

Ecological site R111XC002IN

Wet Sandy Interdune

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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): 111X–Indiana and Ohio Till Plain

A PROVISIONAL ECOLOGICAL SITE is a conceptual grouping of soil map unit components within a Major Land Resource Area (MLRA) based on the similarities in response to management. Although there may be wide variability in the productivity of the soils grouped into a Provisional Site, the soil vegetation interactions as expressed in the State and Transition Model are similar and the management actions required to achieve objectives, whether maintaining the existing ecological state or managing for an alternative state, are similar. Provisional Sites are likely to be refined into more precise group during the process of meeting the APPROVED ECOLOGICAL SITE DESCRIPTION criteria.

This PROVISIONAL ECOLOGICAL SITE has been developed to meet the standards established in the National Ecological Site Handbook. The information associated with this ecological site does not meet the Approved Ecological Site Description Standard, but it has been through a Quality Control and Quality Assurance processes to assure consistency and completeness. Further investigations, reviews and correlations are necessary before it becomes an Approved Ecological Site Description.

111C – Indiana and Ohio Till Plain, Northwestern Part. This MLRA is in the glaciated part of north-central Indiana and is dominated by glacial till plains broken in places by lake plains, outwash plains, and flood plains. Areas that parallel most of the major rivers and streams have deposits of sand.

Although it is an important agricultural region, MLRA 111C hosts a large proportion of Indiana's biodiversity.

Classification relationships

Major Land Resource Area (MLRA)(USDA-Natural Resources Conservation Service, 2006)

USFS Ecological Regions (USDA, 2007):

Sections - Central Till Plains, Beech Maple (222H), South Central Great Lakes (222J), Central Till Plains and Grand Prairies (251D)

Subsections - Kalamazoo-Elkhart Moraines and Plains (222Jh), Steuben Interlobate Moraines (222Ji), Bluffton Till Plains (222Ha), Entrenched Valleys (222Hf), Miami-Scioto Plain-Tipton Till Plain (222Hb), Kankakee Sands (251Dg) and Eastern Grand Prairie (251Dd).

NatureServe Systems anticipated (NatureServe, 2011): Agriculture-Pasture/Hay, Agriculture-Cultivated Crops and Irrigated Agriculture, Central Interior Highlands calcareous Glade and Barrens, Central Interior Highlands Dry Acidic Glade & Barrens, Central Tallgrass Prairie, Harvested Forest-Grass Regeneration, Harvested Forest-Herbaceous Regeneration, Introduced Upland Vegetation – Treed, Laurentian-Acadian Alkaline Conifer-Hardwood Swamp, Laurentian-Acadian Northern Hardwoods Forest, Laurentian-Acadian Northern Pine-Oak Forest, Laurentian-Acadian Wet Meadow-Shrub Swamp, Laurentian Pine-Oak Barrens, Managed Tree Plantation, North-Central Interior and Appalachian Acidic Peatland, North-Central Interior Beech-Maple Forest, North-Central Interior Dry Oak

Forest & Woodland, North-Central Interior Dry-Mesic Oak Forest & Woodland, North-Central Interior Floodplain, North-Central Interior Freshwater Marsh, North-Central Interior Maple-Basswood Forest, North-Central Interior Oak Savanna, North-Central Interior Sand Gravel Tallgrass Prairie, North-Central Interior Wet Flatwoods, North-Central Interior Wet Meadow-Shrub Swamp, North-Central Oak Barrens, Ruderal Forest, Ruderal Upland-Old Field, South-Central Interior Large Floodplain.

