

Ecological site F057XY016MN

Flood Plain Forest

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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): 057X–Northern Minnesota Gray Drift

The Northern Minnesota Gray Drift (57) is located within the Northern Lakes Forest and Forage Region. This area is entirely in north-central Minnesota and makes up about 9,785 square miles (Figure 1). The entire area is covered by Wisconsin-age glacial drift. The glacial deposits are from four major ice lobes—Des Moines, Rainy, Superior, and Wadena. The landscape developed through a series of glaciations and the subsequent retreating and wasting of the ice sheets, which resulted in a complex pattern of moraines, outwash plains, drumlins, lake plains and drainages. Lakes, ponds and marshes are common. The thickness of the glacial till ranges from 90 to 185 meters. Some areas of these deposits are overlain by outwash or lacustrine sediments. Some depressional areas have an accumulation of organic matter. The organic deposits are more than 2.5 meters thick in some areas. Elevation ranges from 300 to 500 meters across the area. (USDA-NRCS 2006) The dominant soil orders in this MLRA are Alfisols, Entisols, and Histisols, with some Mollisols in the westernmost part of the area. The soils in the area have a frigid soil temperature regime; aquic or udic soil moisture regime, and mixed mineralogy. Their natural drainage class is related to landscape position. In general, the Alfisols formed in till on moraines, Entisols formed in outwash on moraines and outwash plains, and Histisols formed in organic material over outwash or till on moraines or outwash plains. (USDA-NRCS 2006)

Classification relationships

Major Land Resource Area (MLRA): Northern Minnesota Gray Drift (57) (USDA Handbook 296, 2006) USFS Subregions: Northern Minnesota Drift & Lake Plain Section (212N); Chippewa Plains Subsection (212Na), Pine Moraines & Outwash Plains Subsections (212Nc), St. Louis Moraines Subsection (212Nb); Minnesota & NE Iowa Morainal Section (222M); Hardwood Hills Subsection (222Ma); Northern Superior Uplands Section (212L); Nashwauk Uplands Subsection (212Lc); Northern Minnesota & Ontario Peatlands Section (212M); Littlefork-Vermillion Uplands Subsection (212Ma) (Cleland et al. 2007). US EPA Level IV Ecoregion: Itasca and St. Louis Moraines (50q); Chippewa Plains (50r); Nashwauk/Marcell Moraines and Uplands (50s); Alexandria Moraines and Detroit Lakes Outwash Plain (51j); McGrath Till Plain and Drumlins (51k); Wadena/Todd Drumlins and Osakis Till Plain (51l) (U.S. Environmental Protection Agency, 2013)

Ecological site concept

Flood Plain Forest are widespread throughout MLRA 57, and are present on occasionally or annually flooded sites on terraces and floodplains of streams and rivers. 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.

Associated sites

F057XY015MN	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.
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F057XY002MN	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) <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 widespread throughout MLRA 57 but do not account for much area, and are present on occasionally or annually flooded sites on terraces and floodplains of streams and rivers.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Flood plain
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days) to very long (more than 30 days)
Flooding frequency	Rare to frequent
Elevation	210 – 520 m
Slope	0 %
Water table depth	30 cm
Aspect	Aspect is not a significant factor

Climatic features

In general, MLRA 57 has cold winters and warm summers. About 65 percent of the annual precipitation falls as rain during the 5-month growing season (May through September), and an additional 18 percent falls as snow.

Table 3 Representative climatic features

Frost-free period (characteristic range)	100-110 days
Freeze-free period (characteristic range)	130-140 days
Precipitation total (characteristic range)	640-690 mm
Frost-free period (actual range)	100-120 days
Freeze-free period (actual range)	130-140 days
Precipitation total (actual range)	640-710 mm
Frost-free period (average)	110 days
Freeze-free period (average)	130 days
Precipitation total (average)	660 mm

- (1) ITASCA UNIV OF MINN [USC00214106], Park Rapids, MN
- (2) RED LAKE INDIAN AGCY [USC00216795], Ponemah, MN
- (3) FOSSTON 1 E [USC00212916], Fosston, MN
- (4) GULL LAKE DAM [USC00213411], Brainerd, 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

The central concept soil series are Fairdale, Fordum and Pengilly, but other series are included as well. 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.

Table 4. Representative soil features

Parent material	(1) Alluvium
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Surface texture	(1) Silt loam (2) Loam
Drainage class	Very poorly drained to moderately well drained
Permeability class	Moderate to moderately rapid
Soil depth	200 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-152.4cm)	8.13 – 11.43 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Soil reaction (1:1 water) (0-101.6cm)	5.6 – 8.4
Subsurface fragment volume <=3" (0-101.6cm)	0 – 20 %
Subsurface fragment volume >3" (0-101.6cm)	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 (%)
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Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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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. Relationship to Other Established Classifications: 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

Other references

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Contributors

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Approval

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Acknowledgments

MLRA 57 technical team completed in 2022.

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:
