USDA Natural Resources Conservation Service

Ecological site R064XY022NE
Wet Land

Accessed: 05/19/2024

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.

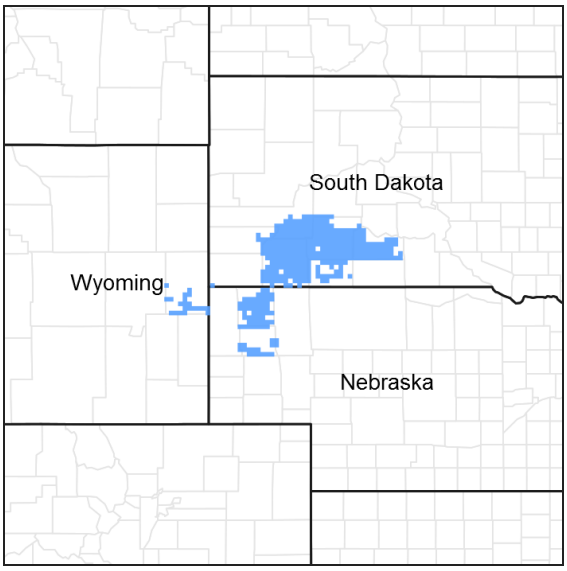


Figure 1. Mapped extent

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: 25a – Pine Ridge Escarpment, 43h – White River Badlands, and 43i – Keya Paha Tablelands.

Associated sites

R064XY024NE	**Subirrigated**
R064XY026NE	**Loamy Overflow**
R064XY027NE	**Clayey Overflow**
GX064X01X028	**Loamy Terrace**
R064XY029NE	**Sandy Lowland**

Similar sites

R064XY002NE	**Wet Subirrigated** [Less prairie cordgrass.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Spartina pectinata* (2) *Calamagrostis canadensis*

Physiographic features

This site normally occurs on level to nearly level valleys near springs, seeps and sloughs.

Table 2. Representative physiographic features

Landforms	(1) Drainageway (2) Oxbow (3) Flood plain
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	Occasional to frequent
Elevation	884–1,219 m
Slope	0–3%
Ponding depth	0–30 cm
Water table depth	15–30 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 64 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the northern Great Plains and air masses move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 20 inches per year. The normal average annual temperature is about 47° F. January is the coldest month with average temperatures ranging from about 21° F (Wood, SD) to about 25° F (Hemingford, NE). July is the warmest month with temperatures averaging from about 70° F (Keeline 3 W, WY) to about 76° F (Wood, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 55° F. This large annual range attests to the continental nature of this area's climate. Hourly winds 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 cool season plants begins in early to mid March, slowing or ceasing in late June. Warm season plants begin growth about mid May and continue to early or mid September. 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)	143 days
Freeze-free period (average)	163 days
Precipitation total (average)	508 mm

Influencing water features

Soil features

The features common to soils in this site are the loamy fine sand to fine sandy loam textured surface layers and slopes of 0 to 3 percent. A number of soils have surfaces of mucky peat and/or slightly decomposed plant material. The soils in this site are very poorly drained and formed in eolian sands and sandy alluvium. The surface layer is 5 to 14 inches thick. The texture of the subsurface layers ranges from sand to very fine sandy loam. Rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent.

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.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Very fine sandy loam (3) Loamy fine sand
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)	10.16–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0–40%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–50
Soil reaction (1:1 water) (0-101.6cm)	5.6–9.6
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

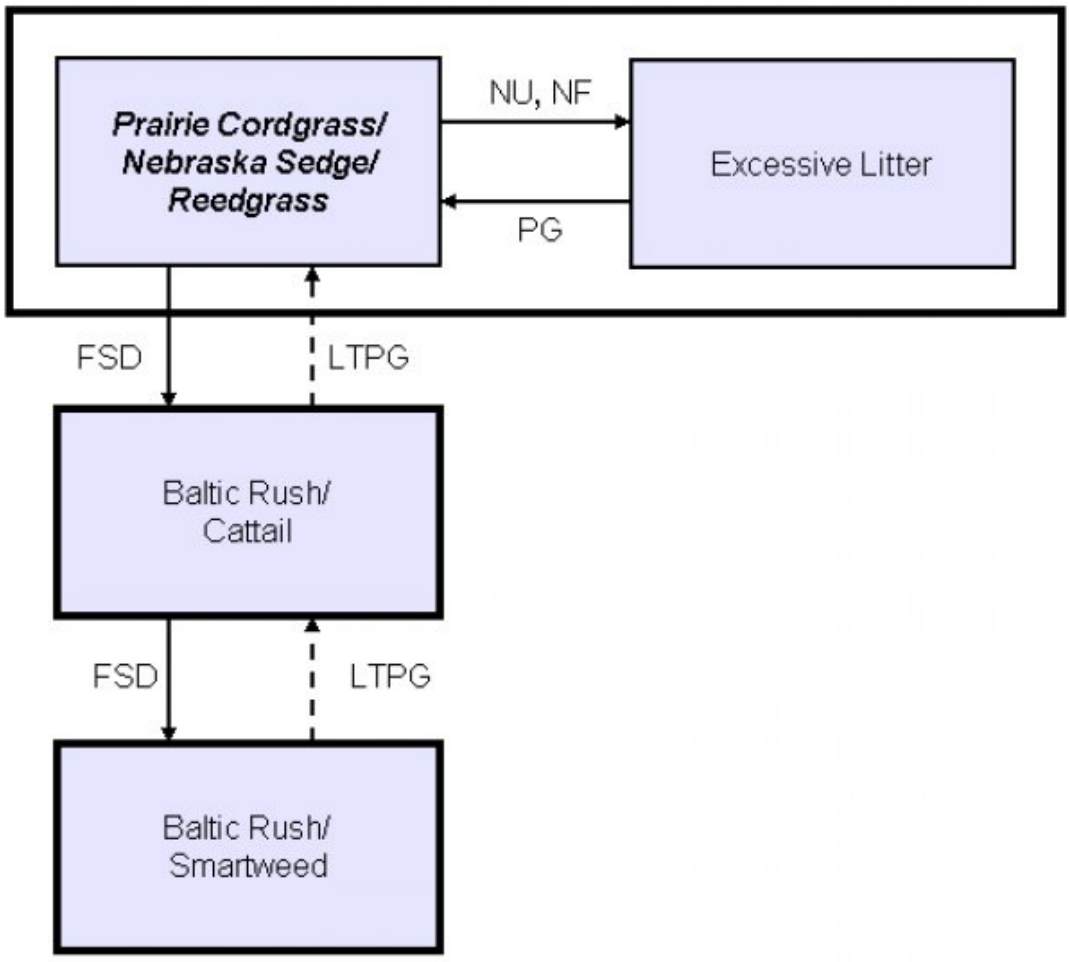
Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Prairie Cordgrass/Nebraska Sedge/Reedgrass Plant Community. Species such as spike sedge and Baltic rush increase. Grasses/grass-likes such as Nebraska sedge, northern

reedgrass and bluejoint reedgrass will decrease in frequency and production.

Interpretations are primarily based on the Prairie Cordgrass/Nebraska Sedge/Reedgrass 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. 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 transitions between communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

State and transition model



FSD - Frequent and Severe Defoliation of the cool-season mid-grasses/grasslikes during the growing season
LTPG - Long-tem prescribed grazing
NU, NF - No Use and No Fire
PG - Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528)

State 1
Prairie Cordgrass/Nebraska Sedge/Reedgrass

Community 1.1
Prairie Cordgrass/Nebraska Sedge/Reedgrass

Interpretations are based primarily on the Prairie Cordgrass/Nebraska Sedge/Reedgrass Plant Community (this is also considered to be climax). Potential vegetation is about 45-75% grasses, 20-35% sedges and rushes, 5-10% forbs, and 0-10% trees. The major grasses/grass-likes include prairie cordgrass, Nebraska sedge, bluejoint reedgrass, and northern reedgrass. Grasses/grass-likes of lesser importance are Baltic rush and low-growing, unpalatable sedges. The plant community is well adapted to the Northern Great Plains climatic conditions. It is a critical plant community providing water and habitat for the surrounding area. The diversity in plant species provides a variety of habitats for wildlife. It is resistant to drought due to a dependable water supply. This is a sustainable plant community (soil stability, watershed function, and biologic integrity).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	4797	5086	5268
Forb	247	771	1345
Tree	–	307	673
Total	**5044**	**6164**	**7286**

Figure 5. Plant community growth curve (percent production by month). NE6408, Pine Ridge/Badlands, lowland cool-season/warm-season co-dominant. Cool-season, warm-season co-dominant, lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	12	20	25	19	11	5	3		

