

## Ecological site F094DY019WI Upper Riparian Terraces

Accessed: 05/10/2024

### 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.

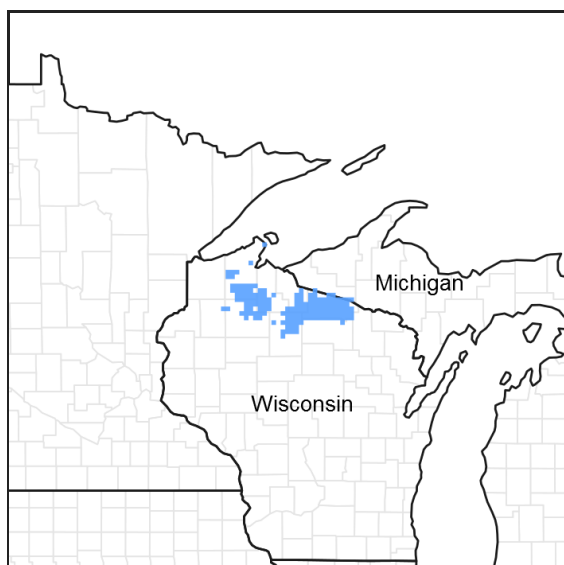


Figure 1. Mapped extent

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

About 13% of MLRA 94D is surface water: lakes, reservoirs, ponds, rivers and streams. The interaction of land and water is important to this region. Riparian ecological sites are in the zone of maximum interaction. The Upper Riparian Terrace ecological site occupies about 5000 acres in MLRA 94D.

### Classification relationships

This site is not a floodplain forest but rather an upland forest that is influenced by the proximity of a water body, either a river, stream or lake. If the site is directly adjacent to water, as opposed to sites with intervening floodplains or beaches, then the site has sufficient elevation to be a mesic or dry-mesic site.

### 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 Upper Riparian Terrace ecological site is near the waterfront with buildable sites. As such, it is subject to highest level of development pressure in the region apart from urban land, unless it is in a protected status of some kind. This site, unlike the other shoreland ecological site, has enough elevation above the waterline so that it never floods. This site is not a floodplain forest but rather an upland forest that is influenced by the proximity of a water body, either a river, stream or lake. If the site is directly adjacent to water, as opposed to sites with intervening floodplains or beaches, than the site has sufficient elevation to be a mesic or dry-mesic site. The site is occurs in a relatively narrow band adjacent to water or adjacent to the lower-lying shoreland sites. Thus it is not of large extent, but it is important due to the high economic and environmental value it holds. Often these sites are redeveloped from small seasonal cabins to larger, year-round dwellings. This site is distinctive ecologically for its impact on water bodies and wildlife. To maximize water quality and maintain fish and wildlife populations, it is important to minimize human disturbance on these sites. However, the conflict between develop and preservation has led to many controversies.

## Associated sites

F094DY018WI	<p><b>Lower Riparian Terraces</b></p> <p>Upper Riparian Terraces are occasionally adjacent to Lower Riparian Terraces.</p>
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Table 1. Dominant plant species

Tree	(1) <i>Pinus resinosa</i> (2) <i>Quercus rubra</i>
Shrub	(1) <i>Rubus allegheniensis</i> (2) <i>Prunus virginiana</i>
Herbaceous	(1) <i>Carex pensylvanica</i> (2) <i>Galium triflorum</i>

## Physiographic features

This ecological site is characterized by its proximity to surface water and the ecological interactions produced by that location. There are major hydrological, micro-climatic, and biological implications to the upper riparian terrace ecological site. While the site will seldom if ever flood, often there are old channels on the site that are mostly dry but will on occasion run with water. The climate on the site is affected by close-by water bodies, but ironically that makes some sites warmer and some cooler than average.

