USDA Natural Resources Conservation Service

Ecological site R065XY024NE
Subirrigated

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.

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 subirrigated site is found on interdunes and stream valleys. The slope is less than 3%. The water table is seasonally high under these sites. The depth to rusty spots and iron stains in the soil or saturation is 18 to 36 inches. No visible surface salts are associated with this site

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
R065XY023NE	**Wet Subirrigated** Wet 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

R065XY023NE	**Wet Subirrigated** Wet Subirrigated (less big bluestem; no little bluestem, more prairie cordgrass; bluejoint reedgrass common; more production)

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) Interdune (2) Alluvial flat
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional
Elevation	610–1,189 m

Slope	2%
Water table depth	46–91 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)	138 days
Freeze-free period (average)	157 days
Precipitation total (average)	508 mm

Influencing water features

This ecological site has a combination of physical and hydrological features that: 1) normally has partial growing-season groundwater within the root zone (1.5 ft. to 3 ft.), 2) allowing relatively free movement of water and air (aerobic conditions) throughout the upper half of the root zone, and 3) normally is not ponded or flooded during the growing-season in most years

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 somewhat poorly drained and formed in eolian sand and/or sandy alluvium. The surface layer is 3 to 10 inches thick. The texture of the subsurface 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: Boel, Bolent, Els, Elsmere and Ord.

Other soil series that have been correlated to this site include: Els Calcareous, Elsmere Calcareous and Lamo.

Table 4. Representative soil features

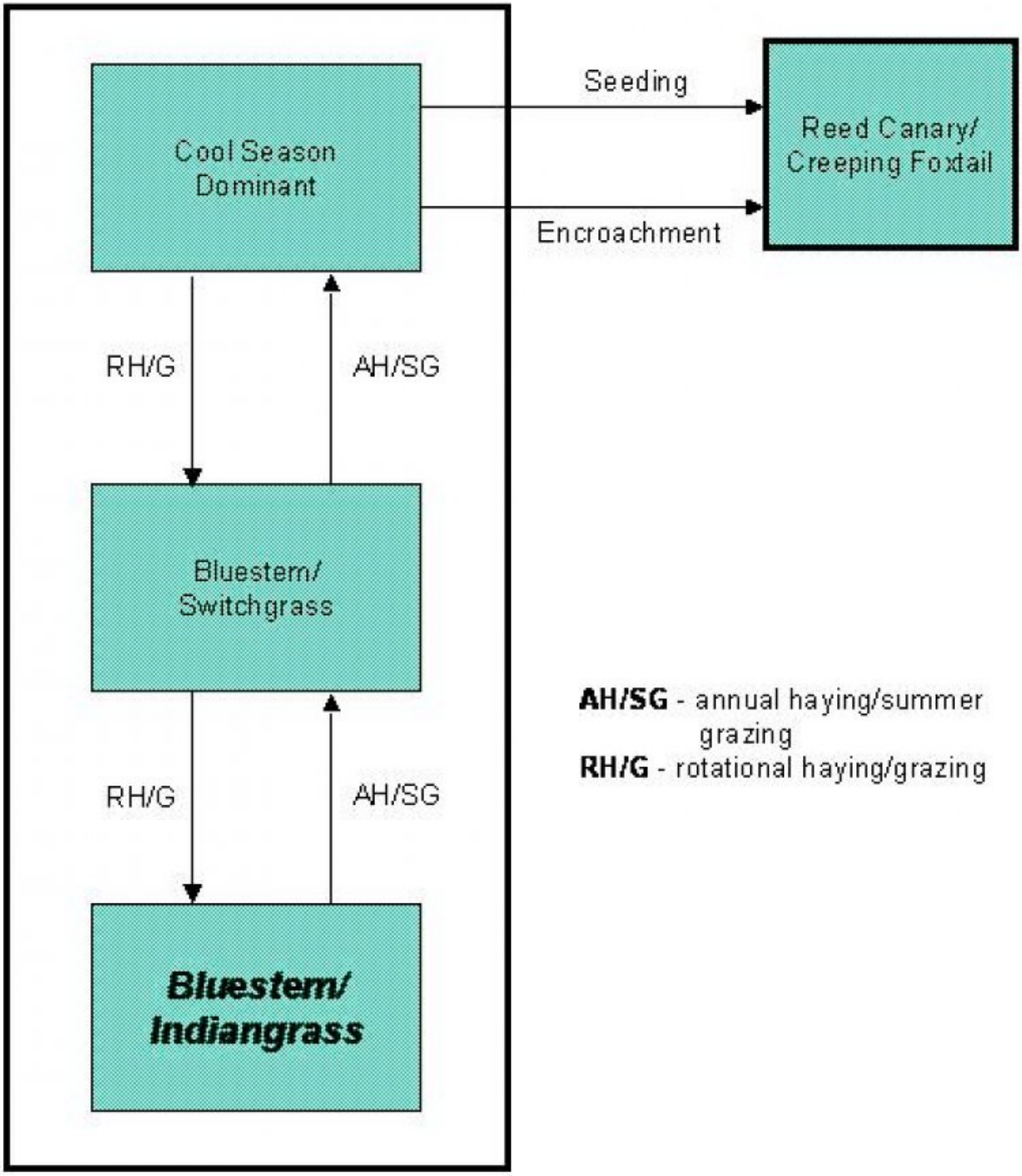
Surface texture	(1) Fine sand (2) Loamy fine sand (3) Fine sandy loam
Family particle size	(1) Sandy

