

Ecological site R108XD904IA

Wet Floodplain Prairie

Last updated: 10/17/2024

Accessed: 09/23/2026

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): 108X—Illinois and Iowa Deep Loess and Drift

The Illinois and Iowa Deep Loess and Drift, Western Part MLRA covers parts of both Iowa and Missouri and is known locally as part of the Southern Iowa Drift Plain. A silty loess deposit of varying thickness (5 to 20 feet) covers a series of glacial advances known collectively as pre-Illinoisan till. This till, deposited more than half a million years ago, was subjected to multiple instances of extreme erosion as well as periods of subdued erosion and intense weathering. The loess is thickest in the western part of the MLRA and generally thins eastward. In some areas, the loess has been removed and the older weathered till, called a “paleosol,” entirely exposed. These highly weathered soils, or paleosols, have a high content of clay, which slows the downward movement of water through the profile and causes water to move laterally instead of vertically. Wet areas, or “side-hill seeps,” commonly form where these paleosols become exposed along hillsides (Prior, 1991). The dominant soil orders in this MLRA are Mollisols and Alfisols and, to a lesser extent, Entisols and Inceptisols. Most of the soils are Udolls or Udalfs. Aquolls are on the flatter interfluvies. The soils in the area dominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. They generally are very deep, well drained to poorly drained, and silty, loamy, or clayey. These soils on uplands include somewhat poorly drained, nearly level Argiudolls (Macksburg series); moderately well drained, gently sloping to strongly sloping Argiudolls (Sharpsburg series); poorly drained, nearly level Argiaquolls (Winterset series); and well drained strongly, sloping to steep Hapludalfs (Gara, Lindley, Ladoga, and Armstrong series) (USDA-NRCS, 2006). The western part of the Illinois and Iowa Deep Loess and Drift is a segment of three other MLRAs within the Central Feed Grains and Livestock Region. The other areas are: the West-Central part (108C), the East-Central part (108B) and the Eastern part (108A).

Classification relationships

Major Land Resource Area (MLRA): Illinois and Iowa Deep Loess and Drift, Western Part (108D) USFS Subregions: Central Dissected Till Plains Section (251C); Loess Hills (251Cb) and Central Dissected Till and Loess Plain (251Cc) Subsections (Cleland et al, 2007) Relationship to Other Established Classifications: NatureServe Classification: Ecological System: North-Central Interior Floodplain (9338); Ecological Association: Black Willow Riparian Forest (NatureServe, 2013) Landfire Biophysical Setting: Central Interior and Appalachian Floodplain Systems (4314710) (Landfire, 2009)

Associated sites

F108XD902IA	Sandy/Loamy Floodplain Forest Sandy/ Loamy Floodplain Forest. Sandy soils including Alluvial land and the Perks series.
F108XD901IA	Loamy Floodplain Forest Loamy Floodplain Forest. Fine-silty and coarse-loamy textured soils including Nodaway, Landes, Kennebec and Huntsville series.

Similar sites

F108XD901IA	Loamy Floodplain Forest Loamy Floodplain Forest. Fine-silty and coarse-loamy textured soils including Nodaway, Landes, Kennebec and Huntsville series.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Carex atherodes</i> (2) <i>Carex lacustris</i>

Physiographic features

Wet Floodplains are of large extent, and can be found on floodplains in river valleys throughout MLRA 108D. These sites are within a dissected till plain landscape. Slopes are generally less than 5 percent. These sites typically occur along streams and rivers and are subjected to flooding and ponding.

Figure 1. Distribution of Wet Floodplain Prairies within MLRA 108D

Figure 2. Block diagrams representing typical soil-landform sequences in Loess Ridges, Glacial Till Side/Footslopes. Red asterisks identify soil components correlated to Wet Floodplain Prairie.

Table 2. Representative physiographic features

Landforms	(1) River valley > Flood plain
Runoff class	Negligible to low
Flooding frequency	None to frequent
Ponding frequency	None to frequent
Elevation	120 – 480 m
Slope	0 – 10 %
Water table depth	0 – 180 cm
Aspect	Aspect is not a significant factor

Climatic features

The soil temperature regime of MLRA 108D is classified as “mesic” where the mean annual soil temperature is between 46 and 59°F (Soil Survey Staff, 2014). The average freeze-free period of this ecological site is about 166 days, while the frost-free period is about 144 days.

Average annual precipitation is 31 inches, which includes rainfall plus the water equivalent from snowfall.. The average annual low and high temperatures are 38 and 60°F, respectively.

Table 3 Representative climatic features

Frost-free period (characteristic range)	140-150 days
Freeze-free period (characteristic range)	160-170 days
Precipitation total (characteristic range)	890-940 mm
Frost-free period (actual range)	130-150 days
Freeze-free period (actual range)	150-180 days
Precipitation total (actual range)	890-970 mm
Frost-free period (average)	140 days
Freeze-free period (average)	170 days
Precipitation total (average)	910 mm

- (1) WINTERSET 1N [USC00139132], Winterset, IA
- (2) MARYVILLE 2E [USC00235340], Maryville, MO
- (3) CLARINDA [USC00131533], Clarinda, IA
- (4) CORNING [USC00131833], Corning, IA
- (5) CRESTON 2 SW [USC00131962], Creston, IA
- (6) BEDFORD [USC00130576], Bedford, IA
- (7) GUTHRIE CTR [USC00133509], Guthrie Center, IA
- (8) INDIANOLA 2W [USC00134063], Indianola, IA
- (9) GREENFIELD [USC00133438], Greenfield, IA
- (10) KNOXVILLE [USC00134502], Knoxville, IA
- (11) DES MOINES INTL AP [USW00014933], Des Moines, IA

Influencing water features

This ecological site is in floodplains of perennial streams, primarily in backswamp positions, and are not typically adjacent to the current stream channel. They are influenced by a seasonal high water table, due to high groundwater levels in these topographically low positions. Most soils also have slow hydraulic conductivity, which impedes throughflow from precipitation and flood events. The water table is typically near the surface in late fall through spring, receding in the summer.

Stream levels typically respond quickly to storm events, especially in watersheds where surface runoff is dominant. Medium- to long-duration flooding is common in many areas, particularly during spring and early summer storm events. Constructed levees, often accompanied by stream channelization, have altered the hydrology and flooding dynamics in many places.

This site is in the RIVERINE wetlands class of the Hydrogeomorphic (HGM) classification system (Brinson, 1993), and are Emergent Palustrine wetlands (Cowardin et al., 1979).

Soil features

These soils have no major rooting restriction. The soils were formed under prairie vegetation, and have dark, organic-rich surface horizons. Parent material is glacial till. Some soils are underlain by shale residuum. The soils have loam, silt loam, silty clay and silty clay loam surface horizons (Table 5). Soil series associated with this site include Ackmore, Amana, Carlow, Colo, Lawson, Mt. Sterling, Spillville, Vesser, Wabash, Zook and Coland.

Table 4. Representative soil features

Parent material	(1) Residuum – shale
Surface texture	(1) Loam (2) Silt loam (3) Silty clay (4) Silty clay loam
Drainage class	Very poorly drained to moderately well drained
Permeability class	Very slow to moderately rapid
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (Depth not specified)	12.7 – 22.35 cm
Calcium carbonate equivalent (Depth not specified)	Not specified
Soil reaction (1:1 water) (Depth not specified)	5.6 – 6.9
Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %

Subsurface fragment volume >3" (Depth not specified)	0 – 20 %
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Ecological dynamics

Reference plant community is categorized as an emergent sedge wetland and includes grasses and sedges, forbs, and shrubs. Species composition typically includes *Carex atherodes*, *Carex lacustris*, *Polygonum amphibium*, *Sparganium eurycarpum*, *Polygonum punctatum*, *Ludwigia palustris*, *Ludwigia polycarpa*, *Penthorum sedoides*, *Polygonum hydropiper*, and *Sagittaria latifolia* (Rosburg, 2014).

Fire during dry periods removed the dense mat of leaf litter creating opportunities for plants less aggressive than the grasses and sedges. Peak water levels were usually high and persistent enough to preclude tree establishment under normal hydrologic regimes. In the long term, siltation slowly filled these depressions, altering flood duration and causing a shift toward floodplain woodland communities (Mutel, 2008).

Today most of these ecological sites have been drained and farmed. Only a very few quality remnants exist. While their flood regime usually has been altered, because of their site conditions, during wet years, they still act as ephemeral farmed wetlands in the agricultural landscape. Their position and soil properties also still make them good candidates for wet prairie development management. Left unfarmed, these sites can quickly develop into naturally wet communities.

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 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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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 for this provisional ecological site. Information for the state-and-transition model was obtained from the same sources. All community phases are considered provisional based on these plots and the sources identified in ecological site description.

Other references

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Approval

Suzanne Mayne-Kinney, 10/17/2024

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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)	John Hammerly, soil scientist Dan Pulido, SSOL
Contact for lead author	
Date	09/23/2026
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:

17. Perennial plant reproductive capability:
