Ecological site F094DY008WI
Sandy 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

MLRA 94D, the Northern Highland Sandy Drift, comprises 1.346 million acres of outwash plains, sandy moraines, wetlands and numerous water bodies (large lakes, small ponds, large rivers, small streams and flowages of all sizes). The Sandy Terraces and Plains ecological site comprises about 60,000 acres in MLRA 94D.

Classification relationships

The Sandy Terraces and Plains ecological sites correlate to the PArVAa habitat type developed by Kotar and Burger (2002); this habitat type is named after Pinus strobus (white pine)-Acer rubrum (red maple) /Vaccinium angustifolium (low-bush blueberry)-Aralia nudicaulis (wild sarsaparilla). 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 dry-mesic moisture regime and is poor to 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 Sandy Terraces and Plains ecological site is distinguished by flat terrain with less than 6% slopes and moderately well drained soils that support productively growing xerophytic species. The overstory species can tap into a water table at 3 to 6 feet during the spring months and the understory benefits from the cool shade of the closed canopy forest.

Table 1. Dominant plant species

Tree	(1) *Pinus strobus* (2) *Acer rubrum*
Shrub	(1) *Corylus cornuta* (2) *Vaccinium angustifolium*
Herbaceous	(1) *Maianthemum canadense* (2) *Eurybia macrophylla*

Physiographic features

This nearly level ecological site is located between the uplands and the wetlands. If the site is linear in shape, it is called a terrace, if irregular or ovoid, then it is a plain. Outwash fans are somewhat triangular; given that the sediment was derived from a narrow

glaciofluvial channel, then fanned out with distance. Most notably, these flat, very porous landforms are groundwater flowthrough conduits; subsurface water flows from the upland watershed to the wetlands where the water surfaces.

Figure 1. Sandy ecological sites on pitted outwash

Table 2. Representative physiographic features

Landforms	(1) Outwash plain (2) Outwash terrace (3) Outwash fan
Flooding frequency	None
Ponding frequency	None
Elevation	410 – 570 m
Slope	0 – 10 %
Water table depth	100 – 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. The microclimate of this site matches the average regional climatic data, as this is the site that deviates the least from the ambient conditions on a day-to-day basis.

Table 3 Representative climatic features

Frost-free period (average)	110 days
Freeze-free period (average)	130 days
Precipitation total (average)	840 mm

- (1) RHINELANDER [USC00477113], Rhinelander, WI
- (2) EAGLE RIVER [USC00472314], Eagle River, WI
- (3) MINOCQUA [USC00475516], Minocqua, WI
- (4) REST LAKE [USC00477092], Manitowish Waters, WI

Influencing water features

The extra groundwater flowing through these sites makes a more productive site. The depth of groundwater flowthrough is dependent on the size of the subsurface watershed and the height of the hydraulic head, because the hydraulic conductivity of these sites is uniformly high. Thus, smaller ecological sites with the same size watershed and hydraulic head as Sandy Terraces and Plains would be a wetter site, and likely classify as Wet Sandy Drainageways.

Soil features

Sandy Terraces and Plains ecological sites have nearly level, moderately well drained sandy soils characterized by the Croswell series. The surface layer can either be loamy sand or sand with loamy sand more common. The subsoil and substratum to depth of 80 inches is mostly sand with some gravelly layers in places. The spodic horizon is well developed in these soils; spodic materials increase the water-holding and cation exchange capacities of the soil and thus the productivity of this site. In many of these horizons, iron and aluminum sesquioxides have cemented sand grains together to form a material called ortstein (iron stone). Also present is a seasonal high water that occurs between 40 and 80 inches deep during spring months in most years. The presence of the water table also increases the productivity of the site, even though the water table drops below 80 inches rapidly during the growing season, it may still be within the root zone of large trees.

Table 4. Representative soil features

Surface texture	(1) Loamy sand (2) Sand
Family particle size	(1) Sandy
Drainage class	Moderately well drained
Permeability class	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)	5.08 – 10.16 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 – 5.9
Subsurface fragment volume <=3" (Depth not specified)	10 – 20 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The Sandy Terraces and Plains ecological site has plant communities that are responding directly or indirectly to the seasonal high water table and subsequent groundwater flowthrough at 3 to 6 feet. The deeper-rooted forest canopy species, especially white pine, have a decided advantage because they are essentially sub-irrigated on this site. The root zone of the ground flora is mostly confined to the dry upper 2 feet, thus these are water stress-tolerant species such as wintergreen (Gaultheria procumbens) and trailing-arbutus (Epigaea repens). The success of the canopy species creates a favorable habitat for shade-tolerant species such large-leaf aster and wild sarsaparilla. As a result of the interaction of climate, vegetation and sandy parent materials, this nearly level, sub-irrigated site has soils that are strongly podzolized and exhibit clear Spodosol diagnostic horizons: O horizons at the surface, albic horizon and spodic horizons with humus accumulation in the upper part and iron cementation in the lower part. This site has the full expression of soil characteristics that supported the vast pinery of pre-European settlement times.

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 2.1 plant community composition

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

Table 8. Community 2.2 plant community composition

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

Table 9. Community 3.2 plant community composition

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

Table 10. Community 3.4 plant community composition

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

Table 11. Community 4.1 plant community composition

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

Table 12. Community 4.2 plant community composition

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

Table 13. Community 4.3 plant community composition

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

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:**
