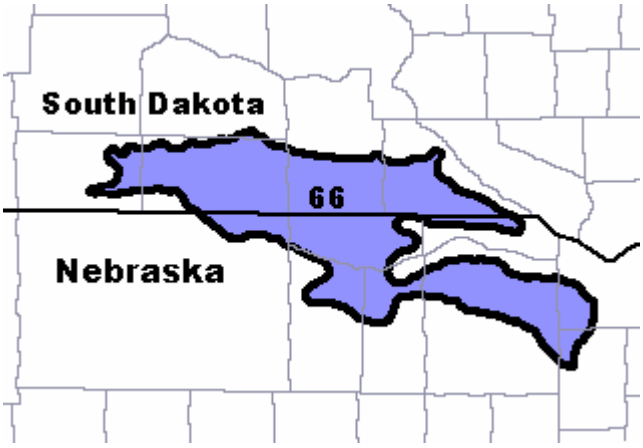
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Wet Land

Site ID: R066XY044NE

Major Land Resource Area (MLRA):
66 – Dakota - Nebraska Eroded Tableland

Physiographic Features

This site occurs on nearly level wet swales of interdunes on uplands and on floodplains of valleys.

Landform: swale, flood plain **Aspect:** N/A

	Minimum	Maximum
Elevation (feet):	1900	3000
Slope (percent):	0	1
Water Table Depth (inches):	0	12
Flooding:		
Frequency:	None	Frequent
Duration:	None	Brief
Ponding:		
Depth (inches):	0	6
Frequency:	Occasional	Occasional
Duration:	Long	Long
Runoff Class:	Negligible	Negligible

Climatic Features

MLRA 66 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 the winds move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 18 to 25 inches per year. The normal average annual temperature is about 48°F. January is the coldest month with average temperatures ranging from about 19°F (Bonesteel, South Dakota (SD)), to about 23°F (Ainsworth, Nebraska (NE)). July is the warmest month with temperatures averaging from about 73°F (Harrington, SD), to about 75°F (Gregory, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 54°F. This large annual range attests to the continental nature of this area's climate. Hourly winds average about 10 miles per hour annually, ranging from about 11 miles per hour during the spring to about 9 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 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.

	Minimum	Maximum
Frost-free period (days):	127	154
Freeze-free period (days):	144	173
Mean Annual Precipitation (inches):	18	25

Average Monthly Precipitation (inches) and Temperature (ºF):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.28	0.42	8.2	33.6
February	0.48	0.69	13.5	38.9
March	0.92	1.58	21.3	46.9
April	1.94	3.03	31.7	61.2
May	3.08	4.20	42.8	72.5
June	3.10	3.74	52.6	82.2
July	2.86	3.25	58.5	88.3
August	2.33	2.68	56.2	86.8
September	1.54	2.71	45.9	77.3
October	1.03	1.79	33.7	65.0
November	0.55	0.94	20.8	47.6
December	0.32	0.45	11.2	37.1

Climate Stations		**Period**	
Station ID	**Location or Name**	**From**	**To**
NE0050	Ainsworth	1948	2003
SD0778	Bonesteel	1956	2003
NE1365	Butte	1948	2003
SD3574	Harrington	1960	2003
NE8760	Valentine WSO AP	1948	2003

For other climate stations that may be more representative, refer to http://www.wcc.nrcs.usda.gov.

Influencing Water Features

Wetland Description:	**System**	**Subsystem**	**Class**	**Sub-class**
Cowardin, et. al., 1979	Lacustrine	Littoral	Unconsolidated Shoreline	Permanently or Semi-permanently or Seasonally Flooded
OR:				
Cowardin, et. al., 1979	Palustrine	N/A	Persistent Emergent Wetland	Permanently or Semi-permanently or Seasonally Flooded or Saturated

These wetland types include: fen, abandoned ox-bow

Stream Type: None (Rosgen System)

Representative Soil Features

The features common to all soils in this site are the loamy sand to loam textured surface layers and slopes of zero to one 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 on upland swales and sandy alluvium on floodplains. The texture of the control section ranges from loamy sand to gravelly coarse sand and has thin strata of loamy material. Runoff as evidenced by patterns of rills, gullies, or other water flow is negligible due to the low slope gradient and high intake rate of these soils. Pedestalling of plants does not typically occur on this site.

