Ecological site R065XY026NE
Deep Wetland

Accessed: 04/24/2024

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)

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 deep wetland site is found on interdunes and stream valleys. The slope ranges from 0 to 1%.
The site is generally saturated or ponded for a very long duration to or near the surface during the growing season to a depth of up to 24 inches.

Associated sites

R065XY022NE	**Wet Land** Wetland
R065XY023NE	**Wet Subirrigated** Wet Subirrigated

Similar sites

R065XY022NE	**Wet Land** Wetland

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Typha latifolia* (2) *Scirpus*

Physiographic features

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

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 area. 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) Swale (2) Flood plain (3) Fen
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding duration	Long (7 to 30 days)
Elevation	2,000–3,900 ft
Slope	0–1%
Ponding depth	0–6 in
Water table depth	6–12 in
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)	130 days
Freeze-free period (average)	151 days
Precipitation total (average)	25 in

Climate stations used

- (1) ARTHUR [USC00250365], Arthur, NE
- (2) BARTLETT 1S [USC00250525], Bartlett, NE
- (3) BREWSTER [USC00251130], Brewster, NE
- (4) CHAMBERS [USC00251590], Chambers, NE
- (5) GORDON 6N [USC00253355], Gordon, NE
- (6) ELSMERE 9 ENE [USC00252680], Johnstown, NE
- (7) ERICSON 8 WNW [USC00252770], Burwell, NE
- (8) GREELEY [USC00253425], Greeley, NE
- (9) MERRIMAN [USC00255470], Merriman, NE
- (10) NEWPORT [USC00255925], Newport, NE
- (11) PURDUM [USC00256970], Purdum, NE
- (12) RUSHVILLE [USC00257415], Rushville, NE
- (13) ATKINSON 3SW [USC00250420], Atkinson, NE
- (14) KINGSLEY DAM [USC00254455], Keystone, NE
- (15) VALENTINE NWR [USC00258755], Valentine, NE
- (16) NORTH PLATTE RGNL AP [USW00024023], Maxwell, NE

Influencing water features

This ecological site has a combination of physical and hydrological features that: 1) normally has season-long groundwater near to or above the soil surface (0.5 ft. to +2 ft.), 2) restricting free movement of water and air (anaerobic conditions) in the entire root zone, and 3) is ponded or flooded during long to very long periods of the growing season in most years.

Soil features

The features common to all soils in this site include frequent inundation, mucky peat surface textures and slopes of 0 to 1 percent. A few soils included within this site may lack the organic surface layer. The soils in this site are very poorly drained and formed in eolian sands and sandy alluvium. The surface layer is 0 to 15 inches thick. The texture of the subsurface ranges from sand to fine sandy loam interspersed with thin to thick layers of mucky loam, muck or mucky peat. Fen soils (Medihemists) having moderately deep (>16 inches within the upper 32 inches) to very deep layers of muck and/or mucky peat occur on similar landscape positions. They are currently included as associated soils within this ecological site. 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. Pedestalling of plants does not occur on this site. Frost-heave mounding and/or mucking by excessive hoof traffic is common, and can result in a rough and uneven land

surface.
More information can be found in the various soil survey reports. Contact the local USDA Service Center for internet links to soil survey data that includes more details specific to your location.

Major soils series correlated to this ecological site include: Marlake series, and Fluvaquents, Sandy mapping units.

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) Loamy fine sand (2) Fine sandy loam
Family particle size	(1) Sandy
Drainage class	Poorly drained
Permeability class	Moderate to rapid
Soil depth	80 in
Available water capacity (0-40in)	3–15.99 in
Calcium carbonate equivalent (0-40in)	0–40%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	5.6–8.4

Ecological dynamics

Typically, this site is extremely stable. Plant species composition and production does may fluctuate during wet and dry cycles. Deep water species such as Cattails and swamp smartweed may increase during a wet cycle, and decrease during a dry cycle.

Human disturbance is generally not an issue due to the depth of the water. In some instances, in prolonged dry conditions, plant material has been harvested for use as a stabilizing agent on two-track sand roads.

Ditching is not a common practice for this site, as it occupies the lowest position in the landscape, and it is usually not deemed cost effective to excavate the required distances to drain the water into an adjacent local watershed with lower elevations.

Interpretations are based on the Cattail, bulrush Plant community.
The following is a diagram that illustrates the common plant communities that can occur on the site.

State and transition model

Animal community

"Wetlands provide migration, breeding, nesting, and feeding habitat for millions of waterfowl, shorebirds, songbirds, and other wildlife. Wetlands are home to thousands of different plant and animal species including many that are threatened or endangered. Nine of Nebraska’s 12 federal endangered and threatened species use wetland areas, as do 19 of Nebraska’s 27 state listed endangered and threatened species.
Many wetlands provide important feeding and rearing habitat for fish. All the state’s amphibians, as well as many reptiles and invertebrates, use wetlands.

Wetlands also provide important winter cover for pheasants, deer and other resident wildlife.
They also provide a watering source for both domestic livestock and wildlife." (LaGrange, 2004).

Hydrological functions

"Wetlands act as a sponge by storing water temporarily and allowing it to percolate into the ground, evaporate, or be slowly released back into a stream or river. This temporary storage reduces flooding after a storm. Wetlands also slow the overland flow of water, reducing downstream soil erosion.

Wetlands store rainwater and runoff. Many wetlands slowly release water into the ground to recharge groundwater. Some wetlands also slowly release water to streams and rivers, helping to maintain streamflows." (LaGrange, 2004)

Recreational uses

"Wetlands provide numerous recreational opportunities including hunting, trapping, wildlife watching, photography, and enjoyment of the serenity that a wetland can offer. Anglers also benefit from wetlands because many species of fish use these areas for spawning, hiding, or because the foods used by the fish are produced in wetlands. Wetlands provide an excellent setting for environmental education because of the many unusual life forms present and because they are unique features of the landscape. Wetlands also serve a heritage function because they represent a landscape as it once appeared in the past." (LaGrange,2004)

Wood products

Not a viable source of wood products.

Other products

Wetlands in general have potential as sites for entrepreneurial endeavors such as raising fish, crayfish and frogs;growing alternative crops like wild rice or new strains of crops adapted to wetlands. There may also be potential for using wetland plants for biomass or ethanol production

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

There is no inventory data available for this site.

Other references

LaGrange,T. 2004. Guide to Nebraska's Wetlands. Nebraska Game and Parks Commission. pp 3-4.
Steinauer,G., S.Rolfsmeier, J.Hardy; 1996. Inventory and Floristics of Sandhills Fens in Cherry County, Nebraska. Nebraska Academy of Sciences.
Local expertise from the Nebraska NRCS Soils and resources Staff.

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-R065XN026NE - 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.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

   _____

2. **Presence of water flow patterns:**

   _____

3. **Number and height of erosional pedestals or terracettes:**

   _____

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

   _____

5. **Number of gullies and erosion associated with gullies:**

   _____

6. **Extent of wind scoured, blowouts and/or depositional areas:**

   _____

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

   _____

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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

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:

    Sub-dominant:

    Other:

    Additional:

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

14. **Average percent litter cover (%) and depth (in):**

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

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:**

17. **Perennial plant reproductive capability:**