

# Mukwonago River Watershed Protection Plan Update



# Tonight's Objectives

- Summarize elements completed to date
- Summarize assets of the Mukwonago River Watershed
- Revised important issues/concerns in the watershed
- Alternatives/Opportunities to address issues of concern
  - Proposed refined plan goals & objectives
    - Prioritize lands for protection
    - Groundwater
    - Outreach summary---

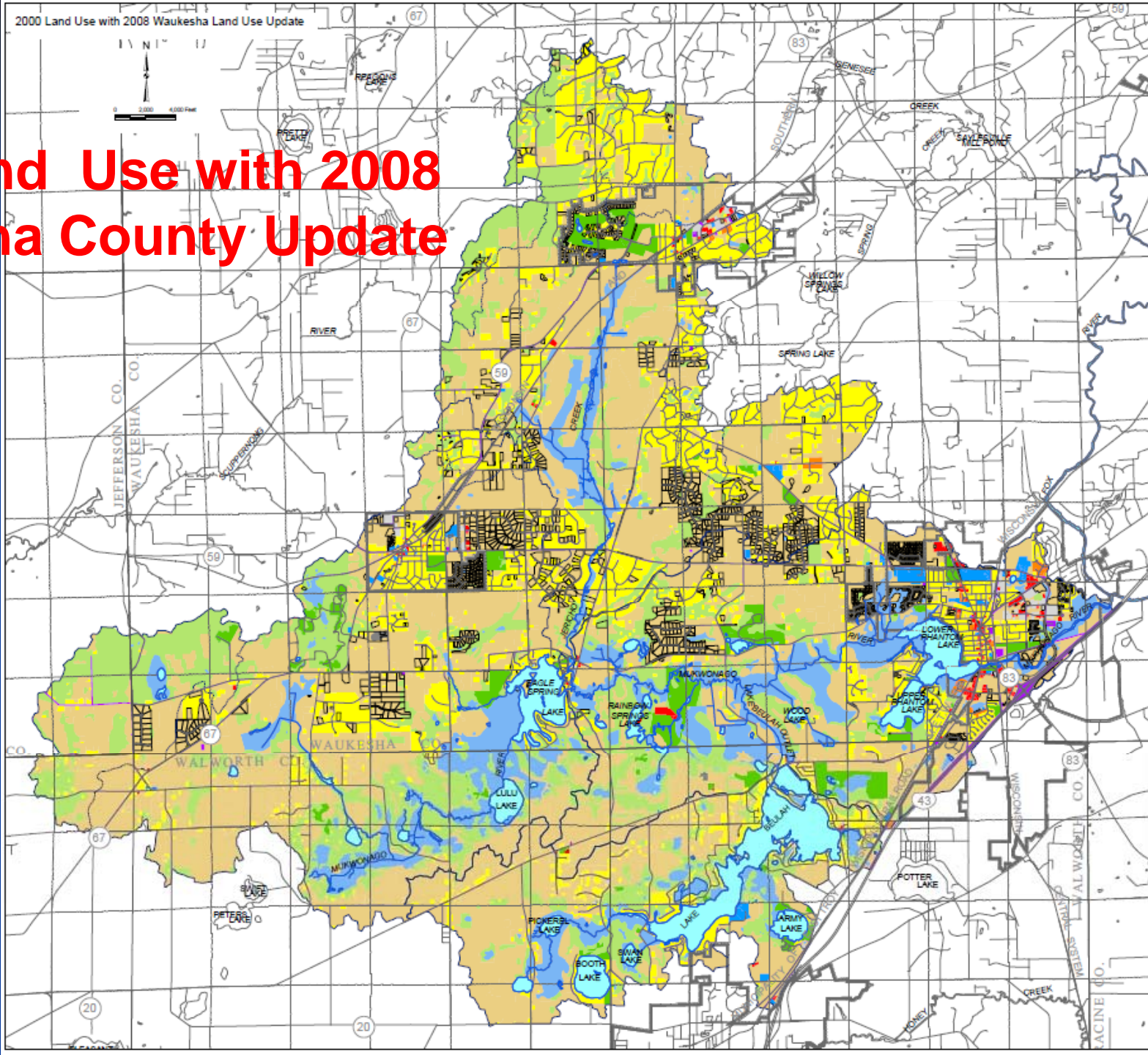
# Plan Chapters

1. Introduction
2. Natural and Human Features of the Watershed
3. Related Plan, Regulations, and Programs
4. Background and Summary of Inventory Findings
5. Watershed Goals, Objectives, and Recommended Actions
6. Plan Implementation

# Informational Meetings

- April 9, 2009
- June 29, 2009—Draft Chapters 1-3
- September 29, 2009—Reviewed Inventory for Chapter 4
- April 8, 2010
- Plan Completion---June 29, 2010

# 2000 Land Use with 2008 Waukesha County Update



# Assets of the Mukwonago River Watershed?





**Chemical:**  
**Excellent water quality within  
the stream and lakes systems**

**Biological:**

- Generally good health of stream and diversity
- Highly diverse warmwater fishery
- Diverse and abundant mussels
- Diverse and abundant aquatic insects
- High quality coldwater stream
- Large trout
- Good quality Lake Sport Fisheries---
- High diversity & abundance of wildlife species
- Numerous threatened, endangered, and species of special concern







## Physical:

- Well connected floodplain and good flood control
- Stable streambed & banks
- Low density of development
- Significant amount of infiltration areas/groundwater recharge potential
- High groundwater discharge
- natural meanders-limited channelization/diversions
- low number of road crossings
- extensive riparian buffers

## Physical-Habitat

High quality, quantity, and diversity of instream and in-lake habitats:

- Flows
- pool-riffle structure
- substrates, water depths
- aquatic vegetation
- woody cover





**High quality & diverse recreational experience:**

**Boating/Skiing**

**Canoeing**

**Hunting**

**Fishing**

**Wildlife viewing**

**Golfing**

**Biking**

**Picnicking**

**Public access**



## Goals:

- Protect and improve wildlife, land, surface water , and groundwater resources
- Minimize impacts of land development by controlling agriculture and urban runoff pollution and flooding
- Build partnerships and inform public to promote protection and use of natural resources

## Protect and improve wildlife, land, surface water , and groundwater resources

- Land Management Measures
  - Objective-Preserve and protect environmentally sensitive areas such as designated natural areas, wetlands, fish and wildlife habitat, riparian buffers, and primary and secondary environmental corridors.
- Groundwater Protection Measures
  - Objective-Preserve groundwater recharge areas and prevent groundwater contamination from stormwater infiltration practices.
- Fisheries and Wildlife Enhancement
  - Objective-Protect lakes and streams to support a high quality sustainable coldwater and warmwater fishery community, habitat, and water quality.

## Minimize impacts of land development by controlling agriculture and urban runoff pollution and flooding

- Land Use Management and Zoning
  - Objective-Develop policies and install practices that reduce urban nonpoint source water pollution and help achieve the recommended water use objectives and supporting water quality standards for surface waters.
- Stormwater and Floodland Management Measures
  - Objective-Preserve floodwater storage areas and control the quantity of runoff from new urban development.
- Agricultural Land Use Planning and Zoning Measures
  - Objective-Preserve and protect environmentally sensitive areas such as designated natural areas, wetlands, fish and wildlife habitat, riparian buffers, and primary and secondary environmental corridors.
- Agricultural Pollution Control Measures
  - Objective-Promote the use of agricultural nonpoint pollution control practices to meet or exceed State and Federal standards.

