

APPENDIX A: WETLANDS ASSESSMENT



Functional Wetland Assessment

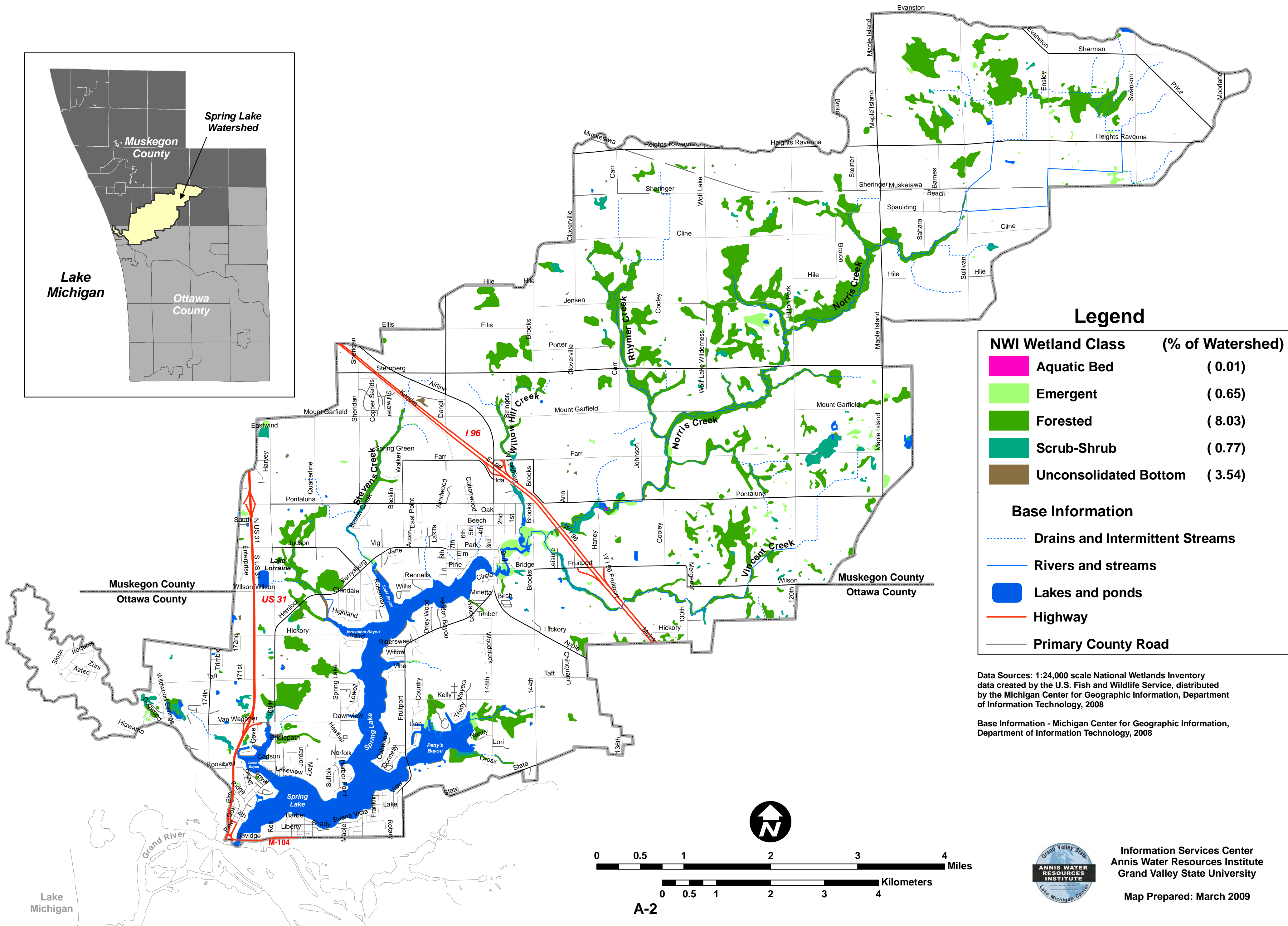
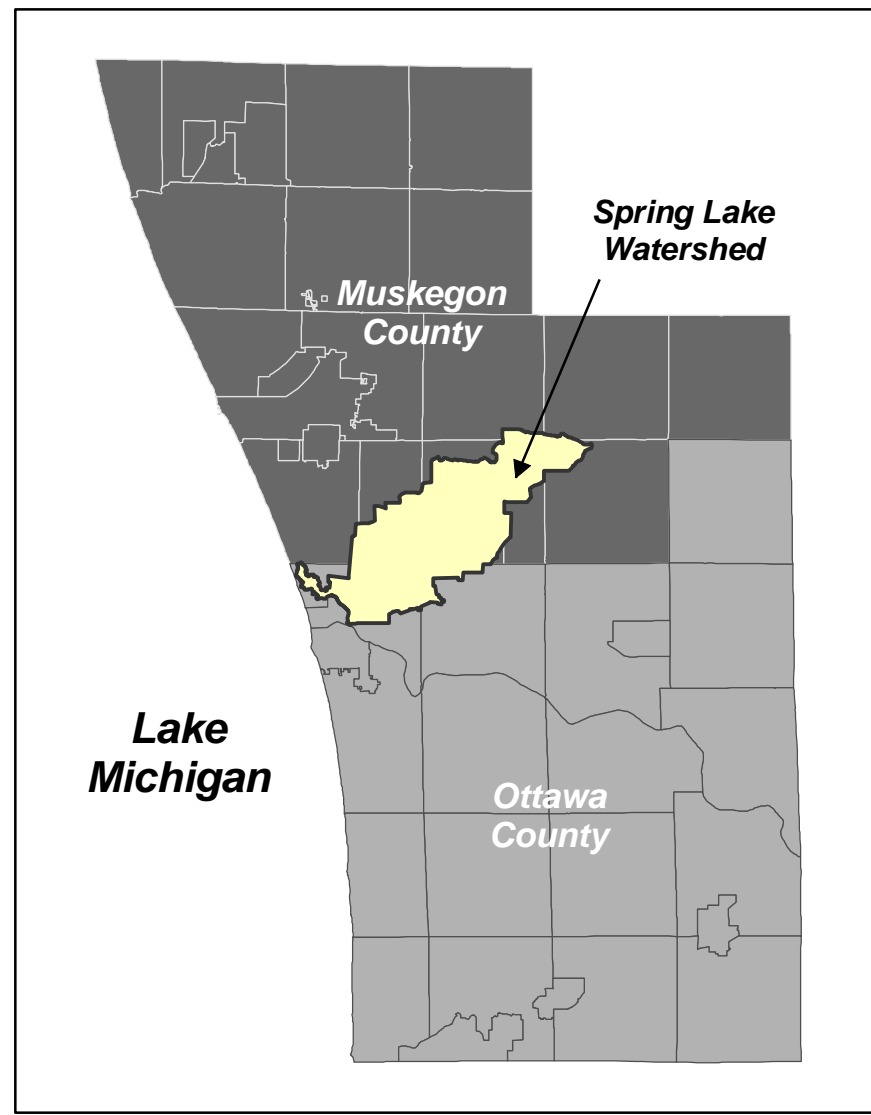
The Information Services Center (ISC) at the Annis Water Resources Institute is conducting a landscape level functional assessment of the wetlands in the Lower Grand River Watershed. Funded by the U.S. Environmental Protection Agency, Region 5, this assessment identifies how the extent of wetland change within the watershed has impacted the functional services generally provided by those wetlands. Because of the ongoing work of the Rein in the Runoff project team, the Spring Lake Watershed was selected as a targeted watershed for this wetland assessment. ISC has preliminarily identified locations within the Spring Lake Watershed where there is high potential for floodwater storage, sediment retention, and nutrient transformation.



