

Ecological site F094DY016WI Mucky Floodplains

Accessed: 05/05/2024

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.

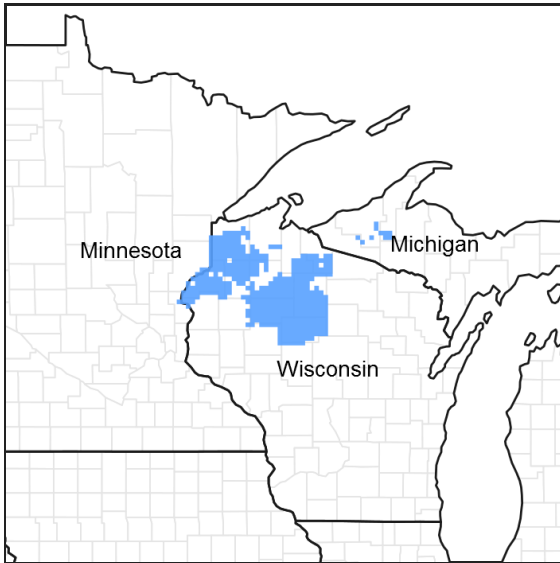


Figure 1. Mapped extent

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): 094D–Northern Highland Sandy Pitted Outwash

The Northern Highland Sandy Drift, aka MLRA 94D, lies mostly in northern Wisconsin with a few narrow outwash channels extending into the upper peninsula of Michigan. MLRA 94D encompasses 1.364 million acres and is surrounded by much larger, geologically different MLRAs. MLRA 94D is characterized mainly by sandy and gravelly soils formed in outwash sediments deposited by melt-water streams from late Wisconsin-Age glaciers, which receded from the area about 10,000 years before present (Attig 1985), and by peat soils that cover about 30% of the area. Mucky Floodplain ecological sites occupy about 20,000 acres in MLRA 94D.

Classification relationships

MLRA 94D is an LRU sized area that will be reclassified as such in the near future. This change is justified as long as the unit remains intact. The boundaries between 94D and adjacent MLRAs are justified based on clear geomorphic and soil parent material differences: sandy drift--outwash and till-- in 94D and loess mantled loamy till in the neighboring areas.

Ecological site concept

ATTENTION: This ecological site meets the NESH 2014 requirements for PROVISIONAL. A provisional ecological site is established after broad ecological site concepts are identified and an initial state-and-transition model is

drafted. Following quality control and quality assurance reviews of the ecological site concepts, an identification number and name for the provisional ecological site are entered into ESIS. A provisional ecological site may include literature reviews, land use history information, some soils data, legacy data, ocular estimates for canopy and/or species composition by weight, and even some line-point intercept information. A provisional ecological site does not meet the NESH 2014 standards for an Approved ESD, but does provide the conceptual framework of soil-site correlation for the development of the ESD. For more information about this ecological site, please contact your local NRCS office.

The Mucky Floodplain ecological site is annually flooded, and in addition, extended periods of ponding occur in numerous patches across this site. The extensive ponding precludes the growth trees most of the site. The vegetation on this site is clearly dominated by sedges, grasses and forbs. However, as is typical in alluvial areas, small landform and elevational differences cause interspersed patches of water-tolerant trees (mostly tamarack) and shrubs such as alder, willows (*Salix* spp.), redosier dogwood (*Cornus sericea*) and *Spirea* species. The soils are, for the most part, very poorly drained Histosols that contain thin layers of mineral sediments within the organic profile; these mineral layers indicate that were major flooding events in the past which carried and re-deposited mineral sediments from upstream. This site represents the wettest of the non-aquatic ecological sites in the region due to both frequent flooding and long duration ponding.

Associated sites

F094DY017WI	Wet Sandy Floodplains Mucky Floodplains occasionally have Wet Sandy Floodplains within them.
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Table 1. Dominant plant species

Tree	(1) <i>Larix laricina</i>
Shrub	(1) <i>Alnus incana</i> (2) <i>Cornus sericea</i>
Herbaceous	(1) <i>Carex stricta</i> (2) <i>Calamagrostis canadensis</i>

Physiographic features

Glacio-fluvial processes in this area produced many broad, low-gradient river valleys in which Mucky Floodplain ecological sites have developed. These sites have 0 to 1 percent slopes and they occupy the lowest lying portions of the floodplain. In addition to the low lying floodplain, alluvial landform features such natural levees, meander scars, sandbars can be found within these sites.