## Build partnerships and inform public to promote protection and use of natural resources

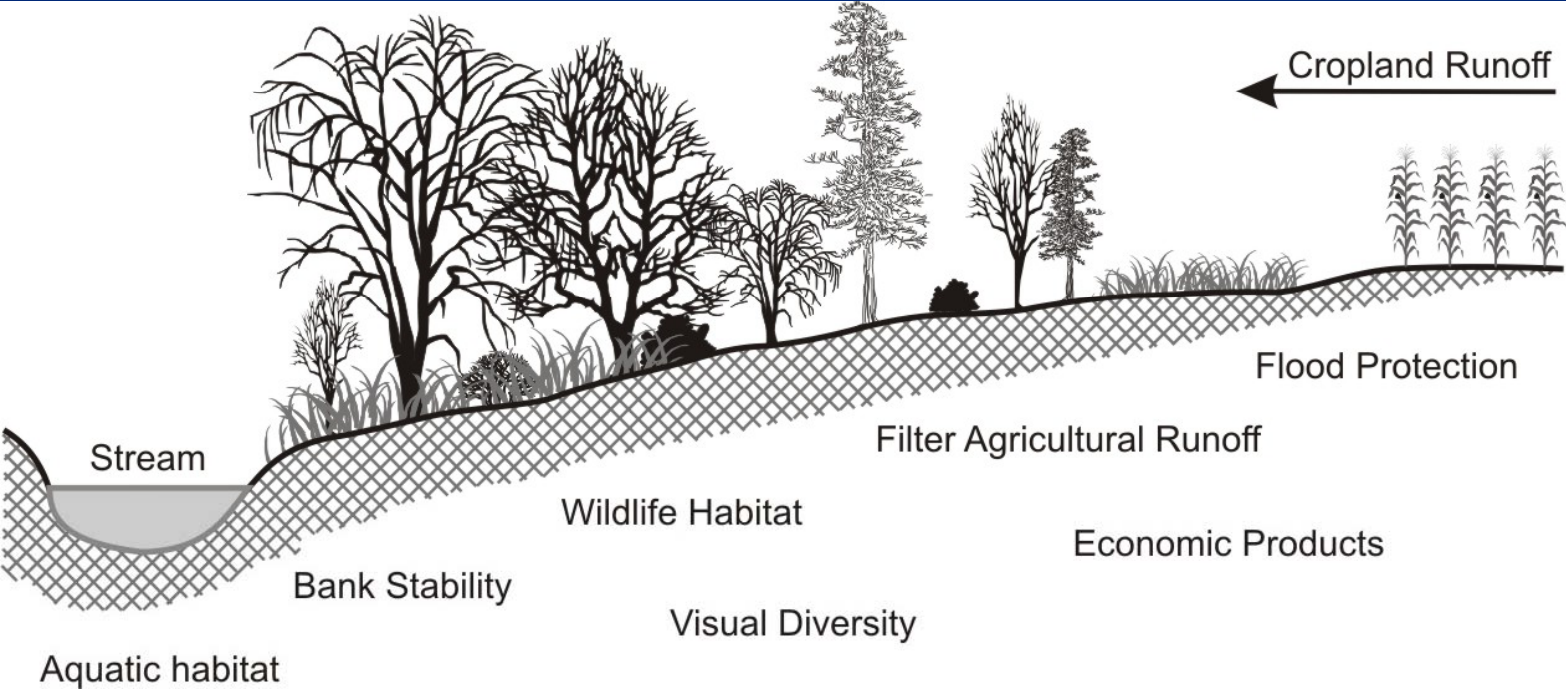
- Targeted Informational Programming
  - Objective-Develop or expand land use and water quality information and education programs as needed to implement plan goals and objectives.
- Waukesha & Walworth Counties Nonpoint Information and Education Program Proposal
  - Objective-Comply with educational component of Municipal Separate Storm Sewer System (MS4) Permit Requirements under NR 216 of the Wisconsin Administrative Code.
- Stakeholder participation
  - Objective –Continue cooperation among community organizations and municipalities, and develop public participation opportunities.
- Recreational development
  - Objective-Promote and expand safe recreational opportunities

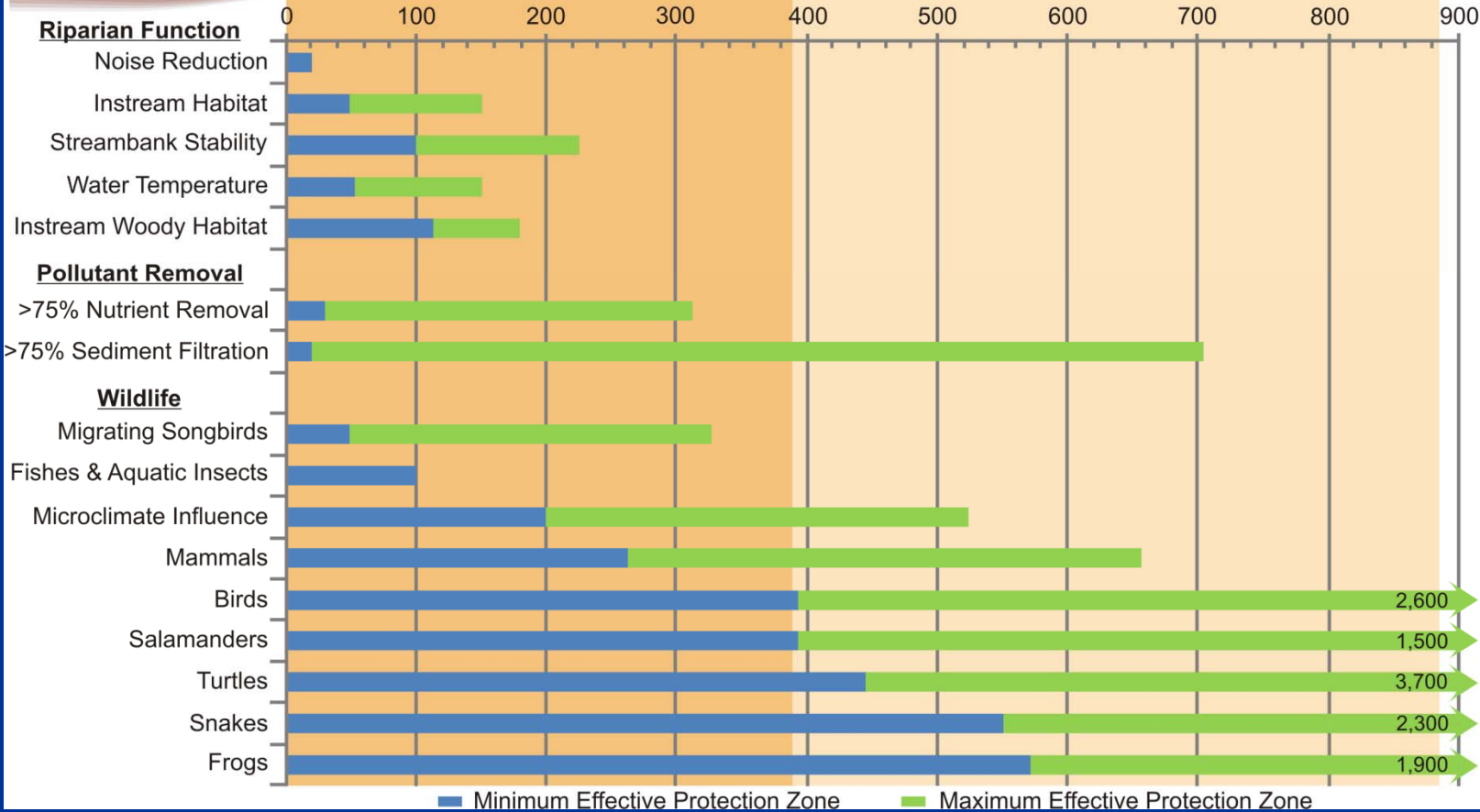
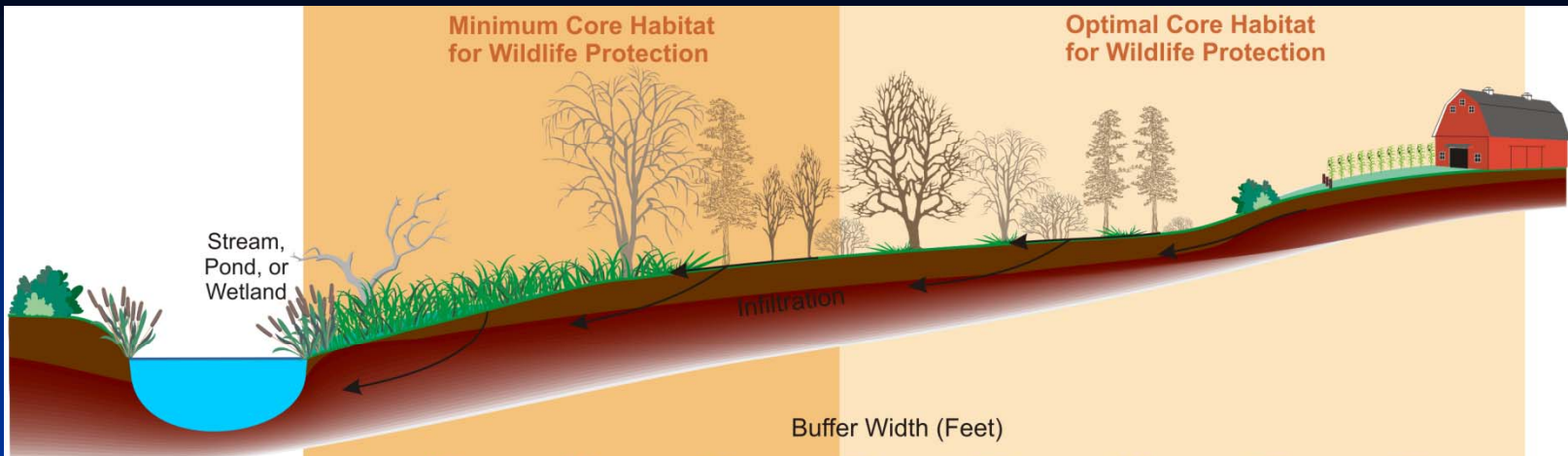
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  - Groundwater Protection Measures
  - Fisheries and Wildlife Enhancement



# Riparian buffers





# Stream and Riparian Conditions: 1941

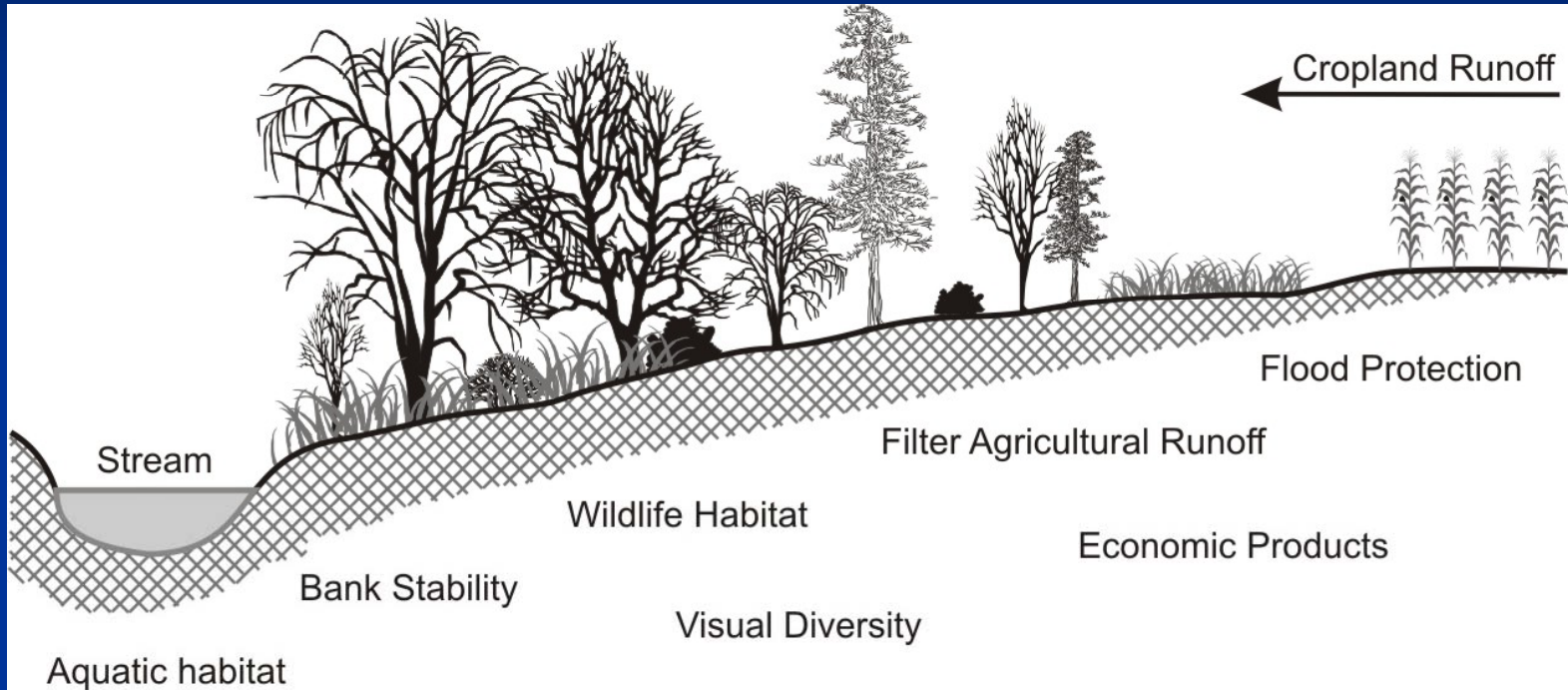


# Stream and Riparian Conditions: 2007

## Conditions Change...



# Riparian buffers



How defined within Mukwonago River Watershed?

- 2005 Wisconsin Wetland inventory
- Primary Environmental Corridors

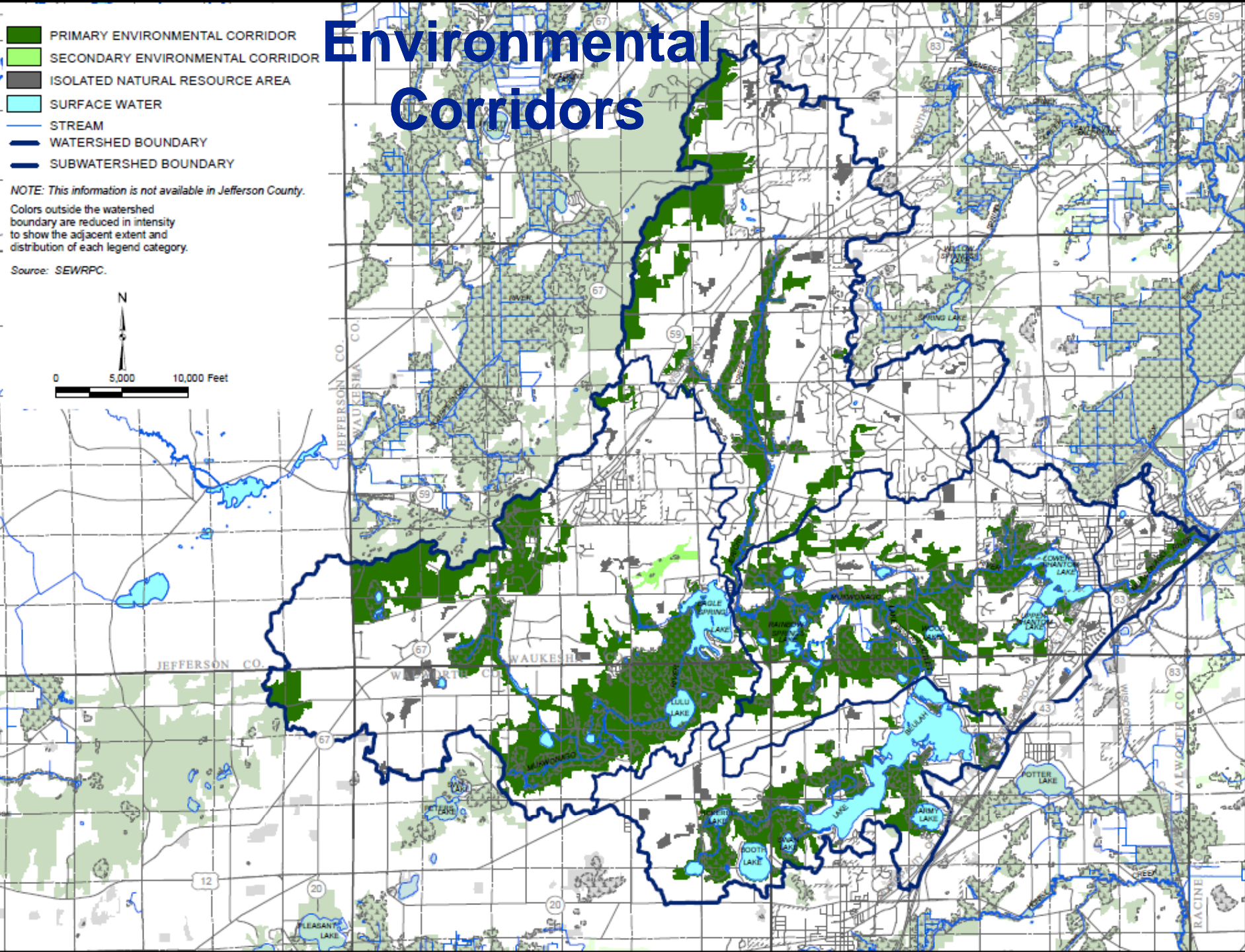
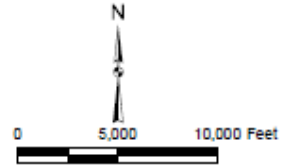
# Environmental Corridors

- PRIMARY ENVIRONMENTAL CORRIDOR
- SECONDARY ENVIRONMENTAL CORRIDOR
- ISOLATED NATURAL RESOURCE AREA
- SURFACE WATER
- STREAM
- WATERSHED BOUNDARY
- SUBWATERSHED BOUNDARY

NOTE: This information is not available in Jefferson County.

Colors outside the watershed boundary are reduced in intensity to show the adjacent extent and distribution of each legend category.

Source: SEWRPC.



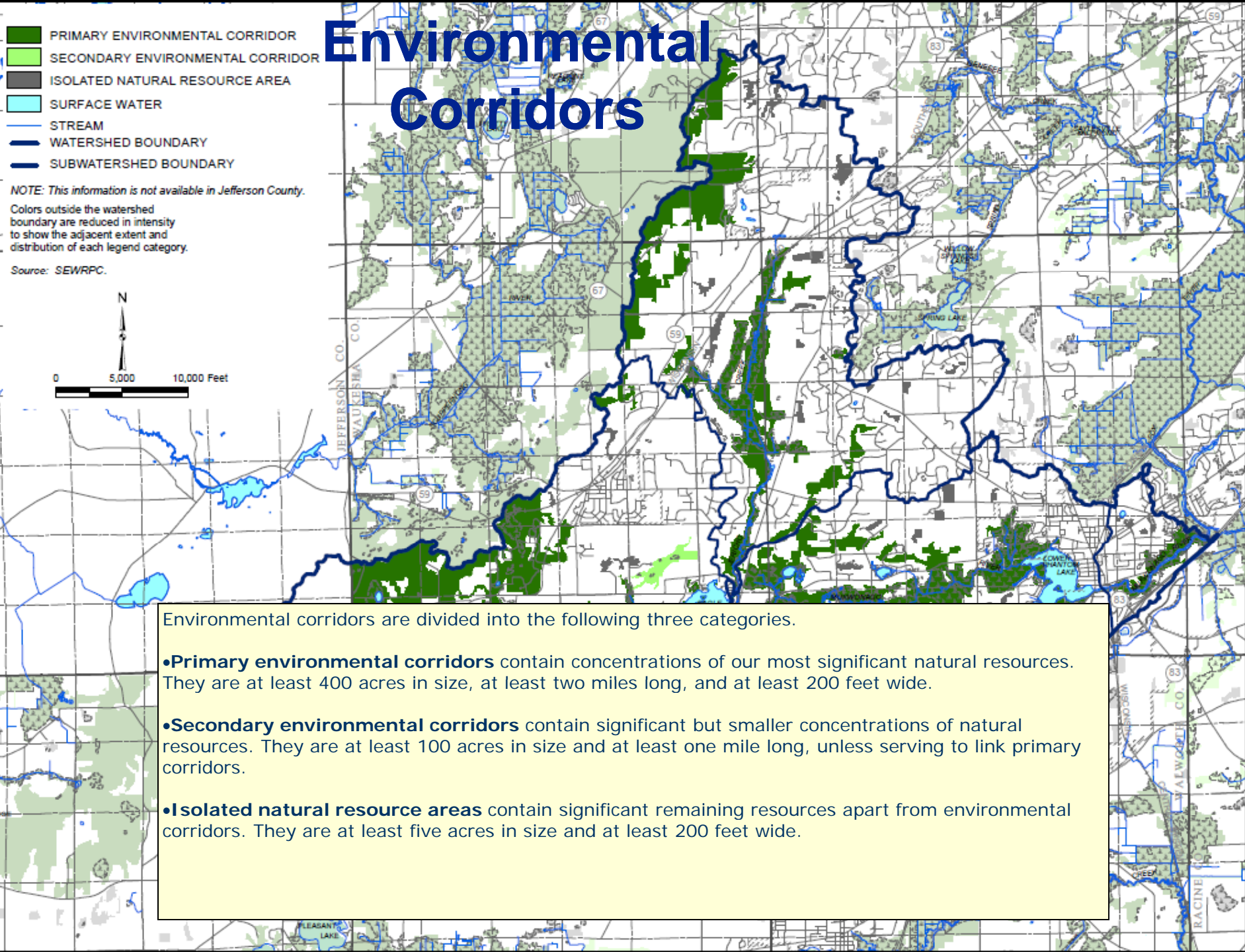
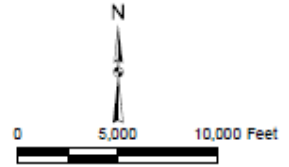
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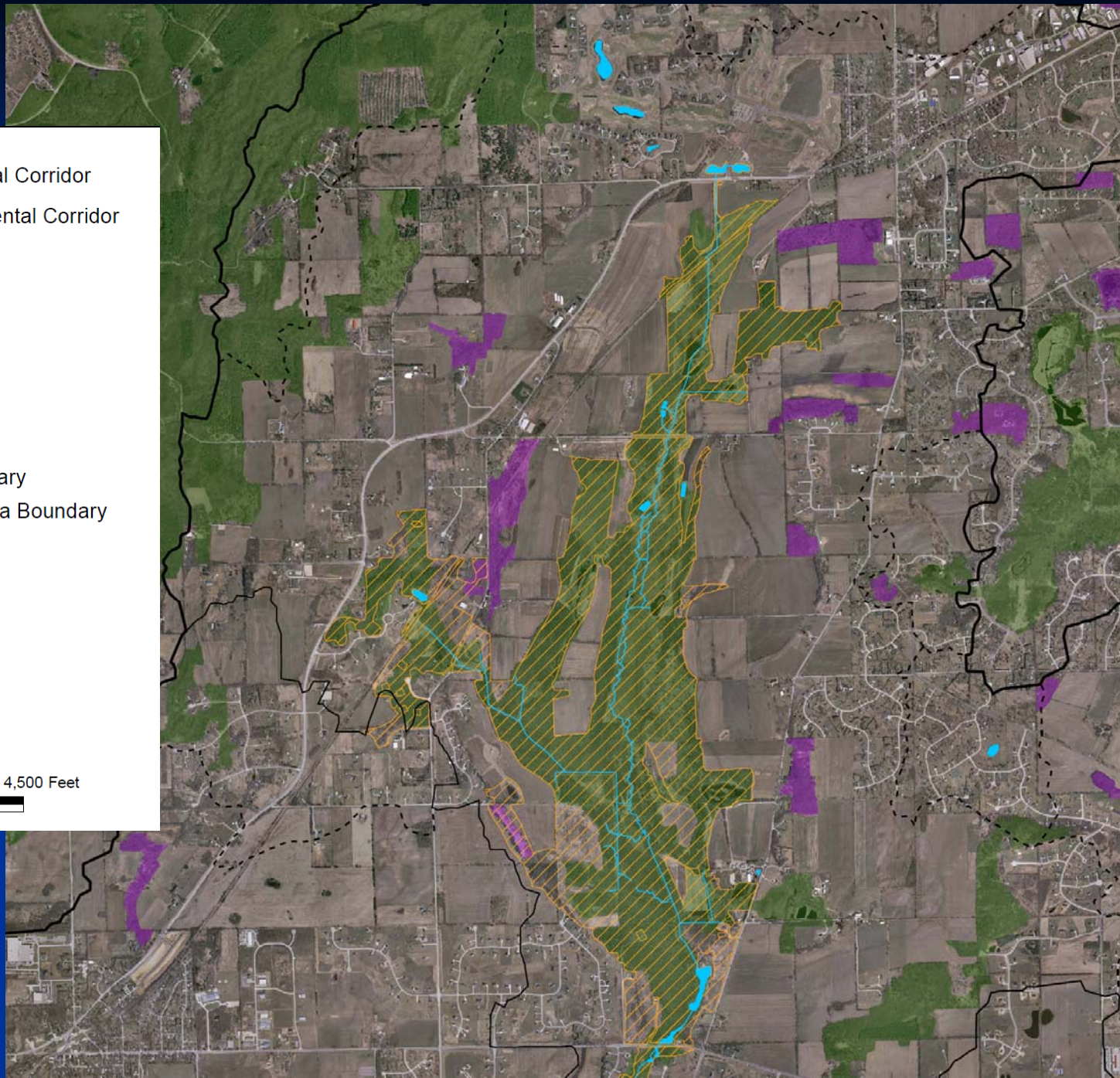
Environmental corridors are divided into the following three categories.

- Primary environmental corridors** contain concentrations of our most significant natural resources. They are at least 400 acres in size, at least two miles long, and at least 200 feet wide.
- Secondary environmental corridors** contain significant but smaller concentrations of natural resources. They are at least 100 acres in size and at least one mile long, unless serving to link primary corridors.
- Isolated natural resource areas** contain significant remaining resources apart from environmental corridors. They are at least five acres in size and at least 200 feet wide.