Drainage class	Somewhat 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)	0–10%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–6
Soil reaction (1:1 water) (0-101.6cm)	5.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–6%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

As this site deteriorates, species such as redtop, Kentucky bluegrass, slender wheatgrass and smooth brome will increase. Warm season grasses such as Indiangrass and big bluestem will decrease in frequency and production. Interpretations are primarily based on the Bluestem/Indiangrass 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



State 1
Bluestem/Indiangrass Plant Community

Community 1.1
Bluestem/Indiangrass Plant Community

Interpretations are primarily based on the Bluestem/Indiangrass 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 is 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 75% grasses, 10% grass-like plants, 10% forbs, and 5% woody plants. Tall, warm-season grasses dominate. The major grasses include big bluestem, Indiangrass, little bluestem, prairie cordgrass, switchgrass, and

grass-likes include sedges, rushes and bulrushes. Other grasses occurring on this plant community include plains bluegrass, slender wheatgrass, 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: Haying (removed timely) or grazing can shift this plant community to the Bluestem/Switchgrass Plant Community. Haying or grazing at set times during the growing season can reduce plant diversity and reduce vigor of desirable plants.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	4450	4742	4988
Forb	247	396	560
Total	**4697**	**5138**	**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
Bluestem/Switchgrass Plant Community

Community 2.1
Bluestem/Switchgrass Plant Community

Historically, this plant community evolved under annual haying or moderate summer grazing followed by heavy grazing in the fall. This plant community closely resembles, but lacks the diversity of the Bluestem/Indiangrass Plant Community. The potential vegetation is about 80% grasses, 15% grass-like plants, 5% forbs, and 1% shrubs. Dominant grasses include big bluestem, switchgrass, little bluestem and Kentucky bluegrass. Other grasses include needlegrasses, prairie cordgrass, wheatgrasses and Indiangrass. Grass-like plants have increased. The abundance of forbs and shrubs remains constant, but species shifts have occurred. Tall, warm season grasses are suppressed, while cool season grasses have increased slightly. This plant community is not resistant to change, but is resilient. 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 can shift this plant community back to the Bluestem/Indiangrass 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 provides quality hay. Grazing after a killing frost in the fall will also help reduce cool season grasses. Repeated annual mid summer haying or grazing can 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	3923	4349	4764
Forb	–	112	230
Total	**3923**	**4461**	**4994**

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 mid summer. Cool season grasses make up the majority of the plant community with the balance made up of warm season grasses and miscellaneous forbs. The potential vegetation is about 65% grasses, 20% grass-like plants, 15% forbs, and 1% shrubs. Dominant grasses include red top, timothy, Kentucky bluegrass, slender wheatgrass, smooth brome, and prairie cordgrass. Grasses of secondary importance include big bluestem, Indiangrass and switchgrass. Forbs commonly found in this plant community include red and white clover. This plant community produces from 2700 to 3700 pounds per acre (air-dry weight) annually, depending on growing conditions. When compared to the Bluestem/Indiangrass Plant Community, Kentucky bluegrass and slender wheatgrass have increased. Big bluestem and Indiangrass have decreased, and production of other warm-season grasses has also been reduced. Smooth brome and quackgrass may invade this plant community. This site is often over-used as winter feed ground. American licorice may become a problem in areas where the cattle are hayed in the winter, and lower overall production of the site can be expected. This plant community is moderately resistant to change. 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 can shift this plant community back to the 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 provides quality hay. Grazing after a killing frost in the fall will also help reduce cool season grasses. Grazing this plant community in mid-May to early June will suppress cool season grasses. Caution must be used on areas where Subirrigated and Wetland complexes exist, as concentrated spring grazing can cause damage on wetter sites. Seeding will 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	2853	3210	3491
Forb	174	359	616
Total	**3027**	**3569**	**4107**

