

Ecological site F098XB032IN

Kankakee Wet Acidic Interdunes

Last updated: 1/12/2024

Accessed: 08/22/2026

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): 098X–Southern Michigan and Northern Indiana Drift Plains

"This area is in the Eastern Lake Section of the Central Lowland Province of the Interior Plains. It is a broad glaciated plain that is deeply mantled by till in the north and outwash to the south. Much of the area is nearly level to gently rolling. Elevation ranges from 183 to 391 m (600 to 1285 ft). Local topographic relief averages 9 m and ranges up to 74 m (30 to 245 ft). Highest relief occurs adjacent to river valleys eroded through moraines. Topography is more subdued south of the Atlantic/Gulf drainage divide near the Michigan/Indiana state line, elevations ranging from 185 to 280 m (605 to 920 ft). Local topographic relief in the south averages 4 m and ranges up to 49 m (10 to 160 ft). The surface of this area is covered by 30 to 150 m (100 to 500 ft) of glacial drift in most areas. At the northern edge of the area, the drift is more than 100 meters (300 ft) thick. From the Grand River basin northward, most of the drift consists of till from the Saginaw Lobe of the Wisconsin Ice Sheet. From the Kalamazoo River basin southward, there are significant deposits of unconsolidated sand and gravel outwash formed between major lobes of the receding Wisconsin Ice Sheet. The outwash deposits are reworked as sand dunes in the Kankakee River basin. The bedrock beneath the glacial deposits in this area is deformed in the shape of a basin. The center of this basin is in the north-central part of the area. Pennsylvanian-age sandstone are in the center of the basin, and Mississippian-age sandstone and shale beds form the outer rings of the basin. In a few areas the drift deposits are less than 2 m (6 ft) thick, where glacial outwash channels have eroded to limestone bedrock in Grand Rapids, and where sandstone bedrock cuestas peak in elevation in near Hillsdale, Michigan. A sandstone cliff 15 m high (50 ft) occurs along a short stretch of the Grand River in Grand Ledge, Michigan. Most of the rivers in this area are short because of their proximity to the Great Lakes east and west of the area. The largest watersheds, the St. Joseph River, Grand River, and Kalamazoo River drain into Lake Michigan. The southern extent of the MLRA is drained by the Kankakee River of the Mississippi River watershed."

Classification relationships

Among the USFS ecoregional framework (Cleland et al., 2007), most of MLRA 98 is represented by the Humid Temperate Domain (200), Hot Continental Division (220), Midwest Broadleaf Forest Province (222), South Central Great Lakes Section (222J), subsections 222Jc, 222Jg, 222Jh, and 222Jf. Similar sites within the portion of MLRA 98 that overlap the Prairie Division (250) and Prairie Parkland Province (251) are treated as separate ecological sites. MLRA 98 recently was adjusted to exclude portions of Warm Continental Division (210), Laurentian Mixed Forest Province (212) to the north, and subsections 222Ja and 222Jb to the northwest. Among the EPA ecoregional framework (Omernik and Griffith, 2014), most of MLRA 98 falls within Eastern Temperate Forests (Level I: 8), Mixed Wood Plains (Level II: 8.1), Southern Michigan/Northern Indiana Drift Plains (Level III: 56), and Level IV: 56b, 56g, and 56h. Similar sites within the portion of MLRA 98 that overlap the Central USA Plains (Level II: 8.2) and Central Corn Belt Plains (Level III: 54) are treated as separate ecological sites. MLRA 98 recently was adjusted to exclude portions of Northern Forests (Level I: 5), Mixed Wood Shield (Level II: 5.2), Northern Lakes and Forests (Level III: 50) to the north, and level IV: 56d and 56f to the northwest.

Ecological site concept

The central concept of the Kankakee Wet Acidic Interdunes is deep sands (>70 percent sands >100 cm deep) with low base saturation (pHs 5.5 or Spodosols) and seasonal ponding (poorly drained and very poorly drained). Such sites support vegetation composed of mostly wetland species of which tolerate low nutrient conditions. Characteristic species include pin oak and black gum in forested sites with ferns, heaths, and peat moss in the understory. Open sites tend to have various grasses, sedges, and rushes with Atlantic-Gulf Coastal Plain affinities, and buttonbush.

Associated sites

F098XB031IN	Kankakee Acidic Interdunes
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Similar sites

F098XA018MI	Wet Acidic Drift Depressions
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Table 1. Dominant plant species

Tree	(1) <i>Quercus palustris</i>
Shrub	Not specified
Herbaceous	(1) <i>Osmundastrum cinnamomeum</i> (2) <i>Dichanthelium spretum</i>

Physiographic features

Site is on swales between inland sand dunes from glaciofluvial and glaciolacustrine sands.

Table 2. Representative physiographic features

Landforms	(1) Interdune
Runoff class	Negligible to low
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	Occasional to frequent
Elevation	160 – 280 m
Water table depth	0 – 30 cm
Aspect	Aspect is not a significant factor

Climatic features

This ecological site experiences a humid continental climate with warm summers and cold winters. Precipitation is moderately well distributed through the year with higher amounts during the growing season than the winter. This ecological site is distributed only along the southern portion of the MLRA, and consequently is outside the moderating envelope of the Great Lakes. This area does have slightly greater annual rainfall due to being slightly closer to the main source of moisture (the Gulf of Mexico) than the rest of the MLRA, but this trend is canceled out by higher potential evapotranspiration rates. More significantly, this area has lower snowfall, warmer summer temperatures, and more frequent lightning, all of which contribute to higher fire frequencies than northern portions of the MLRA.

Table 3 Representative climatic features

Frost-free period (characteristic range)	140-150 days
Freeze-free period (characteristic range)	180-180 days
Precipitation total (characteristic range)	990-1,040 mm
Frost-free period (actual range)	140-150 days
Freeze-free period (actual range)	180-180 days
Precipitation total (actual range)	970-1,040 mm
Frost-free period (average)	150 days
Freeze-free period (average)	180 days
Precipitation total (average)	1,020 mm

- (1) KANKAKEE WASTEWATER [USC00114603], Kankakee, IL
- (2) FRANCESVILLE [USC00123078], Francesville, IN
- (3) KNOX WWTP [USC00124657], Knox, IN
- (4) WHEATFIELD [USC00129511], Wheatfield, IN
- (5) ROCHESTER [USC00127482], Rochester, IN
- (6) SOUTH BEND MICHIANA RGNL AP [USW00014848], South Bend, IN

Influencing water features

Water table is within 0 - 25 cm.

Soil features

Soils are poorly drained to very poorly drained sands with low pH. They are commonly classified as Typic Humaquepts, Typic Endoaqualfs, and Aquic Humic Dystrudepts, and commonly mapped as Newton and Quinn series.

Table 4. Representative soil features

Parent material	(1) Eolian sands
Surface texture	(1) Sand
Drainage class	Very poorly drained to poorly drained
Permeability class	Moderately rapid to very rapid

Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-100.1cm)	3.99 – 10.01 cm
Soil reaction (1:1 water) (0-50cm)	3.5 – 5.5
Subsurface fragment volume <=3" (0-150.1cm)	Not specified
Subsurface fragment volume >3" (0-150.1cm)	Not specified

Ecological dynamics

Fire frequently invaded from adjacent prairies and barrens, but intensity is moderated by discontinuous fuels as most of the time leaf litter is too moist to burn. Windthrow is a frequent disturbance due to shallow rooting in wet soils. Wet anoxic soils favor facultative and obligate wetland species. The moderate nutrient status and moderately stable water table supports swamp white oak, royal fern, and an moderate diversity of other swamp species. The reference community is dominated by pin oak (*Quercus palustris*) with an understory including cinnamon fern (*Osmundastrum cinnamomeum*).

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 (%)
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Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 1.4 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 1.5 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 13. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 14. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 15. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 16. Community 4.2 plant community composition

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

Site Development and Testing Plan Future work is needed, as described in a future project plan, to validate the information presented in this provisional ecological site description. Future work includes field sampling, data collection and analysis by qualified vegetation ecologists and soil scientists. As warranted, annual reviews of the project plan can be conducted by the Ecological Site Technical Team. A final field review, peer review, quality control, and quality assurance reviews of the ESD are necessary to approve a final document.

Other references

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Contributors

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Approval

Nels Barrett, 1/12/2024

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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	08/22/2026
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:
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