- Primary Environmental Corridor
- Secondary Environmental Corridor
- Isolated Natural Resource Area
- Riparian Corridor
- Surface Water
- Watershed Boundary
- Subwatershed Boundary
- Internally Drained Area Boundary

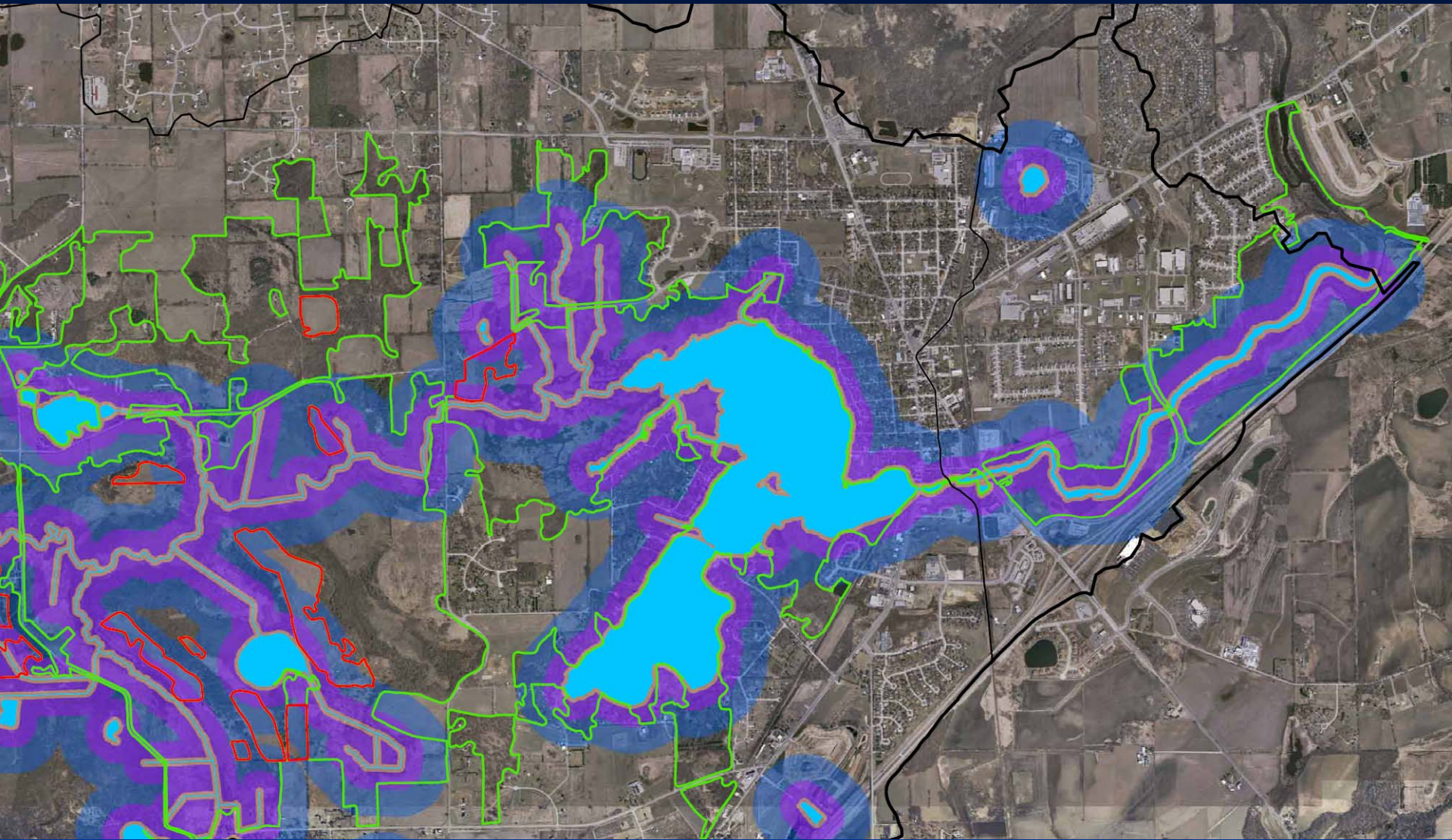


0 1,500 3,000 4,500 Feet





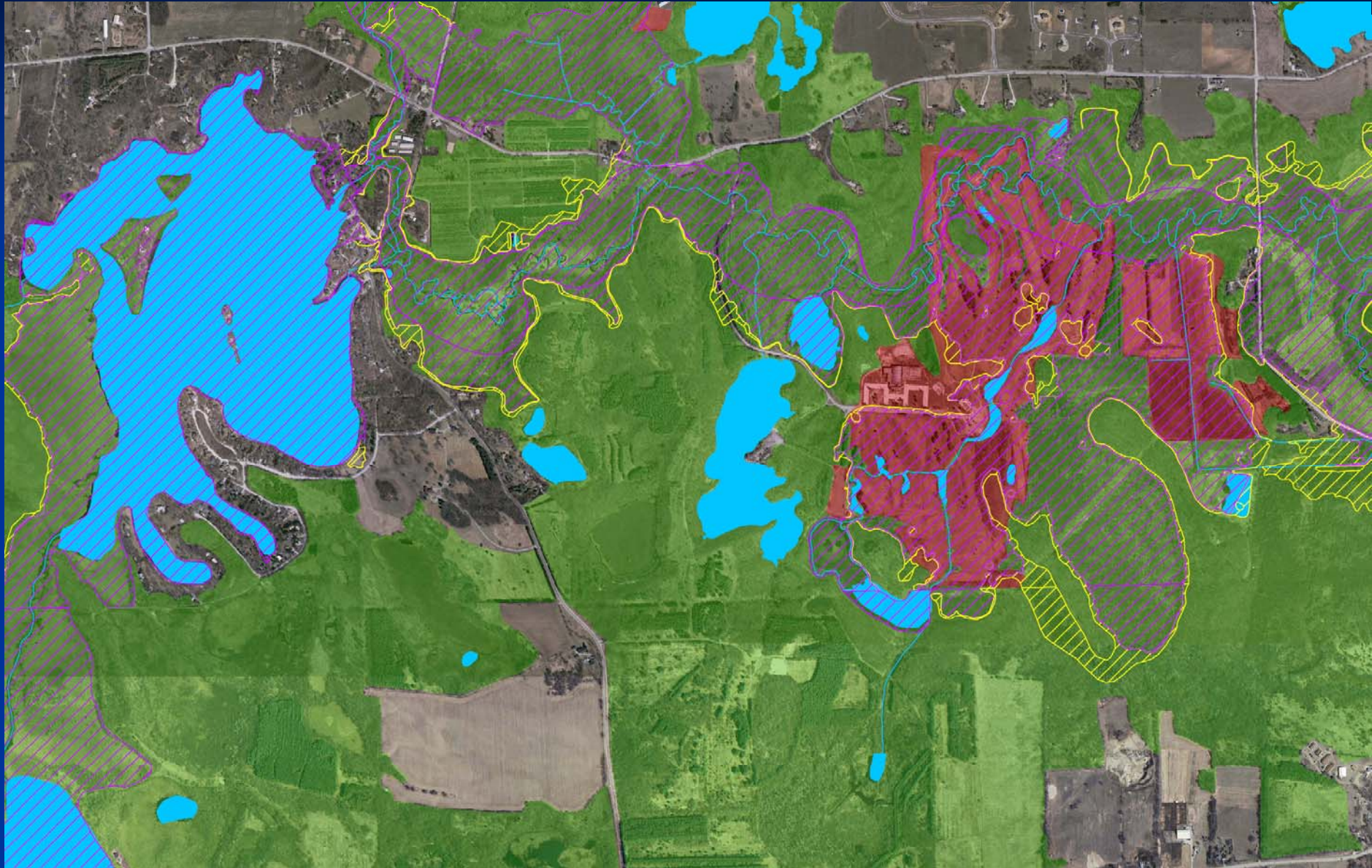
Minimum goals of 75?