LANDFIRE Biophysical Settings anticipated (USGS, 2010): North-Central Interior Oak Savanna, North-Central Interior Sand and Gravel Tallgrass Prairie, Central Interior and Appalachian Swamp Systems, North-Central Interior Dry-Mesic Oak Forest and Woodland, North-Central Interior Dry Oak Forest and Woodland, North-Central Interior Beech-Maple Forest, North Central Oak Barrens, Central Interior and Appalachian Floodplain Systems, Great Lakes Coastal Marsh Systems, Central Interior and Appalachian Shrub-Herbaceous wetland systems, North Central Wet Flatwoods, North-Central Interior Maple-Basswood Forest, Central Tallgrass Prairie, South-Central Interior Mesophytic Forest, Boreal White Spruce-Fire-Hardwood Forest-Inland, Great Lakes Pine Barrens, Great Lakes Wet-Mesic Lakeplain Prairie, Laurentian-Acadian Alkaline Conifer-Hardwood Swamp, Laurentian-Acadian Floodplain Systems, Laurentian-Acadian Shrub-Herbaceous Wetland Systems, Laurentian Pine-Oak Barrens, Northern Sugar Maple-Basswood Forest, Paleozoic Plateau Bluff and Talus.

Ecological site concept

This is an upland site formed on wind and water deposited sand parent material. This site is located on toeslopes and backslopes with a slope less than 7%. Soil drainage for this site is very poorly to poorly drained. There are 3 distinct states: 1) wet sand prairie, 2) agriculture state, mostly row crops, and 3) and old field state. Fire was a driver of this site historically as the site would alter from being very wet, to being very dry. The recurrent fires kept this a herbaceous dominated site. Today the majority of the site is row crop agriculture. Improved drainage allows for this site to be used for raising corn and soybeans.

Associated sites

F111XC003IN	Sandy Interdune Generally higher on the landscape. Drier with many more trees.
R111XC008IN	Wet Overflow Site with alluvium overlaying the sandy materials. Often in similar landscapes.

Similar sites

R111XC008IN	Wet Overflow Dominated by big bluestem instead of bluejoint.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Calamagrostis canadensis</i> (2) <i>Spartina pectinata</i>

Physiographic features

This site is located in the 111C - Indiana and Ohio Till plain, Northwestern Part Major Land Resources area (MLRA). This site is classified as an upland site located in depressions on outwash plains, lake plains, and developed on sandy material.

Table 2. Representative physiographic features

Landforms	(1) Interdune
Flooding frequency	None
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)

Ponding frequency	Frequent
Slope	0–2%
Water table depth	0–30 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is humid continental in nature typified by large season temperature differences, with warm to hot, humid summers and cold winters. Precipitation is relatively well distributed year-round.

The average first frost should occur around October 12 and the last freeze of the season should occur around April 25.

Table 3. Representative climatic features

Frost-free period (average)	160 days
Freeze-free period (average)	189 days
Precipitation total (average)	1,041 mm

