

Ecological site F094DY014WI Wet Loamy-Mantled Drainageways

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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.

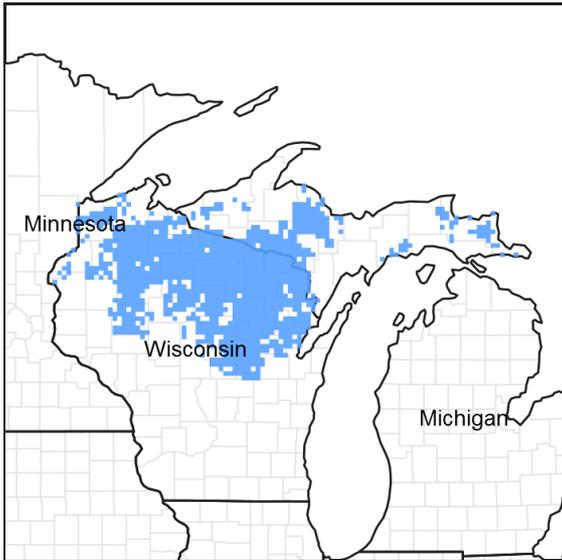


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 094D–Northern Highland Sandy Pitted Outwash

The Wet Loamy-Mantled Drainageways ecological site occupies about 10,000 acres in MLRA 94D. This ecological site is minor in MLRA 94D, however it occupies a more significant portion of adjacent Major Land Resource Areas.

Classification relationships

The Habitat Type (Kotar et al 2002) most closely associated with this site is ArAbCo (*Acer rubrum*-*Abies balsamea*/*Cornus canadensis*). In terms of major edaphic gradients, the site has a wet-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 Wet Loamy-Mantled Drainageways ecological site is species-rich and highly productive. The site has somewhat poorly drained soils that are borderline to the hydric classification but remain non-hydric because the water table drops during the growing season due to the slope gradient of the drainageway.

Associated sites

F094DY015WI	Wet Loamy-Mantled Depressions Loamy-Mantled Drainageways often have small areas of Loamy-Mantled Depressions within them or drain into those aforementioned depressions.
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Table 1. Dominant plant species

Tree	(1) <i>Acer rubrum</i> (2) <i>Tsuga canadensis</i>
Shrub	(1) <i>Ribes lacustre</i> (2) <i>Corylus cornuta</i>
Herbaceous	(1) <i>Cornus canadensis</i> (2) <i>Clintonia borealis</i>

Physiographic features

This nearly level ecological site is found on concave to linear broad drainageways or sometimes as rims of depressions. Slopes range from 0 to 4percent. Loamy-Mantled Drainageways occur on pitted and dissected outwash plains, outwash fans and sandy moraines where these sites function as drains from upland areas into landscape depressions. Moreover, these sites can pond during snowmelt and before frost-out in early spring. However, the water table drops during the growing season due to the slope and gradient of the drainageway and high evapo-transpiration rates. However, small depressional sites, which are subject to frequent ponding, are a common occurrence within larger drainageway sites.

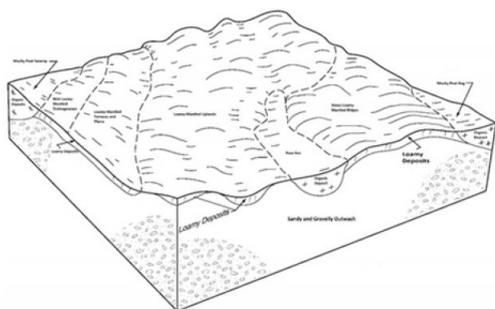


Figure 2. Wet Loamy-Mantled Drainageways

Table 2. Representative physiographic features

Landforms	(1) Outwash plain (2) Outwash terrace (3) Pitted outwash plain
Ponding duration	Brief (2 to 7 days)
Ponding frequency	Rare
Elevation	1,175–1,860 ft

Slope	0–4%
Ponding depth	0–6 in
Water table depth	6–48 in
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)	96 days
Freeze-free period (average)	123 days
Precipitation total (average)	34 in

Climate stations used

- (1) LONG LAKE DAM [USC00474829], Eagle River, WI
- (2) NORTH PELICAN [USC00476122], Rhinelander, WI
- (3) WILLOW RSVR [USC00479236], Hazelhurst, WI
- (4) REST LAKE [USC00477092], Manitowish Waters, WI

Influencing water features

This site is not a wetland, but it is subject to periods of wetness that make it borderline to wetlands, especially in the spring and during periods of heavy precipitation. Groundwater frequently flows through the soils on this site from higher elevations to lower elevations. Also, during spring snowmelt when there is frost in the ground, water flows across the soil surface on this site toward wetlands.

Soil features

These ecological sites have a fluctuating table due to their landscape position between well drained uplands and very poorly drained wetlands. The soils have a loamy-mantle between 10 and 40 inches thick that shows many distinct redoximorphic features, including both low chroma depletions and high chroma iron accumulations. These are strong indicators of fluctuating zones of saturation in soils. Soils with less than 10 inches of loamy-mantle tend to function like sandy soils and those with greater than 40 inches function like entirely loamy soils, hence the 10 to 40 inch (25 to 100 cm) classification breaks. Also there is an important classification break at 24 inches of loamy mantle; those soils with less than 24 inches of loamy mantle are called Wormet soils and those with 24 to 40 inches are known as Worcester soils. This break is due to increased water holding capacity and decreased hydraulic conductivity of the thicker loamy mantles.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Loam
Family particle size	(1) Sandy
Drainage class	Somewhat poorly drained
Permeability class	Moderately rapid to very rapid
Soil depth	80 in
Surface fragment cover <=3"	2–10%

