USDA Natural Resources Conservation Service

Ecological site F088XY006MN
Floodplain Forest Wet

Last updated: 8/12/2024
Accessed: 09/27/2024

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.

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.
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Table 1. Dominant plant species

Tree	(1) *Fraxinus nigra* (2) *Acer saccharinum*
Shrub	(1) *Prunus virginiana* (2) *Viburnum lentago*
Herbaceous	(1) *Laportea canadensis* (2) *Matteuccia*

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	800–1,610 ft
Slope	0–2%
Ponding depth	0 in
Water table depth	0–6 in
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)	84-110 days
Freeze-free period (characteristic range)	117-135 days
Precipitation total (characteristic range)	25-28 in
Frost-free period (actual range)	75-112 days

Freeze-free period (actual range)	114-141 days
Precipitation total (actual range)	24-28 in
Frost-free period (average)	97 days
Freeze-free period (average)	128 days
Precipitation total (average)	26 in

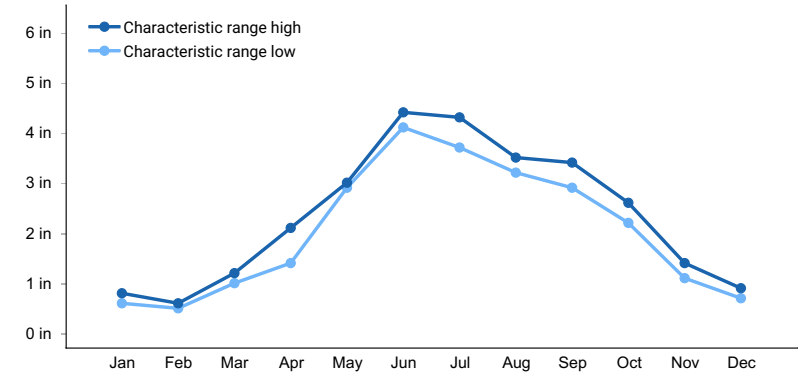


Figure 1. Monthly precipitation range

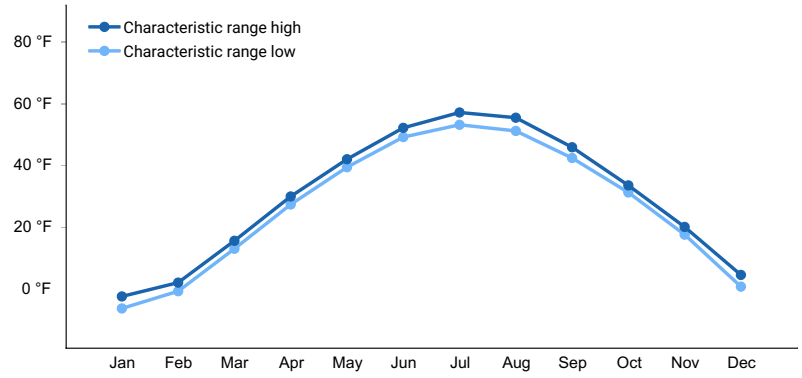


Figure 2. Monthly minimum temperature range

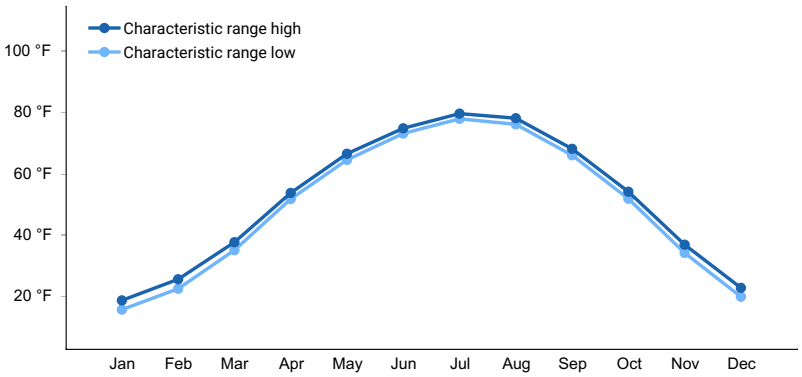


Figure 3. Monthly maximum temperature range

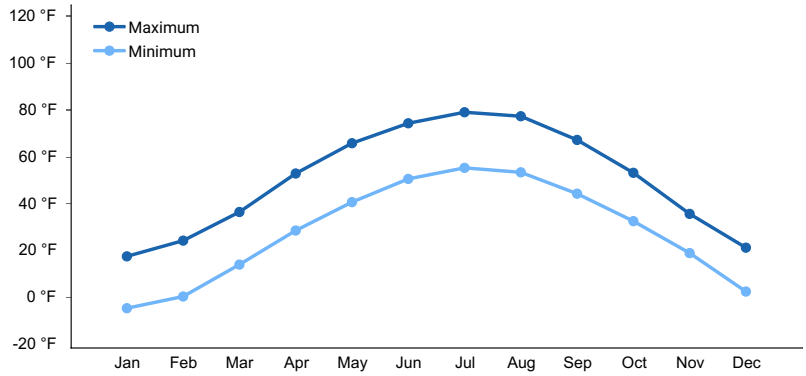


Figure 4. Monthly average minimum and maximum temperature

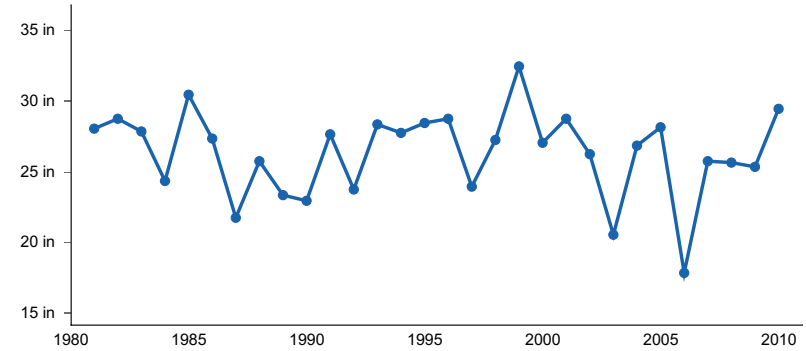


Figure 5. Annual precipitation pattern

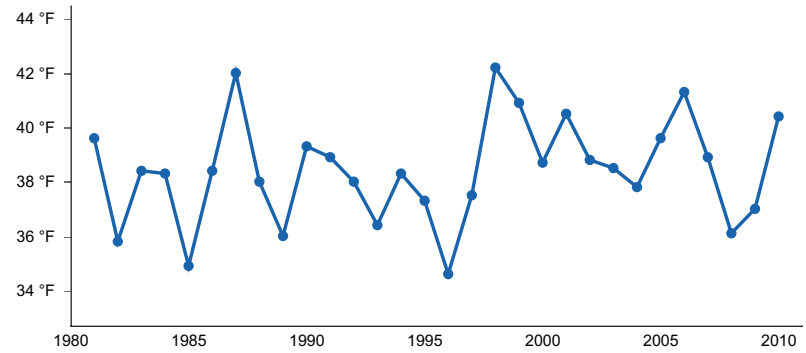


Figure 6. Annual average temperature pattern

Climate stations used

- (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 Endoaquepts.

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

Table 4. Representative soil features

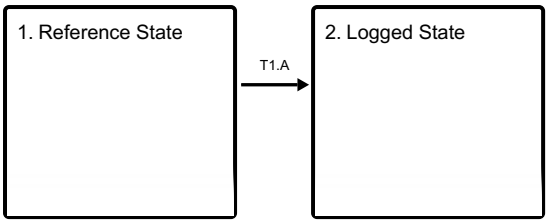
Parent material	(1) Alluvium
Surface texture	(1) Very fine sandy loam (2) Mucky silt loam (3) Fine sandy loam (4) Silty clay (5) Silt loam
Drainage class	Very poorly drained to poorly drained
Permeability class	Moderately rapid
Depth to restrictive layer	0 in
Soil depth	60–80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	4.1–8 in
Soil reaction (1:1 water) (0-10in)	5.6–8.4
Subsurface fragment volume <=3" (0-80in)	0–4%
Subsurface fragment volume >3" (0-80in)	0%

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.

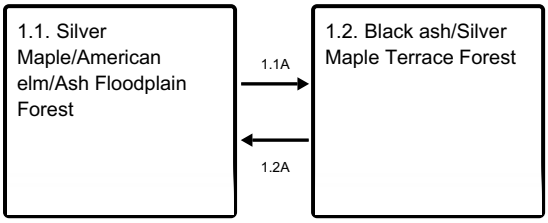
State and transition model

Ecosystem states



T1.A - Mechanical removing of timber.

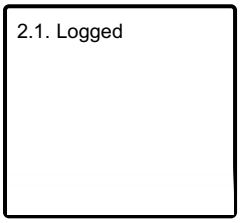
State 1 submodel, plant communities



1.1A - Prolonged drought and infrequent flooding.

1.2A - Excessive flooding or extreme weather events

State 2 submodel, plant communities



State 1
Reference State

The reference state of this site is characterized by annual or periodic flooding resulting in two communities, a true floodplain forest, and a more upland terrace forest.

Dominant plant species

- silver maple (*Acer saccharinum*), tree
- black ash (*Fraxinus nigra*), tree
- green ash (*Fraxinus pennsylvanica*), tree
- American elm (*Ulmus americana*), tree
- American basswood (*Tilia americana*), tree
- Virginia wildrye (*Elymus submuticus*), grass
- Canadian woodnettle (*Laportea canadensis*), other herbaceous
- Tuckerman's sedge (*Carex tuckermanii*), other herbaceous
- ostrich fern (*Matteuccia struthiopteris*), other herbaceous

Community 1.1
Silver Maple/American elm/Ash Floodplain Forest

Ground cover is patchy (25–50% cover) and characterized by annual or flood tolerant perennial species. Wood nettle (*Laportea canadensis*), Virginia wild rye (*Elymus virginicus*), and Tuckerman’s sedge (*Carex tuckermanii*) are often abundant. Shrub layer is sparse. Canopy is 50-100% covered and strongly dominated by silver maple, with occasional green ash, black ash, or American elm. Historically, the Ash and Elm components of this plant community were thought to have had a stronger presence.

Community 1.2
Black ash/Silver Maple Terrace Forest

Canopy is interrupted to continuous (50–100% cover), with black ash and silver maple often abundant, mixed with basswood, green ash, bur oak, or American elm. Shrubs are sparse. Ground cover is variable, ranging from sparse to continuous (5–100%), often with abundant wood nettle (*Laportea canadensis*) and ostrich fern (*Matteuccia struthiopteris*).

Pathway 1.1A
Community 1.1 to 1.2

Prolonged drought and infrequent flooding.

Pathway 1.2A
Community 1.2 to 1.1

Excessive flooding or extreme weather events lower terraces leading to more floodplain sites.

State 2
Logged State

Mechanical removal of tree species for timber.

Dominant plant species

- Virginia wildrye (*Elymus submuticus*), grass
- Canadian woodnettle (*Laportea canadensis*), other herbaceous
- Tuckerman's sedge (*Carex tuckermanii*), other herbaceous

Community 2.1
Logged

Understory vegetation remains but is disturbed.

Transition T1.A
State 1 to 2

Mechanical removal of timber.

Additional community tables

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

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Contributors

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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	09/27/2024
Approved by	Suzanne Mayne-Kinney
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):**

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

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

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

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

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

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

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

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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:

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

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

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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:**