Greenprint Section - Blue Earth County Water Management Plan

Wetland Priorities

Priority Subwatersheds

Land Use Planning Goals and Strategies

Greenprint Priority Areas

- River Corridors
- Shoreland
- Wetland Complexes
- Geology
- Recreation

Inventory and Criteria

Priority Areas Section

Blue Earth County Water Management Plan

Land Use Planning Goals and Strategies - Greenprint

Blue Earth County Water Management Plan 2017-2026
Greenprint Section

Appendix F — Greenprint
Blue Earth County Land Use Plan

Greenprint Priority Areas

Priority Areas - Greenprint

The Greenprint is a map of green infrastructure in the county. Priority areas include river corridors, lake shoreland and wetland complexes.

Green Infrastructure

Green infrastructure is a strategically planned, interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks, trails; conservation lands; and other open spaces that support natural ecosystem processes and contributes to the health and quality of life for communities and people.

Adapted from:
Green Infrastructure: Smart Conservation for the 21st Century
Mark A. Benedict and Edward T. McMahon
and ESRI

Green infrastructure is an organizational strategy that provides a planning framework for conservation and development.

Source: *Green Infrastructure:*
Linking Landscapes and Communities
Mark A. Benedict and Edward T. McMahon

Making the Greenprint

A land use planning approach was used to identify Greenprint priority areas based on the ability to provide multiple aquatic and natural resource benefits. An inventory of aquatic and natural resources, sensitive features, land cover, floodplains, rivers, streams, lakes, wetlands, rare plant and animal habitat, sensitive geology, park lands, and protected or publicly-owned lands was followed by an analysis of their landscape position, proximity and connectivity in four landscape settings - river corridors, shallow bedrock and karst, lake shoreland and wetland complexes. These diverse landscape settings, natural resources and hydrologic conditions were combined to make the Greenprint.

Protecting natural resources and open spaces in Greenprint priority areas is a land use management priority.

A map, detailed descriptions of the Greenprint river corridors, shoreland and wetland complexes and a summary of Greenprint criteria are on the following pages.

