USDA Natural Resources Conservation Service

Ecological site R065XY023NE
Wet Subirrigated

Accessed: 05/01/2024

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.

MLRA notes

Major Land Resource Area (MLRA): 065X–Nebraska Sand Hills

This PROVISIONAL ECOLOGICAL SITE has been developed to meet the standards established in the National Ecological Site Handbook. The information associated with this ecological site does not meet the Approved Ecological Site Description Standard, but it has been through a Quality Control and Quality Assurance processes to assure consistency and completeness. Further investigations, reviews and correlations are necessary before it becomes an Approved Ecological Site Description.

Classification relationships

Major Land Resource Area (MLRA): Major Land Resource Area (MLRA) and Land Resource Unit (LRU) (USDA-Natural Resources Conservation Service, 2006)

Revision Notes:
A PROVISIONAL ECOLOGICAL SITE is a conceptual grouping of soil map unit components within a Major Land Resource Area (MLRA) based on the similarities in response to management. Although there may be wide variability in the productivity of the soils grouped into a Provisional Site, the soil vegetation interactions as expressed in the State and Transition Model are similar and the management actions required to achieve objectives, whether maintaining the existing ecological state or managing for an alternative state, are similar. Provisional Sites are likely to be refined into more precise group during the process of meeting the APPROVED ECOLOGICAL SITE

DESCRIPTION criteria.

Ecological site concept

The wet subirrigated site is found on interdunes and stream valleys. The slope is less than 0 to 1%. The water table is seasonally high under these sites, with a 6 to 18 inch depth to rusty spots and iron stains in the soil or saturation.

Associated sites

R065XY011NE	**Sandy Low P.Z .14-17** Sandy 14-17" P.Z.
R065XY012NE	**Sands Low P.Z.14-17** Sands 14-17" P.Z.
R065XY022NE	**Wet Land** Wetland
R065XY024NE	**Subirrigated** Subirrigated
R065XY032NE	**Sandy Medium P.Z. 17-22** Sandy 17-22" P.Z.
R065XY033NE	**Sands Medium P.Z. 17-22** Sands 17-22" P.Z.
R065XY054NE	**Sandy High P.Z. 22-25** Sandy 22-25" P.Z.
R065XY055NE	**Sands High P.Z. 22-25** Sands 22-25" P.Z.

Similar sites

R065XY024NE	**Subirrigated** Subirrigated (more big bluestem; little bluestem present; less prairie cordgrass; bluejoint reedgrass common; slightly less productive)

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Andropogon gerardii*

Physiographic features

This area consists of Quaternary sand dunes. The sands are derived from the underlying Tertiary Ogallala and Arikaree Groups. These units formed when rivers deposited sediments that originated as erosional detritus following the uplift of the Rocky Mountains to the west. The Ogallala aquifer underlies this are. It is the most extensive and heavily used aquifer on the high plains between the Rocky Mountains and the Mississippi River. The major recharge area for this aquifer is the Sand Hills.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Frequent
Elevation	610–1,189 m
Slope	0–2%

Ponding depth	0 cm
Water table depth	0–46 cm
Aspect	Aspect is not a significant factor

Climatic features

The mean average annual precipitation varies from 14 - 25 inches, but has varied from 12 to 29 inches in the driest to wettest seasons. Approximately 65 percent of the annual precipitation occurs during the growing season of mid-April to late September. The average annual snowfall varies from about 30 inches to about 55 inches. The wind velocity is high throughout the year, averaging 10 to 12 miles per hour. Maximum wind velocities generally occur in the spring.

The average length of the growing season is 138 days, but the growing season has varied from 114 to 168 days. The average date of first frost in the fall is September 25, and the last frost in the spring is about May 10. July is the hottest month and January is the coldest. It is not uncommon for the temperature to reach 100 ºF during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds, producing severe cold with temperatures dropping to as low as -30 ºF.

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

Table 3. Representative climatic features

Frost-free period (average)	127 days
Freeze-free period (average)	148 days
Precipitation total (average)	610 mm

Climate stations used

- (1) BARTLETT 1S [USC00250525], Bartlett, NE
- (2) ROSE 10 WNW [USC00257318], Long Pine, NE
- (3) NORTH PLATTE RGNL AP [USW00024023], Maxwell, NE
- (4) ATKINSON 3SW [USC00250420], Atkinson, NE
- (5) BREWSTER [USC00251130], Brewster, NE
- (6) CRESCENT LAKE NWR [USC00252000], Oshkosh, NE
- (7) HYANNIS [USC00254100], Hyannis, NE
- (8) VALENTINE NWR [USC00258755], Valentine, NE
- (9) ARTHUR [USC00250365], Arthur, NE
- (10) ELLSWORTH 15 NNE [USC00252647], Ellsworth, NE
- (11) ERICSON 8 WNW [USC00252770], Burwell, NE
- (12) KINGSLEY DAM [USC00254455], Keystone, NE
- (13) MERRIMAN [USC00255470], Merriman, NE
- (14) NEWPORT [USC00255925], Newport, NE
- (15) PURDUM [USC00256970], Purdum, NE
- (16) CHAMBERS [USC00251590], Chambers, NE
- (17) ELSMERE 9 ENE [USC00252680], Johnstown, NE
- (18) GREELEY [USC00253425], Greeley, NE
- (19) MULLEN [USC00255700], Mullen, NE
- (20) MULLEN 21 NW [USC00255702], Whitman, NE

Influencing water features

This ecological site has a combination of physical and hydrological features that: 1) provide season-long ground water within 3.5 feet of the surface, 2) allows relatively free movement of water and air in the upper part of the soil,

and 3) are rarely to frequently flooded.

Soil features

The features common to all soils in this site are the fine sand and loamy textured surface soils and slopes of 0 to 2 percent. The soils in this site are poorly drained and formed in eolian sands and sandy alluvium. Minor soils in this site occur along streams flowing through and out of the Sand Hills, and formed in sandy to loamy alluvium. The surface layer is 3 to 10 inches thick. The subsurface texture ranges from loamy fine sand to fine sand. Runoff as evidenced by patterns of rill, gully or other water flow is negligible due to the low slope gradient and high intake rate of these soils. Cryptobiotic crusts are present, but their function is not well understood. Some pedestalling of plants occurs, but it is not very evident on casual observation and occurs on less than 5% of the plants.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Major soil series correlated to this ecological site include: Hoffland, Loup and Tryon.

Other soil series that have been correlated to this site include: Almeria, Crowther, Cullison, Gannett, Gus and Lawet.

Table 4. Representative soil features

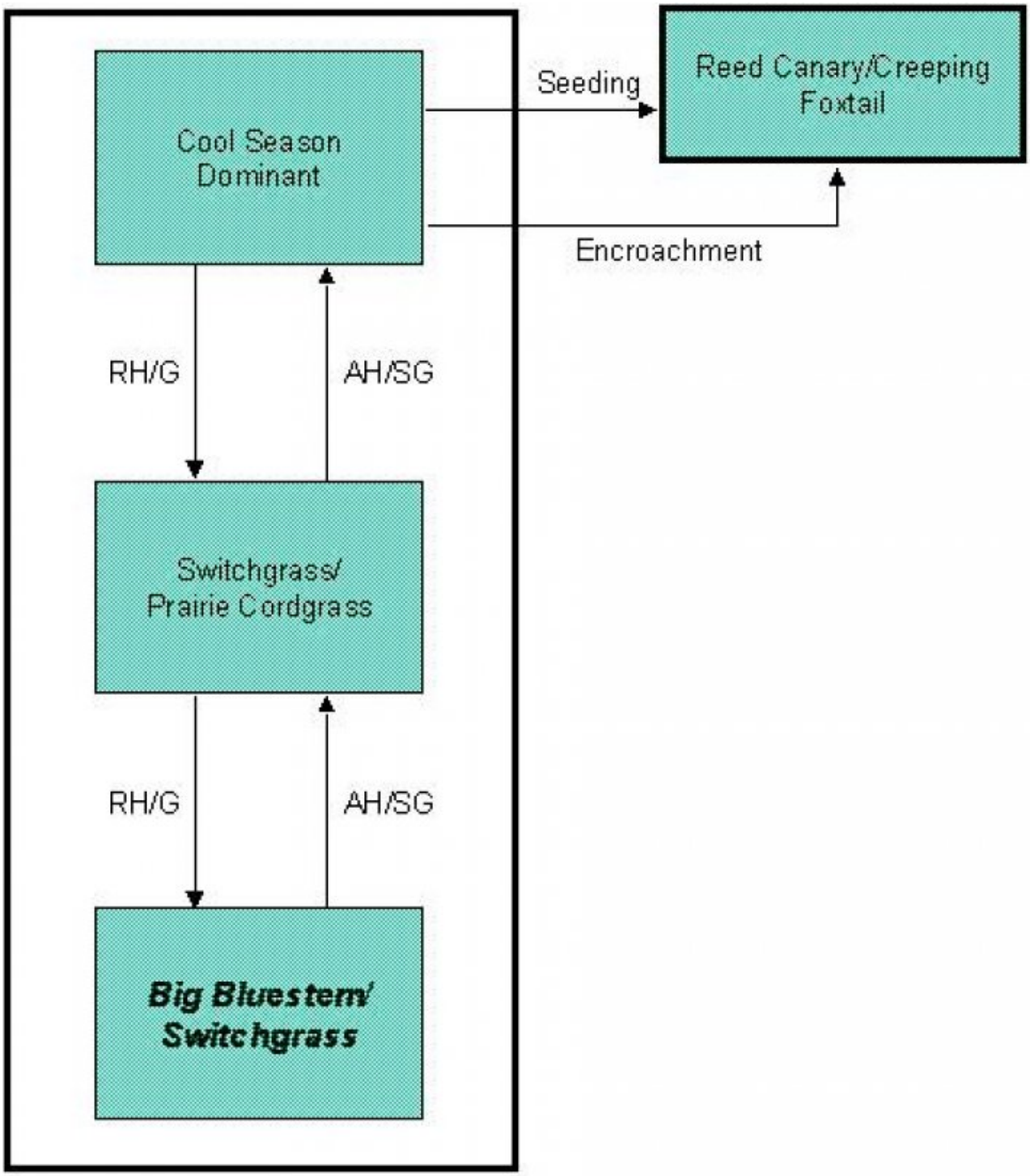
Surface texture	(1) Loamy fine sand (2) Fine sandy loam (3) Loam
Family particle size	(1) Sandy
Drainage class	Poorly drained
Permeability class	Moderate to rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0–40%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	5.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