Photo credits: E. S. Isely



National Wetlands Inventory



Legend

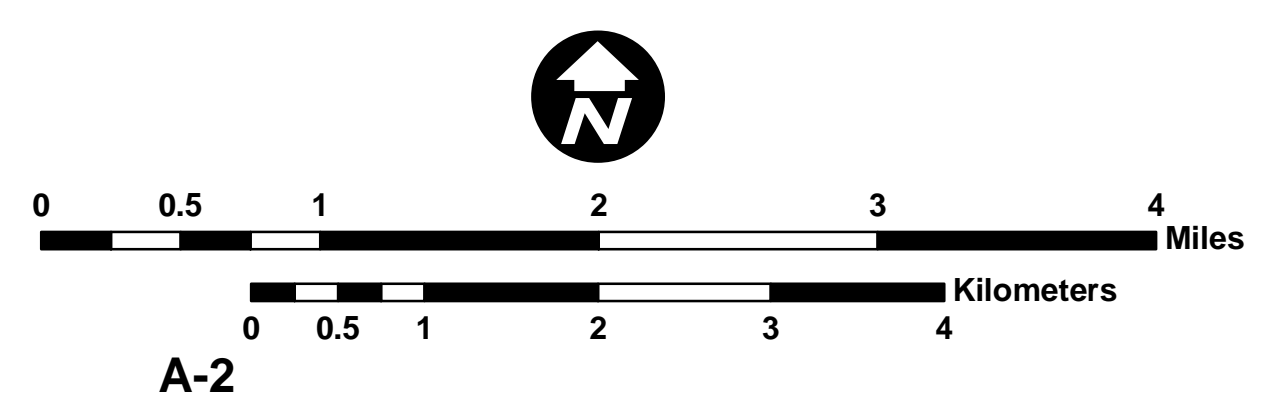
NWI Wetland Class	(% of Watershed)
Aquatic Bed	(0.01)
Emergent	(0.65)
Forested	(8.03)
Scrub-Shrub	(0.77)
Unconsolidated Bottom	(3.54)

Base Information

- Drains and Intermittent Streams
- Rivers and streams
- Lakes and ponds
- Highway
- Primary County Road

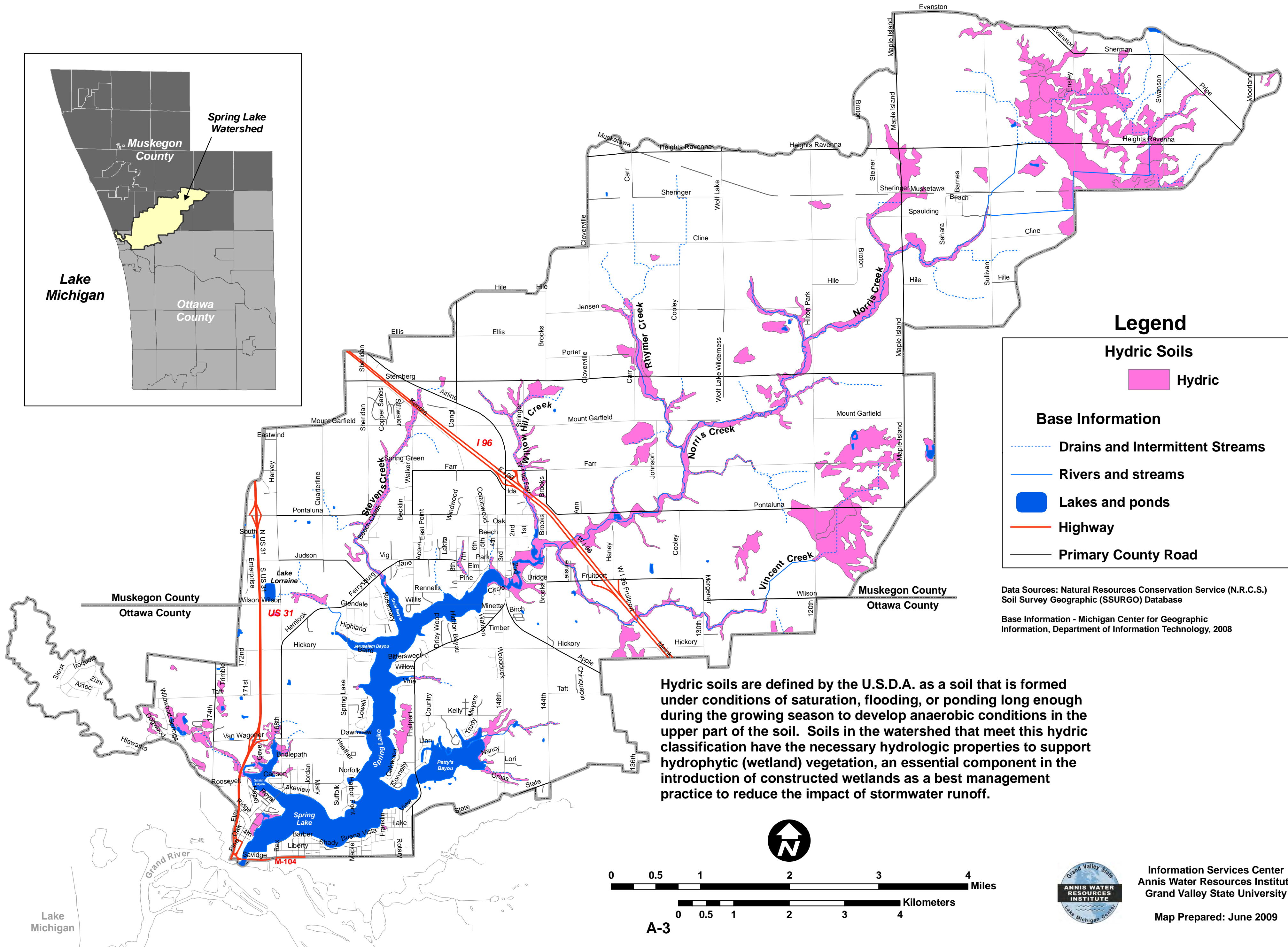
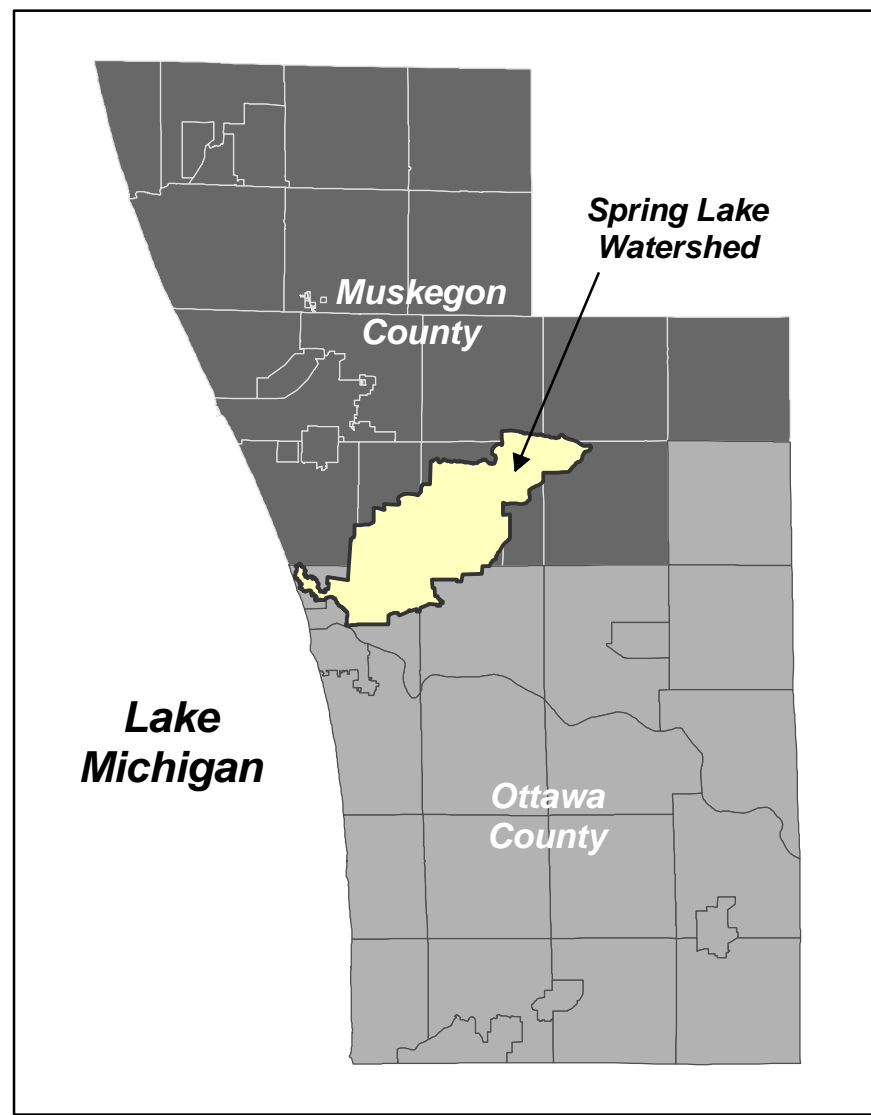
Data Sources: 1:24,000 scale National Wetlands Inventory data created by the U.S. Fish and Wildlife Service, distributed by the Michigan Center for Geographic Information, Department of Information Technology, 2008