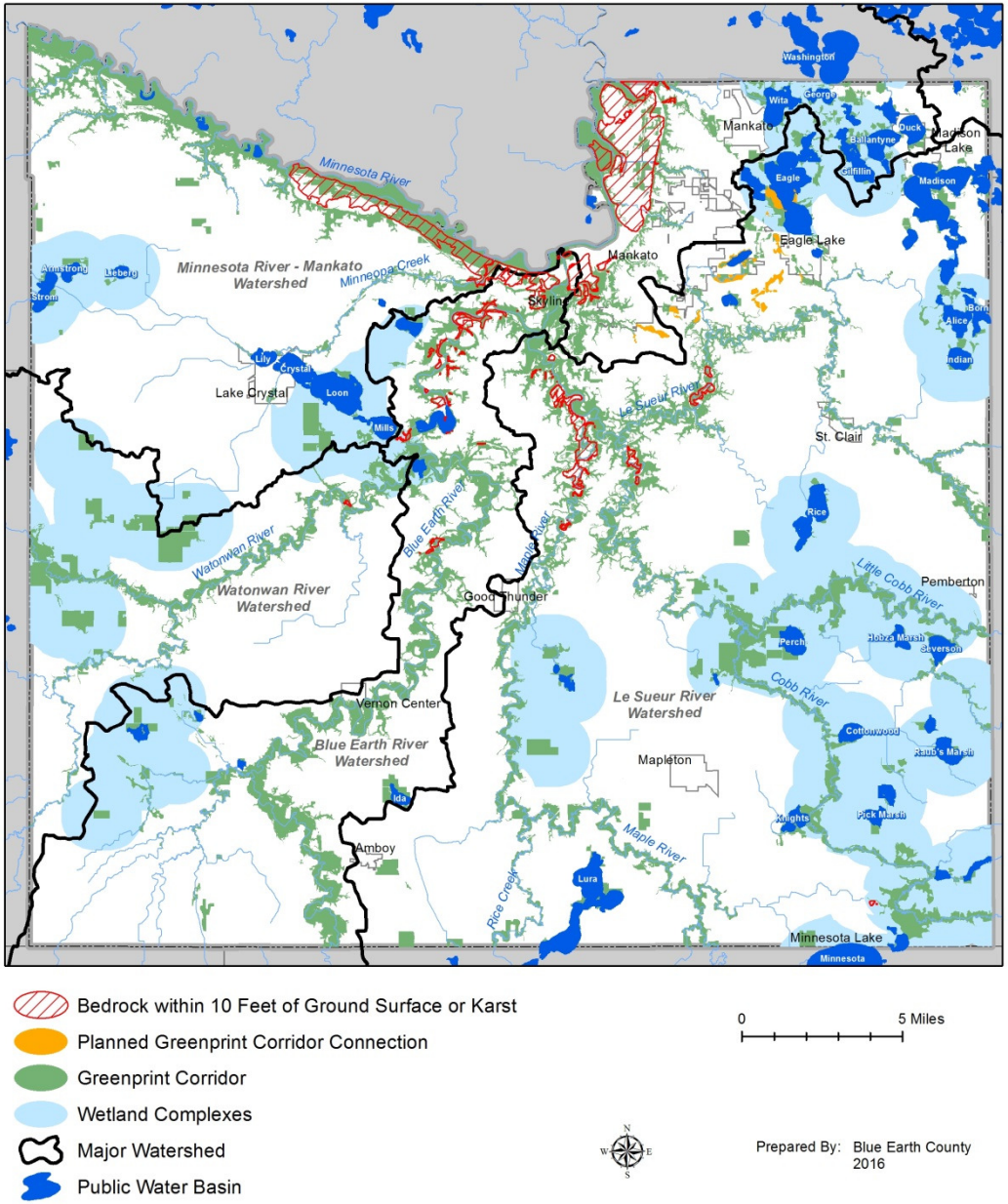
Relationship to Other Plans

The Greenprint incorporated goals and objectives in many local and regional plans, including the following:

- *Blue Earth County Comprehensive Land Use Plan*
- *City of Mankato Comprehensive Land Use Plan - Environmentally Sensitive Areas*
- *City of Mankato Park and Open Space Plan*
- *Envision 2020 Community Plan for Greater Mankato – Community Planning and Regional Governance Green Infrastructure Mini-vision*
- *Greenprint Wetland Guidelines and Policy Framework Suggestions*

Once adopted, the wetland ecosystem and management goals of the Greenprint and the *Blue Earth County Water Management Plan* can be integrated in land use decisions and local recreation, transportation and land use plans and updates at the local and watershed scale.

Greenprint, Wetland Complexes, Shallow Bedrock and Karst



Greenprint River Corridors

River corridors in the county contain a continuous band of flood plains, riparian habitat, wooded and grassy hillsides, marshes and swamps. This variety of landscapes provides excellent habitat for a wide variety of terrestrial and aquatic wildlife species.

River corridors are the least disturbed ecosystem in the county, and aquatic and terrestrial habitat connectivity is greatest in river corridors. Most of the outstanding, high and moderate value sites mapped by the Minnesota County Biological Survey are in the river corridors in the county.

Nearly half of the wetlands in the county are located in river corridors, and the majority of forested lands are in or adjacent to river corridors. The highest quality and greatest diversity of wetlands are located in the river corridors.

Shallow depth to bedrock and karst areas in the county naturally extend from river corridors along the Minnesota River and in the lower reaches of the Blue Earth River and Le Sueur River. Fens are located in these areas, and one Calcareous Fen was located by the MNDNR in the Minnesota River corridor.

The *Map of Original Vegetation at the Time of the Public Land Survey* shows Big Woods hardwoods extending along the river corridors in the lowest reaches of the Blue Earth, Le Sueur, Maple, Cobb and Watonwan River.

Greenprint River Corridor Inventory and Criteria

- Floodplain
- Native Plant Communities in the Minnesota County Biological Survey that have ratings of Outstanding, High or Moderate for level of biodiversity
- Steep slopes (18% slopes or greater that have connections to river corridors)
- Woodlands connected to floodplains, steep slopes or native plant communities

All areas with karst and fens and most areas with shallow depth to bedrock are in the Greenprint.

Greenprint Shoreland

A natural shoreline is more than an aesthetic buffer for the water; it is a complex ecosystem that provides critical habitat for fish and wildlife, protects water quality and water storage for fluctuating water levels. Near shore wetlands and aquatic plants protect the shore from high water and erosion from waves and ice dams and provide habitat. Often, shoreline development results in the loss of these essential shoreline protection buffers and habitat.

Wetlands connected to lakes and in the near shore area provide critical wildlife habitat, water storage and water quality benefits.

Minnesota Conservation Plan
Shoreland Impacts

"On average, there is a 66% reduction in aquatic vegetation coverage with shoreland development."

"Structures and turf-grass lawns have replaced natural shores along many lakes, and have had adverse impacts on water quality and the diverse wildlife that depend on a natural shore. Rainwater runoff from manicured lawns can be 5 times to 10 times higher than natural shorelines, and runoff from turf lawns can carry up to 9 times more phosphorus to the lake than runoff from natural shorelines."

Many wildlife species are highly dependent on naturally vegetated shorelines and adjacent wetlands as habitat for feeding, resting, and mating and as nursery areas for juvenile life stages.

Green frogs are shoreline-dependent species that prefer quiet bays and protected areas with a high abundance of aquatic plants. Male green frogs establish breeding territories within two feet from the lake edge.

Many fish depend on aquatic vegetation, woody habitat, and shorelines to provide spawning habitat, cover, and refuge from predators. Wetlands are critical for northern pike spawning. Downed trees provide important in-lake structure, habitat, food, and shelter for fishes, frogs, turtles, water birds, and mammals. Turtles need to bask on deadfalls or floating logs. Woody habitat is also important for aquatic invertebrates.

Shoreline buffers—corridors of natural vegetation along rivers, lakes, wetlands and sinkholes—protect water quality by trapping, filtering, and impeding runoff laden with nutrients, sediments, and other pollutants. Shoreline buffers also stabilize banks, screen shoreland development, reduce erosion, and provide critical habitat for shoreline species.

Greenprint Shoreland Criteria

- Public Water lakes or Public Water wetlands
- Wetlands adjacent to the shore
- Wetlands with a direct hydrologic connection to Public Waters or Public Water Wetlands

Greenprint Wetland Complexes

Priority wetland complexes are not located in river corridors but may be in close proximity to river corridors and/or lakes. Most wetlands outside of river corridors and shoreland are relatively isolated and surrounded by cropland, limiting the potential for providing multiple wetland functions. Wetland complexes provide habitat for most types of birds and waterfowl as well as other wildlife species and many forms of aquatic life. Direct hydrologic connections are not required for some species and may not be beneficial for some species. Habitat structure, proximity and connectivity are important for terrestrial wildlife habitat rather than watershed boundaries.

The criteria used to define priority wetland complexes for the Greenprint are based primarily on habitat and providing stepping stones of habitat connectivity to form corridors. The criteria used are consistent with numerous federal and state agency and conservation organization plans or criteria including the following:

- Minnesota MNDNR D*uck Recovery Plan*
- Minnesota Audubon Society I*mportant Bird Areas Upper Minnesota Valley* and *Blueprint for Minnesota Prairie Parkland Region*
- US Fish and Wildlife Service Minnesota Valley Waterfowl Management District – Small Wetlands Acquisition Program
- Minnesota MNDNR Working Lands Initiative
- 2015 *Minnesota Pheasant Summit Action Plan*

Common to all of these plans and programs is recognition that:

> "The best waterfowl production habitat occurs within prairie habitat complexes 4–9 square miles in size where at least 20% of the area is wetland and 40% is grassland. At least one-half of the wetland acreage should be temporary or seasonal basins and

ideally each complex will include one shallow lake over 50 acres. One-half of the grasslands should be under long-term protection."

Greenprint Wetland Complexes Criteria

The priority waterfowl habitat complexes were identified by first identifying 50-acre or greater shallow lakes and a one mile buffer around Wildlife Management Areas (WMA), Wildlife Protection Areas (WPA) and permanent conservation easements. The resulting 4 to 9 square mile areas are priority wetland complexes in the county. The following is a list of criteria used:

- 50-acre or greater public shallow lake
- Wildlife Management Area
- Waterfowl Production Areas
- Permanent conservation easement
- 4 to 9 square miles in total size

The Greenprint wetland complexes' boundaries will be dynamic as the elements in these complexes may change with establishment of new permanent conservation easements, WMAs, WPAs or other land use changes that may shift a 4 to 9 square mile wetland complex from the initial Greenprint maps.

Small seasonal basins less than two acres as well as grasslands are also important in wetland complexes, but these areas were not mapped for restoration in this plan. The U.S. Fish and Wildlife Service and Ducks Unlimited restorable depressional wetlands inventory for the Prairie Pothole region of Minnesota can provide information about smaller wetlands in the Greenprint wetland complexes and throughout the county.

Greenprint		
The Blue Earth County Greenprint is a strategically planned interconnected network of waterways, wetlands, woodlands, wildlife habitat, conservation lands and open spaces that support natural ecosystems. The Greenprint identifies priority areas and provides a planning framework for conservation and development that contributes to the health and quality of life for communities and people.		
Landscape Position	**Description**	**Greenprint Inventory & Criteria**
Corridors	River corridors contain a continuous band of flood plains, riparian wildlife habitat, wooded and grassy hillsides, marshes and swamps. This variety of landscapes provides excellent habitat for a wide variety of bird and other wildlife species as well as water storage and water treatment functions.	• Floodplain • Native Plant Communities in the Minnesota County Biological Survey that have ratings of Outstanding, High or Moderate for level of biodiversity • Steep slopes (18% slopes or greater that have connections to river corridors) • Woodlands connected to floodplains, steep slopes or native plant communities
Wetland Complexes	Wetland complexes are areas where wetlands are in close proximity, providing ideal habitat for most types of birds and waterfowl as well as other wildlife species. Hydrologic connections are not required. A variety of wetland types (seasonal and temporarily flooded) is preferred along with grassland. The working lands criteria were used to prioritize wetland complexes: • 4 to 9 square miles in size • 1 shallow lake over 50 acres • 20% total wetland acres • 50% seasonal wetland acres (few weeks to a few months) and temporary (few days to a few weeks) • 40% is grassland, one half in long term protection	• 50-acre or greater public shallow lake • Wildlife Management Area • Waterfowl Production Areas • Permanent conservation easements • 4 to 9 square miles in total size
Shoreland	Wetlands connected to lakes and near the shore provide critical wildlife habitat, water storage and water quality benefits. Near-shore wetlands protect the shore from erosion. Near-shore habitat is critical for many wildlife species. For example, male green frogs establish breeding territories within 2 feet from the lake edge.	• Lakes or wetlands that are Public Waters • Wetlands adjacent to the shore • Wetlands that have a direct hydrologic connection to Public Waters
Geology	The *Geologic Atlas of Blue Earth County, Part B*, 2016, shows areas with shallow depth to bedrock and karst. Fens are most likely to be in these areas.	• Bedrock within 10 Feet of ground surface • Karst
Recreation	Parks, trails and open spaces can provide important connections between population centers or developed landscapes to wetlands, woodlands and waterbodies.	• Park and Open Space Plans • Planned Greenways

Conservation Practices and Replacement Sites for Voluntary Conservation

Potentially restorable basins may provide important functions such as water storage, nutrient treatment and wildlife habitat, depending on site suitability, the landowner's goals, project engineering and design.

Function	Considerations	Basin Criteria
Water Storage	Basin has the potential to store a large volume of water and store surface runoff to the basin from a 10-year, 24-hour storm event. Volume assumes the basin is dry.* This will vary year-to-year and seasonally. 10-year: 4.37 inches. 2-year: 2.91 inches.	Capacity for 10-year, 24-hour storm event or larger* **Yes or No**
Nutrient Treatment	Vegetation is needed for nutrient treatment. The basin must be shallow to support wetland vegetation. For maximum nutrient treatment, the wetland/basin should be located near the bottom of its watershed and receive drainage from tile-drained fields. Iowa CREP: Depressions that have a watershed size of 494 acres or larger, have at least 75% of basin that is less than 3 feet in depth, and surface area is 0.5-2.0% of the total drainage area.	**High:** (Modified Iowa CREP) ***Depth:*** at least 75% of basin less than 3 feet ***Ratio of basin to watershed area:*** Basin 0.4% to 2.5% of watershed area ***No minimum watershed size*** **Medium:** ***Depth:*** *75%* or more of basin is less than 3 feet deep **Low:** ***Depth:*** Less than 75% of basin is under 3 feet deep
Pollution Sensitivity & Groundwater Recharge	Soil types in the county limit infiltration and groundwater recharge capabilities. Geologic Atlas of Blue Earth County Part B, maps of pollution sensitivity to buried sand aquifers and near surface materials provide a qualitative evaluation of recharge rate or flow of surface water to deeper aquifers.	Geologic Atlas of Blue Earth County Part B pollution sensitivity maps of surficial and buried sand aquifers **Very High:** hours to months **High:** weeks to years
Other	Determined by landowners. Basins owned by one landowner.	

Land Use Planning Goals and Strategies

GOAL: Protect, enhance and restore aquatic and natural resources in priority areas to provide important water quality, wildlife habitat, water storage and groundwater protection functions in local watersheds.

Greenprint Priority Areas Strategies and Policies

The Blue Earth County Greenprint was built with a land use planning approach, including an inventory of aquatic and natural resources, sensitive features, land cover, park lands, and protected or publicly-owned lands, followed by an analysis of their landscape position, proximity and connectivity in four landscape settings - river corridors, shallow bedrock and karst, lake shoreland and wetland complexes.

STRATEGY: GREENPRINT AND LOCAL PLANS.
Land Use Policy: Protect, enhance and restore aquatic and natural resources in Greenprint priority areas with coordination among land use plans, comprehensive plans, transportation plans, stormwater plans, water management plans and park and open space plans from all local government jurisdictions.

Land Use Policy: Local government units in the county will consider minimizing fragmentation and development of woodlands, wildlife habitat, open space, shoreland and wetlands in Greenprint priority areas. (Reference: Minnesota Statutes 2017, sections 394.23, 394.231 and 462.357 Subd.9)

Action: Local government units in the county will consider adopting land use policies and official controls requiring dedication of open space, including wetlands, for public use in Greenprint priority areas. (Reference: Minnesota Statutes 2017, sections 394.25 Subd.7 and 462.358 Subd. 2b)

Action: Local government units in the county will consider developing programs and funding mechanisms for aquatic and natural resource protection such as conservation easements and external sources of funds targeted to water quality, wildlife habitat and recreation.

STRATEGY: SHORELAND PROTECTION.
Policy: Protect wetlands and aquatic vegetation in near-shore areas to provide critical fish and wildlife habitat and shoreline protection from waves and ice ridges.

STRATEGY: PRIORITY WETLAND FUNCTIONS FRAMEWORK.
Policy: Local units of government should consider the wetland functions classification framework when developing all types of land use and comprehensive plans. (Reference: Minnesota Statutes 2017, sections 394.23, 394.231 and 462.357 Subd.9)

POLICY STRATEGY: ENVIRONMENTAL REVIEW.
Policy: Aquatic and natural resource priority areas in the Greenprint and the *Blue Earth County Water Management Plan* should be included in environmental review documents, such as Environmental Assessment Worksheet (EAW), Environmental Impact Statement (EIS) and Alternative Urban Area Review (AUAR) to assess compatibility of proposed projects with local government plans. (Reference: Environmental Review, Minnesota Rules, part 4410.1200 subpart H. and 4410.2100)

STRATEGY: TRANSPORTATION PLANNING.

Policy: In the transportation planning and project design process, all road authorities should consider protection, enhancement and restoration of aquatic and natural resource in the Greenprint and the *Blue Earth County Water Management Plan*. (Reference: MATAPS 2035)

Action: Consider construction of appropriately sized culverts, bridges, tunnels or other types of safe passage to maintain, protect and restore wetland and aquatic habitat, minimize fragmentation and restore connectivity in the design and construction of transportation and trail systems. Seek funds for viable projects.