As this site deteriorates, species such as switchgrass, slender wheatgrass, Scribner panicum, western wheatgrass, foxtail barley, and prairie cordgrass will increase. Warm season grasses such as big bluestem and Indiangrass will decrease in frequency and production.
Interpretations are primarily based on the Big Bluestem/Switchgrass Plant Community. It 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 used. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.
The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

State and transition model



AH/SG - annual haying/summer grazing
RH/G - rotational haying/grazing

State 1
Big Bluestem/Switchgrass Plant Community

Community 1.1
Big Bluestem/Switchgrass Plant Community

Interpretations are primarily based on the Big Bluestem/Switchgrass Plant Community (this is also considered climax). This site evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning. Harvesting hay at a different time during the growing season each year allows this plant community to persist. The potential vegetation is about 85% grasses, 10% grass-like plants and 5% forbs. Tall, warm season grasses dominate the plant community. The major grasses include big bluestem, Indiangrass, switchgrass, bluejoint reedgrass, northern reedgrass, and prairie cordgrass. Other grasses occurring on this plant community include slender wheatgrass, plains bluegrass, and western wheatgrass. This plant community is extremely resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a healthy and sustainable plant community (site/soil stability, watershed function, and biologic integrity). The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year: Growth curve number: NE6543 Growth curve name: Nebraska/South Dakota Sandhills, Native Grasslands, Wet Growth curve description: Warm-season dominant, cool-season subdominant, mid & tall grasses. Transitional pathways and/or community pathways leading to other plant communities are as follows: Annual haying or summer grazing will shift this plant community to the Switchgrass/Prairie Cordgrass Plant Community. Haying or grazing at set times during the growing season can reduce plant diversity and reduce the vigor of desirable grasses.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	4797	5044	5240
Forb	–	170	308
Total	**4797**	**5214**	**5548**

Figure 7. Plant community growth curve (percent production by month). NE6543, NE/SD Sandhills, Native Grass, Wet. Warm-season dominant, cool-season subdominant, mid & tall grasses.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	20	35	25	10	5	0	0	0

State 2
Switchgrass/Prairie Cordgrass Plant Community

Community 2.1
Switchgrass/Prairie Cordgrass Plant Community

Historically, this plant community evolved under annual haying or moderate summer grazing followed by heavy grazing in the fall. The potential vegetation is about 80% grasses, 15% grass-like plants and 5% forbs. Dominant grasses include switchgrass, prairie cordgrass, big bluestem and forbs such as smartweed and ironweed. When compared to the Big Bluestem/Switchgrass Plant Community, switchgrass and prairie cordgrass have increased while big bluestem and Indiangrass have decreased. Plant diversity has decreased with the desirable, more palatable, grasses being suppressed due to heavier use. This plant community is somewhat resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term. The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year: Growth curve number: NE6544 Growth curve name: Nebraska/South Dakota Sandhills, Hayed and Grazed Subirrigated Meadows Growth curve description: Warm-season dominant, cool-season subdominant, mid & tall grasses. Transitional pathways and/or community pathways leading to other plant communities are as follows: Timely haying and/or rotational grazing will shift this plant community back to the Big Bluestem/Switchgrass Plant Community. Haying or grazing prior to the onset of active warm-season grass growth will improve warm season grass vigor. This early haying also reduces cool season grass competition, and

improves the quality of the hay. Waiting to graze after a killing frost in the fall will also help to reduce the cool season grasses, while improving the vigor of the warm season grasses. Repeated annual mid summer haying or grazing will shift this plant community to the Cool Season Dominant Plant Community.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	4237	4414	4618
Forb	–	127	258
Total	**4237**	**4541**	**4876**

Figure 9. Plant community growth curve (percent production by month). NE6544, NE/SD Sandhills, Hayed and Grazed Subirrigated Meadows. Warm-season dominant, cool-season subdominant, mid and tall grasses.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	20	25	20	15	10	0	0	0

State 3
Cool Season Dominant Plant Community

Community 3.1
Cool Season Dominant Plant Community

Historically, this plant community evolved under long term annual haying in the mid summer. Cool season grasses make up a majority of the plant community with the balance made up of warm season grasses and miscellaneous forbs. The potential vegetation is about 70% grasses, 20% grass-like plants and 10% forbs. Dominant grasses include bluejoint and northern reedgrass, which are acceptable grasses on this plant community. The reedgrasses become aggressive and increase, crowding out the warm season plants of big bluestem, Indiangrass and switchgrass. Grasses of secondary importance include prairie cordgrass, slender wheatgrass, and western wheatgrass. Forbs commonly found in this plant community include red and white clover. When compared to the Big Bluestem/Switchgrass Plant Community, bluejoint and northern reedgrass, slender wheatgrass and prairie cordgrass have increased. Big bluestem and Indiangrass have decreased. This plant community is moderately resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term. The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year: Growth curve number: NE6545 Growth curve name: Nebraska/South Dakota Sandhills, Hayed and Grazed Cool-Season Meadows Growth curve description: Cool-season dominant, warm-season subdominant, mid & tall grasses. Transitional pathways and/or community pathways leading to other plant communities are as follows: Timely haying and/or rotational grazing will shift this plant community back to the Big Bluestem/Switchgrass Plant Community. Haying or grazing prior to the onset of active warm-season grass growth will improve plant vigor. This early haying also reduces cool season grass competition, and improves the quality of the hay. Grazing after a killing frost in the fall will also help to reduce cool season grasses. Seeding can move this plant community to the Reed Canary/Creeping Foxtail Plant Community.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	3699	3941	4147
Forb	–	207	448
Total	**3699**	**4148**	**4595**

Figure 11. Plant community growth curve (percent production by month). NE6545, NE/SD Sandhills, Hayed and Grazed Cool-Season Meadows. Cool-season dominant, warm-season subdominant, mid & tall grasses.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	15	30	25	10	5	10	0	0	0