Base Information - Michigan Center for Geographic Information, Department of Information Technology, 2008



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 Map Prepared: March 2009

SSURGO Soils - Hydric Soils



Legend

Hydric Soils

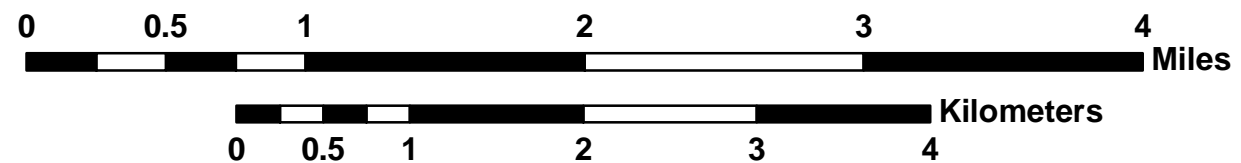
Hydric

Base Information

- Drains and Intermittent Streams
- Rivers and streams
- Lakes and ponds
- Highway
- Primary County Road

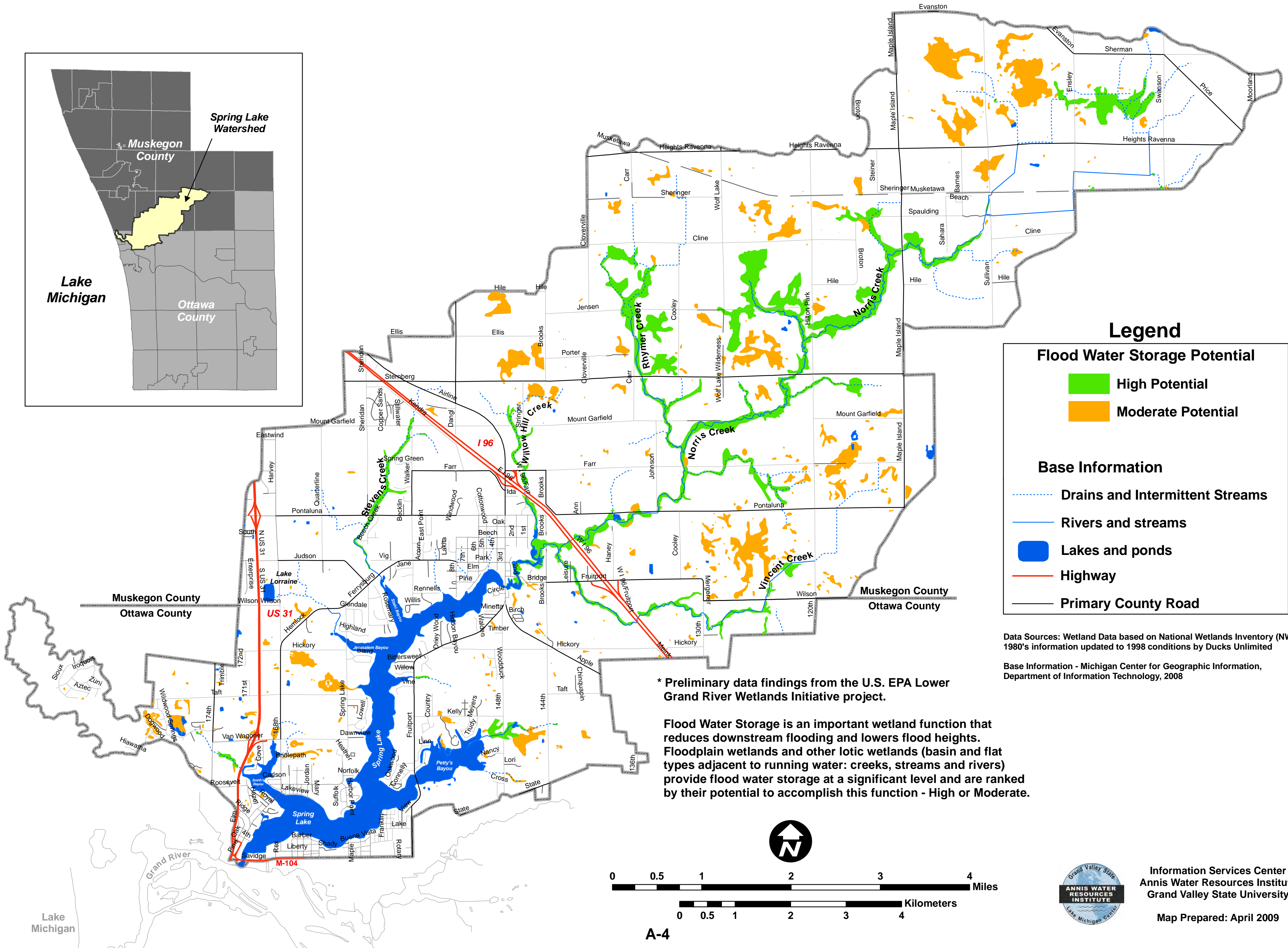
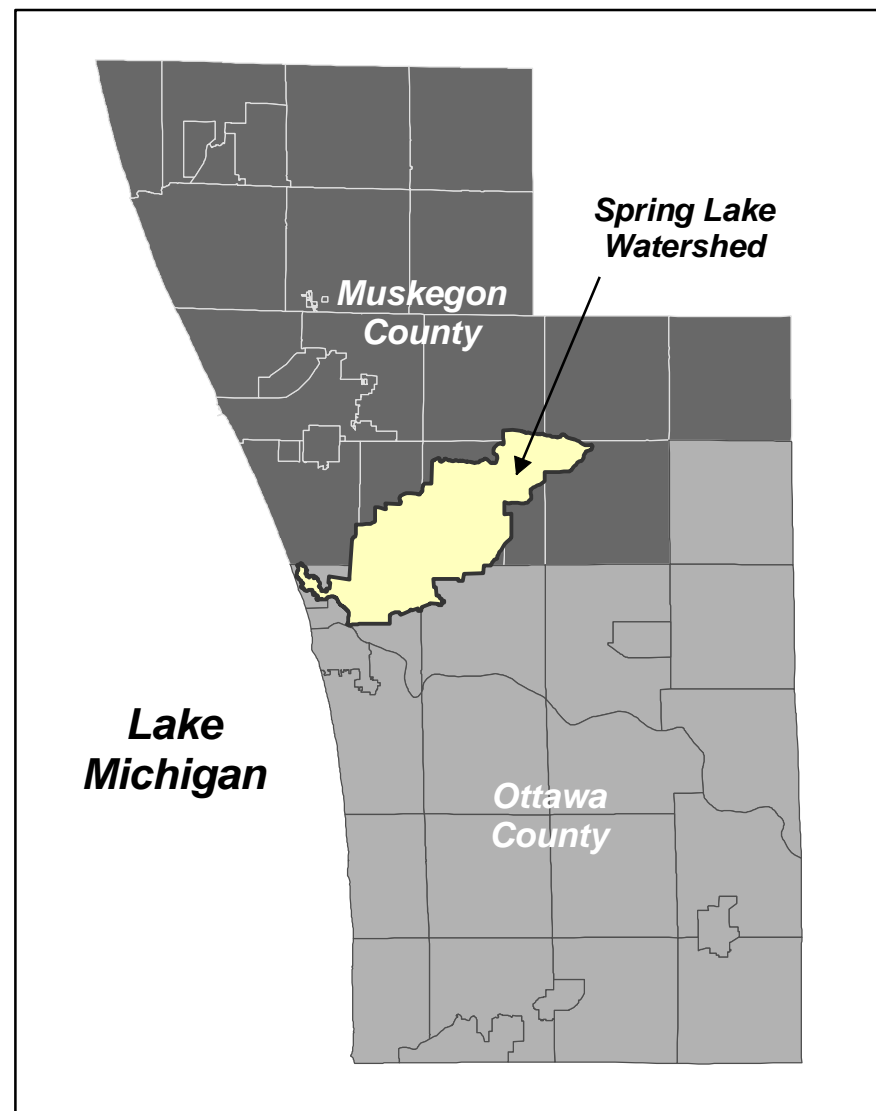
Data Sources: Natural Resources Conservation Service (N.R.C.S.) Soil Survey Geographic (SSURGO) Database
 Base Information - Michigan Center for Geographic Information, Department of Information Technology, 2008

Hydric soils are defined by the U.S.D.A. as a soil that is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil. Soils in the watershed that meet this hydric classification have the necessary hydrologic properties to support hydrophytic (wetland) vegetation, an essential component in the introduction of constructed wetlands as a best management practice to reduce the impact of stormwater runoff.



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Functional Wetland Analysis - Flood Water Storage*



Legend

Flood Water Storage Potential

- High Potential (Green)
- Moderate Potential (Orange)

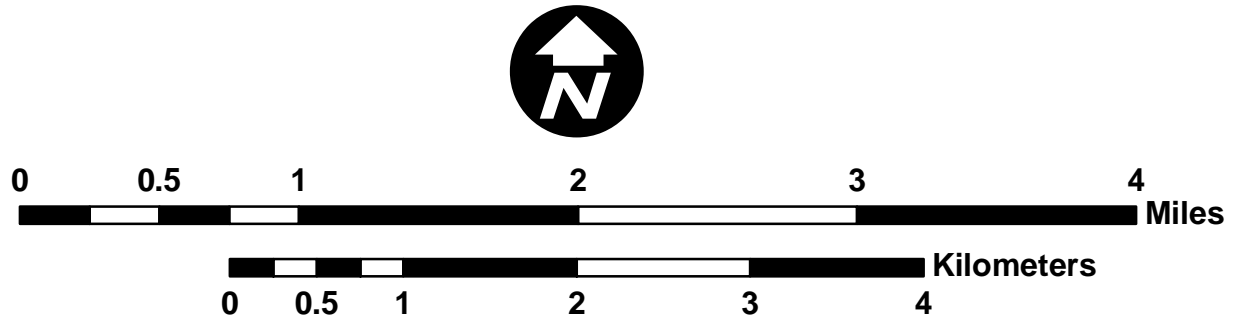
Base Information

- Drains and Intermittent Streams (Dotted Blue Line)
- Rivers and streams (Solid Blue Line)
- Lakes and ponds (Blue Polygon)
- Highway (Red Line)
- Primary County Road (Black Line)

Data Sources: Wetland Data based on National Wetlands Inventory (NWI) 1980's information updated to 1998 conditions by Ducks Unlimited
 Base Information - Michigan Center for Geographic Information, Department of Information Technology, 2008

* Preliminary data findings from the U.S. EPA Lower Grand River Wetlands Initiative project.

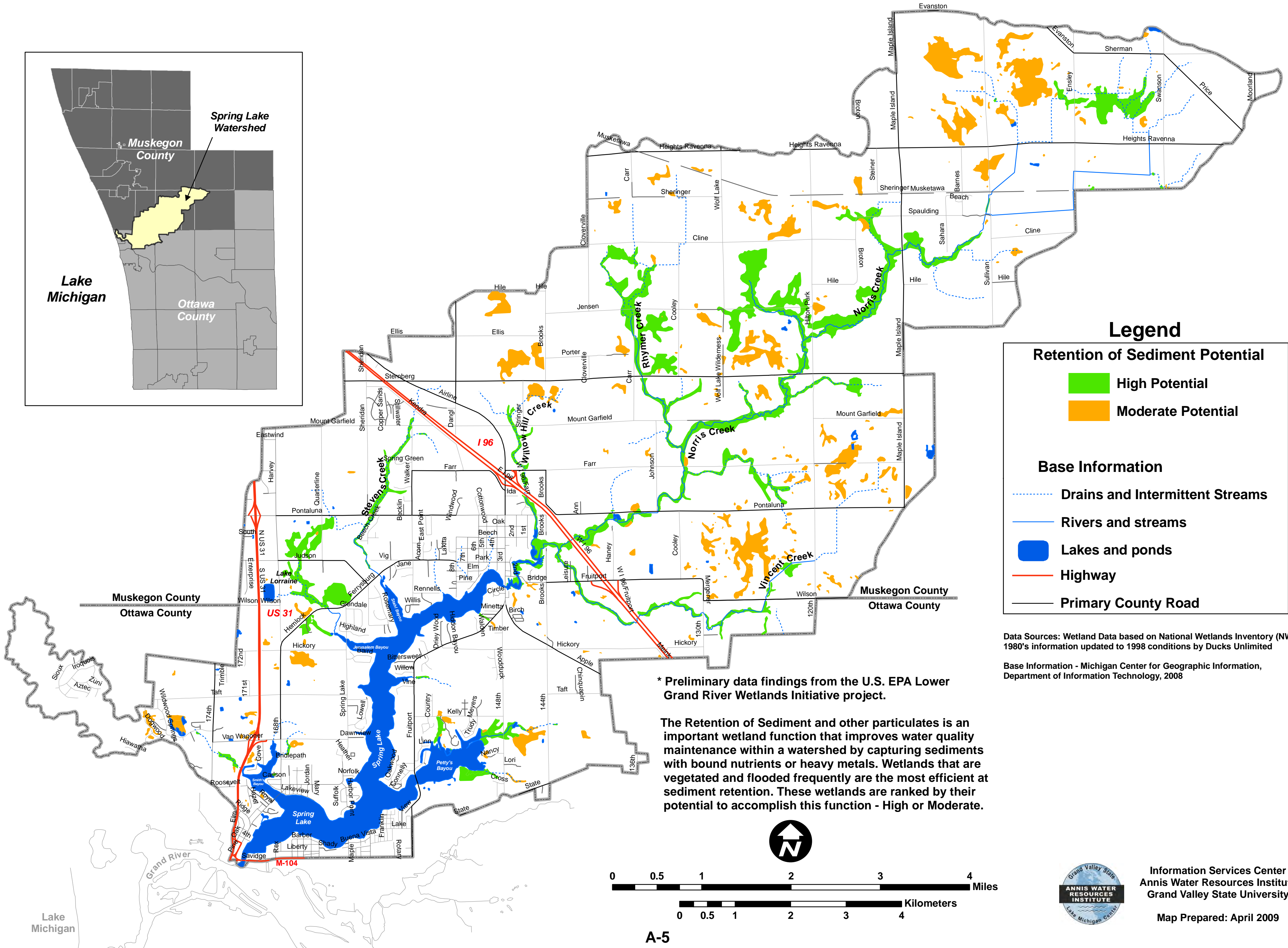
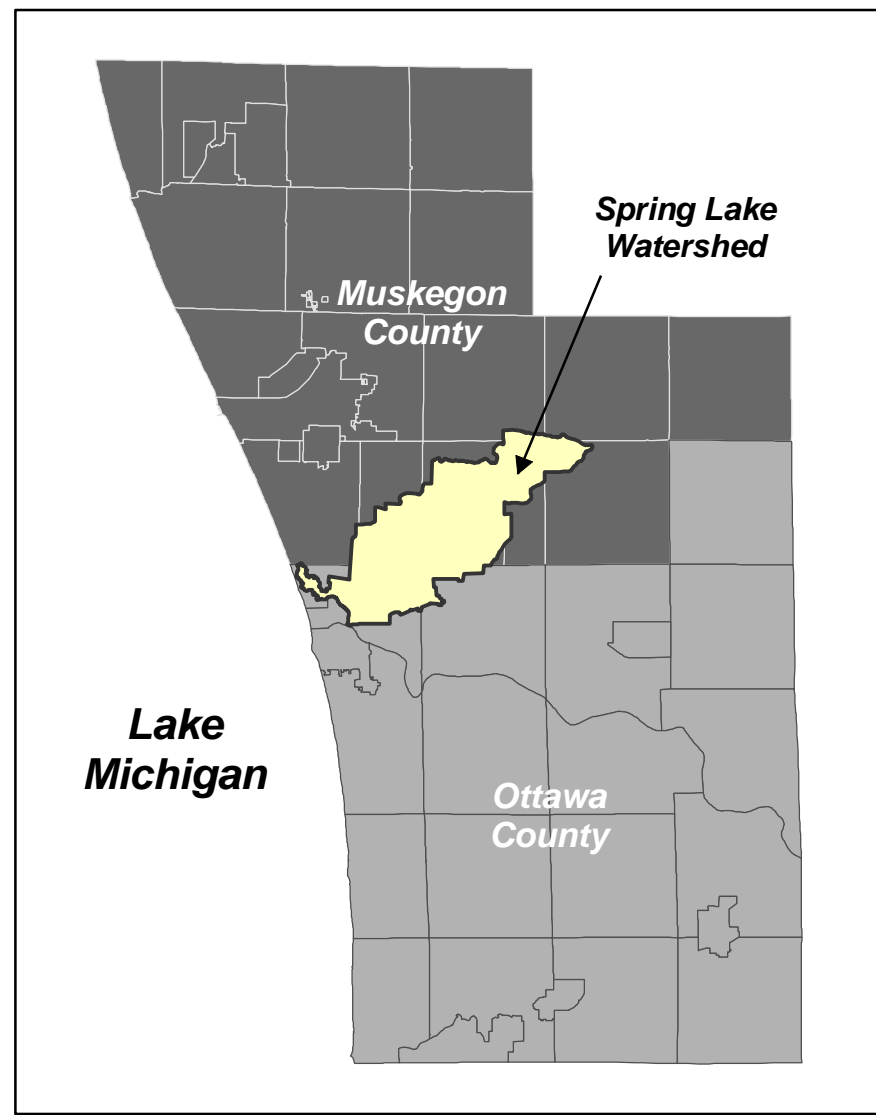
Flood Water Storage is an important wetland function that reduces downstream flooding and lowers flood heights. Floodplain wetlands and other lotic wetlands (basin and flat types adjacent to running water: creeks, streams and rivers) provide flood water storage at a significant level and are ranked by their potential to accomplish this function - High or Moderate.



