

Ecological site R057XY010MN

Loamy Prairie

Last updated: 10/03/2023
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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): 057X–Northern Minnesota Gray Drift

The Northern Minnesota Gray Drift (57) is located within the Northern Lakes Forest and Forage Region. This area is entirely in north-central Minnesota and makes up about 9,785 square miles (Figure 1). The entire area is covered by Wisconsin-age glacial drift. The glacial deposits are from four major ice lobes-Des Moines, Rainy, Superior, and Wadena. The landscape developed through a series of glaciations and the subsequent retreating and wasting of the ice sheets, which resulted in a complex pattern of moraines, outwash plains, drumlins, lake plains and drainages. Lakes, ponds and marshes are common. The thickness of the glacial till ranges from 90 to 185 meters. Some areas of these deposits are overlain by outwash or lacustrine sediments. Some depressional areas have an accumulation of organic matter. The organic deposits are more than 2.5 meters thick in some areas. Elevation ranges from 300 to 500 meters across the area. (USDA-NRCS 2006) The dominant soil orders in this MLRA are Alfisols, Entisols, and Histisols, with some Mollisols in the westernmost part of the area. The soils in the area have a frigid soil temperature regime; aquic or udic soil moisture regime, and mixed mineralogy. Their natural drainage class is related to landscape position. In general, the Alfisols formed in till on moraines, Entisols formed in outwash on moraines and outwash plains, and Histisols formed in organic material over outwash or till on moraines or outwash plains. (USDA-NRCS 2006)

Classification relationships

Major Land Resource Area (MLRA): Northern Minnesota Gray Drift (57) (USDA Handbook 296, 2006) USFS Subregions: Northern Minnesota Drift & Lake Plain Section (212N); Chippewa Plains Subsection (212Na), Pine Moraines & Outwash Plains Subsections (212Nc), St. Louis Moraines Subsection (212Nb); Minnesota & NE Iowa Morainal Section (222M); Hardwood Hills Subsection (222Ma); Northern Superior Uplands Section (212L); Nashwauk Uplands Subsection (212Lc); Northern Minnesota & Ontario Peatlands Section (212M); Littlefork-Vermillion Uplands Subsection (212Ma) (Cleland et al. 2007). US EPA Level IV Ecoregion: Itasca and St. Louis Moraines (50q); Chippewa Plains (50r); Nashwauk/Marcell Moraines and Uplands (50s); Alexandria Moraines and Detroit Lakes Outwash Plain (51j); McGrath Till Plain and Drumlins (51k); Wadena/Todd Drumlins and Osakis Till Plain (51l)(U.S. Environmental Protection Agency, 2013)

Ecological site concept

Loamy Prairie sites are limited in extent in the southern region of MLRA 57, and typically occur on moraines on summits, shoulders and backslope hillslope positions. Soils textures are typically loamy but can vary from fine sandy loam to silt loam and are mollisols with dark organic-enriched upper horizons.

Associated sites

F057XY015MN	Wet Mixed Forest These sites occur on summit, shoulder and backslope hillslope positions on short convex slopes greater than 12 percent on moraines. Parent material is variable and consists of a wide range of soil textures.
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R057XY013MN	Loamy Overflow These sites occur on lower backslope and footslope hillslope positions, and upland swales. They are generally low relief with linear slopes from 0 to 3 percent on moraines, lake plains and outwash plains.
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Similar sites

R057XY013MN	Loamy Overflow These sites occur on lower backslope and footslope hillslope positions, and upland swales. They are generally low relief with linear slopes from 0 to 3 percent on moraines, lake plains and outwash plains. Parent material is variable and consists of a wide range of soil textures.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Andropogon gerardii</i> (2) <i>Hesperostipa spartea</i>

Physiographic features

Loamy Prairie sites are limited in extent in the southern region of MLRA 57, and typically occur on moraines on summits, shoulders and backslope hillslope positions. These sites are mostly well drained.

Table 2. Representative physiographic features

Hillslope profile	(1) Footslope (2) Backslope
Landforms	(1) Moraine
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	270 – 610 m
Slope	0 – 20 %
Aspect	Aspect is not a significant factor

Climatic features

In general, MLRA 57 has cold winters and warm summers. About 65 percent of the annual precipitation falls as rain during the 5-month growing season (May through September), and an additional 18 percent falls as snow.

Table 3 Representative climatic features

Frost-free period (characteristic range)	110-110 days
Freeze-free period (characteristic range)	130-140 days
Precipitation total (characteristic range)	660-740 mm
Frost-free period (actual range)	110-110 days
Freeze-free period (actual range)	130-140 days
Precipitation total (actual range)	660-760 mm
Frost-free period (average)	110 days
Freeze-free period (average)	130 days
Precipitation total (average)	710 mm

- (1) TAMARAC WILDLIFE REF [USC00218191], Rochert, MN
- (2) NEW YORK MILLS [USC00215902], New York Mills, MN
- (3) LONG PRAIRIE [USC00214861], Long Prairie, MN

Influencing water features

No influencing water features.

Wetland description

Not Applicable.

Soil features

Soil textures can vary from medium to fine textured and are mollisols with dark organic-enriched upper horizons. These sites are typically well drained soils with depth to gray and or rust colored redoximorphic features or depth to seasonal high water-table ranging from 100 to more than 150 centimeters. Soils in the Loamy Prairie ecological site include the Almora and Lizzie soil series among others.

Table 4. Representative soil features

Parent material	(1) Till
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Surface texture	(1) Loam (2) Sandy loam (3) Silt loam
Drainage class	Well drained
Permeability class	Moderate
Soil depth	200 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-152.4cm)	9.4 – 22.1 cm
Soil reaction (1:1 water) (0-101.6cm)	5.6 – 7.3
Subsurface fragment volume <=3" (0-101.6cm)	0 – 20 %
Subsurface fragment volume >3" (0-101.6cm)	Not specified

Ecological dynamics

Plant communities typical with Loamy Prairies tend to be on the dry end of the southern mesic prairie community class. Graminoid cover consists of little bluestem, porcupine grass and side-oats grama. Forb cover consists of rough blazing star, Missouri and gray goldenrods and bird's foot coreopsis. The low shrub wolfberry is commonly found in these areas, along with leadplant, prairie rose and sage wormwood. This site can also support sparsely treed communities with the same graminoid-dominated herbaceous species above. These southern mesic savanna sites consist typically of bur oak, but northern pin oak is also present. With fire suppression, trees other than oaks can become established, especially green ash, quaking aspen and basswood.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (t)	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 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 4.2 plant community composition

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

Information presented was derived from Minnesota Department of Natural Resources Field Guide to the Native Plant Communities of Minnesota, USDA-NRCS soil survey information, and USDA Plants Database. Relationship to Other Established Classifications: MN DNR Native Plant Community (MN DNR, 2003); the reference community of this Provisional Ecological Site is most similar to: UPS23 Southern Mesic Prairie (**Drier end of this NCP**)

Other references

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U.S. Environmental Protection Agency. 2013. Level III and IV ecoregions of the continental United States: Corvallis, Oregon, U.S. EPA, National Health and Environmental Effects Research Laboratory, map scale 1:3,000,000, <https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states>.

Contributors

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Approval

Suzanne Mayne-Kinney, 10/03/2023

Acknowledgments

MLRA 57 technical team completed in 2022.

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	08/30/2026
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:
