Ecological site F094DY011WI
Loamy-Mantled Uplands

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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 Uplands ecological site occupies about 160,000 acres in MLRA 94D.

Classification relationships

The Loamy-Mantled Uplands ecological site correlates to two habitat types—ATM and ATD; both were developed by Kotar and Burger (2002). ATM habitat type is named after Acer saccharum (sugar maple)-Tsuga canadensis (eastern hemlock)/Maianthemum canadense (Canada mayflower); in the ATD habitat type the D stands for Dryopteris spinulosa (spinulose wood fern). 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. The ATD habitat type is a slighty richer site, it produces a denser canopy which casts a deep shade to which the ferns are better adapted. This ecological site has dry-mesic to mesic moisture regime—due to the variable thickness of the loamy mantle--and is medium in nutrients. With both hemlock and sugar maple on this on this site, sunlight is a limiting resource for understory vegetation.

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 Uplands ecological site has both mesic and dry-mesic sites depending on the thickness of the loamy mantle. The loamy-mantle ranges from 10 to 40 inches of sandy loam or loam; these texture have between 10 and 20 percent clay, between 20 to 40 percent silt and between 40 and 70 percent sand. have These sites have both well-drained and somewhat excessively drained soils, generally both soil types contain enough nutrients to grow highly productive mixed hardwood-conifer forests, with more conifers on the drier sites.

Associated sites

F094DY011WI	**Loamy-Mantled Uplands** Small areas of Steep Loamy-Mantled Ridges often occur within areas of Loamy-Mantled Uplands.

Table 1. Dominant plant species

Tree	(1) *Acer saccharum* (2) *Tilia americana*
Shrub	(1) *Corylus cornuta* (2) *Lonicera canadensis*

Herbaceous	(1) *Aralia nudicaulis* (2) *Dryopteris intermedia*

Physiographic features

The Loamy-Mantled Uplands ecological site is found on undulating to hilly glacio-fluvial deposits, and they are located on backslopes, shoulders and summits of those hilly deposits. Slopes are less than 16%. The loamy mantles that occur on this site were deposited either by slow-velocity glacial meltwater as alluvium, or as wind-blown sediments deposited as the landscape was beginning dry out after the glaciers melted. These landforms typically contain more cobbles (3 to 10 inches in diameter) and stones (10 to 24 inches in diameter) than the sandy group of ecological sites in this area. This is mainly because these sediments were deposited closer to the source of the melting glacier.

Figure 1. Loamy-mantled ecological sites

Table 2. Representative physiographic features

Landforms	(1) Disintegration moraine (2) Outwash fan (3) Kame
Flooding frequency	None
Ponding frequency	None
Elevation	410 – 560 m
Slope	0 – 20 %
Ponding depth	0 cm
Water table depth	200 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) NORTH PELICAN [USC00476122], Rhinelander, WI
- (2) REST LAKE [USC00477092], Manitowish Waters, WI
- (3) WILLOW RSVR [USC00479236], Hazelhurst, WI
- (4) LONG LAKE DAM [USC00474829], Eagle River, WI

Influencing water features

This ecological site is not a wetland. This site does contribute to groundwater recharge. Runoff from this low to medium, this increases the potential for non-transpired infiltration during spring melt and after the growing season in autumn.

Soil features

The soils on this ecological site are characterized by a sandy loam or finer surface layer of highly variable thickness (typically between 10 to 40 inches). These soils are the well drained Padus and somewhat excessively drained Pence map unit components; they frequently occur in an intricately mixed map unit complex. The underlying soil layers are mainly stratified sand and gravel. The range of thickness of the loamy mantle for this site starts at 10 inches, but soils with thinner loamy mantles produce sites that are transitional to this site. Soils with a significant loamy mantle (>10 inches) have a higher water holding capacity and a higher nutrient content than soils that entirely formed in sand and gravel, thus they produce richer ecological sites.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Fine sandy loam (3) Loam
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to very rapid
Soil depth	200 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	12.7 – 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 – 6.4
Subsurface fragment volume <=3" (Depth not specified)	10 – 30 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

This ecological site supports a mesic northern hardwood and conifer forest with an understory of ferns, spring ephemeral wildflowers, sedges and grasses, and shrubs. The understory can be species rich or sparse depending successional stage. Later seral stages have a closed multi-layered canopy, with a high leaf area index. This condition restricts light penetration, which in turn, limits understory productivity. Early seral stage forests, mainly aspen and birch, allow more light to the forest floor and this results in a denser understory, often with a well developed shrub-sapling layer. Small-scale disturbances, such as windthrow, insect damage and plant diseases play a major role in creating a diverse and patchy plant community on this site. Windthrow is common on sites that have a lithologic discontinuity in the soil; which on this site is the loamy soil over sand and gravel. However, some sites are more exposed to wind than others, so location plays a major role as well. A site that is subject to high windthrow hazard typically displays a profound pit and mound micro-topography over most of the forest floor. This is especially true where the loamy mantles contains a high silt content. Silty material has a high natural angle of repose and produces very stable and long-lasting "cradle-knolls".

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 (%)

Other references

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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:**