State 4
Reed Canary/Creeping Foxtail

Community 4.1
Reed Canary/Creeping Foxtail

When the Cool Season Dominant Plant Community is stressed by heavy grazing and repeated haying, reed canarygrass or creeping foxtail may encroach if a viable seed source is available. Reed canarygrass and creeping foxtail seedings have occurred when cool season grass production deteriorates. However, this seeding practice has serious repercussions on numerous wildlife species, and once established becomes difficult to alter due to aggressive behavior. While this plant community has a high production potential, forage quality is sacrificed.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm-Season Grasses**			2242–4483	
	prairie cordgrass	SPPE	*Spartina pectinata*	841–1681	–
	big bluestem	ANGE	*Andropogon gerardii*	841–1681	–
	switchgrass	PAVI2	*Panicum virgatum*	841–1681	–
	Indiangrass	SONU2	*Sorghastrum nutans*	280–841	–
2	**Cool-Season Grasses**			560–1681	
	bluejoint	CACA4	*Calamagrostis canadensis*	280–560	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	280–560	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	112–560	–
	plains bluegrass	POAR3	*Poa arida*	280–560	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–280	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–112	–
3	**Other Native Grasses**			0–280	
	Grass, perennial	2GP	*Grass, perennial*	0–280	–
4	**Non-Native Grasses**			–	
	reed canarygrass	PHAR3	*Phalaris arundinacea*	–	–
5	**Grass-Likes**			280–560	
	sedge	CAREX	*Carex*	56–560	–
	rush	JUNCU	*Juncus*	0–280	–
	bulrush	SCIRP	*Scirpus*	0–280	–
	spikerush	ELEOC	*Eleocharis*	0–168	–
Forb					
6	**Native Forbs**			0–280	
	Forb, perennial	2FP	*Forb, perennial*	0–112	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–56	–
	scouringrush horsetail	EQHY	*Equisetum hyemale*	0–56	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–56	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0–56	–
	cinquefoil	POTEN	*Potentilla*	0–56	–
	blackeyed Susan	RUHI2	*Rudbeckia hirta*	0–56	–
	goldenrod	SOLID	*Solidago*	0–56	–
	white heath aster	SYER	*Symphyotrichum ericoides*	0–56	–
	ironweed	VERNO	*Vernonia*	0–56	–

Table 9. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm-Season Grasses**			2018–4035	
	prairie cordgrass	SPPE	*Spartina pectinata*	1009–2018	–
	switchgrass	PAVI2	*Panicum virgatum*	1009–2018	–
	big bluestem	ANGE	*Andropogon gerardii*	504–1009	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	0–252	–
	Indiangrass	SONU2	*Sorghastrum nutans*	0–252	–
2	**Cool-Season Grasses**			504–1513	
	western wheatgrass	PASM	*Pascopyrum smithii*	0–504	–
	plains bluegrass	POAR3	*Poa arida*	252–504	–
	bluejoint	CACA4	*Calamagrostis canadensis*	252–504	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	252–504	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	101–504	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–151	–
3	**Other Native Grasses**			0–252	
	Grass, perennial	2GP	*Grass, perennial*	0–252	–
4	**Non-Native Grasses**			0–252	
	reed canarygrass	PHAR3	*Phalaris arundinacea*	0–252	–
5	**Grass-Likes**			252–757	
	sedge	CAREX	*Carex*	50–504	–
	rush	JUNCU	*Juncus*	0–252	–
	bulrush	SCIRP	*Scirpus*	0–252	–
	spikerush	ELEOC	*Eleocharis*	0–151	–
Forb					
6	**Native Forbs**			0–252	
	white heath aster	SYER	*Symphyotrichum ericoides*	0–101	–
	ironweed	VERNO	*Vernonia*	0–101	–
	Forb, perennial	2FP	*Forb, perennial*	0–101	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–101	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0–101	–
	blackeyed Susan	RUHI2	*Rudbeckia hirta*	0–101	–
	goldenrod	SOLID	*Solidago*	0–50	–
	cinquefoil	POTEN	*Potentilla*	0–50	–
	scouringrush horsetail	EQHY	*Equisetum hyemale*	0–50	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–50	–

Table 10. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm-Season Grasses**			829–1866	
	prairie cordgrass	SPPE	*Spartina pectinata*	622–1451	–
	big bluestem	ANGE	*Andropogon gerardii*	0–622	–
	switchgrass	PAVI2	*Panicum virgatum*	207–622	–
	Indiangrass	SONU2	*Sorghastrum nutans*	0–207	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	0–83	–
2	**Cool-Season Grasses**			1244–3110	
	bluejoint	CACA4	*Calamagrostis canadensis*	415–1037	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	415–1037	–
	plains bluegrass	POAR3	*Poa arida*	415–1037	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	83–622	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–415	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–207	–
3	**Other Native Grasses**			0–207	
	Grass, perennial	2GP	*Grass, perennial*	0–207	–
4	**Non-Native Grasses**			0–622	
	reed canarygrass	PHAR3	*Phalaris arundinacea*	0–622	–
5	**Grass-likes**			207–829	
	sedge	CAREX	*Carex*	83–622	–
	spikerush	ELEOC	*Eleocharis*	0–207	–
	rush	JUNCU	*Juncus*	41–207	–
	bulrush	SCIRP	*Scirpus*	0–207	–
Forb					
6	**Native Forbs**			0–415	
	white heath aster	SYER	*Symphyotrichum ericoides*	0–124	–
	ironweed	VERNO	*Vernonia*	0–124	–
	Grass, perennial	2GP	*Grass, perennial*	0–83	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–83	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0–83	–
	blackeyed Susan	RUHI2	*Rudbeckia hirta*	0–83	–
	goldenrod	SOLID	*Solidago*	0–41	–
	cinquefoil	POTEN	*Potentilla*	0–41	–
	scouringrush horsetail	EQHY	*Equisetum hyemale*	0–41	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–41	–
7	**Non-Native Forbs**			0–207	
	red clover	TRPR2	*Trifolium pratense*	0–207	–
	white clover	TRRE3	*Trifolium repens*	0–83	–