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Functional Wetland Analysis - Retention of Sediment*



Legend

Retention of Sediment Potential

- High Potential (Green)
- Moderate Potential (Orange)

Base Information

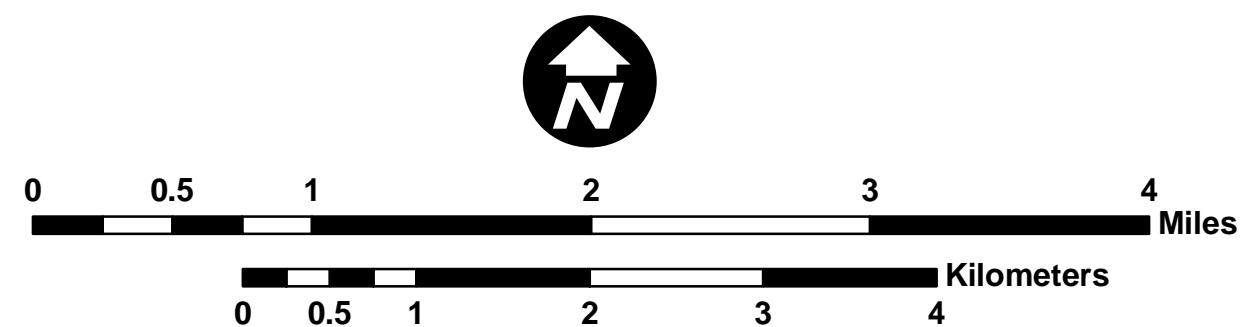
- Drains and Intermittent Streams (Dotted blue line)
- Rivers and streams (Solid blue line)
- Lakes and ponds (Blue polygon)
- Highway (Red line)
- Primary County Road (Black line)

Data Sources: Wetland Data based on National Wetlands Inventory (NWI) 1980's information updated to 1998 conditions by Ducks Unlimited

Base Information - Michigan Center for Geographic Information, Department of Information Technology, 2008

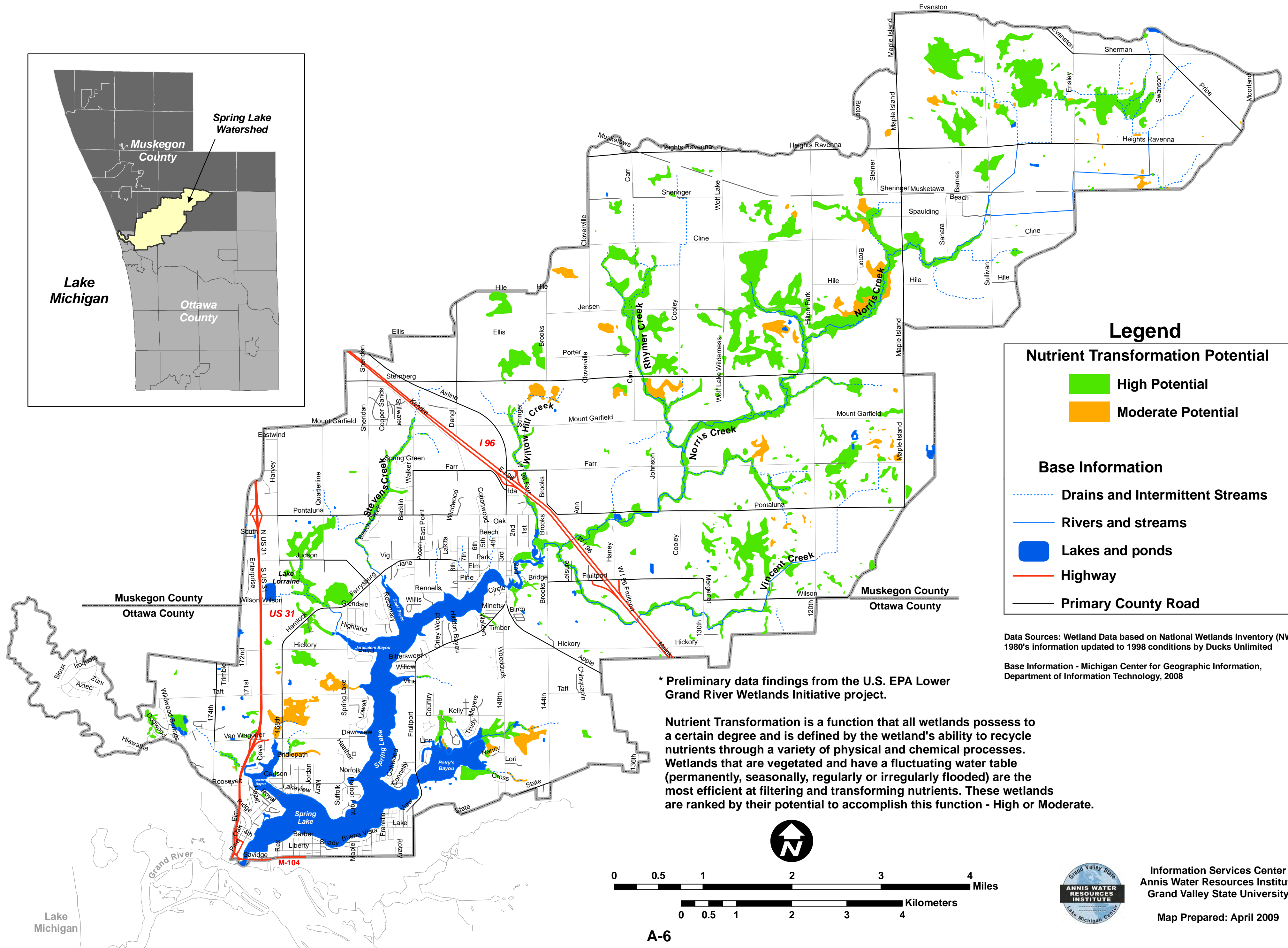
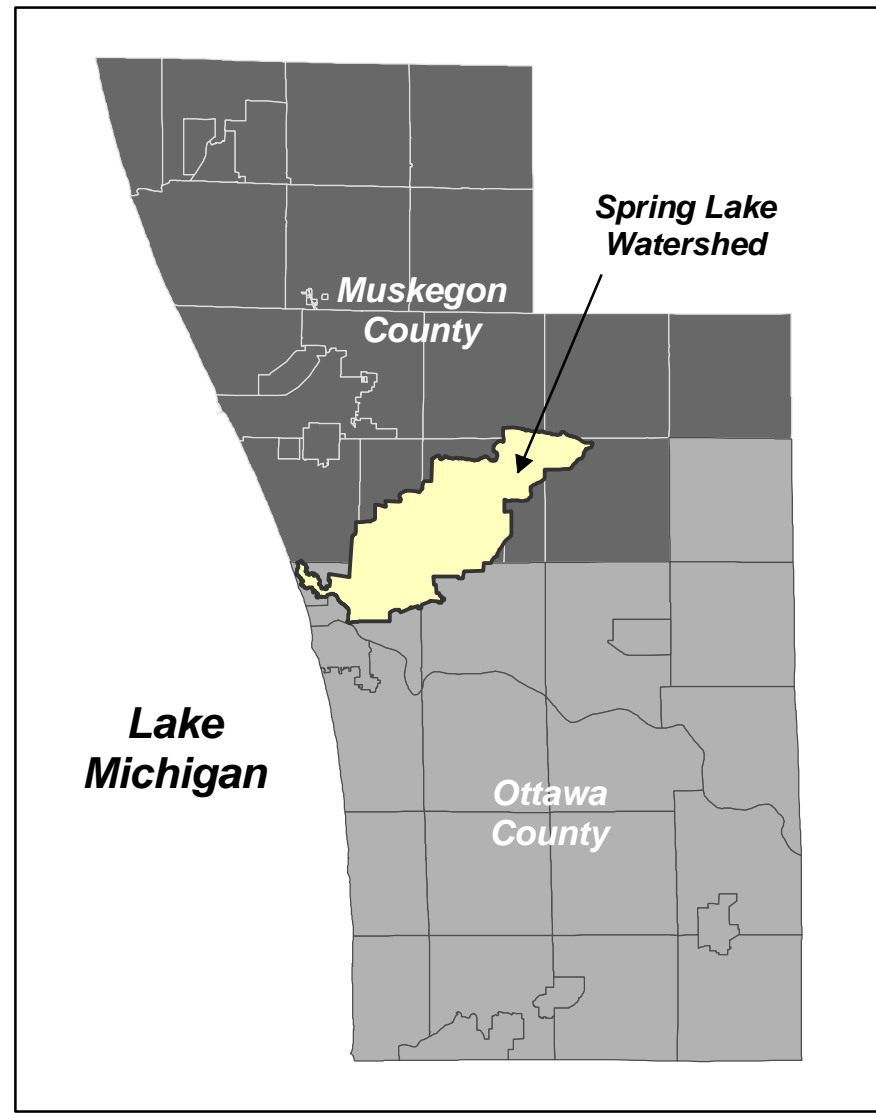
* Preliminary data findings from the U.S. EPA Lower Grand River Wetlands Initiative project.