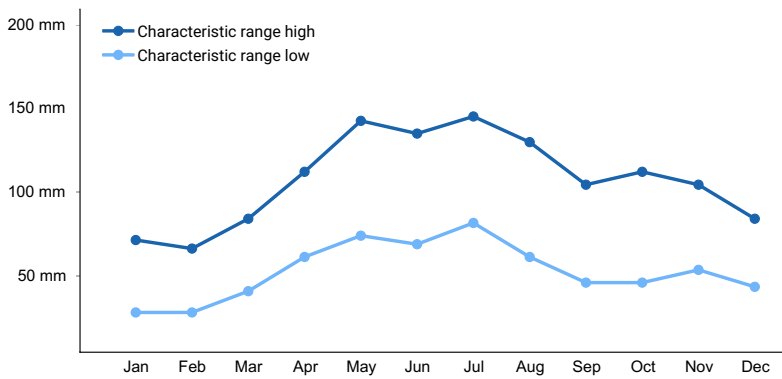


Figure 1. Monthly precipitation range

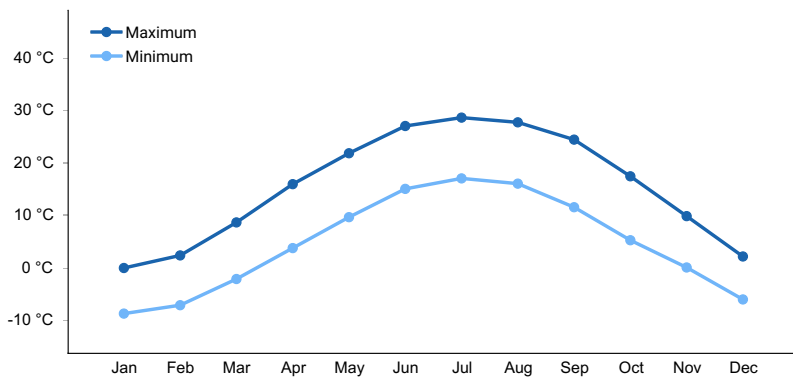


Figure 2. Monthly average minimum and maximum temperature

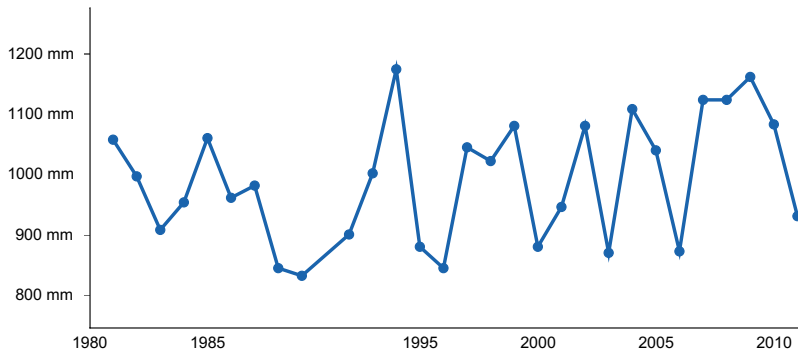


Figure 3. Annual precipitation pattern

Climate stations used

- (1) RENSSELAER [USC00127298], Rensselaer, IN
- (2) CHALMERS 5 W [USC00121417], Chalmers, IN
- (3) FRANCESVILLE [USC00123078], Francesville, IN
- (4) GOSHEN 3SW [USC00123418], Goshen, IN
- (5) PLYMOUTH [USC00126989], Plymouth, IN
- (6) LAKEVILLE [USC00124782], Lakeville, IN
- (7) LOGANSFORT CICOTT ST [USC00125117], Logansport, IN
- (8) WARSAW [USC00129240], Warsaw, IN
- (9) WEST LAFAYETTE 6 NW [USC00129430], West Lafayette, IN
- (10) LAGRANGE 1 S [USC00124730], LaGrange, IN
- (11) ROCHESTER [USC00127482], Rochester, IN
- (12) WINAMAC 2SSE [USC00129670], Winamac, IN

Influencing water features

This being an upland site, it is not influenced by water from a wetland or stream.

Soil features

In a representative profile for the Wet Sandy Interdune ecological site, the soils are black to very dark gray, sandy loams or loamy sands, with mollic epipedons up to 24+ inches. Some will have a small amount of gravel in the upper sections which increases with depth.

The two largest soil components for this site, by acres, are Maumee and Gilford.

It should be noted that there may be inclusions of other soils and because of mapping scale are not divided out.

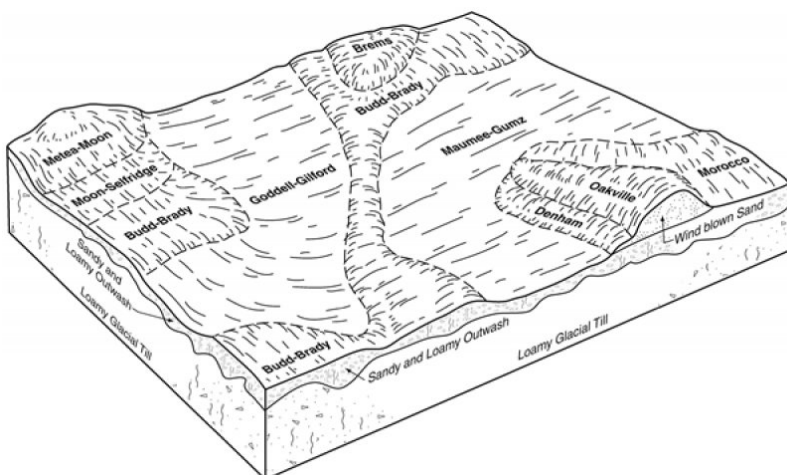


Figure 5. Block diagram showing Gilford and Maumee soils

Table 4. Representative soil features

Parent material	(1) Eolian sands–sandstone
Surface texture	(1) Loamy sand (2) Fine sandy loam (3) Sandy loam
Drainage class	Very poorly drained to poorly drained
Permeability class	Moderately rapid to rapid
Surface fragment cover <=3"	0–3%
Subsurface fragment volume <=3" (Depth not specified)	0–10%

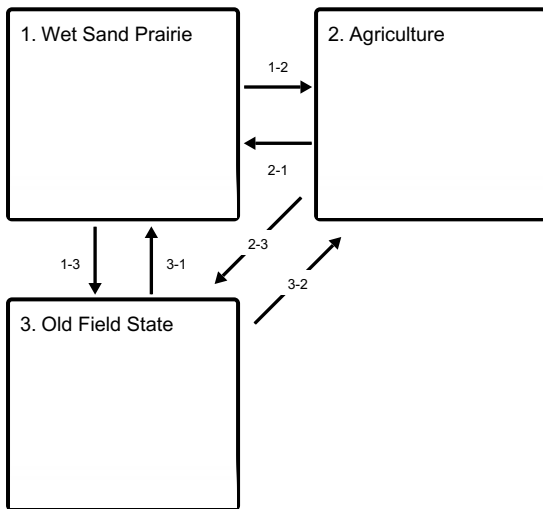
Ecological dynamics

The historic plant community of the Wet Sandy Interdune ecological site is a wet sand prairie. This site is dominated by herbaceous species due to the annual flooding and frequent fires.

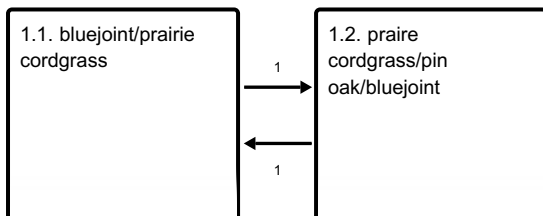
Since settlement, most of this site has been converted to agriculture with the majority being row crop agriculture. The most common practice involves grain rotations between corn and soybeans.

State and transition model

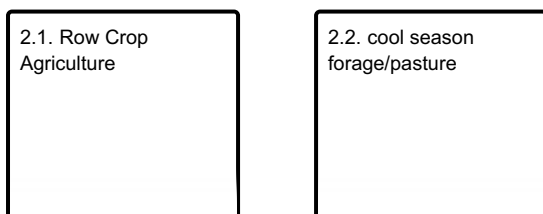
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities

3.1. weedy forbs/tall
fescue

3.2.
dogwood/sassafras/w
eedy forbs

3.3. Oak Woodland

State 1 Wet Sand Prairie

This is the reference plant community for this site and it had two community phases. The reference phase was herbaceous dominated due to nearly annual flooding and a 2-5 year fire interval. Longer fire interval would allow some woody species to invade.

Community 1.1 bluejoint/prairie cordgrass

Frequent flooding and fires maintained the function of this phase and was herbaceous dominated. Absence of fire will shift phase to 1.2

Community 1.2 prairie cordgrass/pin oak/bluejoint

Frequent flooding and fires maintained the function of this phase and was herbaceous dominated. Longer fire interval has allowed some woody species into site. Increase of fire frequency will shift phase to 1.1

Pathway 1 Community 1.1 to 1.2

No woody species management or fire.

Pathway 1 Community 1.2 to 1.1

Fire and/or woody species management

State 2 Agriculture

This site has largely been converted to agricultural use. Roughly 75% of the historic acres are now in row crop agricultural use. Most common is a corn and soybean rotation of various types. Roughly 5% of the site is not used to grow hay or cool season forage and used for grazing.

Community 2.1 Row Crop Agriculture

This phase is characterized by row crop agriculture of small grains, primarily corn, soybeans, and occasionally wheat. Seeding and management could transition this phase to phase 2.

Community 2.2

cool season forage/pasture

This phase is characterized by forage or grazing agriculture. Different mixes of, generally, cool season grasses and forbs, largely clovers, are grown. Tillage, seeding and management could transition this phase to phase 1.

State 3

Old Field State

This state is characterized by interrupted drainage and removal of historical vegetation. Both contribute to site being comprised of largely weedy species that will progress to tree dominance.

Community 3.1

weedy forbs/tall fescue

Weeds from local seed sources and tall fescue colonize the site after agricultural abandonment.

Community 3.2

dogwood/sassafras/weedy forbs

Fast growing, short lived woody plants begin to invade the site due to lack of woody management or fire.

Community 3.3

Oak Woodland

Lack of fire/management allows the site to develop into an oak woodland.

Transition 1-2

State 1 to 2

Drainage installed, area tilled then planted to crops

Transition 1-3

State 1 to 3

Natural drainage altered/"improved" and no fire or woody species management

Restoration pathway 2-1

State 2 to 1

Remove drainage system, plant appropriate species, frequent fires.

Transition 2-3

State 2 to 3

Abandonment or no management on agricultural field.

Restoration pathway 3-1

State 3 to 1

Remove the drainage in place. Prescribed fire followed with seeding of desired species.

Restoration pathway 3-2

State 3 to 2

Clear woody vegetation, plant crop species, and management that allows the area to be in agriculture.

Additional community tables

Other references

Betz, R. (1973). The prairies of Indiana. Proceedings of the Fifth Midwest Prairie Conference (pp. 34-31). Ames: Iowa State University.

Homoya, M. A., Abrell, D. B., Aldrich, J. R., & Post, T. W. (1985). The Natural Regions of Indiana. Indiana Academy of Science , 94, 245-269.

Jacquart, E., Homoya, M, & Casebere, L. 2002. Natural communities of Indiana (Draft)

Kartesz, J. T. (2011). Density Gradient Map Samples Produced From BONAP's Floristic Synthesis. Retrieved 12 12, 2011, from Biota of North America Program: <http://bonap.org/diversity/diversity/diversity.html>

NatureServe. (2011). An online encyclopedia of life [web application]. NatureServe, Arlington, VA, USA [Online: [www. natureserve. org/explorer](http://www.natureserve.org/explorer)] .

Soil Survey Staff. (2011). Soil Survey Geographic (SSURGO) Database. Retrieved 10 04, 2011, from Natural Resources Conservation Service, United States Department of Agriculture: <http://soildatamart.nrcs.usda.gov>

Transeau, E. (1935). The prairie peninsula. Ecology vol. 16 (3) , 423-437.

U.S. Census Bureau. (2011). Population Distribution and Change: 2000 to 2010. Retrieved 10 06, 2011, from <http://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf>

USDA. (2007). Ecological Subregions: Sections and Subsections for the Conterminous United States. Washington, DC: USDA - Forest Service.

USDA. (2006). Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U. S. Department of Agriculture, Natural Resources Conservation Service. U. S. Department of Agriculture Handbook 296.

USGS. (2010). LANDFIRE Biophysical Settings. Retrieved from <http://www.landfire.gov>

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:**

17. **Perennial plant reproductive capability:**