State 2
Baltic Rush/Cattail

Community 2.1
Baltic Rush/Cattail

This plant community evolved under moderate grazing by domestic livestock. Dominant grasses include cattails, low-growing unpalatable sedges, and Baltic rush. Willows are present near the dryer edges of this plant community. When compared to the Prairie Cordgrass/Nebraska Sedge/Reedgrass Plant Community, prairie cordgrass, northern reedgrass, bluejoint reedgrass, and Nebraska sedge have decreased. Low-growing unpalatable sedges, Baltic rush, and cattails have increased. The abundant production and proximity to water make this plant community important for livestock and wildlife such as birds, mule deer, and antelope. The plant community is stable and protected from excessive erosion. The biotic integrity of this plant community is usually intact. The watershed is usually functioning.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1995	2438	2886
Forb	247	757	1233
Tree	–	168	364
Total	**2242**	**3363**	**4483**

Figure 7. Plant community growth curve (percent production by month). NE6408, Pine Ridge/Badlands, lowland cool-season/warm-season co-dominant. Cool-season, warm-season co-dominant, lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	12	20	25	19	11	5	3		

State 3
Baltic Rush/Smartweed

Community 3.1
Baltic Rush/Smartweed

This plant community is the result of long-term frequent and severe defoliation. Baltic rush, smartweed, and cattails dominate this plant community. American licorice has invaded. Bare ground has increased. The soil is not well protected. Degraded stream banks may erode. The watershed is functioning but may produce excessive runoff. The biotic community is at risk due to invasive plants.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1098	1311	1631
Forb	247	656	1065
Tree	–	50	106
Total	**1345**	**2017**	**2802**

Figure 9. Plant community growth curve (percent production by month). NE6408, Pine Ridge/Badlands, lowland cool-season/warm-season co-dominant. Cool-season, warm-season co-dominant, lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	12	20	25	19	11	5	3		

State 4
Excessive Litter

Community 4.1
Excessive Litter

This plant community developed under the absence of grazing and fire. Excessive litter is shading out plants. This inhibits photosynthesis and reduces soils temperatures, delaying green-up in the spring. Plants become decadent and exhibit low vigor. Bunch grasses often develop dead centers. Organic matter oxidizes in the air rather than being incorporated into the soil. The dominant plants tend to be somewhat similar to those found in the Prairie Cordgrass/Nebraska Sedge/Reedgrass Plant Community. Weedy species, cool-season grasses, and sedges have increased. Prairie cordgrass has decreased. American licorice tends to invade. Noxious weeds such as purple loosestrife may invade if a seed source is present. Plant diversity is moderate to high. This plant community is not resistant to change. The introduction of grazing quickly changes the plant community. It is somewhat more vulnerable to severe disturbance than the Prairie Cordgrass/Nebraska Sedge/Reedgrass Plant Community. Bare ground has increased. The soil is not well protected. The watershed is functioning but may produce excessive runoff. The biotic community is at risk due to invasive plants.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	3979	4063	4147
Forb	504	1261	1961
Tree	–	280	616
Total	**4483**	**5604**	**6724**

Figure 11. Plant community growth curve (percent production by month). NE6408, Pine Ridge/Badlands, lowland cool-season/warm-season co-

dominant. Cool-season, warm-season co-dominant, lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	12	20	25	19	11	5	3		

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				3391–4007	
	prairie cordgrass	SPPE	*Spartina pectinata*	2466–3391	–
	bluejoint	CACA4	*Calamagrostis canadensis*	616–1541	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	308–925	–
2	**Miscellaneous Grasses**			308–616	
	Grass, perennial	2GP	*Grass, perennial*	0–308	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–308	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–308	–
	reed canarygrass	PHAR3	*Phalaris arundinacea*	0–308	–
	bluegrass	POA	*Poa*	0–308	–
3	**Sedges and Rushes**			1233–2158	
	Nebraska sedge	CANE2	*Carex nebrascensis*	616–1541	–
	sedge	CAREX	*Carex*	308–616	–
	bulrush	SCHOE6	*Schoenoplectus*	308–616	–
	rush	JUNCU	*Juncus*	0–308	–
	spikerush	ELEOC	*Eleocharis*	62–308	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0–123	–
Forb					
4	**Forbs**			308–1233	
	Forb, perennial	2FP	*Forb, perennial*	0–308	–
	onion	ALLIU	*Allium*	0–123	–
	aster	ASTER	*Aster*	0–123	–
	milkvetch	ASTRA	*Astragalus*	0–123	–
	water hemlock	CICUT	*Cicuta*	0–123	–
	poison hemlock	COMA2	*Conium maculatum*	0–123	–
	Virginia strawberry	FRVI	*Fragaria virginiana*	0–123	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–123	–
	iris	IRIS	*Iris*	0–123	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	0–123	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0–123	–
	cinquefoil	POTEN	*Potentilla*	0–123	–
	blue-eyed grass	SISYR	*Sisyrinchium*	0–123	–
	broadleaf cattail	TYLA	*Typha latifolia*	0–123	–
Tree					
5	**Trees**			0–616	
	willow	SALIX	*Salix*	0–616	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				504–1177	
	prairie cordgrass	SPPE	*Spartina pectinata*	336–504	–
	bluejoint	CACA4	*Calamagrostis canadensis*	168–336	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	168–336	–
2	**Miscellaneous Grasses**			168–673	
	foxtail barley	HOJU	*Hordeum jubatum*	168–336	–
	reed canarygrass	PHAR3	*Phalaris arundinacea*	168–336	–
	bluegrass	POA	*Poa*	168–336	–
	Grass, perennial	2GP	*Grass, perennial*	0–168	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–67	–
3	**Sedges and Rushes**			504–841	
	bulrush	SCHOE6	*Schoenoplectus*	168–504	–
	Nebraska sedge	CANE2	*Carex nebrascensis*	168–504	–
	sedge	CAREX	*Carex*	168–504	–
	rush	JUNCU	*Juncus*	168–336	–
	spikerush	ELEOC	*Eleocharis*	34–168	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0–168	–
Forb					
4	**Forbs**			336–1177	
	broadleaf cattail	TYLA	*Typha latifolia*	336–841	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–336	–
	Forb, perennial	2FP	*Forb, perennial*	0–168	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	34–168	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	34–168	–
	cinquefoil	POTEN	*Potentilla*	0–67	–
	blue-eyed grass	SISYR	*Sisyrinchium*	0–67	–
	onion	ALLIU	*Allium*	0–67	–
	aster	ASTER	*Aster*	0–67	–
	milkvetch	ASTRA	*Astragalus*	0–67	–
	water hemlock	CICUT	*Cicuta*	0–67	–
	poison hemlock	COMA2	*Conium maculatum*	0–67	–
	Virginia strawberry	FRVI	*Fragaria virginiana*	0–67	–
	iris	IRIS	*Iris*	0–67	–
Tree					
5	**Trees**			0–336	
	willow	SALIX	*Salix*	0–336	–

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				0–202	
	bluejoint	CACA4	*Calamagrostis canadensis*	0–101	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	0–101	–
	prairie cordgrass	SPPE	*Spartina pectinata*	0–101	–
2	**Miscellaneous Grasses**			101–202	
	reed canarygrass	PHAR3	*Phalaris arundinacea*	101–202	–
	bluegrass	POA	*Poa*	101–202	–
	foxtail barley	HOJU	*Hordeum jubatum*	20–101	–
	Grass, perennial	2GP	*Grass, perennial*	0–101	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–20	–
3	**Sedges and Rushes**			303–807	
	sedge	CAREX	*Carex*	20–202	–
	spikerush	ELEOC	*Eleocharis*	20–101	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0–101	–
	Nebraska sedge	CANE2	*Carex nebrascensis*	20–101	–
	rush	JUNCU	*Juncus*	20–101	–
	bulrush	SCHOE6	*Schoenoplectus*	20–101	–
Forb					
4	**Forbs**			303–1009	
	broadleaf cattail	TYLA	*Typha latifolia*	303–807	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	101–303	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	101–303	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	101–303	–
	Forb, perennial	2FP	*Forb, perennial*	0–101	–
	aster	ASTER	*Aster*	0–40	–
	water hemlock	CICUT	*Cicuta*	0–40	–
	poison hemlock	COMA2	*Conium maculatum*	0–40	–
	Virginia strawberry	FRVI	*Fragaria virginiana*	0–20	–
	milkvetch	ASTRA	*Astragalus*	0–20	–
	onion	ALLIU	*Allium*	0–20	–
	cinquefoil	POTEN	*Potentilla*	0–20	–
	blue-eyed grass	SISYR	*Sisyrinchium*	0–20	–
Tree					
5	**Trees**			0–101	
	willow	SALIX	*Salix*	0–101	–