The Retention of Sediment and other particulates is an important wetland function that improves water quality maintenance within a watershed by capturing sediments with bound nutrients or heavy metals. Wetlands that are vegetated and flooded frequently are the most efficient at sediment retention. These wetlands are ranked by their potential to accomplish this function - High or Moderate.



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Functional Wetland Analysis - Nutrient Transformation*



Legend

Nutrient Transformation Potential

- High Potential
- Moderate Potential

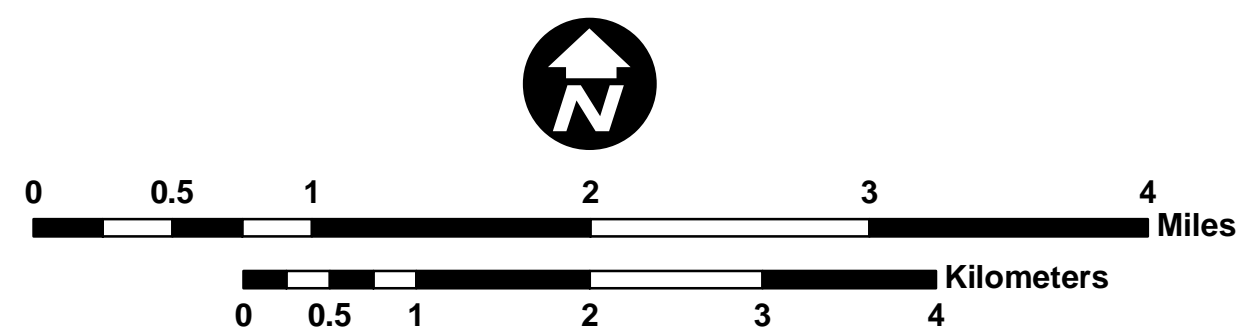
Base Information

- Drains and Intermittent Streams
- Rivers and streams
- Lakes and ponds
- Highway
- Primary County Road