More information can be found in the various soil survey reports. Contact the local United States Department of Agriculture (USDA) service center for soil survey reports that include more detail specific to your location.

Parent Material Kind: alluvium
Parent Material Origin: mixed
Surface Texture: fine sandy loam, fine sand, silt loam
Surface Texture Modifier: none
Subsurface Texture Group: sandy
Surface Fragments ≤3" (% Cover): 0-5
Surface Fragments >3" (%Cover): 0
Subsurface Fragments ≤3" (% Volume): 0-15
Subsurface Fragments >3" (% Volume): 0

	Minimum	**Maximum**
Drainage Class:	very poorly	very poorly
Permeability Class:	rapid	rapid
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	5
Soil Reaction (1:1 Water)*:	5.6	8.4
Soil Reaction (0.1M CaCl2)*:	5.1	7.3
Available Water Capacity (inches)*:	3	16
Calcium Carbonate Equivalent (percent)*:	0	40

*These attributes represent 0-40 inches in depth or to the first restrictive layer.

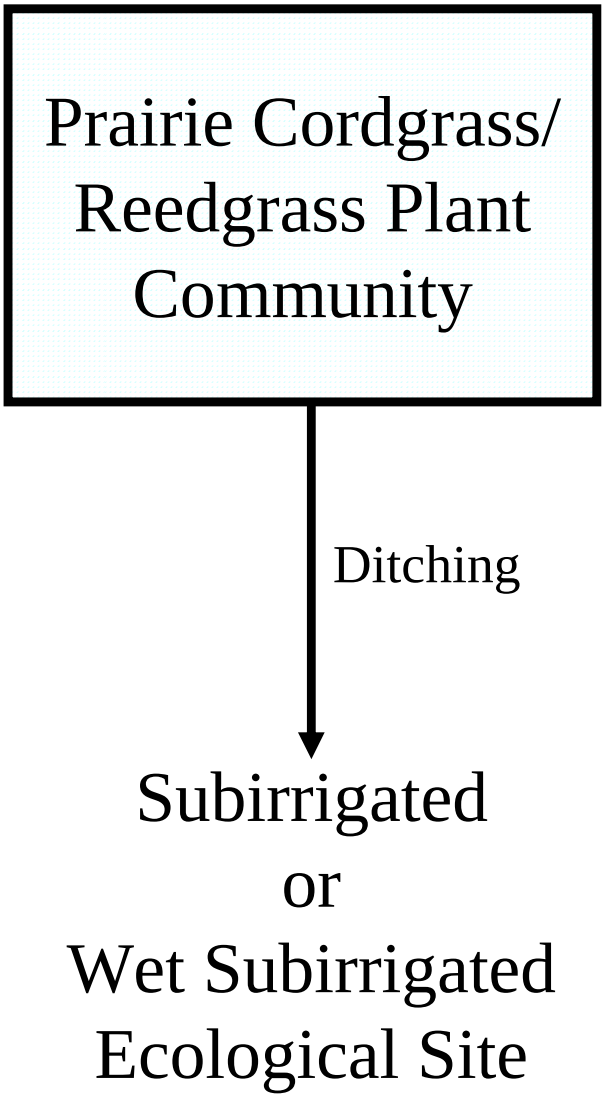
Plant Communities

Ecological Dynamics of the Site:
Typically, this site is extremely stable. Plant species composition and production does not fluctuate greatly under most management scenarios. Ditching is an exception, but this practice usually results in a shift to another ecological site, such as the Wet Subirrigated or the Subirrigated ecological site.

Interpretations are based on the Prairie Cordgrass/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. 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.