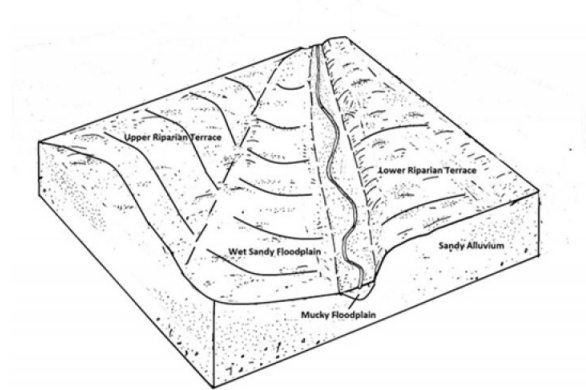


Figure 2. Upper Riparian Terrace

Table 2. Representative physiographic features

Landforms	(1) Terrace
Flooding frequency	None to very rare
Ponding frequency	None
Elevation	411–564 m
Slope	2–40%
Water table depth	203 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

## Climate stations used

- (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

### Soil features

Upper Riparian Terraces ecological sites have well drained, somewhat excessively drained, or excessively drained soils characterized by the Vilas, Sayner, Pence, and Keweenaw soil components. Vilas and Sayner soils have a thin loamy sandy sand surface layer with a sand or gravelly sand substratum. Pence soils have thin sandy loam surface layer over sand or gravelly sand and Keweenaw soils have a thick loamy sand mantle over stony or cobbly sand. Soil variability occurs from site to site but is relatively uniform within a particular site, given the relatively narrow band these sites occupy adjacent to water, beaches, lower terrace or floodplains. Because these sites are found well above a water body in elevation, they are not flood-prone sites. However, they are major contributors to surface water levels and/or floodplain water levels through runoff or subsurface flow. Additionally, springs and side hill seeps are more common adjacent to these sites than elsewhere.

**Table 4. Representative soil features**

Surface texture	(1) Loamy sand (2) Sand (3) Sandy loam
Family particle size	(1) Sandy
Drainage class	Well drained to excessively drained
Soil depth	203 cm
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0%

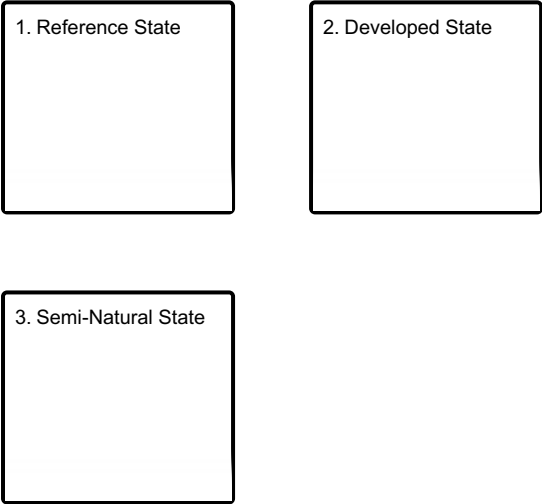
Available water capacity (0-101.6cm)	5.08–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5–5.9
Subsurface fragment volume <=3" (Depth not specified)	0–45%
Subsurface fragment volume >3" (Depth not specified)	0–35%

Ecological dynamics

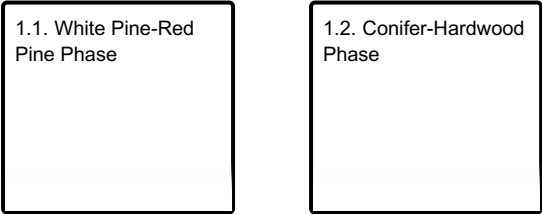
The Upper Riparian Terraces ecological sites includes both river front and lake shoreline areas. As such the ecological dynamics varies from site to site. This site does flood because of the elevation above the stream but the internal drainage of the site is altered by high water conditions. Also this site is likely to have springs or seep areas along the riser portion of the terrace. The site is also likely to conduct water toward the stream or lake both on the surface and sub-surface. These sites are important wildlife corridors and also influence aquatic habitat by adding nutrients and woody debris to the water body. If the surface of these sites is disturbed they are likely to erode and cause sedimentation within the water body. The Reference State has become rare along lakes because this is an ideal building site for recreational property and lake homes.

