Ecological site F090BY004WI
Loamy Floodplain

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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): 090B–Central Wisconsin Thin Loess Dissected Till Plain

The Wisconsin and Minnesota Thin Loess MLRA, Northern and Southern Parts (90A and 90B) correspond closely to the North Central Forest and the Forest Transition Ecological Landscapes, respectively. Some of the following brief overview is borrowed from the Wisconsin Department of Natural Resources ecological landscape publications (2015). The Wisconsin and Minnesota Thin Loess MLRA, Northern and Southern Parts (90A and 90B) is an extensive glacial landscape that comprised of over 11.1 million acres (17,370 sq mi) throughout central and northern Wisconsin – about 27% of the total land area in the state. This glacial landscape is comprised of a heterogenous mix of loess-capped ground moraines, end moraines with eskers and ice-walled lake plains, and pitted, unpitted, and collapsed outwash plains sometimes interspersed with drumlins from the Illinoian and Pre-Illinoian glaciations. The entire area has been glaciated and nearly all of it is underlain by dense glacial till that impedes drainage. An extensive morainal system – the Perkinstown end moraine – spans most of the width of northern Wisconsin and divides the Northern and Southern Parts of this large landscape. This moraine, which has been sliced by outwash in many places, marks the southernmost extent of the Wisconsin glaciation (Wisconsin's most recent glacial advance). North of the Perkinstown morainal system is a loess plain, with a loess mantle 15-60 cm thick. The northernmost edge of this landscape is an undulating till and outwash plain with materials deposited by the Chippewa Lobe. Drumlins are common in the northern and northeastern portions. The drumlins are oriented towards the southwest and formed during a glacial episode prior to the most recent glacial advance. Some are covered with glacial till. Pitted, unpitted, and collapsed outwash plains fill the spaces between drumlins. Detached from the major land mass to the northeast is the hummocky Hayward collapsed end moraines, where swamps, ice-walled lake plains, and eskers are common. Most of the MLRA to the south of the Perkinstown morainal system is an extensive ground moraine with some proglacial stream features including pitted outwash plains, terraces, and fans. A layer of loess 6 to 47 inches (15-120 cm) thick covers much of the area. Like the Northern Part, all areas of the Southern Part of this MLRA were glaciated, although the southcentral portion is a relatively older till plain with materials from the Illinoian and pre-Illinoian glaciations, not the most recent Wisconsin glaciation. The landforms in the southcentral portion are highly variable. Much of the area topography is controlled by underlying bedrock. Sandstone outcrops and pediments can be found here. Some of the most southern portions of the MLRA are mixed glacial deposits and residuum. The land surface of the southeastern portion was formed by many small glacial advances and retreats. Morainal ridges protrude through an erosional, pitted outwash-mantled surface. These parallel ridges run in a northeast to southwest orientation and are dissected by many steams. The continental climate of this MLRA is typical of northcentral Wisconsin, with cold winters and warm summers. The southern boundary of this MLRA straddles Wisconsin's Tension Zone, a zone of transition between Wisconsin's northern and southern ecological landscapes. Historically, the mesic forests were dominated by eastern hemlock (Tsuga canadensis), sugar maple (Acer saccharum), and yellow birch (Betula alleghaniensis).

Classification relationships

Major Land Resource Area (MLRA): Wisconsin and Minnesota Thin Loess and Till (Northern and Southern Parts - 90A and 90B) USFS Subregions: Central-Northwest Wisconsin Loess Plains (212Xd), Glidden Loamy Drift Plain (212Xa), Lincoln Formation Till Plain - Mixed Hardwoods (212Qb), Lincoln Formation Till Plain - Hemlock Hardwoods (212Qc), Brule and Paint Rivers Drumlinized Ground Moraine (212Xc), Perkinstown End Moraine (212Xe), Rib Mountain Rolling Ridges (212Qd), Rosemont Baldwin Plains and Moraines (222Md) Small sections occur in Hayward Stagnation Moraines (212Xf), St. Croix Moraine (212Qa), Mille Lacs Uplands (212Kb), Green Bay Lobe Stagnation Moraine (212Ta) Wisconsin DNR Ecological Landscapes: Western Prairie, Forest Transition, and North Central Forest

Ecological site concept

The Loamy Floodplain ecological site is found scattered throughout MLRA 90A and 90B in floodplains along streams and rivers that dissect expansive till plains and outwash plains. These sites are characterized by very deep, very poorly to moderately well drained soils that formed in loamy alluvium and lacustrine deposits. Sites are subject to frequent flooding in the spring and fall, and some sites are subject to frequent ponding. Some sites remain saturated for long durations and meet hydric soil requirements. Stream inflow,

precipitation, runoff from adjacent uplands, and groundwater discharge are the primary sources of water. Soils range from very strongly acid to moderately alkaline. The characteristic traits of Loamy Floodplain are their loamy textures and their location on a floodplain. The loamy textures, presence of carbonates, and higher pH and available water capacity differentiate these sites from their Sandy Floodplain counterparts.

Similar sites

F090BY003WI	**Sandy Floodplain** Sandy Floodplain sites are found exclusively on floodplains in sandy and sometimes silty alluvium. These sites are somewhat poorly to poorly drained and are subject to flooding. Some sites may be saturated for long enough for hydric conditions to occur. They are found in similar landscape positions as Sandy Floodplain but have coarser textures.
F090BY006WI	**Wet Loamy Lowland** Wet Loamy Lowland sites consist primarily of deep loamy deposits derived from a mixture of outwash, alluvium, loess, and lacustrine sources. Some sites may have bedrock contact within two meters of the surface. These sites are seasonally ponded depressions that remain saturated for sustained periods, allowing hydric conditions to occur.
F090BY008WI	**Moist Sandy Bedrock Upland** Moist Sandy Bedrock Upland sites consist of sandy to clayey alluvium, till, or eolian deposits over residuum weathered from bedrock. Bedrock contact occurs within two meters of the surface. Sites have seasonally high water table within a meter of the surface. Perching of the water table may occur as a result of bedrock contact. Vegetative communities supported by Loamy Floodplains are also supported by Moist Sandy Bedrock Upland sites.
F090BY009WI	**Moist Sandy Upland** Moist Sandy Lowland consist of deep sandy and loamy deposits derived from a mixture of alluvium, residuum, till, or lacustrine sources. The finer textures allow the soil to stay moist - but not saturated - for sustained periods during the growing season. Some vegetative communities supported by Loamy Floodplain are also supported by Moist Sandy Lowland.

Table 1. Dominant plant species

Tree	(1) *Quercus alba* (2) *Quercus bicolor*
Shrub	Not specified
Herbaceous	(1) *Onoclea* (2) *Maianthemum canadense*

Physiographic features

These sites occur in floodplains. All sites are subject to very rare to frequent flooding. Surface runoff is negligible to low.

Table 2. Representative physiographic features

Landforms	(1) Flood plain

Runoff class	Negligible to low
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Very rare to frequent
Ponding duration	Long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	150 – 280 m
Slope	0 %
Ponding depth	0 – 20 cm
Water table depth	0 – 90 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of the expansive Wisconsin and Minnesota Thin Loess and Till Plain is highly variable. The eco-climatic zone (the “Tension Zone”) that runs southeast-northwest across the state splits the MLRA. In general, the MLRA has cold winters and warm summers with an adequate amount of precipitation. Near Lake Superior, precipitation and temperature tend to increase. The far western section of the MLRA, known as the western prairie ecological landscape by the Wisconsin DNR, has warmer temperatures compared to the rest of the MLRA because it falls below the eco-climatic zone. The soil moisture regime of MLRA is udic (humid climate). The soil temperature regime is frigid or cryic.

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)	760-840 mm
Frost-free period (actual range)	70-120 days
Freeze-free period (actual range)	110-150 days
Precipitation total (actual range)	740-840 mm

Frost-free period (average)	90 days
Freeze-free period (average)	130 days
Precipitation total (average)	790 mm

- (1) STAMBAUGH 2SSE [USC00207812], Iron River, MI
- (2) GOODMAN SANITARY DIST [USC00473174], Goodman, WI
- (3) LAONA 6 SW [USC00474582], Laona, WI
- (4) ROSHOLT 9 NNE [USC00477349], Wittenberg, WI
- (5) JUMP RIVER 3E [USC00474080], Sheldon, WI
- (6) HOLCOMBE [USC00473698], Holcombe, WI
- (7) WEYERHAEUSER 1N [USC00479144], Weyerhaeuser, WI
- (8) BIG FALLS HYDRO [USC00470773], Glen Flora, WI
- (9) PARK FALLS DNR HQ [USC00476398], Park Falls, WI
- (10) WINTER [USC00479304], Ojibwa, WI
- (11) LUCK [USC00474894], Luck, WI
- (12) AMERY [USC00470175], Amery, WI
- (13) ISLE 12N [USC00214103], Isle, MN
- (14) MORA [USC00215615], Mora, MN
- (15) BRUNO 7ENE [USC00211074], Bruno, MN
- (16) WRIGHT 3 E [USC00219173], Wright, MN

Influencing water features

Water is received through stream inflow, precipitation, runoff from adjacent uplands, and groundwater discharge. Water levels are greatly influenced by precipitation rates and runoff from upland sites. Water is lost from the site primarily through stream outflow, subsurface outflow, evapotranspiration, and groundwater recharge. These sites are wetlands.

