Ecological site F113XY923IL
Sandy Floodplain Forest

Last updated: 5/17/2024
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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): 113X–Central Claypan Areas

The eastern Illinois portion of the Central Claypan Areas MLRA is in the Till Plains Section of the Central Lowland Province of the Interior Plains (USDA-NRCS, 2006) and includes the Southern Till Plain Natural Division of the natural divisions of Illinois (Schwegman, 1973; 1997; IDNR, 2018) in south-central Illinois. South-central Illinois is a dissected Illinoisan till plain south of the terminal Wisconsin moraine. This region consists of nearly level to gently sloping, old till plains. Stream valleys are shallow and generally are narrow. Elevation is about 660 feet (200 meters), increasing gradually from south to north. Local relief is generally low on the broad, flat till plains and flood plains and high on the dissected hills bordering rivers or drainage systems. The Kaskaskia, Little Muddy, Little Wabash, Embarras, and Skillet Fork rivers are part of this area. This region is covered with loess, which overlies old glacial drift (Illinoisan till) that has a high content of clay. Fragipans are also present. Pennsylvanian limestone and shale bedrock underlay the glacial till. The dominant soil orders in this region are Alfisol and Mollisol. The soils in the area predominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or smectitic mineralogy. They generally are very deep, well drained to poorly drained, and loamy or clayey. (USDA-NRCS, 2006).

Classification relationships

Major Land Resource Area (MLRA) (USDA-NRCS, 2006): 113 – Central Claypan Areas, Eastern Part U.S. Forest Service Ecoregions (Cleland et al. 2007): Domain: Humid Temperate Domain Division: Hot Continental Division Province: Eastern Broadleaf Forest (Continental) Province Code: 222 Section: Central Till Plains, Oak-Hickory Section Section Code: 222G

Ecological site concept

The historic pre-European settlement vegetation on this site was dominated by broadleaf deciduous trees. Canopy closure is complete, or nearly so, with few shrubs and limited tree species. Sandy Floodplain Forests occur in floodplains on recently formed sand bars, front-land ridges and well-drained flats. Soils are excessively drained and very deep formed from sandy alluvium that is frequently flooded (Nelson 2010; SSS NRCS OSD, 2018; NatureServe 2018). This cottonwood (Populus deltoides L.)* - black willow (Salix nigra Marshall) - silver maple (Acer saccharinum L.) forest is characteristic of the fronts and banks of rivers and streams. It develops on bare, moist soil on recently formed sand bars, front-land ridges, and well-drained flats, along with sandbar willow (Salix interior). This natural community can also be found on well-drained ridges in the first bottoms. The tree canopy is tall (to 30 m) and dominated by cottonwood, black willow and silver maple, although green ash (Fraxinus pennsylvanica Marshall), boxelder (Acer negundo L.), American sycamore (Platanus occidentalis L.), and American elm (Ulmus americana L.) are also commonly encountered. Cottonwood trees can exceed 30 m in height with massive trunks which fork into stout branches when growing on sites protected from prolonged severe flooding. Tree diversity is limited due to the dynamics of flooding and resultant deposition and scouring of sediments. In earlier successional stages, the subcanopy can be strongly dominated by black willow. The shrub layer is conspicuously absent in many parts of the range. Herbaceous growth can be thick and lush but is often patchy and sparse due to frequent inundation. Species most often encountered in the ground layer include tall lovegrass (Eragrostis hypnoides (Lam.) Britton, Sterns & Poggenb.), mucronate sprangeltop (Leptochloa panicea (Retz.) Ohwi ssp. brachiata (Steud.) N. Snow), smallflower halfchaff sedge (Lipocarpha micrantha (Vahl) G. Tucker), golden dock (Rumex maritimus L.), Paradox cinquefoil (Potentilla paradoxa Nutt.), sedges (Carex spp.), rice cutgrass (Leersia oryzoides (L.) Sw.), beggarticks (Bidens spp.), and asters (Asteraceae spp.) Thick "dog hair" stands of cottonwood and willow can develop on newly formed sand bars. Historically, seasonal flooding was the primary disturbance factor, while windthrow events and beaver alterations were secondary factors (LANDFIRE 2009; Nelson 2010; NatureServe 2018; Voigt and Mohlenbrock 1964; White 1978). * All plant common and scientific names in this document were obtained from the U.S. Department of Agriculture – Natural Resources Conservation Service National PLANTS Database (USDA NRCS, 2018).

Associated sites

F113XY919IL	**Wet Silty Floodplain Forest** This ecological site is located in lower floodplains along with Loamy Floodplain Forests.
F113XY920IL	**Silty Floodplain Forest** This ecological site is located in floodplains generally adjacent to but lower in elevation than Sandy Floodplain Forests.

Similar sites

F113XY920IL	**Silty Floodplain Forest** This ecological site has poorer drainage and is located in floodplains generally adjacent to but lower than Sandy Floodplain Forests.

Table 1. Dominant plant species

Tree	(1) *Populus deltoides* (2) *Salix nigra*
Shrub	(1) *Salix interior*
Herbaceous	(1) *Carex* (2) *Bidens*

Physiographic features

This site is on very deep, excessively drained soils on flood plains. These soils formed in sandy alluvium that is frequently flooded. Slopes range from 2 to 5 percent. (Table 1). The site generates some runoff to adjacent lower floodplain sites.

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Flood plain
Runoff class	Negligible to very low
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Elevation	160 − 210 m
Slope	0 − 10 %

Water table depth	180 cm
Aspect	Aspect is not a significant factor

Climatic features

The soil temperature regime of MLRA 113 is classified as mesic, where the mean annual soil temperature is between 47 and 59°F. Temperature and precipitation occur along a north-south gradient, where temperature and precipitation increase the further south you travel (USDA-NRCS 2006). The majority of the precipitation occurs as rainfall in the form of convective thunderstorms during the growing season.

Table 3 Representative climatic features

Frost-free period (characteristic range)	160-170 days
Freeze-free period (characteristic range)	190-190 days
Precipitation total (characteristic range)	1,090-1,120 mm
Frost-free period (actual range)	150-170 days
Freeze-free period (actual range)	190-190 days
Precipitation total (actual range)	1,090-1,120 mm
Frost-free period (average)	160 days
Freeze-free period (average)	190 days
Precipitation total (average)	1,090 mm

- (1) CHARLESTON [USC00111436], Charleston, IL
- (2) NEWTON [USC00116157], Newton, IL

Influencing water features

This ecological site is typically in natural levee positions directly adjacent to a perennial stream. Stream levels typically respond quickly to storm events, especially in watersheds where surface runoff is dominant. Short- to medium- duration flooding is common in many areas, particularly during spring and early summer storm events. Land use conversions have altered the hydrology and flooding dynamics in many places.

Wetland description

This site is in the RIVERINE wetlands class of the Hydrogeomorphic (HGM) classification system (Brinson, 1993). The stream hydrograph drives the inflows and outflows of RIVERINE wetlands. As the flood stage recedes, surface and groundwater return to the channel. The direction of movement is horizontal. The direction is also bi-directional in the lateral axis across the floodplain, but is

unidirectional on the longitudinal axis parallel to the valley as water flows downhill along the valley gradient.

Soil features

These soils are very deep and coarse-textured throughout, with moderate to low plant-available water capacity. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is sandy alluvium. They have loamy fine sand surface layers, with slightly alkaline, fine sand subsurface layers. These soils are not affected by seasonal wetness. Soils of this ecological site are in the Entisol order. Soil series associated with this site include Sarpy. (NCSS, 2018; SSS NRCS OSD, 2018)

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Loamy fine sand
Drainage class	Excessively drained
Permeability class	Rapid
Soil depth	180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (Depth not specified)	7.62 cm
Calcium carbonate equivalent (Depth not specified)	0 – 20 %
Soil reaction (1:1 water) (Depth not specified)	6.6 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The MLRA lies within the transition zone between the eastern deciduous forests and the central tallgrass prairies. The heterogeneous topography of the area results in variable microclimates and fuel matrices that in turn can support prairies, savannas, woodlands, and forests. Sandy Floodplain Forests form an aspect of this vegetative continuum. This ecological site occurs on sandy floodplains. Species characteristic of this ecological site consist of broadleaf deciduous floodplain forest species which exhibits high canopy diversity. (Anderson, 1975; White, 1978).

Historically, Sandy Floodplain Forests were on floodplain positions and natural levees that frequently flooded. These forests were structurally and compositionally diverse, with occasional tree fall gaps caused by flooding and natural mortality providing opportunities for regeneration of overstory species. Catastrophic floods will often partially or completely knock down the early successional species and regenerate this ecological system. Consequently, this ecological site is often made up of a mosaic of early to late successional floodplain forests.

Coarse loamy and sandy deposits of sediment were common, occurring along the floodplains with the sandy materials the youngest and most recently deposited substrate in this matrix. This ecological site is located on former streamside areas where frequent swift currents dumped the heavier sandy sediment load next to the river. It is normally surrounded by Loamy or Wet Loamy Floodplain Forests on slightly lower areas. It is likely that the hydrology of these streams has been altered since pre-settlement because of changes in land use. Current flooding is likely more frequent but brief. (NatureServe 2018)

Today many of these ecological sites have been cleared and converted to intensive agriculture. The remaining forests often occur as a narrow band in the floodplain. These remaining bands of forest play an important role as a source of food and shelter for migrating birds. In addition, they are very important for streambank stabilization, capturing sediment and mitigating scour during flood events.

These remaining remnants that still exist also play an important role as a source of food and shelter for migrating birds. In addition, large floodplain trees that extend above the canopy are important nesting sites for bald eagles (Haliaeetus leucocephalus) and herons (Ardea spp.). (Guyon et. al. 2016). Carefully planned timber harvest can be tolerated by this system, but high-grading of the timber will also degrade the system. Re-establishment of these riparian forests is important for stream quality and health, as well as for migratory birds. Planting of appropriate species has proven to be quite successful.

A provisional state and transition diagram is depicted in Figure 2. Detailed descriptions of each state, transition, plant community, and pathway follow the model. This model is based on available experimental research, field observations, professional consensus, and interpretations. It may change as knowledge increases.

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 3.1 plant community composition

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

Table 9. Community 4.1 plant community composition

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

Inventory data references

No field plots were available for this site. A review of the scientific literature and professional experience were used to approximate the plant communities and ecological dynamics for this provisional ecological site. Information for the state-and-transition model was obtained from the same sources. All states and community phases are considered provisional based on the sources identified in ecological site description.

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Other references

Relationship to other established ecological classifications (done)
Biophysical Setting (LANDFIRE, 2009); the reference community of this ecological site is most similar to: South-Central Interior Large Floodplain (CES202.705)

National Vegetation Classification System (NatureServe, 2018): the reference community of this ecological site is most similar to: Populus deltoides - Salix nigra - Acer Saccharinum Floodplain Forest (CEGL002018)

Illinois Natural Areas Survey (INAS) (White, 1978); the reference community of this ecological site is most similar to: INAS Community Class – Floodplain Forest

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Approval

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Acknowledgments

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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	09/02/2026
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:**
