USDA Natural Resources Conservation Service

Ecological site R054XY024ND
Saline Lowland

Accessed: 05/18/2024

General information

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

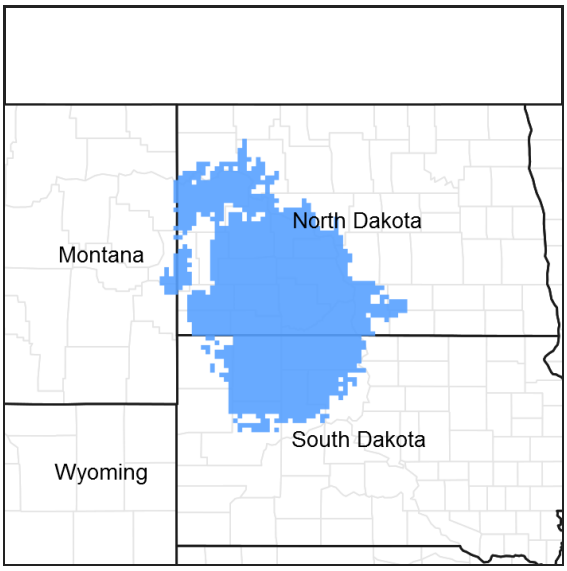


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Classification relationships

Level IV Ecoregions of the Conterminous United States: 43a – Missouri Plateau.

Associated sites

R054XY021ND	**Claypan**
R054XY032ND	**Subirrigated**
R054XY033ND	**Thin Claypan**
R054XY036ND	**Shallow Marsh**
R054XY037ND	**Wet Meadow**

Similar sites

R054XY022ND	**Closed Depression** [Poorly drained clayey soils with sodic subsoils and with noticeable redoximorphic features within depressions. Ponds periodically with no apparent water table. Indicator species: dominated by western wheatgrass with alkaligrass and foxtail barley intermixed, forb indicator is western dock, no shrubs. This site has more western wheatgrass, more dock and smartweed, slightly higher production, no water table, and a sodic restrictive layer.]

R054XY037ND	**Wet Meadow** [Poorly drained soils found adjacent to streams or in depressions, with water table at the surface or within 1.5 feet from the surface with no evidence of salts, noticeable redoximorphic features within 6 inches or just below the organic soil layer. Found upslope from wetlands and downslope of subirrigated or overflow sites; can be located within the listed associated sites. Indicator species are prairie cordgrass, northern reedgrass and no shrub. This site has more production, far less western wheatgrass and far more prairie cordgrass, and a water table without a restrictive sodic layer or evidence of salts within the soil profile.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Pascopyrum smithii*

Physiographic features

This site occurs on gently undulating to rolling sedimentary uplands.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Drainageway
Flooding duration	Very brief (4 to 48 hours) to long (7 to 30 days)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	488–1,097 m
Slope	0–2%
Ponding depth	0 cm
Water table depth	0–91 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 54 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 18 inches per year. The normal average annual temperature is about 42° F. January is the coldest month with average temperatures ranging from about 13° F (Beach, ND) to about 16° F (Bison, SD). July is the warmest month with temperatures averaging from about 69° F (Beach, ND) to about 72° F (Timber Lake, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 57° F. This large annual range attests to the continental nature of this MLRA's climate. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

Table 3. Representative climatic features

Frost-free period (average)	136 days

Freeze-free period (average)	157 days
Precipitation total (average)	457 mm

Influencing water features

DA6
(Rosgen System)

Soil features

The common features of soils of this site are the sandy loam to clay-textured subsoils and slopes of 0 to 2 percent. The soils in this site are poorly drained and formed in calcareous alluvium. The silt loam to very fine sandy loam surface layer is 1 to 5 inches thick. Salinity is moderate to strong. Rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present in association with bunchgrasses such as Nuttall's alkaligrass and slender wheatgrass. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are common. Cryptogamic crusts occasionally occur on the soil surface. Typically, the interpretive plant community will have good cover of perennial grasses and limited areas of bare ground and infrequent salt crusts.

These soils are susceptible to wind and water erosion. The hazard of water erosion increases on areas that are denuded of vegetation. Stream channels are intact with occasional water pockets scattered throughout. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:
North Dakota http://www.nd.nrcs.usda.gov/
South Dakota http://www.sd.nrcs.usda.gov/
Montana http://www.mt.nrcs.usda.gov/

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Very fine sandy loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Very slow to slow
Soil depth	10–183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	2.54–7.62 cm
Calcium carbonate equivalent (0-101.6cm)	1–15%
Electrical conductivity (0-101.6cm)	4–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	2–25
Soil reaction (1:1 water) (0-101.6cm)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	0–20%

Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered quite fragile. Under continued adverse impacts, a rapid decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can slowly return to the Reference Plant Community.

