

Ecological site F088XY006MN Floodplain Forest Wet

Last updated: 8/12/2024
Accessed: 09/01/2026

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.

MLRA notes

Major Land Resource Area (MLRA): 088X–Northern Minnesota Glacial Lake Basins

MLRA 88 consists of the lake beds of glacial Lakes Agassiz, Upham, and Aitkin. These vast glacial lake beds were formed by meltwaters associated with the last glaciation of the Wisconsin age. The large, flat, wet landscapes are filled with lacustrine lake sediments, wave-washed glacial till, and vast expanses of organic soils. This area is entirely in Minnesota and makes up about 11,590 square miles (30,019 square kilometers). The western boundary of MLRA 88 with MLRA 56B is gradual. MLRA 56B is a portion of the Red River Valley that was formed by glacial Lake Agassiz and is dominantly prairie. The southern boundary of MLRA 88 with MLRA 57 consists of distinct moraines that formed from the glacial drift sediments of Late Wisconsin age. The eastern and southeastern boundaries are with portions of MLRAs 90A and 93A. These MLRAs are in a distinct glaciated region of sediments of the Rainy and Superior Lobes, and much of MLRA 93A is bedrock controlled (USDA-Ag Handbook 296, 2022).

Classification relationships

MN DNR Native Plant Community (MN DNR, 2003); the reference community of this Provisional Ecological Site is most similar to: FFn57 Northern Terrace Forest FFn67 Northern Floodplain Forest

Ecological site concept

Flood Plain Forest sites are present on occasionally or annually flooded sites on flats and floodplains of streams and rivers. Soils consist of stratified alluvium which vary widely from silty clay to fine sandy loam soils on the occasionally flooded river terraces to coarser textured alluvium on the active floodplain sites.

Associated sites

F088XY008MN	Wet Mixed Forest These sites occur on footslope and toeslope hillslope positions, drainageways surrounded by uplands or on the edge of uplands grading to very poorly drained peatland soils. These sites typically exist on loamy and occasionally sandy moraines and till plains.
F088XY007MN	Wet Depressional Forest These sites occur in shallow wetland basins, closed depressions and along drainage ways, and are generally in narrow transition zones between mineral uplands and peatlands. Soil surface layers are typically mucky-modified surface textures or muck less than 8" thick over variable parent materials.

Similar sites

F088XY007MN	Wet Depressional Forest These sites occur in shallow wetland basins, closed depressions and along drainage ways, and are generally in narrow transition zones between mineral uplands and peatlands. Soil surface layers are typically mucky-modified surface textures or muck less than 8" thick over variable parent materials.
F088XY008MN	Wet Mixed Forest These sites occur on footslope and toeslope hillslope positions, drainageways surrounded by uplands or on the edge of uplands grading to very poorly drained peatland soils. These sites typically exist on loamy and occasionally sandy moraines and till plains.

Table 1. Dominant plant species

Tree	(1) <i>Fraxinus nigra</i> (2) <i>Acer saccharinum</i>
Shrub	(1) <i>Prunus virginiana</i> (2) <i>Viburnum lentago</i>
Herbaceous	(1) <i>Laportea canadensis</i> (2) <i>Matteuccia</i>

Physiographic features

Flood Plain Forest are present on occasionally or annually flooded sites on flats and floodplains of streams and rivers.

Table 2. Representative physiographic features

Slope shape across	(1) Linear
Slope shape up-down	(1) Linear
Landforms	(1) Flood plain (2) Flat
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Frequent
Ponding frequency	None
Elevation	240 – 490 m

Slope	0 %
Ponding depth	0 cm
Water table depth	0 – 20 cm
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation is 25 to 28 inches (635 to 711 millimeters). Most of the rainfall comes from convective thunderstorms during the growing season. Snowfall generally occurs from October through April. The average annual temperature is 43 to 46 degrees F (6 to 8 degrees C). The mean frost free period ranges from 84 to 110 days, with the mean freeze-free period ranging from 117 to 135 days.

Table 3 Representative climatic features

Frost-free period (characteristic range)	80-110 days
Freeze-free period (characteristic range)	120-140 days
Precipitation total (characteristic range)	640-710 mm
Frost-free period (actual range)	80-110 days
Freeze-free period (actual range)	110-140 days
Precipitation total (actual range)	610-710 mm
Frost-free period (average)	100 days
Freeze-free period (average)	130 days
Precipitation total (average)	660 mm

- (1) WARROAD [USC00218679], Warroad, MN
- (2) CAMP NORRIS DNR [USC00211250], Beltrami Isl State for, MN
- (3) BAUDETTE INTL AP [USW00094961], Baudette, MN
- (4) WASKISH 4NE [USC00218700], Big Falls, MN
- (5) RED LAKE INDIAN AGCY [USC00216795], Ponemah, MN
- (6) BIG FALLS [USC00210746], Big Falls, MN
- (7) LITTLEFORK 10 SW [USC00214809], Big Falls, MN
- (8) INTL FALLS INTL AP [USW00014918], International Falls, MN
- (9) LEECH LAKE [USC00214652], Bena, MN

- (10) POKEGAMA DAM [USC00216612], Cohasset, MN
- (11) SANDY LAKE DAM LIBBY [USC00217460], McGregor, MN
- (12) FLOODWOOD 3 NE [USC00212842], Floodwood, MN
- (13) HIBBING CHISHOLM HIBBING AP [USW00094931], Hibbing, MN
- (14) EVELETH WWTP [USC00212645], Eveleth, MN
- (15) GRAND RPDS FOREST LAB [USC00213303], Grand Rapids, MN

Influencing water features

Annual or periodic flooding occurs on this site and is the main driver for the plant species found here. The floodplain positions are annually flooded, while the terraces receive only occasional flooding.

Wetland description

Although these sites can be inundated by water for periods of 30 or more days, these sites are not considered wetlands due to the periodic and/or unpredictable nature of the wet and dry cycles and resulting vegetation.

Soil features

Soils consist of stratified alluvium which vary widely from silty to fine sandy soils on the occasionally flooded river terraces to coarser textured alluvium on the active floodplain sites. Soils on the active floodplain positions are annually flooded, somewhat poorly to poorly drained soils with grey soil color or grey-mottles shallow within the soil profile indicative of high local water tables, and are subject to scouring and deposition from floodwater.

Soils in the Floodplain Forest Wet ecological site fall within the Entisol and Inceptisol soil orders. These soils can be further classified as Mollic Fluvaquents, Typic Fluvaquents, Fluvaquents, and Fluvaquentic Endoaquents.

Major soil series of this ecological site include: Pengilly, Greaney, Waupaca, and Fordum.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Very fine sandy loam (2) Mucky silt loam (3) Fine sandy loam (4) Silty clay (5) Silt loam
Drainage class	Very poorly drained to poorly drained
Permeability class	Moderately rapid
Depth to restrictive layer	Not specified
Soil depth	150 – 200 cm
Surface fragment cover <=3"	Not specified

Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.41 – 20.32 cm
Soil reaction (1:1 water) (0-25.4cm)	5.6 – 8.4
Subsurface fragment volume <=3" (0-203.2cm)	Not specified
Subsurface fragment volume >3" (0-203.2cm)	Not specified

Ecological dynamics

These communities are driven by the periodic or frequent flooding regimes of these lowland areas. Plant communities often differ between the terraces and the floodplains, with the terraces sometimes appearing with more upland plant communities. The canopy of the terrace community often has abundant black ash, basswood, green ash, bur oak, or American elm in addition to silver maple, while the lowland floodplains tend to be strongly dominated by silver maple with other trees only of minor importance.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Inventory data references

Information presented was derived from Minnesota Department of Natural Resources Field Guide to the Native Plant Communities of Minnesota, USDA-NRCS soil survey information, and USDA Plants Database.

Other references

Cleland, D.T.; Freeouf, J.A.; Keys, J.E., Jr.; Nowacki, G.J.; Carpenter, C; McNab, W.H. 2007. Ecological Subregions: Sections and Subsections of the Conterminous United States.[1:3,500,000], Sloan, A.M., cartog. Gen. Tech. Report WO-76. Washington, DC: U.S. Department of Agriculture, Forest Service.

Eggers, Steve D. and Donald M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St. Paul District.

Minnesota Department of Natural Resources (2003). Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province. Ecological Land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame

Research Program. MNDNR St. Paul, MN.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions. Available online. Accessed March 2018.

United States Department of Agriculture, Natural Resources Conservation Service. 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

USDA, NRCS. 2018. The PLANTS Database (<http://plants.usda.gov>, 27 March 2018). National Plant Data Team, Greensboro, NC 27401-4901 USA.

U.S. Environmental Protection Agency. 2013. Level III and IV ecoregions of the continental United States: Corvallis, Oregon, U.S. EPA, National Health and Environmental Effects Research Laboratory, map scale 1:3,000,000, <https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states>.

Contributors

Ezra Hoffman, Ecological Site Specialist, NRCS North Central Region
Kade Anderson, Ecological Site Specialist, NRCS North Central Region
Patty Burns, Soil Scientist at Bemidji Soil Survey Office
Stacey Clark, Former Regional Ecologist for Regions 10 & 11
Landon Wolter, Rangeland Management Specialist for North Central Region

Approval

Suzanne Mayne-Kinney, 8/12/2024

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	09/01/2026
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:
