USDA icon **Natural Resources Conservation Service**

Ecological site F094DY013WI
Loamy-Mantled Terraces And Plains

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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): 094D–Northern Highland Sandy Pitted Outwash

The Loamy-Mantled Terraces and Plains ecological site occupies about 15,000 acres in MLRA 94D

Classification relationships

The Loamy-Mantled Terraces and Plains ecological site correlates to a hybrid of ATM and ATD habitat types developed by Kotar and Burger (2002); these habitat types are named after Acer saccharum (sugar maple)- Tsuga canadensis (eastern hemlock)/ Maianthemum canadense (Canada mayflower) and Acer saccharum (sugar maple)- Tsuga canadensis (eastern hemlock)/ Dryopteris spinulosa (spinulose shield fern), respectively. These species have very high constancy value relative to this site, i.e. they are present on a higher percentage of these sites than other species. This ecological site has a mesic moisture regime and is medium in nutrients.

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 Loamy-Mantled Terraces and Plains ecological site is the richest non-wet site in the region. The loamy mantle is 10 to 40 inches thick consisting primarily of sandy loam, loam or silt loam. The loamy mantle increases both water-holding capacity and fertility compared to the sandy ecological sites. This site occurs on nearly level slopes typically found between steeper areas and low-lying areas. If the site occurs as a narrow band it resembles a terrace, if it occurs as a broad expanse, roughly equal in all directions from a central point, then it is called a plain. The vegetation is mixed hardwood and conifer forest, with sugar maple and eastern hemlock common associates in climax communities. In the undisturbed state, the understory is often low-growing and dominated by shade-tolerant ferns, club mosses and spring ephemerals because the forest canopy is so dense.

Associated sites

F094DY010WI	**Wet Sandy Depressions** Loamy-Mantled Terraces and Plains are typically adjacent to Loamy-Mantled Uplands.
F094DY012WI	**Steep Loamy-Mantled Ridges** Loamy-Mantled Drainageways frequently occur downslope from Loamy-Mantled Terraces and Plains.

Table 1. Dominant plant species

Tree	(1) *Acer saccharum* (2) *Tsuga canadensis*
Shrub	(1) *Lonicera canadensis* (2) *Diervilla lonicera*
Herbaceous	(1) *Dryopteris spinulosa* (2) *Trientalis borealis*

Physiographic features

This nearly level to gently sloping ecological site is typically found on linear to convex slopes ranging from 0-6% between the upland (7 to 16%) or steeper sites (>16% slopes) and the low-lying drainageway or depressional sites. Loamy mantled soils with sandy substrata can occur on outwash plains, outwash terraces, and pitted outwash plains due to thin local loess, lacustrine or stream deposits which were laid atop the outwash. When the site occurs as a narrow band it resembles a terrace, if it occurs as a broad expanse, roughly equal in all directions from a central point, then it is called a plain. These sites often receive some subsurface lateral water flow from the uplands, which generally causes higher forest productivity on these sites.

Figure 1. Loamy-Mantled Terraces and Plains

Table 2. Representative physiographic features

Landforms	(1) Outwash plain (2) Outwash terrace (3) Pitted outwash plain
Elevation	360 – 570 m
Slope	0 – 20 %
Water table depth	60 – 170 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)	100 days
Freeze-free period (average)	120 days

Precipitation total (average)	860 mm

- (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

This site is not a wetland. However, there is periodic soil saturation typically below 40 inches (1 meter) on this site.

Soil features

The Loamy-Mantled Terraces and Plains also have variable thickness of loamy-mantles. However, the variability is greater between sites than is within the site. In other words, the thickness of loamy-mantles is relatively uniform within any given site. The difference between sites arises due to mode of deposition and proximity to loamy parent materials. Thinner loamy-mantles are in or around areas with more outwash plain deposits, and thicker deposits are associated with or adjacent to till deposits on moraines. The effect of thicker loamy-mantles and/or mantles with higher percentages of silt and clay is to increase water-holding capacity and cation exchange capacity producing a richer, more productive site. Soils with thinner loamy-mantles are represented by the Manitowish soil series, and the thicker ones are Tipler soils. Both of these soils are spodosols with a well developed horizon sequence of O-E-Bhs-Bs, where the surface is undisturbed. Disturbances like windthrow or tree tipping will mix these horizons. Man-made disturbances such as logging or farming, as well as the introduction of earthworms, also mixes the surface horizons to form A horizons or in some cases A/E horizons in which remnants of the former E horizon are clearly visible. In some cases, the former E horizon is solely represented by an abundance of uncoated, white-colored sand grains in an otherwise dark-colored A horizon.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Fine sandy loam (3) Loam
Family particle size	(1) Sandy
Drainage class	Moderately well drained
Permeability class	Moderately rapid to rapid
Soil depth	200 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.16 – 20.32 cm

Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	5.1 – 6.2
Subsurface fragment volume <=3" (Depth not specified)	10 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

The Loamy-Mantled Terraces and Plains ecological site is capable of producing a variety of forest cover types. The site has a mesic moisture regime and a medium level of nutrients which provides potential habitat for most of the tree species found in the region. Thus the disturbance history of the site is the main determining factor for which species will be found on any given site. Sites with a low disturbance frequency will likely have an old-growth sugar maple, hemlock and yellow birch stand. On sites at the other end of the disturbance gradient are stands with quaking aspen, paper birch, and balsam fir. It is not uncommon to find stands with mix of early, mid and late successional species which includes red oak and white pine, indicating a diverse and complicated disturbance history. Therefore, the understory species are more indicative of the true productivity of the site.

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 1.3 plant community composition

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

Table 8. Community 2.1 plant community composition

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

Table 9. Community 2.2 plant community composition

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

Table 10. Community 2.3 plant community composition

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

Table 11. Community 3.1 plant community composition

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

Table 12. Community 3.2 plant community composition

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

Table 13. Community 3.3 plant community composition

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

Table 14. Community 4.1 plant community composition

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

Table 15. Community 4.2 plant community composition

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

Table 16. Community 4.3 plant community composition

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

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Contributors

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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	
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:**