The plant community upon which interpretations are primarily based is the Reference Plant Community. The Reference Plant Community 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. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

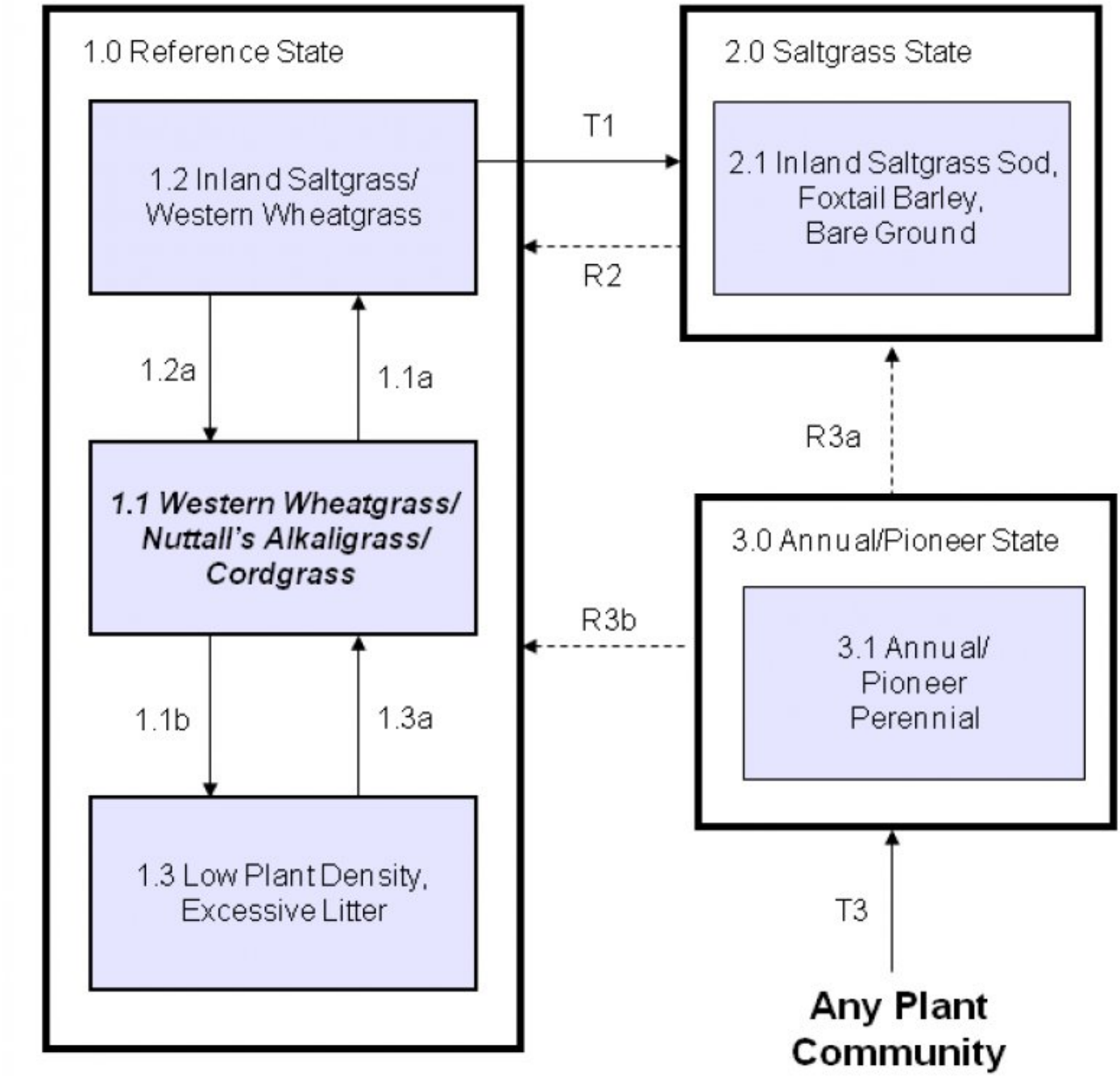
Continuous grazing without adequate recovery periods following each grazing occurrence causes this site to depart from the Reference Plant Community. Species such as western wheatgrass and inland saltgrass will initially increase. Alkali cordgrass and Nuttall’s alkaligrass will decrease in frequency and production. Heavy continuous grazing causes foxtail barley, inland saltgrass, mat muhly 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.

Excessive rest or non-use and lack of fire will result in a plant community having high litter levels with low plant density with an increase in Nuttall’s alkaligrass.

Due to a general invasion of exotic species (such as Kentucky bluegrass and smooth bromegrass) across the MLRA within this site, returning to the 1.1 Western Wheatgrass/Nuttall's Alkaligrass/Cordgrass Plant Community Phase may not be possible. Today, the 1.2 Inland Saltgrass/Western Wheatgrass Plant Community Phase most resembles the 1.1 Reference Plant Community Phase in appearance and function.

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



State 1
Reference

The State narrative is under development.

Community 1.1
Western Wheatgrass/Nuttall's Alkaligrass/Cordgrass

This is the interpretive plant community and is considered to be 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 potential vegetation is about 90% grasses and grass-like plants, 5% forbs and 5% shrubs. 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. The shrub that may occur on this site is Nuttall’s saltbush.

This plant community 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 variations in climate.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2141	2606	3071
Shrub/Vine	22	84	146
Forb	78	112	146
Total	**2241**	**2802**	**3363**

Figure 5. Plant community growth curve (percent production by month). ND5401, Missouri Slope, Native Grasslands, Cool-season Dominant. Cool-season, mid-grass dominant.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	8	24	45	10	3	5	2	0	0

Community 1.2
Inland Saltgrass/Western Wheatgrass

This community develops with short-term heavy use, longer term 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 increased percolation of the high water table, which increases salt concentrations on the surface. This gives inland saltgrass and other salt tolerant species a competitive advantage over less tolerant species. Nuttall’s alkaligrass, slender wheatgrass, 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 becomes 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, water and nutrient cycles of this plant community are becoming impaired.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1345	1836	2331
Forb	95	141	185
Shrub/Vine	17	40	62
Total	**1457**	**2017**	**2578**

Figure 7. Plant community growth curve (percent production by month). ND5404, Missouri Slope, Warm-season Dominant, Cool-season Subdominant. Short warm-season dominant, mid cool-season subdominant & club moss..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	5	20	38	25	8	3	0	0	0

Community 1.3
Low Plant Density, Excessive Litter

This plant community occurs when grazing is removed for long periods of time (rest) in the absence of fire. Plant composition is similar to the Reference Plant Community, however individual species production and frequency will be lower. Much of the nutrients are tied up in excessive litter. Standing dead plant residues that are not in contact with a moist soil surface results in a slow nutrient recycling process. Aboveground litter also limits sunlight from reaching plant crowns. Tall warm-season grasses (cordgrasses) die off or reduce 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 Reference Plant Community. Soil erosion is low. Runoff is similar to the Reference Plant Community. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in diversity.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1670	1894	2208
Forb	219	280	364
Shrub/Vine	17	67	118
Total	**1906**	**2241**	**2690**

Figure 9. Plant community growth curve (percent production by month). ND5406, Missouri Slope, Introduced Cool-season Grasses. Introduced cool-season grasses.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	35	35	5	2	8	2	0	0

Pathway 1.1a
Community 1.1 to 1.2

Heavy, continuous grazing or continuous seasonal (i.e. spring) grazing will convert the plant community to the Inland Saltgrass/Western Wheatgrass Plant Community.

Pathway 1.1b
Community 1.1 to 1.3

Non-use and no fire will move this plant community to the Low Plant Density, Excessive Litter Plant Community.

Pathway 1.2a
Community 1.2 to 1.1

Prescribed grazing that includes changing season of use and allowing adequate recovery periods following each grazing event and proper stocking will shift this plant community back to the Western Wheatgrass/Nuttall's Alkaligrass/Cordgrass Plant Community.

Conservation practices

Prescribed Grazing

Pathway 1.3a
Community 1.3 to 1.1

Prescribed grazing or prescribed burning followed by prescribed grazing, will move this plant community toward the

Western Wheatgrass/Nuttall's Alkaligrass/Cordgrass. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.

Conservation practices

Prescribed Burning
Prescribed Grazing

State 2
Saltgrass

The State narrative is under development.