Figure 11. 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 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 its 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**			3161–4214	
	big bluestem	ANGE	*Andropogon gerardii*	1580–2634	–
	Indiangrass	SONU2	*Sorghastrum nutans*	841–1580	–
	little bluestem	SCSC	*Schizachyrium scoparium*	527–1317	–
	prairie cordgrass	SPPE	*Spartina pectinata*	263–841	–
	switchgrass	PAVI2	*Panicum virgatum*	263–790	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	0–263	–
	Grass, perennial	2GP	*Grass, perennial*	0–105	–
2	**Cool-Season Grasses**			158–790	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	0–527	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–527	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–263	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	0–263	–
	plains bluegrass	POAR3	*Poa arida*	0–158	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–105	–
	Grass, perennial	2GP	*Grass, perennial*	0–105	–
3	**Non-Native Grasses**			–	
4	**Grass-Likes**			263–527	
	sedge	CAREX	*Carex*	263–527	–
	spikerush	ELEOC	*Eleocharis*	0–263	–
	rush	JUNCU	*Juncus*	0–263	–
	bulrush	SCIRP	*Scirpus*	0–263	–
Forb					
5	**Native Forbs**			263–527	
	sedge	CAREX	*Carex*	56–560	–
	rush	JUNCU	*Juncus*	0–280	–
	bulrush	SCIRP	*Scirpus*	0–280	–
	spikerush	ELEOC	*Eleocharis*	0–168	–
	white heath aster	SYER	*Symphyotrichum ericoides*	0–158	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–158	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	0–105	–
	blazing star	LIATR	*Liatris*	0–105	–
	blackeyed Susan	RUHI2	*Rudbeckia hirta*	0–105	–
	goldenrod	SOLID	*Solidago*	0–105	–
	Forb, perennial	2FP	*Forb, perennial*	0–105	–
	scouringrush horsetail	EQHY	*Equisetum hyemale*	0–105	–
Shrub/Vine					
7	**Shrubs**			0–263	
	dwarf false indigo	AMNA	*Amorpha nana*	0–263	–

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**			1345–3138	
	big bluestem	ANGE	*Andropogon gerardii*	448–1121	–
	switchgrass	PAVI2	*Panicum virgatum*	448–1121	–
	prairie cordgrass	SPPE	*Spartina pectinata*	224–673	–
	little bluestem	SCSC	*Schizachyrium scoparium*	224–448	–
	Indiangrass	SONU2	*Sorghastrum nutans*	90–448	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	0–135	–
	Grass, perennial	2GP	*Grass, perennial*	0–90	–
2	**Cool-Season Grasses**			224–897	
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–224	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	0–224	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	0–224	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–224	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–224	–
	plains bluegrass	POAR3	*Poa arida*	0–224	–
	Grass, perennial	2GP	*Grass, perennial*	0–90	–
3	**Non-Native Grasses**			224–897	
	Kentucky bluegrass	POPR	*Poa pratensis*	224–897	–
	smooth brome	BRIN2	*Bromus inermis*	0–448	–
4	**Grass-Likes**			224–673	
	sedge	CAREX	*Carex*	224–448	–
	spikerush	ELEOC	*Eleocharis*	0–224	–
	rush	JUNCU	*Juncus*	0–224	–
	bulrush	SCIRP	*Scirpus*	0–224	–
Forb					
5	**Native Forbs**			0–224	
	goldenrod	SOLID	*Solidago*	0–224	–
	white heath aster	SYER	*Symphyotrichum ericoides*	0–135	–
	blackeyed Susan	RUHI2	*Rudbeckia hirta*	0–135	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–135	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	0–135	–
	blazing star	LIATR	*Liatris*	0–90	–
	Forb, perennial	2FP	*Forb, perennial*	0–90	–
	scouringrush horsetail	EQHY	*Equisetum hyemale*	0–90	–
Shrub/Vine					
7	**Shrubs**			0–45	
	dwarf false indigo	AMNA	*Amorpha nana*	0–45	–