Frequent flooding from stream inflow is a significant factor in the ecological development of Loamy Floodplain sites. The vegetation must be tolerant of frequent flooding that may persist for a month.

Wetland description

the Cowardin System of Wetland Classification, or National Wetlands Inventory (NWI), the wetlands can be classified as:
1) Palustrine, forested, broad-leaved deciduous, saturated, or
2) Palustrine, scrub-shrub, broad-leaved deciduous, saturated, or
3) Palustrine, emergent, persistent, saturated

Under the Hydrogeomorphic Classification System (HGM), the wetlands can be classified as:
1) Depressional, scrub-shrub/organic

Permeability of the soils is impermeable to moderately slow.
Hydrologic Group: B, C, B/D
Hydrogeomorphic Wetland Classification: Depressional, scrub-shrub/organic
Cowardin Wetland Classification: PFO1B, PSS2B, PEM1B

Soil features

These sites are represented by the Coland, Fordum, Moppet, and Orion soil series. Coland is classified as a Cumulic Endoaquoll, Fordum is a Mollic Fluvaquent, Moppet is an Oxyaquic Dystrudept, and Orion is a Fluvaquentic Hapludoll. Some sites are also represented by Fluvaquents, Haplaquolls, and Udifluvents that are not classified to a series.

These sites formed in sandy to silty alluvium, possibly underlain by loamy to clayey lacustrine deposits. Soils are very deep, and most sites are very poorly or moderately well drained. The very poorly and poorly drained sites are saturated for long periods of time and meet hydric soil requirements.

Surface textures of these sites are loam, sandy loam, and silt loam. Subsurface textures include silt loam, sandy loam, and sand. Some horizons have a gravelly modifier. Soil pH ranges from very strongly acid to moderately alkaline with values of 4.8 to 7.9. Carbonates are absent in some sites, but others can have 20 percent found throughout the profile.

Table 4. Representative soil features

Parent material	(1) Alluvium (2) Lacustrine deposits
Surface texture	(1) Loam (2) Sandy loam (3) Silt loam
Drainage class	Very poorly drained to moderately well drained
Permeability class	Very slow to moderately slow
Soil depth	200 – 250 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-151.9cm)	6.4 – 12.29 cm
Calcium carbonate equivalent (0-100.1cm)	0 – 20 %
Soil reaction (1:1 water) (0-100.1cm)	4.8 – 7.9
Subsurface fragment volume <=3" (Depth not specified)	0 – 60 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Because this Ecological Site is subject to seasonal, yearly and long-term variation in hydrological conditions, it is not possible to speak of any directional, community-driven plant succession, as is typical of more environmentally-stable upland plant communities. Instead, individual hydrologic events create conditions temporarily favorable to a given species, or groups of species, and unfavorable to other species or groups. Species differ greatly in their ability to tolerate frequency of flooding and duration of ponding. Silver maple (Acer saccharinum) is best adapted species to colonize freshly deposited sediment. It is a prolific seed producer and germinates immediately upon maturing, without the need of undergoing a cold period. Once established, seedlings, as well as mature trees, tolerate repeated flooding and prolonged ponding. Black ash (Fraxinus nigra) is well adapted to growing in saturated conditions, allowing it to grow commonly in seasonally flooded habitats. Other species that may become established in periods without major flooding or ponding include red maple (Acer rubrum), white oak (Quercus alba), swamp white oak (Q. bicolor), and white ash (Fraxinus americana).

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 (%)

Inventory data references

Plot and other supporting inventory data for site identification and community phases is located on a NRCS North Central Region shared and one drive folder. University Wisconsin-Stevens Point described soils, took photographs, and inventoried vegetation data at community phases within the reference state. The data sources include WI ESD Plot Data Collection Form - Tier 2, Releve Method, NASIS pedon description, NRCS SOI 036, photographs, and Kotar Habitat Types. Habitat Types of N. Wisconsin (Kotar, 2002): The sites of this ES keyed out to three habitat types: Acer-Tsuga/Athyrium-Onoclea (ATAtOn); Acer rubrum-Abies balsamea/Cornus (ArAbCo); Acer/Hydrophyllum-Impatiens (AHI) Biophysical Settings (Landfire, 2014): This ES is largely mapped as Laurentian-Acadian Floodplain Forest, Central Interior and Appalachian Floodplain Shrubland, North-Central Interior Maple-Basswood Forest, Laurentian-Acadian Northern Oak Forest, and Laurentian-Acadian Alkaline Conifer-Hardwood Swamp Forest WDNR Natural Communities (WDNR, 2015): Floodplain Forest

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Approval

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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	08/20/2026
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):**

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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):**

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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:**

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17. **Perennial plant reproductive capability:**