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				1681–2802	
	prairie cordgrass	SPPE	*Spartina pectinata*	1121–1681	–
	bluejoint	CACA4	*Calamagrostis canadensis*	280–841	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	280–560	–
2	**Miscellaneous Grasses**			280–1121	
	bluegrass	POA	*Poa*	280–841	–
	foxtail barley	HOJU	*Hordeum jubatum*	280–560	–
	reed canarygrass	PHAR3	*Phalaris arundinacea*	280–560	–
	Grass, perennial	2GP	*Grass, perennial*	0–280	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–112	–
3	**Sedges and Rushes**			560–1401	
	sedge	CAREX	*Carex*	280–841	–
	rush	JUNCU	*Juncus*	280–560	–
	bulrush	SCHOE6	*Schoenoplectus*	280–560	–
	Nebraska sedge	CANE2	*Carex nebrascensis*	280–560	–
	spikerush	ELEOC	*Eleocharis*	56–280	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0–280	–
Forb					
4	**Forbs**			560–1961	
	broadleaf cattail	TYLA	*Typha latifolia*	280–841	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	280–841	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	0–560	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0–560	–
	Forb, perennial	2FP	*Forb, perennial*	0–280	–
	aster	ASTER	*Aster*	0–112	–
	milkvetch	ASTRA	*Astragalus*	0–112	–
	water hemlock	CICUT	*Cicuta*	0–112	–
	poison hemlock	COMA2	*Conium maculatum*	0–112	–
	cinquefoil	POTEN	*Potentilla*	0–112	–
	blue-eyed grass	SISYR	*Sisyrinchium*	0–112	–
	Virginia strawberry	FRVI	*Fragaria virginiana*	0–56	–
	onion	ALLIU	*Allium*	0–56	–
	iris	IRIS	*Iris*	0–56	–
Tree					
5	**Trees**			0–560	
	willow	SALIX	*Salix*	0–560	–

Hydrological functions

Excessive water is the principal factor limiting forage production on this site. Soils on this site are in Hydrologic Soil

Group C and D due to high water tables. Although soils are permeable, high water tables limit infiltration. Surrounding upland areas tend to have very permeable soils that cause surface inflow peaks to these sites to be muted. Outflows generally occur only as a result of very intense storms or seepage inflows during very wet years. Many areas are frequently to continuously flooded. Refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves.

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.

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: Stan Boltz, Range Management Specialist, NRCS; Jill Epley, Range Management Specialist, NRCS; Rick Peterson, Range Management Specialist, NRCS; David Steffen, Range Management Specialist, NRCS; Jeff Vander Wilt; Range Management Specialist, NRCS; Phil Young, Soil Scientist, NRCS.

Other references

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)
USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)
USDA, NRCS. National Range and Pasture Handbook, September 1997
USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (http://nasis.nrcs.usda.gov)
USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
USDA, NRCS, Various Published Soil Surveys.

Contributors

SCB

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	03/31/2004

Approved by	Stan Boltz
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. During periods of above average precipitation and run-on, this site may be ponded for longer than normal durations, and typical vegetation may be temporarily reduced, creating areas of bare ground for relatively short periods of time.

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

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

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

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. This site typically has an O-horizon (roots and partly decomposed stems and leaves of plants) that is 0-3 inches thick. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 12 to 24 inches thick with dark gray or gray colors when moist. Structure typically is medium to fine angular blocky in the A-horizon.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep rooted species (tall rhizomatous cool- and warm-season grasses and grass-likes) with fine and coarse roots positively influences infiltration. Infiltration is somewhat limited naturally due to poor drainage and relatively low permeability.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be**

mistaken for compaction on this site): None – when dry, B horizons can be hard and appear to be compacted, but no platy structure will be present.

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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, warm-season rhizomatous grasses > grass-likes species >

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

    Other: Trees > mid and short, cool-season grasses

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 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 1.5 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 4,500 to 6,500 pounds/acre, with the reference values being 5,500 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. Most invasive species will occupy the perimeter of this site.

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17. **Perennial plant reproductive capability:** Perennial grasses and grass-likes should have vigorous rhizomes or tillers.