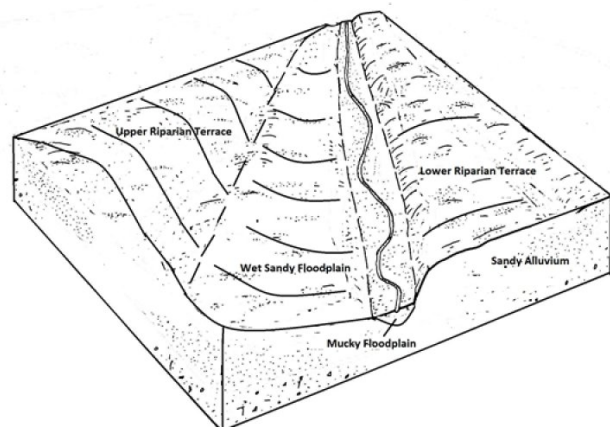


Figure 2. Mucky Floodplains are close to streams

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Drainageway (3) Backswamp
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Frequent to very frequent
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	Occasional to frequent
Elevation	424–570 m
Slope	0–1%
Ponding depth	30–61 cm
Water table depth	15–0 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is humid continental with very cold winters and warm summers. As is common across northern Wisconsin, two-thirds of the precipitation falls as rain during the relatively short growing season of late May to early September. Most of the rainfall is transpired by plants. Snow cover is likely in the months of November through April. Snow cover prevents deep frost penetration which promotes groundwater recharge.

Table 3. Representative climatic features

Frost-free period (average)	96 days
Freeze-free period (average)	123 days
Precipitation total (average)	864 mm

Climate stations used

- (1) LONG LAKE DAM [USC00474829], Eagle River, WI
- (2) NORTH PELICAN [USC00476122], Rhinelander, WI
- (3) REST LAKE [USC00477092], Manitowish Waters, WI
- (4) WILLOW RSVR [USC00479236], Hazelhurst, WI

Influencing water features

The hydrology of this site has major inputs from both the uphill-side and the river-side. This site is frequently flooded from the river or stream overflowing its banks. The site also receives both surface water and groundwater from the uplands. After floodwaters recede, areas of ponding are common. At other times, water is flowing rapidly through the site. This is the most hydrologically active site in the region.

Soil features

The soil found on the Mucky Floodplains ecological site is a Histosol with thin mineral layers within the profile. The mineral layers were deposited by floodwaters from the nearby stream or river. This is the Bowstring soil component, often there are other soil components with similar properties--a mucky surface layer and a frequent flooding interpretation--but they lack the mineral layers in the organic material. The pH of the organic material is about 5.5. The flushing action of water flowing through this riparian system keeps acidity from accumulating, and like Poor Fen ecological sites, which have similar vegetation, the water inputs are not calcareous enough to raise the reaction.

Table 4. Representative soil features

Surface texture	(1) Muck
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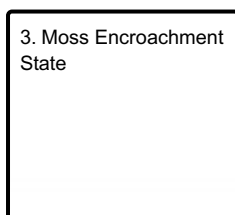
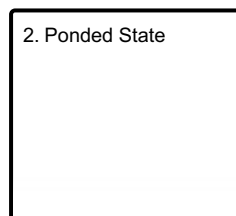
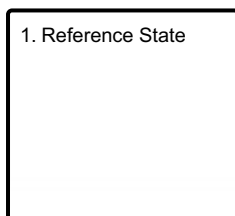
Family particle size	(1) Sandy
Drainage class	Very poorly drained
Permeability class	Moderately slow to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	25.4–38.1 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5–5.6
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

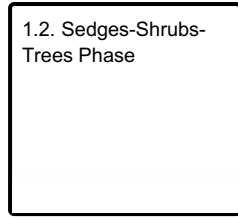
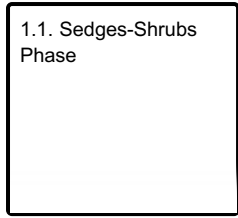
This is a floodplain wetland with shallow to deep organic soils. Flooding occurs during spring melt in most years. It is mostly too wet for trees, but there are a few scattered suitable sites for trees. Plant community phases occur in linear zones paralleling the water course. Aquatic-emergent plants such as wild rice (*Zizania palustris*), cattails (*Typha* spp.), bulrushes (*Scirpus* spp.) or water sedge (*Carex aquatilis*) occur near the flowing water. Grasses and sedges such as *Carex stricta*, *Carex lacustris*, and *Calamagrostis canadensis* are found further inland. Shrubs appear where the soils start to have an aerated root zone for part of the growing season. And finally, trees may occur along the edge farthest from the stream or on slightly higher spots within the site. These vegetation zones may be narrow or wide depending the shape of the valley. These are the lowest-lying, most flood-prone sites in the region. The other riparian sites occur at higher relative elevations.