Community 2.1
Inland Saltgrass Sod, Foxtail Barley, Bare Ground

This plant community developed with heavy continuous 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 Reference Plant Community. 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 massive shallow root system "root pan", characteristic of inland saltgrass, and increased bare ground. It will take a long time to bring this plant community back to the Reference Plant Community with management alone. Renovation (mechanical and/or chemical inputs) is not recommended due to high salt content of the soil and saltgrass persistence.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	953	1133	1423
Forb	56	93	129
Shrub/Vine	–	7	17
Total	**1009**	**1233**	**1569**

Figure 11. Plant community growth curve (percent production by month). ND5405, Missouri Slope, Warm-season Short Grass. Warm-season, short grass dominant, and some sedge.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	7	18	33	26	10	4	1	0	0

State 3
Annual/Pioneer

The State narrative is under development.

Community 3.1
Annual/Pioneer Perennial Plant Community

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, 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 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.

Transition T1
State 1 to 2

Heavy continuous grazing without adequate recovery opportunity between grazing events or continuous seasonal (i.e. spring) grazing will move this plant community across an ecological threshold to the Inland Saltgrass Sod, Foxtail Barley, Bare Ground Plant Community.

Restoration pathway R2
State 2 to 1

Long-term prescribed grazing with adequate recovery periods between grazing events and proper stocking will shift this plant community toward the Inland Saltgrass/Western Wheatgrass Plant Community, and eventually to the Reference Plant Community or associated successional plant community stages assuming an adequate seed/vegetative source is available. This transition may take up to 40 years or more to accomplish depending on the degree of degradation.

Conservation practices

Prescribed Grazing

Transition T3
State 2 to 3

Excessive defoliation (i.e., areas of heavy animal concentration,) or cropped go-back land with continuous grazing will convert the plant community to the Annual/Pioneer Perennial Plant Community.

Restoration pathway R3b
State 3 to 1

Under long-term prescribed grazing and/or removal of disturbance, including adequate rest periods, this plant community will move through the successional stages, and may eventually lead to a plant community resembling the Western Wheatgrass/Nuttall’s Alkaligrass/Cordgrass Plant Community. This process will take a long period of time (25+ years). Range seeding into mulch followed with prescribed grazing can be used to convert this plant community to one that may resemble the Reference Plant Community.

Conservation practices

Prescribed Grazing

Restoration pathway R3a
State 3 to 2

Heavy, continuous grazing will result in a shift towards the Inland Saltgrass Sod, Foxtail Barley, Bare Ground Plant Community.

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			701–981	
	western wheatgrass	PASM	*Pascopyrum smithii*	701–981	–
2	**Alkaligrass**			280–420	
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	280–420	–
3	**Cordgrass**			280–420	
	cordgrass	SPART	*Spartina*	280–420	–
4	**Other Native Perennial**			420–560	
	saltgrass	DISP	*Distichlis spicata*	196–280	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	84–140	–
	Grass, perennial	2GP	*Grass, perennial*	28–140	–
	plains bluegrass	POAR3	*Poa arida*	56–84	–
	fowl bluegrass	POPA2	*Poa palustris*	28–56	–
	little bluestem	SCSC	*Schizachyrium scoparium*	0–56	–
	foxtail barley	HOJU	*Hordeum jubatum*	28–56	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	28–56	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	28–56	–
6	**Grass-Likes**			84–140	
	sedge	CAREX	*Carex*	84–140	–
	rush	JUNCU	*Juncus*	56–84	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	56–84	–
Forb					
7	**Forbs**			84–140	
	western dock	RUAQ	*Rumex aquaticus*	56–84	–
	silver cinquefoil	POAR8	*Potentilla argentea*	28–56	–
	Forb, perennial	2FP	*Forb, perennial*	28–56	–
	povertyweed	IVAX	*Iva axillaris*	0–28	–
	redwool plantain	PLER	*Plantago eriopoda*	28	–
	little hogweed	POOL	*Portulaca oleracea*	0–28	–
	seepweed	SUAED	*Suaeda*	0–28	–
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	0–28	–
Shrub/Vine					
8	**Shrubs**			28–140	
	Nuttall's saltbush	ATNU2	*Atriplex nuttallii*	0–112	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	28–56	–

Table 10. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)

