

# Ecological site F094DY018WI

## Lower Riparian Terraces

Accessed: 05/17/2024

### 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 Lower Riparian Terraces ecological site occupies about 5000 acres in MLRA 94D.

### 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 Lower Riparian Terrace ecological site is on stream terraces and lakeshores including beaches above the ordinary high water mark. Flooding is rare, but possible adjacent to major rivers. These sites are greatly influenced by their proximity to water bodies and vice versa. They typically have subsurface water flowing toward the water body sub-irrigating the site and making the site more productive than non-riparian sites with similar soils. The soils occupying these sites are often stratified with loamy layers which increases water-holding capacity and fertility relative to nearby sandier sites. The lakeshore sites are subject to much more human disturbance than stream terrace sites. Both stream terrace sites and lakeshore sites are important wildlife habitat. These sites are part of a buffer zone between aquatic and terrestrial habitats.

Table 1. Dominant plant species

Tree	(1) <i>Pinus strobus</i> (2) <i>Acer rubrum</i>
Shrub	(1) <i>Viburnum acerifolium</i> (2) <i>Ribes triste</i>
Herbaceous	(1) <i>Carex gracillima</i> (2) <i>Matteuccia struthiopteris</i>

### Physiographic features

The Lower Riparian Terrace ecological site is found adjacent to rivers, lakes, or floodplains. These sites consist of a gently sloping terrace riser and nearly level terrace tread landforms. Slopes are typically less than 5 percent, however the elevation of this site above the nearby water body is sufficient to increase drainage, and generally eliminate frequent flooding. The soil parent material is often stratified indicating it was deposited by ever-changing

velocities of the glacial melt water and post glacial stream flow.

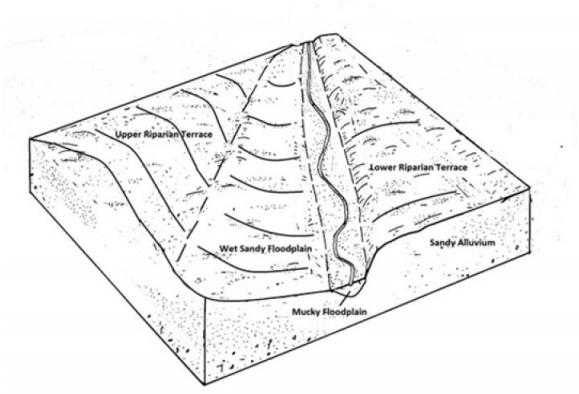


Figure 1. Lower Riparian Terrace

Table 2. Representative physiographic features

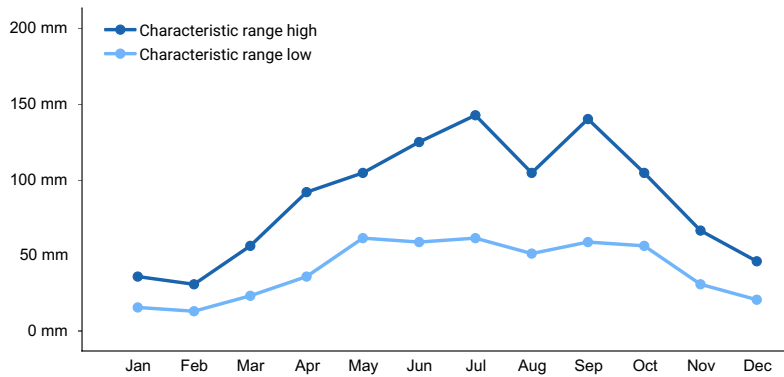
Landforms	(1) Terrace (2) Lake plain (3) Outwash terrace
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to rare
Elevation	384–536 m
Slope	0–4%
Water table depth	30–107 cm
Aspect	Aspect is not a significant factor

Climatic features

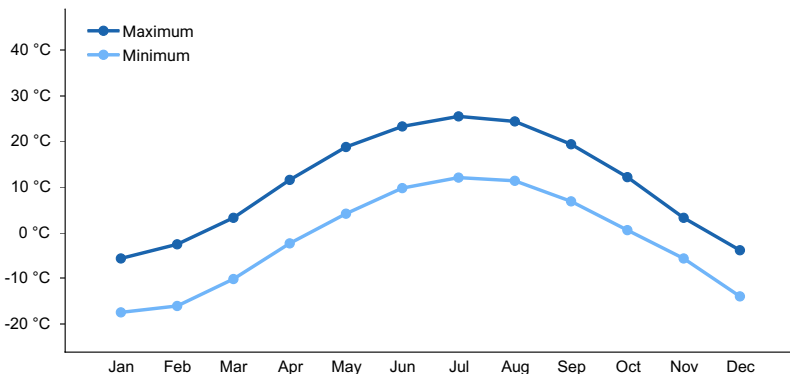
The climate is humid continental with very cold winters and warm summers. As is common across northern Wisconsin, two-thirds of the precipitation falls as rain during the relatively short growing season of late May to early September. Most of the rainfall is transpired by plants. Snow cover is likely in the months of November through April. Snow cover prevents deep frost penetration which promotes groundwater recharge.

Table 3. Representative climatic features

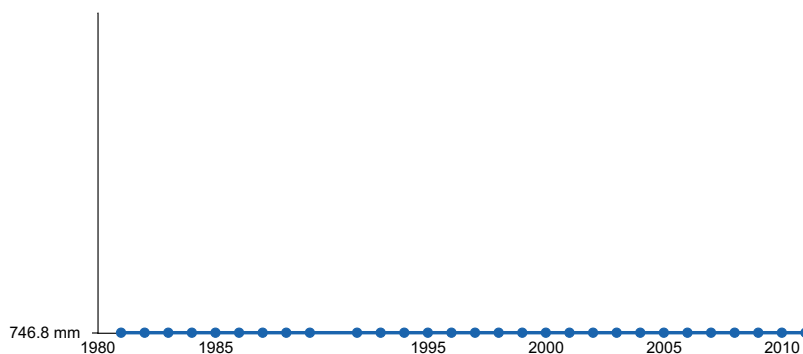
Frost-free period (average)	96 days
Freeze-free period (average)	123 days
Precipitation total (average)	864 mm



**Figure 2. Monthly precipitation range**



**Figure 3. Monthly average minimum and maximum temperature**



**Figure 4. Annual precipitation pattern**

## 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

### Soil features

Lower Riparian Terraces ecological sites have nearly level to gently sloping, somewhat poorly drained to moderately well drained sandy soils characterized by the Flink and Cublake soil components. The surface layer can be loamy sand or sand. The subsoil and upper part of the substratum is sand with less than 15 percent gravel to a depth of 60 inches or so. Below 60 inches, the sandy substratum is typically stratified with loamy soil material of glacio-lacustrine or glacio-fluvial origin. The loamy layers increase water-holding capacity and fertility of the site compared to sandier sites. Thereby resulting in increased biomass productivity of the site. Flooding is very rare on these sites, but since they located near water courses it is possible under extreme conditions. However, these sites

are still greatly influenced by their proximity to water bodies. For example, the soils on these sites typically have subsurface water flowing through them toward the water body. Thereby sub-irrigating the site, thus making the site more productive than non-riparian sites with similar soils.

**Table 4. Representative soil features**

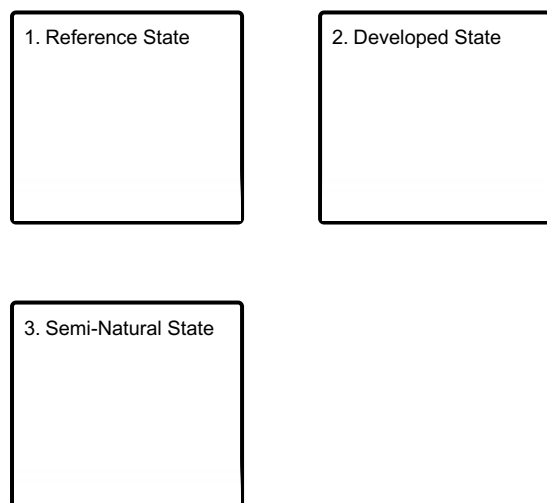
Surface texture	(1) Loam
Family particle size	(1) Sandy
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Moderately slow to rapid
Soil depth	203 cm
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–22.86 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	4.8–6.2
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

These are riparian or lakeshore sites that draw a lot of development pressure, even though they are sub-optimal building sites. Often they were not selected as building sites in the first place because they too wet but subsequent expansions have used them for seasonal cabins or dwellings without basements.

## State and transition model

### Ecosystem states



#### State 1 submodel, plant communities

1.1. White Pine-Red  
Pine Phase

1.2. Conifer-Hardwood  
Phase

#### State 2 submodel, plant communities

2.1. Cleared Land

2.2. Building Sites

#### State 3 submodel, plant communities

3.1. Mature Conifer  
Phase

3.2. Mature  
Hardwoods Phase

### State 1 Reference State

The Reference State for the Lower Riparian Terrace ecological site persists mainly along rivers and patches of undeveloped lakeshore. These sites rarely flood but they have a mix wet and dry soils and water flows through these sites toward the water body. As borderline wetland sites, development has been, until recently less intense.

#### Community 1.1 White Pine-Red Pine Phase

This phase is found on the drier parts of the site.

#### Community 1.2 Conifer-Hardwood Phase

This phase is found on the wetter parts of the site.

### State 2 Developed State

The Developed State is more problematic on the Lower Riparian Terrace as opposed to Upper Riparian Terrace. Extra measures must be taken to avoid wetness problems with any development, roads will probably need extra fill and more culverts, and septic systems will likely need to be mounded.

#### Community 2.1 Cleared Land

Land clearing is the precursor for sorts of development.

#### Community 2.2 Building Sites

Building sites include both the footprint of the structure and land affected by the structure. Some building effects on

adjacent land include shading, water diversions, cut and fill, and compaction.

## **State 3**

### **Semi-Natural State**

Again this state is found near older lakeshore or river front development. The vegetation has largely recovered and the landowners are interested in maintaining the rustic character of the property.

### **Community 3.1**

#### **Mature Conifer Phase**

### **Community 3.2**

#### **Mature Hardwoods Phase**

## **Additional community tables**

### **Other references**

- Attig JW. 1985 Pleistocene geology of Vilas County, Wisconsin. Wis. Geol. and Nat. Hist. Surv. Information Circular 50. 38 pp.
- Black MR., Judziewicz EJ. 2009. Wildflowers of Wisconsin and the Great Lakes Region: a comprehensive field guide. 2nd ed. Univ. Wisc. Press 275pp.
- Curtis JT. 1971. The Vegetation of Wisconsin: an ordination of plant communities. Univ. Wisc. Press. 657 pp.
- ECOMAP. 1993. National hierarchical framework of ecological units. USDA Forest Service, Washington, D.C.
- Epstein E, Smith W, Dobberpuhl J, Galvin A. 1999. Biotic inventory and analysis of the Northern Highland-American Legion State Forest. Bureau of Endangered Resources, Wisconsin Department of Natural Resources. 263pp.
- Faber-Langedoen D, editor. 2001. Plant communities of the Midwest: Classification in an ecological context. Association for Biodiversity Information, Arlington, VA. 61 pp. + appendix (705 pp.).
- Grime JP. 1981. Plant Strategies and vegetation Processes. J Wiley and Sons. 222pp.
- Kent M, Coker P. 1992. Vegetation Description and Analysis: A Practical Approach. CRC Press, Boca Raton, FL. 363pp.
- Kotar J, Kovach JA, Burger TL. 2002. A Guide to Forest Communities and Habitat Types of Northern Wisconsin. 2nd ed. University of Wisconsin-Madison, Dept. of Forest Ecology and Management.
- Kozlowski TT, Pallardy SG. 2002. Acclimation and adaptive responses of woody plants to environmental stresses. The Botanical Review 68(2): 270-334.
- Mitchell SJ. 2013. Wind as a natural disturbance in forests; a synthesis. Forestry 86:147-157.
- Natural Resources Conservation Service. 2008. Hydrogeomorphic Wetland Classification System: An overview and modification to better meet the needs of the Natural Resources Conservation Service. Technical Note No. 190-8-76.
- Pielou EC. 1991. After the Ice Age: the return of life to glaciated North America. Univ. Chicago Press, Chicago, IL. 366 pp.
- Wisconsin Department of Natural Resources (DNR). 2014. The ecological landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management. Chapter 14, Northern Highland Ecological Landscape. Wisconsin Department of Natural Resources, PUB-SS-1131P 2014, Madison. 84 pp.
- Wisconsin Initiative on Climate Change Impacts (WICCI) 2011. Wisconsin's Changing Climate: Impacts and Adaptations. Nelson Institute for Environmental Studies, University of Wisconsin-Madison & the Wisconsin Department of Natural Resources, Madison, Wisconsin.
- Zobel RW. 1992. Soil environment constraints to root growth. Adv. Soil Science 19:27-51.

## **Contributors**

Mark Krupinski

## **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:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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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):**

- 
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:**
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