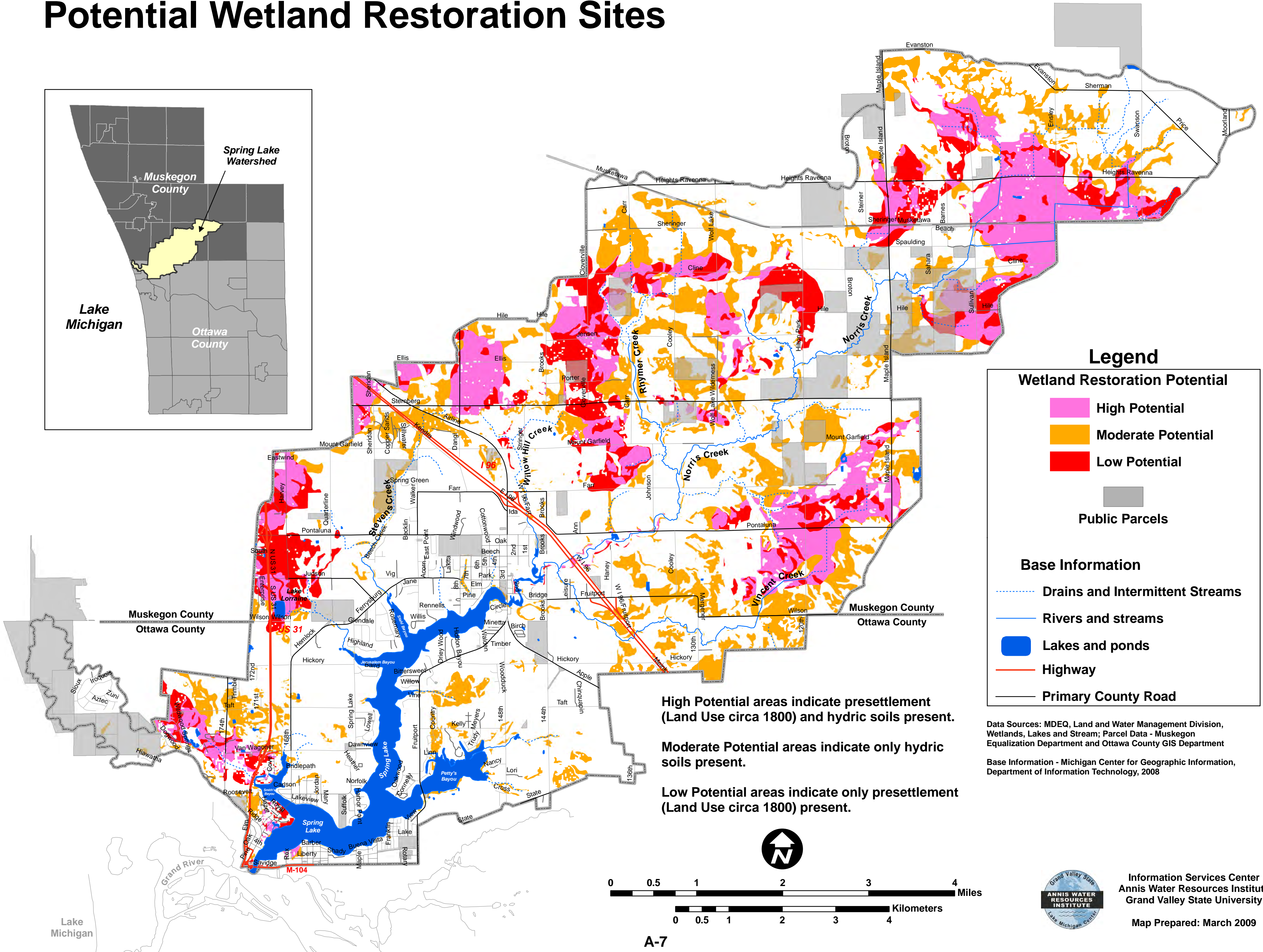
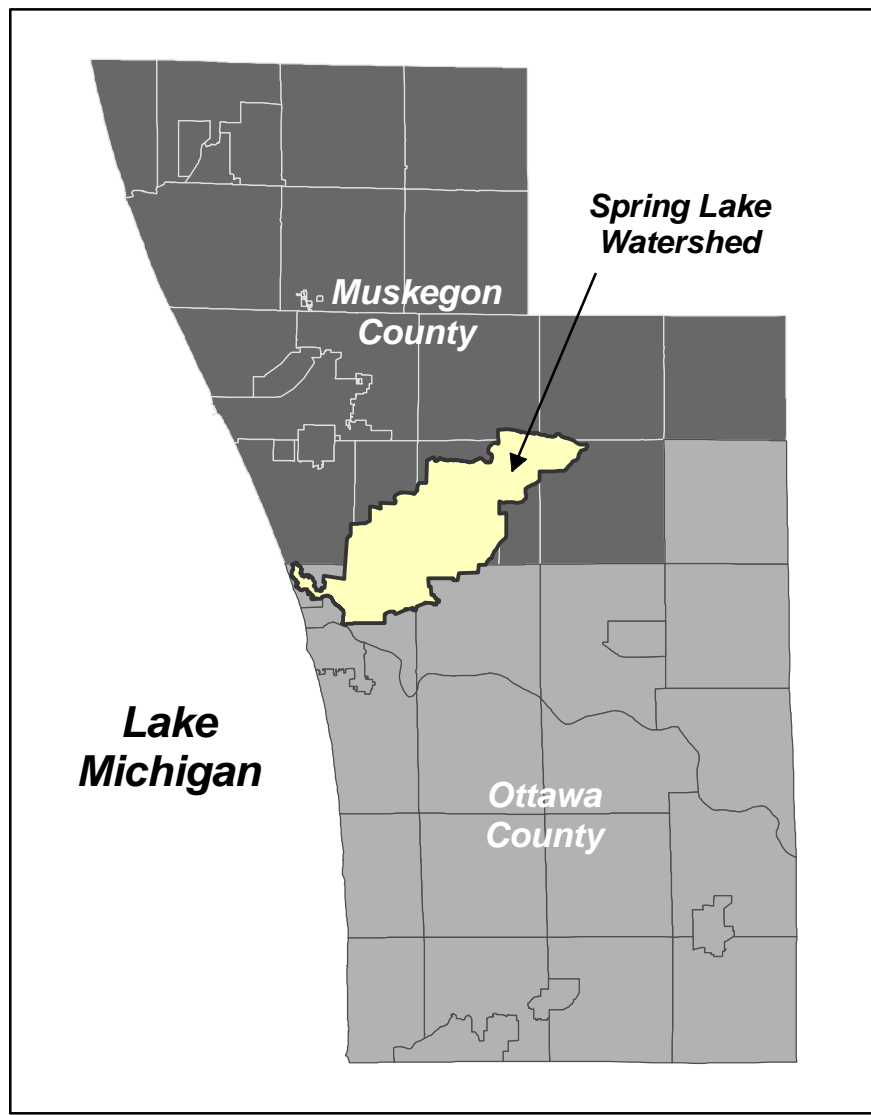
Data Sources: Wetland Data based on National Wetlands Inventory (NWI) 1980's information updated to 1998 conditions by Ducks Unlimited
 Base Information - Michigan Center for Geographic Information, Department of Information Technology, 2008

* Preliminary data findings from the U.S. EPA Lower Grand River Wetlands Initiative project.

Nutrient Transformation is a function that all wetlands possess to a certain degree and is defined by the wetland's ability to recycle nutrients through a variety of physical and chemical processes. Wetlands that are vegetated and have a fluctuating water table (permanently, seasonally, regularly or irregularly flooded) are the most efficient at filtering and transforming nutrients. These wetlands are ranked by their potential to accomplish this function - High or Moderate.



Potential Wetland Restoration Sites



Legend

Wetland Restoration Potential

- High Potential (Pink)
- Moderate Potential (Yellow)
- Low Potential (Red)
- Public Parcels (Grey)

Base Information

- Drains and Intermittent Streams (Dotted Blue Line)
- Rivers and streams (Solid Blue Line)
- Lakes and ponds (Blue Area)
- Highway (Red Line)
- Primary County Road (Black Line)

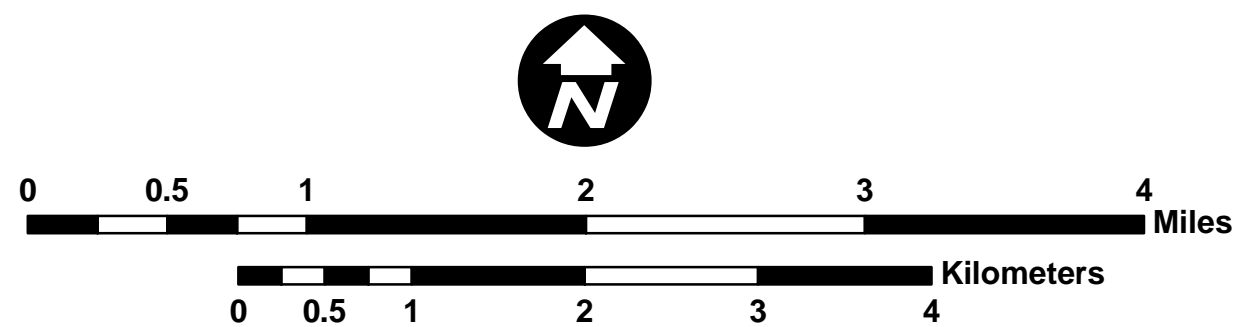
High Potential areas indicate presettlement (Land Use circa 1800) and hydric soils present.

Moderate Potential areas indicate only hydric soils present.

Low Potential areas indicate only presettlement (Land Use circa 1800) present.

Data Sources: MDEQ, Land and Water Management Division, Wetlands, Lakes and Stream; Parcel Data - Muskegon Equalization Department and Ottawa County GIS Department

Base Information - Michigan Center for Geographic Information, Department of Information Technology, 2008



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