Grass/Grasslike					
1	**Wheatgrass**			706–908	
	western wheatgrass	PASM	*Pascopyrum smithii*	706–908	–
2	**Alkaligrass**			40–101	
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	40–101	–
3	**Cordgrass**			0–20	
	cordgrass	SPART	*Spartina*	0–20	–
4	**Other Native Perennial**			404–504	
	saltgrass	DISP	*Distichlis spicata*	303–404	–
	foxtail barley	HOJU	*Hordeum jubatum*	101–202	–
	fowl bluegrass	POPA2	*Poa palustris*	101–202	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	61–101	–
	plains bluegrass	POAR3	*Poa arida*	40–61	–
	Grass, perennial	2GP	*Grass, perennial*	20–61	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–20	–
5	**Non-Native Grasses**			20–40	
	Kentucky bluegrass	POPR	*Poa pratensis*	20–40	–
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0–20	–
6	**Grass-Likes**			101–202	
	rush	JUNCU	*Juncus*	61–101	–
	sedge	CAREX	*Carex*	40–61	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	20–40	–
Forb					
7	**Forbs**			101–182	
	curly dock	RUCR	*Rumex crispus*	81–161	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–101	–
	povertyweed	IVAX	*Iva axillaris*	40–61	–
	seepweed	SUAED	*Suaeda*	0–61	–
	cocklebur	XANTH2	*Xanthium*	0–40	–
	slender cinquefoil	POGRF2	*Potentilla gracilis var. fastigiata*	20–40	–
	little hogweed	POOL	*Portulaca oleracea*	0–40	–
	western dock	RUAQ	*Rumex aquaticus*	20–40	–
	pepperweed	LEPID	*Lepidium*	20–40	–
	lambsquarters	CHAL7	*Chenopodium album*	20–40	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–40	–
	Forb, perennial	2FP	*Forb, perennial*	0–20	–
	redwool plantain	PLER	*Plantago eriopoda*	0–20	–
	silver cinquefoil	POAR8	*Potentilla argentea*	0–20	–
Shrub/Vine					
8	**Shrubs**			20–61	
	Nuttall's saltbush	ATNU2	*Atriplex nuttallii*	20–40	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–20	–

Table 11. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			336–448	
	western wheatgrass	PASM	*Pascopyrum smithii*	336–448	–
2	**Alkaligrass**			112–224	
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	112–224	–
3	**Cordgrass**			112–224	
	cordgrass	SPART	*Spartina*	112–224	–
4	**Other Native Perennial**			448–560	
	foxtail barley	HOJU	*Hordeum jubatum*	112–224	–
	plains bluegrass	POAR3	*Poa arida*	112–224	–
	fowl bluegrass	POPA2	*Poa palustris*	112–224	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	67–135	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	45–112	–
	Grass, perennial	2GP	*Grass, perennial*	45–112	–
	saltgrass	DISP	*Distichlis spicata*	45–112	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	22–45	–
	little bluestem	SCSC	*Schizachyrium scoparium*	0–22	–
5	**Non-Native Grasses**			112–224	
	Kentucky bluegrass	POPR	*Poa pratensis*	112–224	–
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0–45	–
6	**Grass-Likes**			67–112	
	sedge	CAREX	*Carex*	45–90	–
	rush	JUNCU	*Juncus*	22–45	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	22–45	–
Forb					
7	**Forbs**			224–336	
	curly dock	RUCR	*Rumex crispus*	112–224	–
	silver cinquefoil	POAR8	*Potentilla argentea*	67–90	–
	western dock	RUAQ	*Rumex aquaticus*	67–90	–
	slender cinquefoil	POGRF2	*Potentilla gracilis var. fastigiata*	45–67	–
	lambsquarters	CHAL7	*Chenopodium album*	45–67	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	22–45	–
	Forb, perennial	2FP	*Forb, perennial*	22–45	–
	little hogweed	POOL	*Portulaca oleracea*	0–45	–
	pepperweed	LEPID	*Lepidium*	22–45	–
	seepweed	SUAED	*Suaeda*	0–45	–
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	0–45	–
	cocklebur	XANTH2	*Xanthium*	0–45	–
	redwool plantain	PLER	*Plantago eriopoda*	22	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–22	

	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–22	–
	povertyweed	IVAX	*Iva axillaris*	22	–
Shrub/Vine					
8	**Shrubs**			22–112	
	Nuttall's saltbush	ATNU2	*Atriplex nuttallii*	22–90	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	22–45	–

