

# United States Department of Agriculture Natural Resources Conservation Service

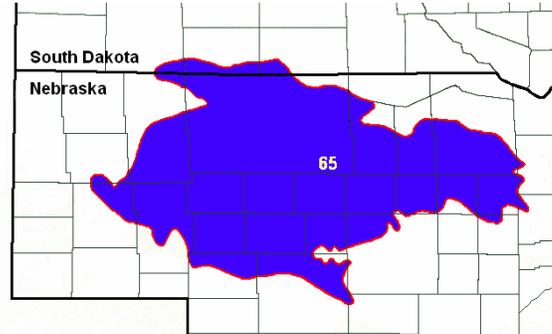
## Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Wet Land

**Site ID:** R065XY022NE

**Major Land Resource Area:**  
65 – Nebraska Sand Hills



### Physiographic Features

This site occurs on nearly level valley floors and water is at or near the surface for most of the year.

**Landform:** Swale, flood plain, fen      **Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2000	3900
<b>Slope (percent):</b>	0	1
<b>Water Table Depth (inches):</b>	+6	12
<b>Flooding:</b>		
<b>Frequency:</b>	None	Frequent
<b>Duration:</b>	None	Brief
<b>Ponding:</b>		
<b>Depth (inches):</b>	0	6
<b>Frequency:</b>	N/A	N/A
<b>Duration:</b>	Long	Long
<b>Runoff Class:</b>	Negligible	Low

### Climatic Features

The mean average annual precipitation varies from 14 to 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°F 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°F.

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.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	131	145
Freeze-free period (days):	150	165
Mean Annual Precipitation (inches):	14	25

**Average Monthly Precipitation (inches) and Temperature (°F):**

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.33	0.51	8.0	37.8
February	0.39	0.66	12.7	43.7
March	0.86	1.54	21.3	50.0
April	1.51	2.31	31.4	62.1
May	2.87	3.54	41.5	72.7
June	2.94	4.15	51.3	82.2
July	2.05	3.29	57.2	88.9
August	1.07	3.12	55.2	87.0
September	1.16	2.37	44.7	77.7
October	0.87	1.61	32.7	66.6
November	0.51	0.94	20.5	49.6
December	0.31	0.61	11.4	40.3

Climate Stations		Period	
Station ID	Location or Name	From	To
NE1130	Brewster	1948	1997
NE2000	Crescent Lake Natl WLR	1948	1997
NE2805	Ewing	1948	1997
NE2647	Ellsworth 15 NNE	1963	1997
NE6970	Purdum	1948	1997
NE7665	Scottsbluff WSO AP	1948	1997

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

**Influencing Water Features**

Wetland Description:	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
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 fine sand and fine sandy loam textured surface soils 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. Minor soils in this site occur along streams flowing through and out of the Sand Hills, and formed in sandy to loamy alluvium. Fen soils (Cutcomb series), included in this site, are very poorly drained and formed in thick deposits of organic material. The surface layer is 2 to 19 inches thick. The texture of the subsurface ranges from sand to fine sandy loam in the major soils of this site. The minor soils have textures ranging from sand to clay loam. Cutcomb soils (fens) have subsurface textures ranging from muck to mucky peat interspersed with thin layers of 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. Pedestalling of plants does not typically occur on this site.

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: Tryon, Loup, and Gannett.

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

**Parent Material Kind:** alluvium

**Parent Material Origin:** mixed

**Surface Texture:** loamy fine sand, fine sandy loam, mucky peat

**Surface Texture Modifier:** none

**Subsurface Texture Group:** sandy

**Surface Fragments  $\leq$  3" (% Cover):** 0

**Surface Fragments  $>$  3" (%Cover):** 0

**Subsurface Fragments  $\leq$  3" (% Volume):** 0-5

**Subsurface Fragments  $>$  3" (% Volume):** 0

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	very poorly	very poorly
<b>Permeability Class:</b>	moderate	rapid
<b>Depth (inches):</b>	>80	>80
<b>Electrical Conductivity (mmhos/cm):</b>	0	4
<b>Sodium Absorption Ratio:</b>	0	5
<b>Soil Reaction (1:1 Water):</b>	5.6	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>):</b>	5.1	7.3
<b>Available Water Capacity (inches):</b>	3	16
<b>Calcium Carbonate Equivalent (percent):</b>	0	$\geq$ 40

## Plant Communities

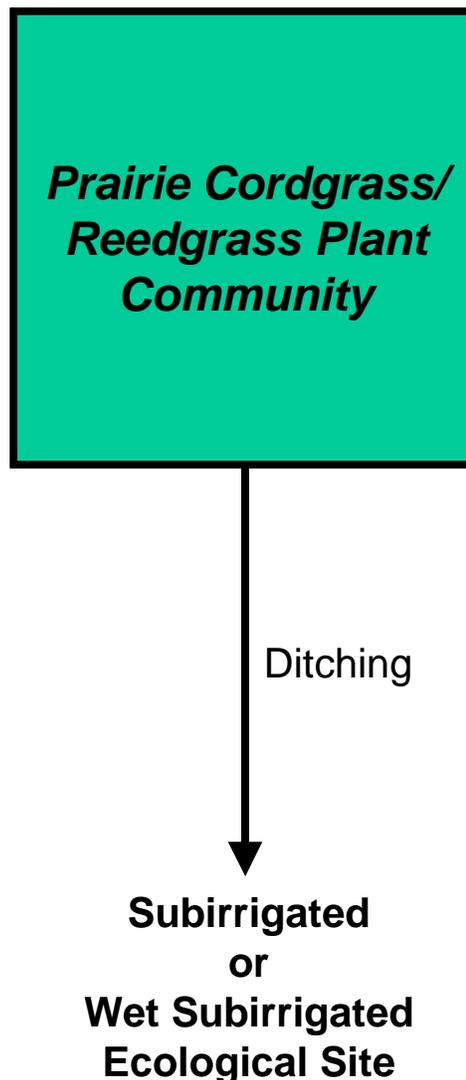
### Ecological Dynamics of the Site:

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 (diagram)



## Plant Community Composition and Group Annual Production

		Prairie Cordgrass/Reedgrass		
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp
<b>GRASSES</b>				
prairie cordgrass	SPPE	1	1450 - 4060	25 - 70
<b>REEDGRASSES</b>				
		<b>2</b>	<b>290 - 2030</b>	<b>5 - 35</b>
northern reedgrass	CASTI3	2	290 - 1160	5 - 20
bluejoint reedgrass	CACA4	2	0 - 1160	0 - 20
narrow reedgrass	CASTS5	2	0 - 870	0 - 15
<b>OTHER NATIVE GRASSES</b>				
		<b>3</b>	<b>290 - 870</b>	<b>5 - 15</b>
plains bluegrass	POAR3	3	290 - 580	5 - 10
slender wheatgrass	ELTRT	3	0 - 580	0 - 10
other perennial grasses	2GP	3	0 - 116	0 - 2
<b>GRASS-LIKES</b>				
		<b>4</b>	<b>870 - 1740</b>	<b>15 - 30</b>
sedge	CAREX	4	870 - 1740	15 - 30
rush	JUNCU	4	0 - 580	0 - 10
bulrush	SCIRP	4	0 - 290	0 - 5
spikerush	ELEOC	4	0 - 290	0 - 5
<b>FORBS</b>				
		<b>5</b>	<b>116 - 580</b>	<b>2 - 10</b>
Pennsylvania smartweed	POPE2	5	0 - 116	0 - 2
swamp smartweed	POHY2	5	0 - 116	0 - 2
wild strawberry	FRVI	5	0 - 116	0 - 2
cinquefoil	POTEN	5	0 - 116	0 - 2
wild mint	MEAR4	5	0 - 116	0 - 2
American licorice	GLLE3	5	0 - 116	0 - 2
arrowgrass	TRPA6	5	0 - 116	0 - 2
other perennial forbs	2FP	5	0 - 116	0 - 2
<b>SHRUBS</b>				
		<b>6</b>	<b>0 - 290</b>	<b>0 - 5</b>
dwarf false indigo	AMNA	6	0 - 174	0 - 3
coyote willow	SAEX	6	0 - 174	0 - 3
Missouri River willow	SAER	6	0 - 174	0 - 3
meadow willow	SAPE5	6	0 - 174	0 - 3
other shrubs	2SHRUB	6	0 - 116	0 - 2
<b>Annual Production lbs./acre</b>				
		LOW	RV	HIGH
<b>GRASSES</b>		4365-	4002	-4675
<b>GRASS-LIKES</b>		220-	1305	-650
<b>FORBS</b>		115-	348	-650
<b>SHRUBS</b>		0-	145	-325
<b>TOTAL</b>		4700-	5800	-6300

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 = Relative 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’s).” 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 exist 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 in the Sandhills area. 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: NE6543

Growth curve name: Nebraska/South Dakota Sandhills, Native Grasslands, Wet

Growth curve description: 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	5	20	35	25	10	5	0	0	0

## Ecological Site Interpretations

### Animal Community – Wildlife Interpretations

#### Prairie Cordgrass/Reedgrass Plant Community:

#### Animal Preferences (Quarterly – 1,2,3,4<sup>†</sup>)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
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
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
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
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
dwarf false indigo	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
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
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
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
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
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

**N** = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

<sup>†</sup> 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 suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using this information along with animal preference data, 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	Production (lbs./acre)	Carrying Capacity* (AUM/acre)
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**Site Type: Rangeland**  
**MLRA: 65 – Nebraska Sand Hills**  
Prairie Cordgrass/Reedgrass

5800

**Wet Land**  
**R065XY022NE**  
1.84

\* Continuous season-long grazing by cattle under average growing conditions. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

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 principle 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 that 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

(065XY023NE) – Wet Subirrigated

(065XY024NE) – Subirrigated

### Similar Sites

(065XY023NE) – 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 was 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; and Dave Steffen, Rangeland Management Specialist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
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**Site Type: Rangeland**

**MLRA: 65 – Nebraska Sand Hills**

SCS-RANGE-417                      7

1968 – 1999

NE

**Wet Land**

**R065XY022NE**

Garden, Garfield, Lincoln,  
Loup, Morrill, Wheeler  
county

Ocular estimates                      0

19 -19

XX

**State Correlation**

This site has been correlated with South Dakota.

**Type Locality**

**State:**

**Township:**

**Latitude:**

**County:**

**Section:**

**Longitude:**

**General Legal Description:**

**Range:**

**Is the type locality sensitive? (Y/N):**

**Field Offices**

- Ainsworth, NE
- Albion, NE
- Alliance, NE
- Bridgeport, NE
- Broken Bow, NE
- Burwell, NE
- Greeley, NE
- Martin, SD
- Neligh, NE
- North Platte, NE
- Ogallala, NE
- O’Neill, NE
- Oshkosh, NE
- Rushville, NE
- Theford, NE
- Valentine, NE
- White River, SD

**Counties**

- Brown, Keya Paha and Rock, NE
- Boone, NE
- Box Butte, NE
- Morrill, NE
- Custer, NE
- Garfield, Loup and Wheeler, NE
- Greeley, NE
- Bennett and Shannon, SD
- Antelope, NE
- Lincoln, Logan and McPherson, NE
- Arthur and Keith, NE
- Holt, NE
- Garden, NE
- Sheridan, NE
- Blaine, Grant, Hooker and Thomas, NE
- Cherry, NE
- Todd, SD

**Relationship to Other Established Classifications**

Level IV Ecoregions of the Conterminous United States; 44a – Nebraska Sand Hills.

**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 Description Approval**

\_\_\_\_\_  
State Range Management Specialist

\_\_\_\_\_  
Date

\_\_\_\_\_  
State Range Management Specialist

\_\_\_\_\_  
Date