Animal community

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrological functions

Moisture conditions tend to be ideal for forage production on this site. Soils on this site are nearly all in Hydrologic Soil Group D due to high water tables. Although soils are permeable, high water tables limit infiltration in wet seasons. Surrounding upland areas tend to have permeable soils and surface inflow peaks on these sites are often muted. Many areas are seasonally flooded for short periods in wet weather.

For the interpretive plant community, rills and gullies are not typically present. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present. Litter falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts may be present but are not significant for hydrologic considerations. Overall this site has the appearance of being very stable and very productive.

Recreational uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood products

No appreciable wood products are present on the site.

Other products

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

Other information

Revision Notes: “This PROVISIONAL ecological site concept has been QC’d and QA’d to ensure that the site meets the NESH standards for a provisional ecological site that provides basic compiled information in one location. This site should not be considered an Approved ESD until further data entry and editing is completed.

Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Dave Cook, Rangeland Management Specialist, NRCS; Dwight Hale, Engineer, NRCS; Sheila Luoma, Resource Conservationist, NRCS; Marla Shelbourn, Rangeland Management Specialist, NRCS; Dave Steffen, Rangeland Management Specialist, NRCS.

There are four records located in SCS-RANGE-417 with a sample period of 1982-1983. This information was collected from Lincoln, Logan, Loup, and Sheridan counties in Nebraska.

Other references

Other sources used as references include: USDA NRCS Water & Climate Center, USDA NRCS National Range and Pasture Handbook, USDA NRCS Soil Surveys from various counties, Atlas of the Sandhills.

Site Development and Testing Plan:
Future work is needed to validate the information in this Provisional Ecological Site Description. Additional data collection and evaluation may also be needed to develop this ESD to the Approved, then Correlated level. This

could include field activities to collect low, medium and high intensity sampling, soil correlations, and analysis of that data. Field reviews of the project plan should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document.
The State and Transitional Model and corresponding pathways and associated vegetative communities will need to be reviewed and upgraded to adhere to the new guidelines.
Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team. The project plan is: ES-R065XY023NE - MLRA 65 -

Contributors

Kim Stine

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)	Stan Boltz
Contact for lead author	Stan Boltz, stanley.boltz@sd.usda.gov, 605-352-1236
Date	10/31/2001
Approved by	Stan Boltz
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:** None.

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 less than 5 percent and pathces less than two inches in diameter.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.

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

7. **Amount of litter movement (describe size and distance expected to travel):** Little to no plant 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):** Soil aggregate stability normally a 6 rating. Typically high root content and organic matter in the soil surface. Soil surface is very resistant to erosion.

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is granular, and mollic (higher organic matter) colors of A-horizon down to about 5 to 10 inches.

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Healthy, deep-rooted native grass and grass-like species enhance infiltration and reduce runoff.

---

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 should be present.

---

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: Tall, warm-season grasses >>

    Sub-dominant: Cool-season rhizomatous grasses >

    Other: Grass-like species > forbs

    Additional: Other native grasses occur in other functional groups in minor amounts.

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little to no evidence of decadence or mortality.

---

14. **Average percent litter cover (%) and depth (in):** 85-90 percent plant litter cover, roughly 0.5 to 1 inches in depth. Litter cover is in contact with the soil surface.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Total annual production ranges from 4,500 to 5,500 pounds/acre, with the reference value being 5,000 pounds/acre (air-dry basis).

---

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: Refer to State and local Noxious Weed List; also Kentucky bluegrass and smooth bromegrass.

---

17. **Perennial plant reproductive capability:** Perennial grass and grass-like species have vigorous rhizomes and/or tillers.