State and transition model

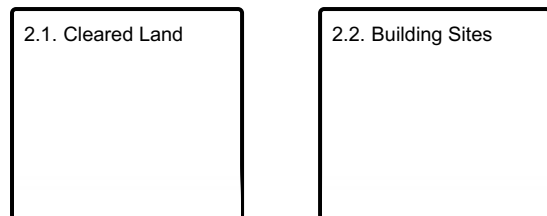
Ecosystem states



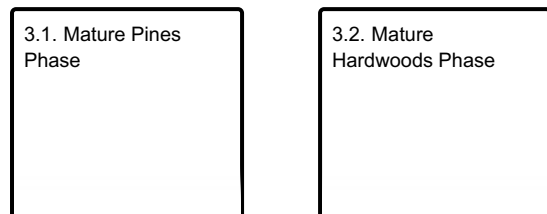
State 1 submodel, plant communities



## State 2 submodel, plant communities



## State 3 submodel, plant communities



## State 1 Reference State

The Reference State for the Upper Riparian Terraces ecological site is highly dependent on the fine-scale variability of the hydrologic conditions and the soil characteristic. The soils vary from moderately well drained to excessively drained depending on the elevation above the adjacent water body and the stratification of the soil parent materials. Thus this site is both internally variable and varies from site to site. The reference State is found along undeveloped stretches of shoreline which are becoming increasingly rare.

### Community 1.1 White Pine-Red Pine Phase

This phase features mature pine trees that readily top 100 feet. Most of these sites are privately owned recreation land with a view of the water. It is high value property that is usually well managed. However some aspects of shoreland property management can lead to water quality issues and land use conflicts.

### Community 1.2 Conifer-Hardwood Phase

Hardwoods will grow quickly into canopy gaps in the pine forest. Quaking and bigtooth aspen, paper birch, red maple and red oak are common on this site. The riparian corridor receives extra sunlight along the open edge; this typically creates lush vegetation understory through canopy near the shoreline.

## State 2 Developed State

The Developed State includes not only the exact footprint of a particular development, be it road, building, or utility area, but also the adjacent sites affected by the development. This dramatically increases the area of sites that exhibit this state. An estimate of extent depends on the width of the buffer so employed. Cleared land starts re-vegetating naturally with mainly exotic weeds, so it's been recommended to plant a cover crop. However some cover crop plants have turned out to be part of the problem.

### Community 2.1 Cleared Land

Cleared land is the first stage of development. Vegetation is bulldozed off the site along with any stones or boulders. Land is cleared for roads, utilities, building sites, yards, and parking areas. Each of these clearings affects the adjacent site through light penetration, invasive species, and possible sedimentation or compaction.

### Community 2.2

## **Building Sites**

Building sites take land out of production more or less permanently.

## **State 3**

### **Semi-Natural State**

This state is very common along lakeshores that were developed many years ago and remain unchanged since then. Rustic cabin owners and resort operators often try to maintain a rustic environment on their grounds. Understory vegetation is mostly sparse in this state, especially in the Mature Pines Phase which often has a closed canopy with a shade tolerant shrub-sapling layer of ironwood and sugar maple.

### **Community 3.1**

#### **Mature Pines Phase**

The Mature Pines Phase of the Upper Riparian Terrace ecological site is the iconic northwoods setting.

### **Community 3.2**

#### **Mature Hardwoods Phase**

Gaps in the Mature Pines Phase, caused by various disturbance factors, foster hardwood species. As those trees mature, the site becomes a mixed hardwood-conifer stand, which is now very common.

## **Additional community tables**

### **Other references**

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## 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):**

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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:**

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