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**			717–1435	
	big bluestem	ANGE	*Andropogon gerardii*	359–538	–
	switchgrass	PAVI2	*Panicum virgatum*	359–538	–
	prairie cordgrass	SPPE	*Spartina pectinata*	179–538	–
	little bluestem	SCSC	*Schizachyrium scoparium*	179–359	–
	Indiangrass	SONU2	*Sorghastrum nutans*	0–179	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	0–72	–
	Grass, perennial	2GP	*Grass, perennial*	0–72	–
2	**Cool-Season Grasses**			538–1255	
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	179–359	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	179–359	–
	western wheatgrass	PASM	*Pascopyrum smithii*	179–359	–
	plains bluegrass	POAR3	*Poa arida*	0–359	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	0–179	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–179	–
	Grass, perennial	2GP	*Grass, perennial*	0–72	–
3	**Non-Native Grasses**			359–1255	
	Kentucky bluegrass	POPR	*Poa pratensis*	359–897	–
	smooth brome	BRIN2	*Bromus inermis*	0–717	–
	timothy	PHPR3	*Phleum pratense*	0–538	–
	creeping bentgrass	AGST2	*Agrostis stolonifera*	0–359	–
4	**Grass-Likes**			179–717	
	sedge	CAREX	*Carex*	179–538	–
	spikerush	ELEOC	*Eleocharis*	0–179	–
	rush	JUNCU	*Juncus*	0–179	–
	bulrush	SCIRP	*Scirpus*	0–179	–
Forb					
5	**Native Forbs**			72–359	
	blackeyed Susan	RUHI2	*Rudbeckia hirta*	0–179	–
	white heath aster	SYER	*Symphyotrichum ericoides*	0–179	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–108	–
	blazing star	LIATR	*Liatris*	0–108	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	0–72	–
	Forb, perennial	2FP	*Forb, perennial*	0–72	–
	scouringrush horsetail	EQHY	*Equisetum hyemale*	0–72	–
	goldenrod	SOLID	*Solidago*	0–72	–
6	**Non-Native Forbs**			108–359	
	red clover	TRPR2	*Trifolium pratense*	0–359	–
	white clover	TRRE3	*Trifolium repens*	0–287	–
Shrub/Vine					

7	**Shrubs**	0–36	

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 are ideal for forage production on this site. Soils on this site are mostly in Hydrologic Soil Group A, but may include soils in Group B, and local areas in Group C. Although most of these soils are very permeable, water tables provide subirrigation of grasses and other vegetation. Surrounding upland areas tend to also have permeable soils and surface inflow peaks on these sites are often muted. These sites are rarely to occasionally flood.

For the interpretive plant community, rills and gullies should not typically be 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 extremely 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 27 SCS-RANGE-417 records available that were collected in Nebraska and South Dakota counties: Blaine, Cherry, Custer, Garden, Garfield, Grant, Morrill, Lincoln, Loup, Thomas, Todd, and Wheeler. These records are from 1968 to 1999.

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- R065XY024NE - MLRA 65 -

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

Indicators

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

2. **Presence of water flow patterns:** None.

3. **Number and height of erosional pedestals or terracettes:** None.

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

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

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

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

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil aggregate stability ratings should typically be 5 to 6, normally 6. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 10 to 30 inches thick with black to very dark gray colors when moist. Structure typically is medium to fine granular in the upper A-horizon.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep rooted species (mid and tall rhizomatous cool- and warm-season grasses and grass-likes) with fine and coarse roots positively influences infiltration.

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

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

    Dominant: Tall and mid, warm-season grasses >>

    Sub-dominant: Mid and tall, cool-season grasses >

    Other: Grass-like species = forbs > shrubs

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

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

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14. **Average percent litter cover (%) and depth (in):** Litter cover is typically 80 to 90 percent, and depth of litter ranges from 0.5 to 1 inches.

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

production): Total annual production ranges from 4,200 to 5,200 pounds/acre, with the reference values being 4,700 pounds/acre (air-dry basis).

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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 weeds; Kentucky bluegrass may be prevalent during dry cycles, but will typically not dominate the site. Russian olive can dominate this site in localized areas. Most invasive species will occupy the perimeter of this site.

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17. **Perennial plant reproductive capability:** All species exhibit high vigor relative to climatic conditions. Do not rate based solely on seed production. Perennial grasses and grass-likes should have vigorous rhizomes or tillers.