Table 12. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			62–123	
	western wheatgrass	PASM	*Pascopyrum smithii*	62–123	–
2	**Alkaligrass**			25–62	
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	25–62	–
4	**Other Native Perennial**			740–863	
	saltgrass	DISP	*Distichlis spicata*	370–616	–
	foxtail barley	HOJU	*Hordeum jubatum*	370–616	–
	fowl bluegrass	POPA2	*Poa palustris*	25–62	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	12–25	–
	plains bluegrass	POAR3	*Poa arida*	0–12	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–12	–
	Grass, perennial	2GP	*Grass, perennial*	0–12	–
6	**Grass-Likes**			25–49	
	rush	JUNCU	*Juncus*	25–49	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–25	–
	sedge	CAREX	*Carex*	0–12	–
Forb					
7	**Forbs**			62–123	
	curly dock	RUCR	*Rumex crispus*	0–62	–
	lambsquarters	CHAL7	*Chenopodium album*	25–62	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–62	–
	povertyweed	IVAX	*Iva axillaris*	25–62	–
	pepperweed	LEPID	*Lepidium*	25–62	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–62	–
	seepweed	SUAED	*Suaeda*	12–49	–
	little hogweed	POOL	*Portulaca oleracea*	25–37	–
	silver cinquefoil	POAR8	*Potentilla argentea*	25–37	–
	slender cinquefoil	POGRF2	*Potentilla gracilis var. fastigiata*	12–25	–
	western dock	RUAQ	*Rumex aquaticus*	12–25	–
	cocklebur	XANTH2	*Xanthium*	0–25	–
	Forb, perennial	2FP	*Forb, perennial*	0–12	–
	redwool plantain	PLER	*Plantago eriopoda*	0–12	–
Shrub/Vine					
8	**Shrubs**			0–12	
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–12	–
	Nuttall's saltbush	ATNU2	*Atriplex nuttallii*	0–12	–

Hydrological functions

Available water is the principal factor limiting forage production on this site. Inherent soil salinity indirectly influences the availability of water to plants growing on the site. This site is dominated by soils in hydrologic group D with

localized areas in hydrologic groups B or C. Infiltration varies from moderately slow to slow and runoff potential varies from medium to high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff.

Recreational uses

This site offers open space and opportunity for intermittent viewing and/or hunting of a few wildlife species.

Wood products

No appreciable wood products are present on the site.

Other products

Seed harvest of native plant species can provide additional income on this site.

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field tested by various private, state and federal agency specialist.
Those involved in developing this site description include: Dennis Froemke, NRCS Range Management Specialist; Dean Chamrad, NRCS State Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; L. Michael Stirling, NRCS Range Management Specialist; Stan Boltz, NRCS Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; Michael D. Brand, State Land Dept. Director Surface Management; David Dewald, NRCS State Biologist; and Brad Podoll, NRCS Biologist.

Data Source Number of Records Sample Period State County
SCS-RANGE-417 0
Ocular estimates 4 1993 – 2001 ND Dunn, Morton

Other references

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Contributors

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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.

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Date	05/12/2011
Approved by	Jeff Printz
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills should not be present.

2. **Presence of water flow patterns:** Not observable.

3. **Number and height of erosional pedestals or terracettes:** Essentially non-existent.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is less than 5%.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present. Existing gullies should be “healed” with a good vegetative cover.

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

7. **Amount of litter movement (describe size and distance expected to travel):** Little to no litter movement. Plant litter remains in place and is not moved by erosional forces.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Plant cover and litter is at 95% or greater of soil surface and maintains soil surface integrity. Stability class anticipated to be 3 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Use soil series description for depth, color and structure of A-horizon.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** High grass canopy and basal cover and small gaps between plants should

reduce raindrop impact and slow overland flow, providing increased time for infiltration to occur. Healthy, deep rooted native grasses enhance infiltration and reduce runoff.

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer or soil surface crusting should be evident.

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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: Mid, cool-season rhizomatous grasses >

    Sub-dominant: tall, rhizomatous warm-season grasses = cool-season bunchgrasses >

    Other: short, rhizomatous warm-season > grass-likes = forbs = shrubs

    Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth bromegrass do not fit into reference plant community F/S groups.

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

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14. **Average percent litter cover (%) and depth (in):** Litter cover is in contact with soil surface.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Representative value = 2500 lbs/ac with a range of 2000 lbs/ac to 3000 lbs/ac (air dry weight) depending upon growing conditions

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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:** State and local noxious, smooth bromegrass, Kentucky bluegrass, Russian olive

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17. **Perennial plant reproductive capability:** All species are capable of reproducing.