State and transition model

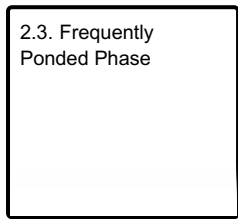
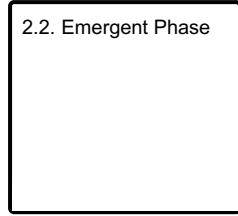
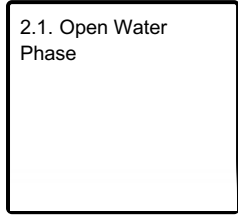
Ecosystem states



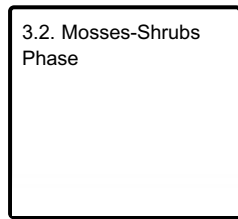
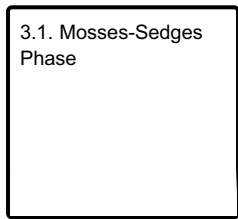
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1 Reference State

The Reference State of this ecological site is still a common occurrence, even though the hydrology of this site is dynamic, and despite the fact that hydrologic manipulations by people are numerous. There are two main community phases; the Sedges-Shrubs Phase is wetter and has less woody vegetation than the Sedges-Shrubs-Trees Phase.

Community 1.1 Sedges-Shrubs Phase

This community phase is governed by water level. Any more water in the system would push it toward the aquatic, less would increase woody vegetation. Seemingly, a delicate balance is maintained. The factor that acts a safety valve for maintaining this phase is the open drainage afforded by the stream or river. As long as that particular water course is flowing the hydrologic system on this site can equilibrate toward a lower water level and the terrestrial nature of the site is maintained.

Community 1.2 Sedges-Shrubs-Trees Phase

This phase occurs on the slightly drier portions of the site because the woody plants are less water tolerant. By definition and in all practical reality, a closed canopy forest is never seen on this site. However, a sparse grove of trees is likely to occur on the upland side of this site, this is an example of the Sedges-Shrubs-Trees Phase.

State 2

Ponded State

The Ponded State is covered with water for a much longer time period than the Reference State, even though the Reference State is also subject to ponding, in addition to flooding. There are three main phases of this state, they are a response to water depth in three categories: Open Water Phase (water >5 feet deep); Emergent Phase with water depth of 2 to 5 feet; and the Frequently Ponded Phase that drains occasionally, it has a water depth of 0 to 2 feet. This ponding is a result of downstream dams made by beavers or people. Beavers are now a common animal in this region after having been nearly extirpated in the past. They prefer the low gradients streams that flow through this ecological site. Beaver dams can be considered beneficial if they impound water on this ecological site that would otherwise cause downstream flooding on developed sites. Large man-made reservoirs were also created to control flood peaks, as well as for recreational and industrial uses. These reservoirs (also called flowages) are well-known for their water level fluctuations.

Community 2.1

Open Water Phase

This phase is most likely to permanently ponded, although water levels can fluctuate below 5 feet at times. Submerged aquatic vegetation is the most abundant form, emergent aquatic plants would indicate the shallower areas.

Community 2.2

Emergent Phase

This phase has a water depth consistently less than 5 feet and is usually around 3 feet deep. Cattails are typically abundant, in some areas wild rice is present. Wild rice beds are an important natural resource and they are regulated.

Community 2.3

Frequently Ponded Phase

This phase is characterized by ponding that recedes to expose mud flats and then refills the area. The mud flats indicate that vegetation establishment is disrupted by the rise and fall of water levels.

State 3

Moss Encroachment State

This state is transitional to the other peatland ecological sites. It occurs where flooding frequency has been reduced by upstream dams or by prolonged drought.

Community 3.1

Mosses-Sedges Phase

This phase is the wetter, moss-encroached site. The mosses in this phase are mainly sun-loving Sphagnum species, these mosses are averse to mineral-rich, so-called "hard" water but proliferate in areas of soft water. So when mineral-rich water inputs are reduced, the mosses have an opportunity to encroach on the site.

Community 3.2

Mosses-Shrubs Phase

This is the drier, moss-encroached site. Were it not for their proximity to a stream with a history of flooding, these phases would be considered to be Poor Fen ecological sites.

Additional community tables

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Contributors

Mark Krupinski

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:
