the sod patches. Increased surface salts are common due to loss of plant cover.

Following the state and transition diagram are narratives for each of the described states and community phases. These may not represent every possibility, but they are the most prevalent and repeatable states/community phases. The plant composition tables shown below have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these community phases and/or states may be revised or removed, and new ones may be added. The main purpose for including the descriptions here is to capture the current knowledge and experience at the time of this revision.

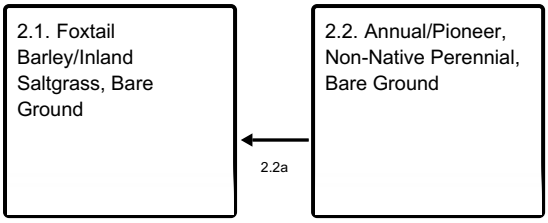
State and transition model

Ecosystem states



State 1 submodel, plant communities

State 2 submodel, plant communities



State 1
Reference

This state represents the natural range of variability that dominates the dynamics of this ecological site. This state is dominated by cool-season grasses, while warm-season grasses are subdominant. Pre-European settlement, the primary disturbance mechanisms for this site in the reference condition included occasional fire and grazing by large herding ungulates. Timing of fires and grazing coupled with weather events dictated the dynamics that occurred within the natural range of variability. Today the primary disturbance is from a lack of fire and concentrated livestock grazing. Grasses that are desirable for livestock and wildlife can decline and a corresponding increase in less desirable grasses will occur.

Dominant plant species

- western wheatgrass (*Pascopyrum smithii*), grass
- Nuttall's alkaligrass (*Puccinellia nuttalliana*), grass
- alkali cordgrass (*Spartina gracilis*), grass
- prairie cordgrass (*Spartina pectinata*), grass
- foxtail barley (*Hordeum jubatum*), grass
- saltgrass (*Distichlis spicata*), grass
- western dock (*Rumex aquaticus*), other herbaceous
- silver cinquefoil (*Potentilla argentea*), other herbaceous
- seepweed (*Suaeda*), other herbaceous
- redwool plantain (*Plantago eriopoda*), other herbaceous

Community 1.1
Wheatgrass/Cordgrass/Alkaligrass

This community evolved with grazing by large herbivores, occasional prairie fires, and periodic flooding events; it 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 potential vegetation is about 95 percent grasses and grass-like plants and 5 percent forbs. The major grasses include western wheatgrass, Nuttall’s alkaligrass, and alkali and prairie cordgrass. Other grasses present include slender wheatgrass, inland saltgrass, and foxtail barley. Salt tolerant forbs such as alkali plantain, western dock, and seepweed are common. Interpretations are based primarily on this plant community phase. This community phase is diverse, stable, productive and well adapted to both saline soils and the Northern Great Plains climatic conditions. Community dynamics, nutrient cycle, water cycle, and energy flow are functioning properly. Litter is properly distributed with very little movement off-site and natural plant mortality is very low. This community is resistant to many disturbances except continuous grazing, tillage, and/or development into urban or other uses. The diversity in plant species allows for both the fluctuation of flooding as well as large seasonal variations.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2765	3686	4585
Forb	35	114	215
Total	**2800**	**3800**	**4800**

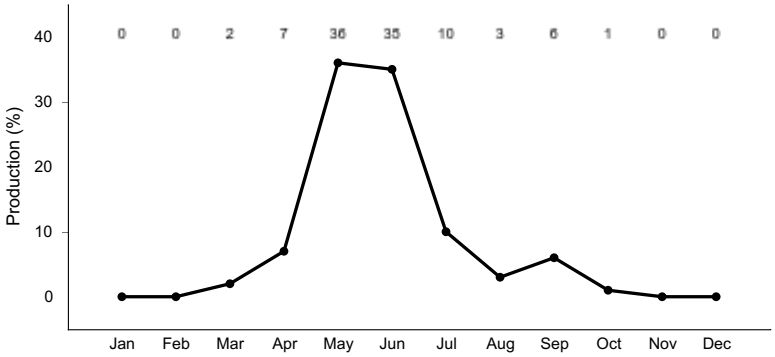


Figure 8. Plant community growth curve (percent production by month). ND5507, Central Black Glaciated Plains, cool-season dominant, warm-season sub-dominant.. Cool-season dominant, warm-season sub-dominant, lowland..

Community 1.2
Wheatgrass/Foxtail Barley/Inland Saltgrass

This community develops with heavy continuous grazing, with lack of adequate recovery periods during the growing season, and/or annual, early spring seasonal grazing. Lack of litter and reduced plant heights result in higher soil temperatures, poor water infiltration rates, high evapotranspiration, and upward percolation of the high water table; the impact is increased salt concentrations on the soil surface. This gives inland saltgrass and other salt tolerant species a competitive advantage over less tolerant species. Nuttall's alkaligrass, slender wheatgrass, prairie cordgrass, and alkali cordgrass have decreased while western wheatgrass and inland saltgrass will initially increase in composition. Mat muhly, foxtail barley, silverleaf cinquefoil, dock and plantain will also increase in composition. As long as the herbaceous component remains intact, the plant community tends to be resilient. However, species composition can be further altered through long-term, heavy continuous grazing. With loss of Nuttall alkaligrass, cordgrasses, slender wheatgrass, and much of the western wheatgrass, inland saltgrass will eventually become the dominant species. This plant community is relatively stable and well adapted to increased salinity. Plant vigor, litter, plant density and production have decreased. The biological integrity and the water and nutrient cycles of this plant community are becoming impaired.

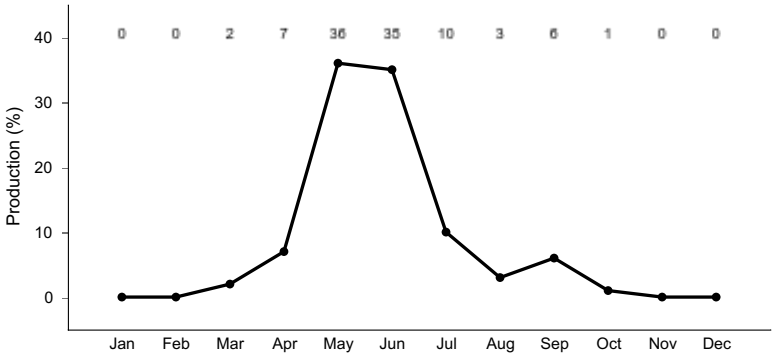


Figure 9. Plant community growth curve (percent production by month). ND5507, Central Black Glaciated Plains, cool-season dominant, warm-season sub-dominant.. Cool-season dominant, warm-season sub-dominant, lowland..

Community 1.3
Wheatgrass/Alkaligrass

This plant community occurs when grazing is removed for long periods of time (rest) in the absence of fire. Plant composition is similar to community phase 1.1; however individual species production and frequency will be lower. Much of the nutrients are tied up in excessive litter. The nutrient cycle is slowed due to standing dead plant residues not in contact with a moist soil surface. Aboveground litter also limits sunlight from reaching plant crowns. Tall warm-season grasses (cordgrasses) die off or are reduced in density and vigor and typically develop into small but dense colonies. Thick litter and absence of grazing animals (animal impact) or fire reduces seed germination and establishment. This plant community develops after an extended period of 10 or more years of non-use by herbivores and exclusion of fire. This plant community is resistant to change without prescribed grazing or fire. The

combination of both grazing and fire is most effective in moving this plant community towards the Wheatgrass/Cordgrass/Alkaligrass Plant Community Phase (1.1). Soil erosion is low and runoff is virtually unchanged.

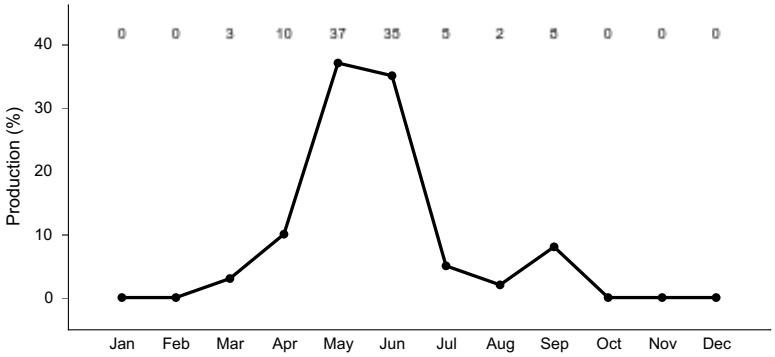


Figure 10. Plant community growth curve (percent production by month). ND5506, Central Black Glaciated Plains, lowland cool-season dominant.. Cool-season dominant, lowland..

Pathway 1.1a
Community 1.1 to 1.2

Heavy continuous grazing (stocking rates well above capacity for extended portions of the growing season without adequate recovery) or heavy seasonal grazing (stocking rates well above capacity for a portion of the growing season, but at the same time of year every year and without adequate recovery) will shift the plant community phase to more grazing tolerant species. In pre-European times, this transition would have occurred following multiple disturbances such as extended periods of below average precipitation followed by heavy concentrations of large ungulate herbivory.

Pathway 1.1b
Community 1.1 to 1.3

Extended periods of non-use and no fire will tend to favor the cool-season grasses, and the warm-season grasses will decline.

Pathway 1.2a
Community 1.2 to 1.1

Prescribed grazing with adequate recovery between grazing events will allow the cordgrasses and Nuttall’s alkaligrass to increase in vigor and production. In pre-European times, this would have occurred where light to moderate disturbances from large ungulates occurred sporadically.

Pathway 1.3a
Community 1.3 to 1.1

Prescribed grazing (stocking levels which match the animals to the forage resource and allow adequate recovery periods between grazing events) coupled with prescribed burning (typically spring burning, but fall burning may also be effective) is the most effective method of effecting this shift.

State 2
Degraded

This State is characterized by the dominance of the shorter-statured, more saline tolerant species such as foxtail barley and inland saltgrass, the increase in bare ground, and the increased presence of salt accumulations on the soil surface. Infiltration is reduced, which allows the moisture and the salts carried by the moisture to be wicked up to the soil surface. The short-statured and shallow rooted species are more capable of withstanding the higher concentrations of salts in the soil surface. As the disturbance level increases, plant density decreases even more, giving way to annual species and invasive perennial species, as well as a further increase in bare ground.

Dominant plant species

- foxtail barley (*Hordeum jubatum*), grass
- saltgrass (*Distichlis spicata*), grass
- Nuttall's alkaligrass (*Puccinellia nuttalliana*), grass
- western wheatgrass (*Pascopyrum smithii*), grass
- seepweed (*Suaeda*), other herbaceous
- curly dock (*Rumex crispus*), other herbaceous
- burningbush (*Bassia scoparia*), other herbaceous

Community 2.1
Foxtail Barley/Inland Saltgrass, Bare Ground

This plant community developed with heavy continuous season-long grazing where adequate recovery periods between grazing events were not allowed. Patches of inland saltgrass sod are typical and foxtail barley is well distributed throughout the community. Nuttall’s alkaligrass and western wheatgrass have been greatly reduced and may persist in remnant amounts, reduced in vigor. Bare ground may develop in micro lows where salt concentrations are highest. A white salt crust is common on the surface. Only a few very salt tolerant annuals, such as glasswort and seepweed, can survive. This plant community is resistant to change due to the grazing tolerance of inland saltgrass and increased surface salts. A significant amount of production and diversity has been lost when compared to the Wheatgrass/Cordgrass/Alkaligrass Plant Community Phase (1.1). Loss of key cool-season grasses and increased bare ground has negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the shallow rooting depth of inland saltgrass, and increased bare ground.

Community 2.2
Annual/Pioneer, Non-Native Perennial, Bare Ground

This plant community develops under severe disturbance and/or excessive defoliation. This can result from heavy livestock or wildlife concentration, and cropping abandonment (go-back land). The dominant vegetation includes pioneer annual grasses, forbs, invaders, and early successional biennial and perennial species. Grasses may include foxtail barley, which will dominate along with fowl bluegrass, Nuttall’s alkaligrass, annual brome and western wheatgrass. The dominant forbs include curly dock, burningbush (kochia), and other early successional salt tolerant species. Plant species from adjacent ecological sites may become minor components of this plant community. The community is susceptible to invasion of non-native species due to severe soil disturbances and relatively high percent of bare ground. This plant community is resistant to change, as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession. Soil erosion is potentially high in this plant community. Reduced surface cover, low plant density, low plant vigor, loss of root biomass, and soil compaction, all contribute to decreased water infiltration, increased runoff, and accelerated erosion rates. Significant economic inputs, management and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new plant community. Due to the highly variable nature of the plant community that may exist, no growth curve has been assigned.

Pathway 2.2a
Community 2.2 to 2.1

This community pathway occurs with the passage of time as successional processes take place and native plant species gradually begin to establish on the site again.

State 3
Cropland

This state is the result of annual cropping

Transition T1a

State 1 to 2

This transition is a result of heavy, continuous season-long grazing (stocking levels well above recommended rates, for the entire growing season). Grazing pressure and physical impacts of livestock on the soil surface alter the plant community. The less grazing tolerant/more palatable plant species are reduced while the grazing tolerant species increase. Physical impacts result in increased bare ground which increases surface salinity and further enhances the salt tolerant species. The physical impacts (i.e., compaction) are greater when the soil surface is wet from short-term flooding or ponding events.

Transition T1b
State 1 to 3

This transition occurs with cessation of cropping practices being applied.

Transition T2a
State 2 to 3

This transition occurs with cessation of cropping practices being applied.

Transition T3a
State 3 to 2

Cropland abandonment. Attempts to crop these areas often fail, resulting in bare ground and weedy species such as kochia.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			570–1140	
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	190–1140	–
	western wheatgrass	PASM	*Pascopyrum smithii*	190–1140	–
2	**Cordgrass**			570–1140	
	alkali cordgrass	SPGR	*Spartina gracilis*	190–1140	–
	prairie cordgrass	SPPE	*Spartina pectinata*	190–1140	–
3	**Cool-season Grasses**			380–760	
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	380–760	–
	plains bluegrass	POAR3	*Poa arida*	38–304	–
	Grass, perennial	2GP	*Grass, perennial*	0–190	–
	foxtail barley	HOJU	*Hordeum jubatum*	38–190	–
4	**Warm-season Grasses**			38–380	
	saltgrass	DISP	*Distichlis spicata*	38–304	–
	Grass, perennial	2GP	*Grass, perennial*	0–190	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	38–114	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–114	–
5	**Grass-likes**			38–190	
	sedge	CAREX	*Carex*	38–190	–
	mountain rush	JUARL	*Juncus arcticus ssp. littoralis*	0–114	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–114	–
Forb					
6	**Forbs**			38–190	
	Forb, native	2FN	*Forb, native*	0–76	–
	redwool plantain	PLER	*Plantago eriopoda*	0–76	–
	silver cinquefoil	POAR8	*Potentilla argentea*	38–76	–
	western dock	RUAQ	*Rumex aquaticus*	0–76	–
	seepweed	SUAED	*Suaeda*	38–76	–
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	0–76	–
	white prairie aster	SYFA	*Symphyotrichum falcatum*	0–38	–
	marsh arrowgrass	TRPA28	*Triglochin palustris*	0–38	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–38	–
	povertyweed	IVAX	*Iva axillaris*	0–38	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–38	–
	silverscale saltbush	ATAR2	*Atriplex argentea*	0–38	–

Inventory data references

Information presented here has been derived from NRCS and other federal/state agency clipping and inventory data. Also, field knowledge of range-trained personnel was used. Many of the site concepts for this MLRA are borrowed from neighboring MLRA 55B. Developed by Stan Boltz, NRCS Range Management Specialist; David Dewald, NRCS State Biologist; Jody Forman, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Shawn Dekeyser, North Dakota State University; Rob Self, The Nature Conservancy and Lee Voigt, NRCS Range Management Specialist.

MLRA 55D was split from MLRA 55B in 2022. Many of the site concepts for this MLRA are borrowed from neighboring MLRA 55B pending further vegetation and soils validation. Many of the site concepts for this MLRA are borrowed from neighboring MLRA 55B.

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Approval

Suzanne Mayne-Kinney, 11/14/2024

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	11/14/2024
Approved by	Suzanne Mayne-Kinney

Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

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

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

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

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

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

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

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

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

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

    Dominant:

    Sub-dominant:

Other:

Additional:

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

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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17. **Perennial plant reproductive capability:**