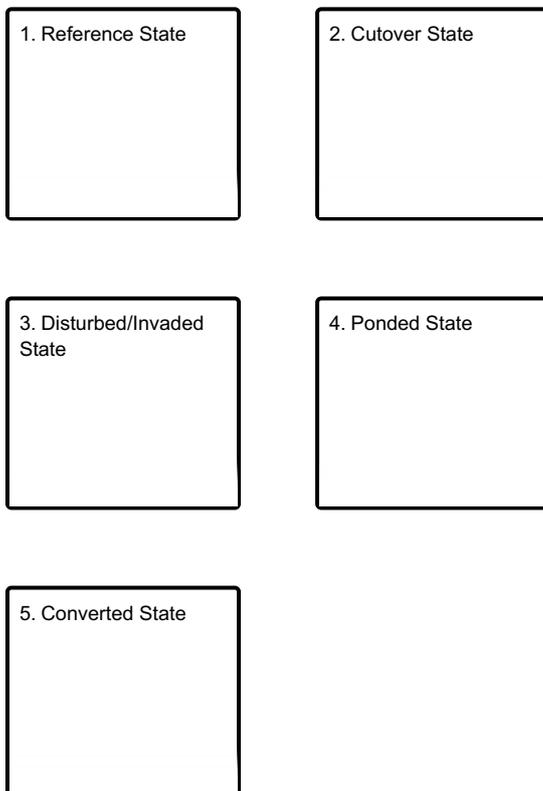
Surface fragment cover >3"	0–3%
Available water capacity (0-40in)	4–6 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.9–6.1
Subsurface fragment volume ≤3" (Depth not specified)	15–30%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

The Wet Loamy-Mantled Drainageways ecological site is a transitional to a wetland. The hydroperiod on this site is the major determining factor for plant species occurrence. Species on this site must be adapted to both wet and dry conditions, or in other words, they need to be facultative. The wetness is both seasonal (springtime) and sporadic throughout the growing season according to precipitation events. Windthrow is common on this site, this creates canopy gaps that either advance regeneration of shade tolerant species or pioneer species can fill. Thus this site is often a blend of the different phases so described, and one might see aspen and birch occurring near hemlock on the same site.

State and transition model

Ecosystem states



State 1 submodel, plant communities

1.1. Early Seral Phase

1.2. Mid Seral Phase

1.3. Climax Phase

State 2 submodel, plant communities

2.1. Quaking Aspen-
Balsam Fir Phase

2.2. White Spruce-
White Pine Phase

2.2. Red Maple-
Balsam Fir Phase

State 3 submodel, plant communities

3.1. Recent Logging
Phase

3.2. Invasive Species
Phase

3.3. Windthrow Phase

State 4 submodel, plant communities

4.1. Vernal Pool Phase

4.2. Standing Dead
Timber Phase

4.3. Open Water
Phase

State 5 submodel, plant communities

5.1. Developed Phase

5.2. Plantation Phase

5.3. Agriculture Phase

State 1 Reference State

The Reference State for this ecological site still exists in small, isolated pockets. Sites that have never been logged are exceedingly rare on uplands, but they increase in frequency on wetter sites.

Community 1.1 Early Seral Phase

The Early Seral Phase is dominated by pioneer tree species, namely quaking aspen and paper birch, balsam fir is likely to appear in the understory as stems start to self-prune.

Community 1.2 Mid Seral Phase

The Mid Seral Phase is prevalent after decades of stability and natural succession. In reality this process is sporadic and spatially variable. Thus the can display a hodgepodge of species depending on the intensity and scale of disturbances, and the regenerating mechanisms of species coupled ecological processes of herbivory, competition and facilitation. The main overstory species are red maple and once again, balsam fir.

Community 1.3 Climax Phase

The Climax Phase is when long-lived species become dominant. These species include white spruce, white pine and eastern hemlock. The forest floor is well shaded during this phase, so the understory is sparsely populated with

ferns, spring ephemeral wildflowers, and woodland sedges and grasses. Older stands become increasingly susceptible to disturbance.

State 2 Cutover State

The Cutover State has been largely transformed to the other states: Disturbed/Invaded, Pondered, and Converted. But the native vegetation found on the other sites will be defined in the community phase descriptions of the Cutover State.

Community 2.1 Quaking Aspen-Balsam Fir Phase

Community 2.2 White Spruce-White Pine Phase

Community 2.3 Red Maple-Balsam Fir Phase

State 3 Disturbed/Invaded State

The Disturbed/Invaded State sounds like it's a messy place, but most sites have entered this condition. Population growth and land use legacies have made this happen. Many of our favorite spots are actually sites in the Disturbed/Invaded State, with adjacent patches of the other states found on this site.

Community 3.1 Recent Logging Phase

Community 3.2 Invasive Species Phase

Community 3.3 Windthrow Phase

State 4 Pondered State

The Pondered State on this site is often the result of indirect or inadvertent additions of water. The temporary ponding in spring, which is common on sites wetter than this site, is only sporadic on this site. It mainly occurs in small patches for short periods on less than half the site. So these naturally-occurring temporarily ponded areas occupy only a small percentage of the overall site, and moreover they don't necessarily occur on every one of these sites. but they worth noting because of their ecological importance and contrasting nature to drier ground around them.

Community 4.1 Vernal Pool Phase

Community 4.2 Standing Dead Timber Phase

Community 4.3 Open Water Phase

State 5 Converted State

Community 5.1 Developed Phase

Community 5.2 Plantation Phase

Community 5.3 Agriculture Phase

Additional community tables

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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):**

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:**
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17. **Perennial plant reproductive capability:**
-