Plant Communities and Transitional Pathways



Plant Community Composition and Group Annual Production

			Prairie Cordgrass/Reedgrass		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES				*3190 - 4930*	*55 - 85*
prairie cordgrass	Spartina pectinata	SPPE	1	1450 - 4060	25 - 70
REEDGRASSES			**2**	**290 - 2030**	**5 - 35**
northern reedgrass	Calamagrostis stricta ssp. inexpansa	CASTI3	2	290 - 1160	5 - 20
bluejoint reedgrass	Calamagrostis canadensis	CACA4	2	0 - 1160	0 - 20
narrow reedgrass	Calamagrostis stricta ssp. stricta	CASTS5	2	0 - 870	0 - 15
OTHER NATIVE GRASSES			**3**	**290 - 870**	**5 - 15**
plains bluegrass	Poa arida	POAR3	3	290 - 580	5 - 10
slender wheatgrass	Elymus trachycaulus	ELTR7	3	0 - 580	0 - 10
foxtail barley	Hordeum jubatum	HOJU	3	0 - 290	0 - 5
green muhly	Muhlenbergia racemosa	MURA	3	0 - 290	0 - 5
other perennial grasses		2GP	3	0 - 116	0 - 2
GRASS-LIKES			*4*	*870 - 1740*	*15 - 30*
sedge	Carex spp.	CAREX	4	870 - 1740	15 - 30
rush	Juncus spp.	JUNCU	4	0 - 580	0 - 10
bulrush	Schoenoplectus spp.	SCHOE6	4	0 - 290	0 - 5
spikerush	Eleocharis spp.	ELEOC	4	0 - 290	0 - 5
other grass-likes		2GL	4	0 - 290	0 - 5
FORBS			*5*	*116 - 580*	*2 - 10*
aster	Aster spp.	ASTER	5	0 - 290	0 - 5
Pennsylvania smartweed	Polygonum pensylvanicum	POPE2	5	0 - 290	0 - 5
swamp smartweed	Polygonum hydropiperoides	POHY2	5	0 - 290	0 - 5
wild strawberry	Fragaria virginiana	FRVI	5	0 - 116	0 - 2
cinquefoil	Potentilla spp.	POTEN	5	0 - 116	0 - 2
wild mint	Mentha arvensis	MEAR4	5	0 - 116	0 - 2
American licorice	Glycyrrhiza lepidota	GLLE3	5	0 - 116	0 - 2
arrowgrass	Triglochin palustre	TRPA6	5	0 - 116	0 - 2
other perennial forbs		2FP	5	0 - 116	0 - 2
other annual forbs		2FA	5	0 - 116	0 - 2
SHRUBS			*6*	*0 - 290*	*0 - 5*
false indigo	Amorpha fruticosa	AMFR	6	0 - 174	0 - 3
coyote willow	Salix exigua	SAEX	6	0 - 174	0 - 3
Missouri River willow	Salix eriocephala	SAER	6	0 - 174	0 - 3
meadow willow	Salix petiolaris	SAPE5	6	0 - 174	0 - 3
other shrubs		2SHRUB	6	0 - 116	0 - 2

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES	3735 -	4002	- 4225
GRASS-LIKES	850 -	1305	- 1600
FORBS	115 -	348	- 650
SHRUBS	0 -	145	- 325
TOTAL	4700 -	5800	- 6800

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities (DPC)." According to the USDA Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook, DPC's will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Prairie Cordgrass/Reedgrass Plant Community

Interpretations are primarily based on the Prairie Cordgrass/Reedgrass Plant Community (this is also considered climax). This plant community is very resistant to any change that does not affect the associated water table. With a seasonably high water table that ranges from above the ground surface in wet years to within one foot of the surface in dry years, traditional hayland management usually leaves these areas idle. Primary use is by wildlife species. The potential vegetation is about 55 percent grasses, 30 percent grass-like plants, 10 percent forbs, and 5 percent shrubs. The dominant grass is prairie cordgrass. A wide variety of grass-like plants exists and may comprise up to 30 percent of the plant community. Forbs include Pennsylvania and swamp smartweed, wild strawberry, and cinquefoil. Dominant shrubs are false indigo and willow.

Ditching has been a traditional management tool. Draining a wetland effectively changes the hydrology of the site and allows it to more closely resemble a Subirrigated or Wet Subirrigated ecological site. Once ditched, significant inputs are required to restore and maintain the high water table.

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: NE6642
Growth curve name: Eroded Tableland, warm-season dominant, cool-season subdominant.
Growth curve description: Warm-season dominant, cool-season subdominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	8	18	27	23	12	6	3	0	0

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Prairie Cordgrass/Reedgrass Plant Community:

Animal Preferences (Quarterly – 1,2,3,4[†])

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-likes							
bluejoint reedgrass	U P D U	N D U N	U P D U	N D U N	N D U N	U P D U	U P D U
bulrush	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	U U U U
foxtail barley	U D N N	N P N N	U D N N	N P N N	N P N N	U D N N	U D N N
green muhly	U D D U	N U N N	U D D U	N U N N	N U N N	U D D U	U D D U
narrow reedgrass	U P U D	N D U N	U P U D	N D U N	N D U N	U P U D	U P U D
northern reedgrass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
plains bluegrass	U D U D	N D N U	U D U D	U P N D	U P N D	U D U D	U D U D
prairie cordgrass	U D D U	N N N N	U D D U	N N N N	N N N N	U D D U	U D D U
rush	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
spikerush	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
Forbs							
American licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
arrowgrass	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
aster	U U D U	U U D U	U U D U	U U D U	U U D U	U U D U	U U D U
cinquefoil	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
Pennsylvania smartweed	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
swamp smartweed	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
wild mint	U D U U	U P P U	U D U U	U P P U	U P P U	U D U U	U P P U
wild strawberry	U D U U	N U U N	U D U U	N U U N	N U U N	U D U U	N U U N
Shrubs							
coyote willow	P U D P	P U D P	P U D P	P U D P	U U U U	P U D P	P U D P
false indigo	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N
meadow willow	P U D P	P U D P	P U D P	P U D P	U U U U	P U D P	P U D P
Missouri River willow	P U D P	P U D P	P U D P	P U D P	U U U U	P U D P	P U D P

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic
[†] Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Prairie Cordgrass/Reedgrass	5800	1.59

*Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25 percent harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

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.

Hydrology Functions

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

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 not typically present. Litter falls in place, and signs of movement are not common. Litter often accumulates to create muck peat like conditions. Chemical and physical crusts are rare. Cryptogamic crusts are present but are not expected to significantly affect hydrologic considerations. Overall, this site has the appearance of being stable and productive.

Recreational Uses

This site provides hunting opportunities for upland game and waterfowl species. The wide varieties 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

None noted.

Supporting Information

Associated Sites

(066XY045NE) – Wet Subirrigated
(066XY046NE) – Subirrigated

Similar Sites

(066XY045NE) – Wet Subirrigated
[big bluestem/prairie cordgrass co-dominant; more switchgrass; less productive]

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: Wayne Bachman, Soil Scientist, NRCS; Stan Boltz, Range Management Specialist, NRCS; Anna Ferguson, Soil Conservationist, NRCS; Roger Hammer, Soil Scientist, NRCS; Dana Larsen, Range Management Specialist, NRCS; Dave Schmidt, Rangeland Management Specialist, NRCS; and Kim Stine, Rangeland Management Specialist, NRCS.

Data Source	Number of Records	Sample Period	State	County
SCS-RANGE-417				

State Correlation

This site has been correlated with NE and SD in MLRA 66.

Field Offices	Counties	Field Offices	Counties
Ainsworth, NE	Brown, Keya Paha & Rock	O'Neill, NE	Holt
Bloomfield, NE	Knox	Spencer, NE	Boyd
Burke, SD	Gregory	Valentine, NE	Cherry
Martin, SD	Bennett & Shannon	White River, SD	Mellette, Todd
Neligh, NE	Antelope	Winner, SD	Tripp

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43i – Keya Paha Tablelands.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://www.hprcc.unl.edu/)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://www.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, 2002. National Soil Survey Handbook, title 430-VI. (http://soils.usda.gov/technical/handbook/)

Site Description Approval

_____ _____
NE, State Range Management Specialist Date

_____ _____
SD, State Range Management Specialist Date