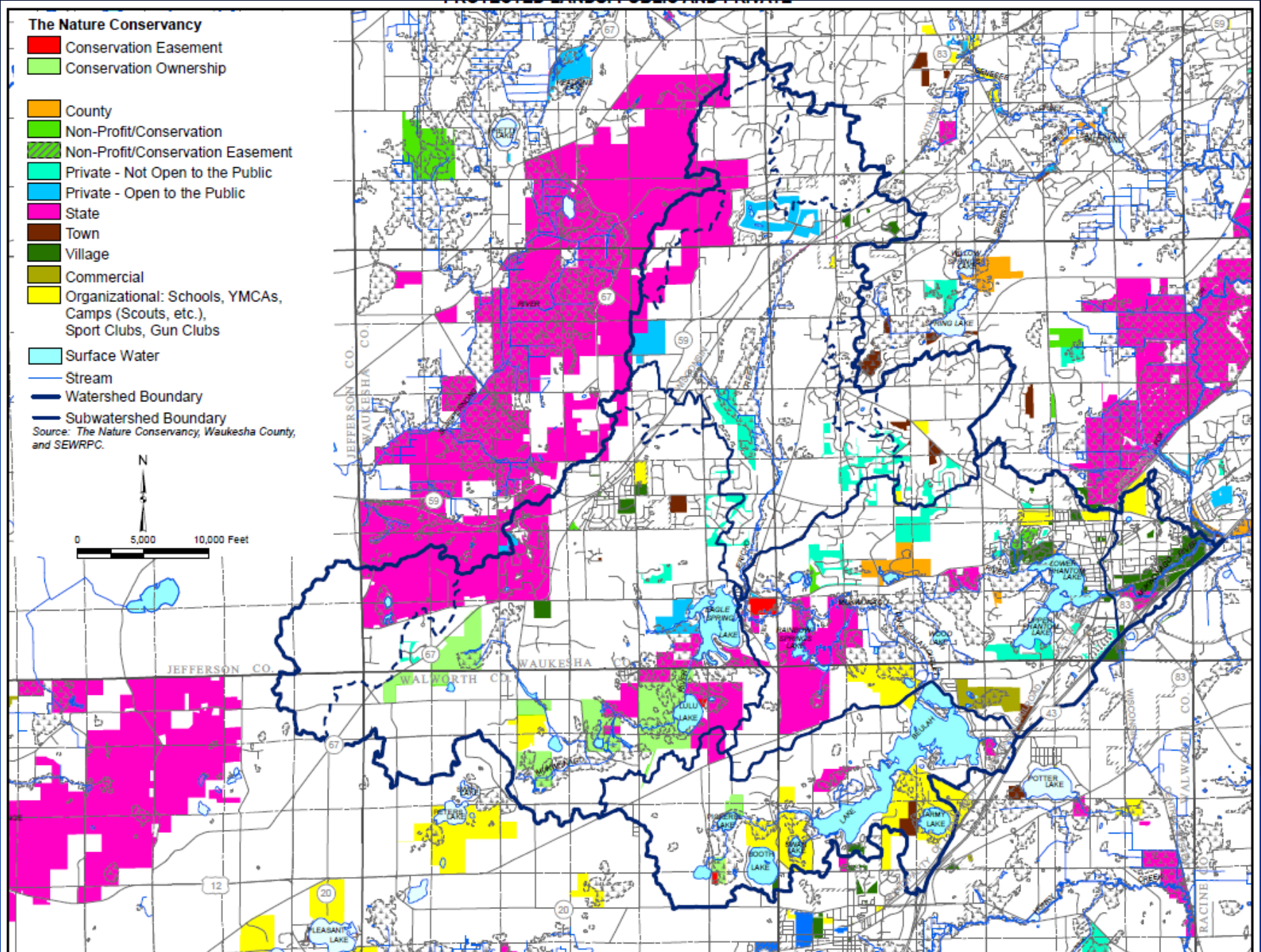
# How to identify lands for protection or purchase?

- Prioritization strategy
- Identify lands protected by regulation & ownership/easement
  - -100-year floodplain boundary
  - -lands protected: Public & Private (need to distinguish public access vs not)

# 100-Year & 500-Year Floodplain



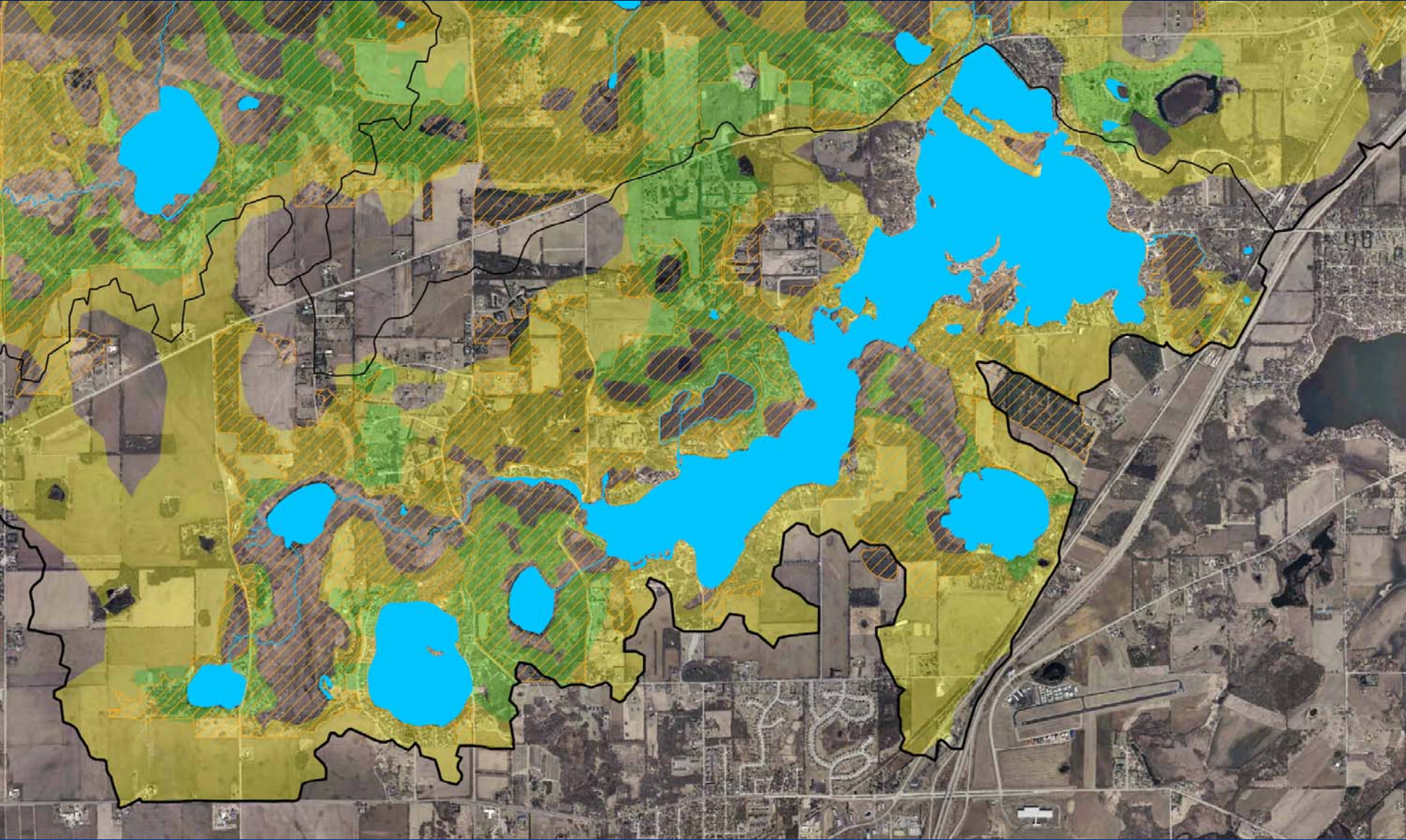
# Protected Lands: Public & Private



# How to identify lands for protection or purchase?

- Prioritization strategy
- Identify lands protected by regulation & ownership/easement
  - -100-year floodplain boundary
  - -lands protected: Public & Private (need to distinguish public access vs not)
- Identify what to do
- Lands planned for development-higher candidate for conservation type setback/conservation easement with development
- Lands not planned for development-higher candidate for purchase
  
- Minimum goals of 75
- 400-foot minimum & 900-foot optimum protection width assessment
- Groundwater recharge potential –using good & very good recharge categories

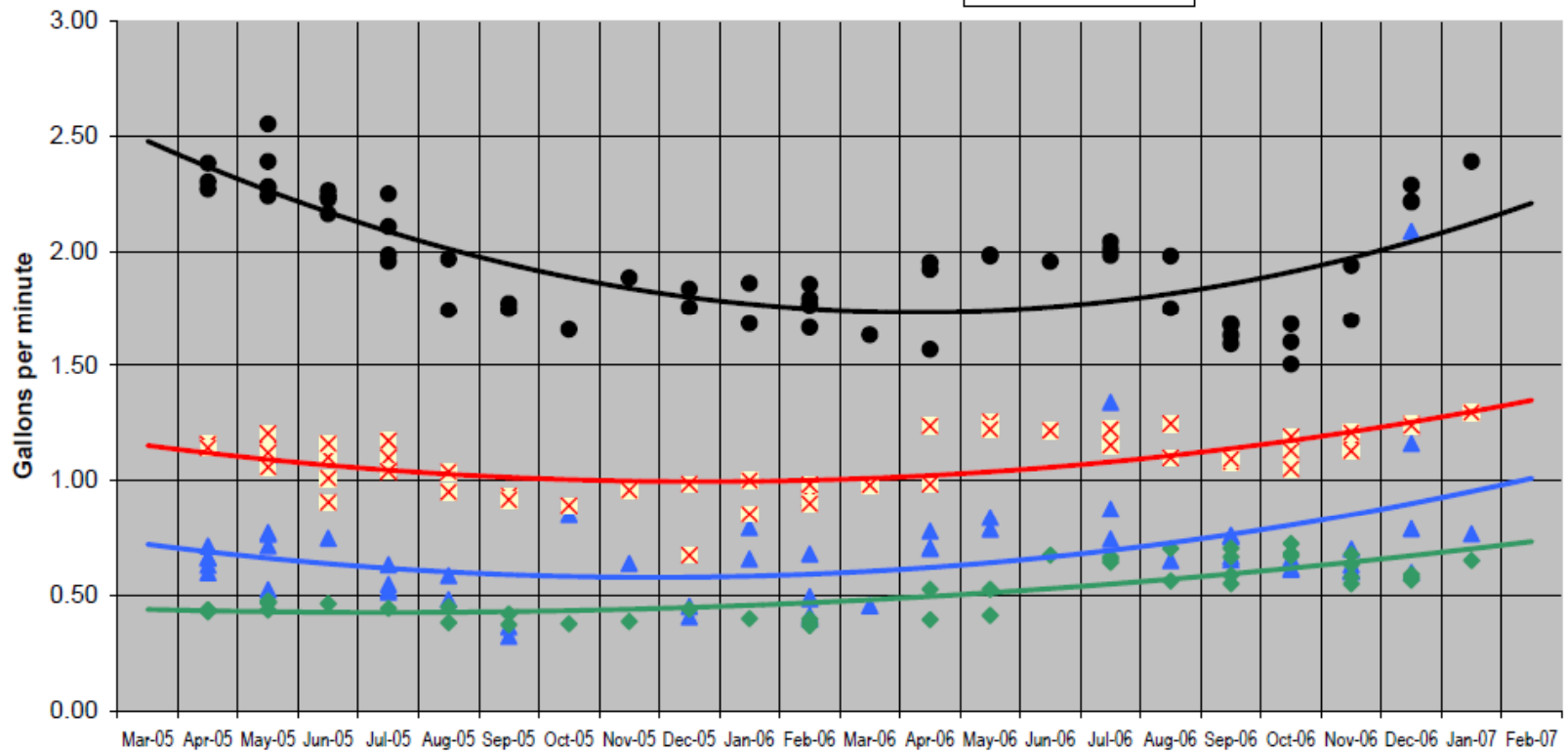
# Groundwater Recharge



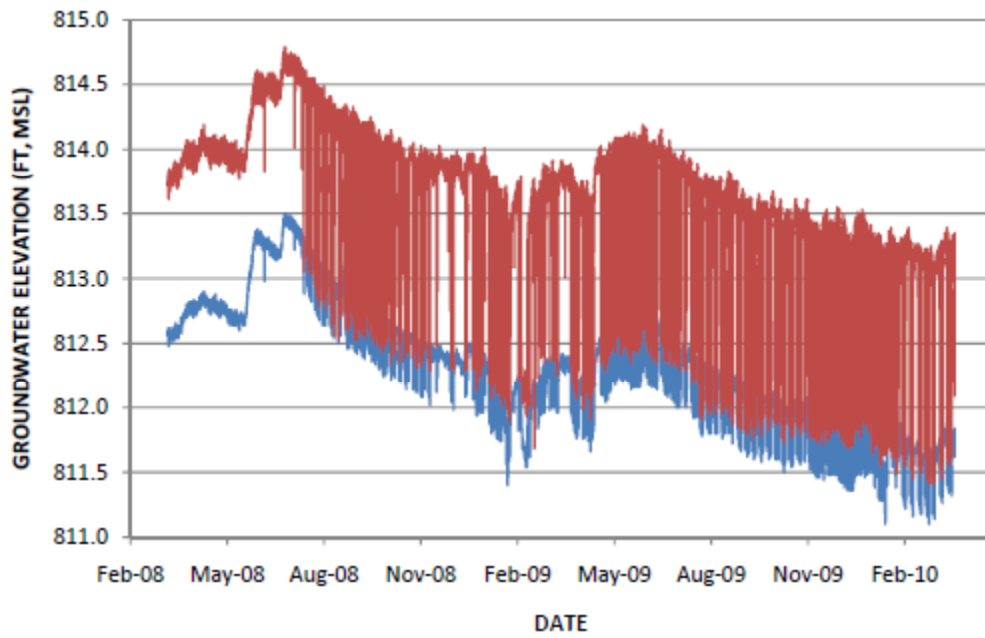
# Groundwater Discharge

## Flow Rates for Four Phantom Lake Springs

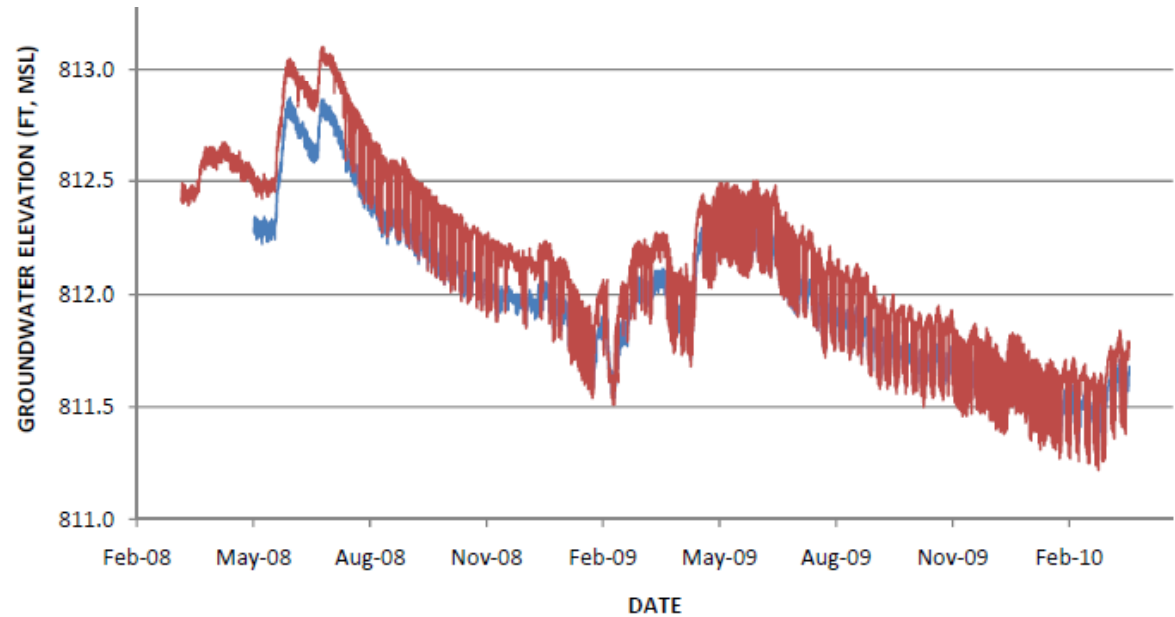
<u>Averages</u>	
(1year 10 months)	
Gamble	0.69
Heuver	0.53
Barber 1	1.96
Barber 2	1.09



# Groundwater & Surface Water Connections



— MW-1S — MW-1D

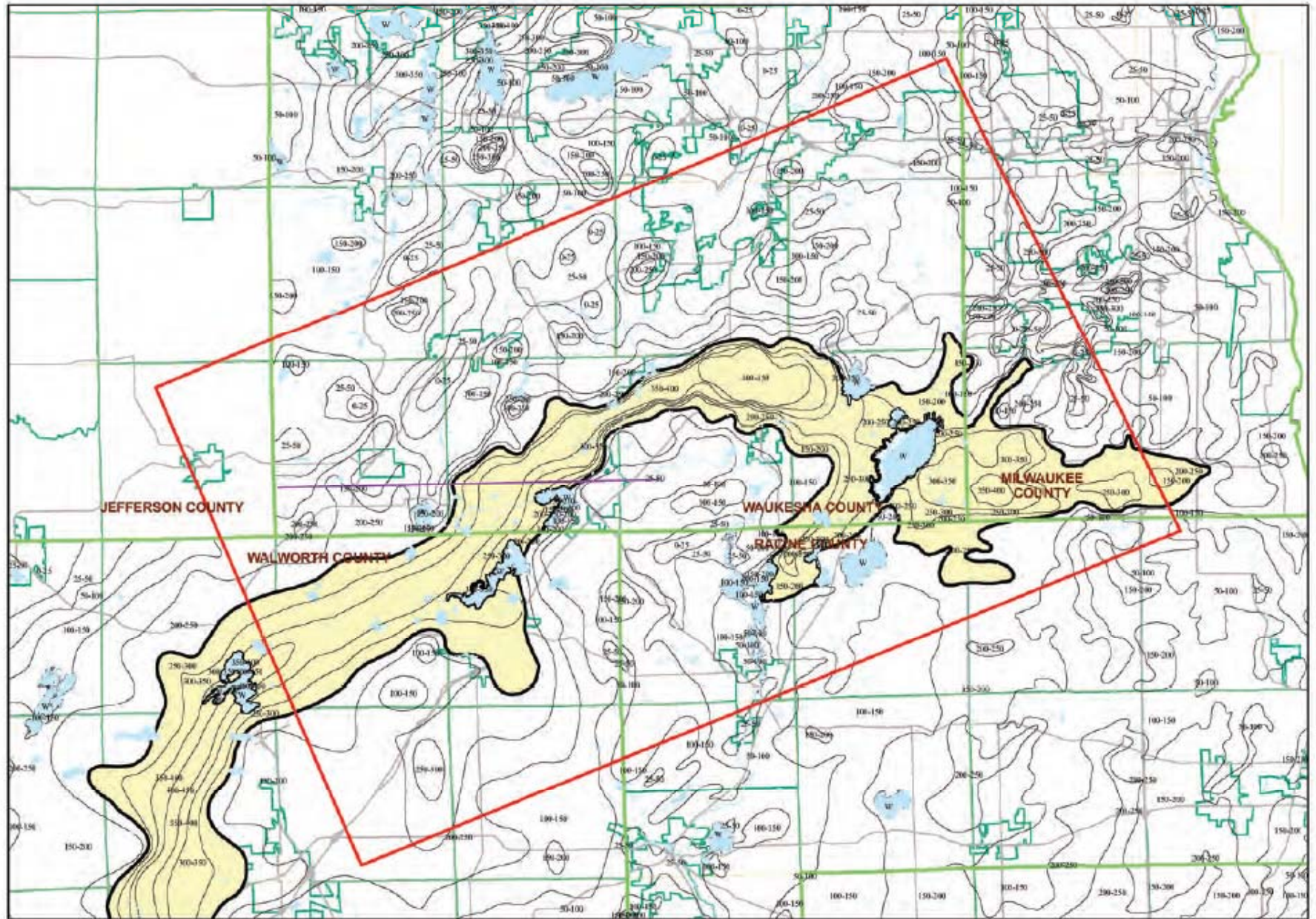


— MW-2S — MW-2D



# Groundwater Tools: SEWRPC MR-188

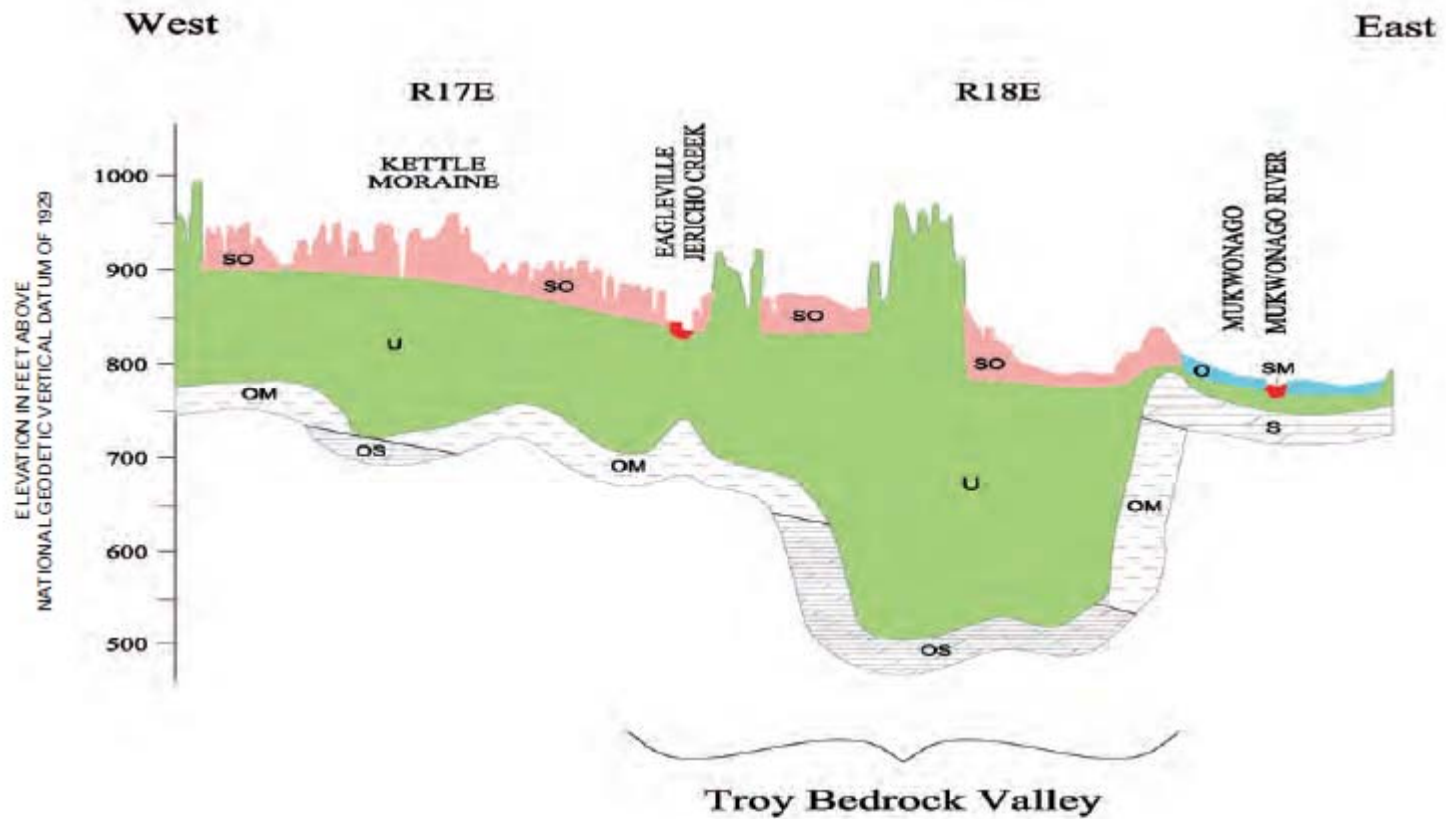
## LOCATION OF TROY BEDROCK VALLEY



# Groundwater Tools: SEWRPC MR-188

Figure 2

## GEOLOGICAL CROSS-SECTION THROUGH THE TROY BEDROCK VALLEY IN SOUTHERN WAUKESHA COUNTY





# Water Conservation

Base-Level Program: Providing about a 4 percent reduction in average daily demand and from 6 to 10 percent reduction in maximum daily demand.

- Water supply system efficiency actions including meter testing, leak detection and repair, water main maintenance replacement, water system audits, and water production system refinement.

These measures are, at least in part, being applied by most of the water utilities within the Region;

- Moderate level of public information and education programming, including redesign of water bills, collation and distribution of educational materials, and presentations to school and civic groups; and

- Outdoor watering reduction measures such as the use of rain barrels, and imposition of lawn and landscape plant watering restrictions, such as time-of-day and limited-day watering requirements.

# Water Conservation

Intermediate-Level Program: Providing from about 6 to 8 percent reduction in average daily demand and 12 to 16 percent reduction in maximum daily demand.

- All of the components of the low-level program;
- Higher levels of public information and education programming, including the development of school curriculum and broader informational programs involving newspapers, websites, and flyers;
- Plumbing retrofits, including the provision and installation of low-volume shower heads and toilet displacement device kits;
- Use of water conservation rate structures; and
- More aggressive outdoor watering restrictions.**

# Water Conservation

Advanced-Level Program: Providing about a 10 percent reduction in average daily demand and 18 percent reduction in maximum daily demand.

- All of the components of the moderate-level program;
- **Fixture and plumbing management**, including toilet, water softener, and clothes washing machine replacement rebate programs; and
- **Even more aggressive water conservation rate structures and outdoor watering restrictions considerations.**

# Water Conservation

Where does your water come from?

How much water do you use?

How far do we take recommendations?

## Build partnerships and inform public to promote protection and use of natural resources

- Targeted Informational Programming
- Waukesha & Walworth Counties Nonpoint Information and Education Program Proposal
- Stakeholder participation
- Recreational development





# Partners

A Joint Effort of the:

Eagle Spring Lake Management District

Phantom Lakes Management District

The Nature Conservancy

Mukwonago Fisheries Committee

Fox River Partnership

Friends of the Mukwonago River

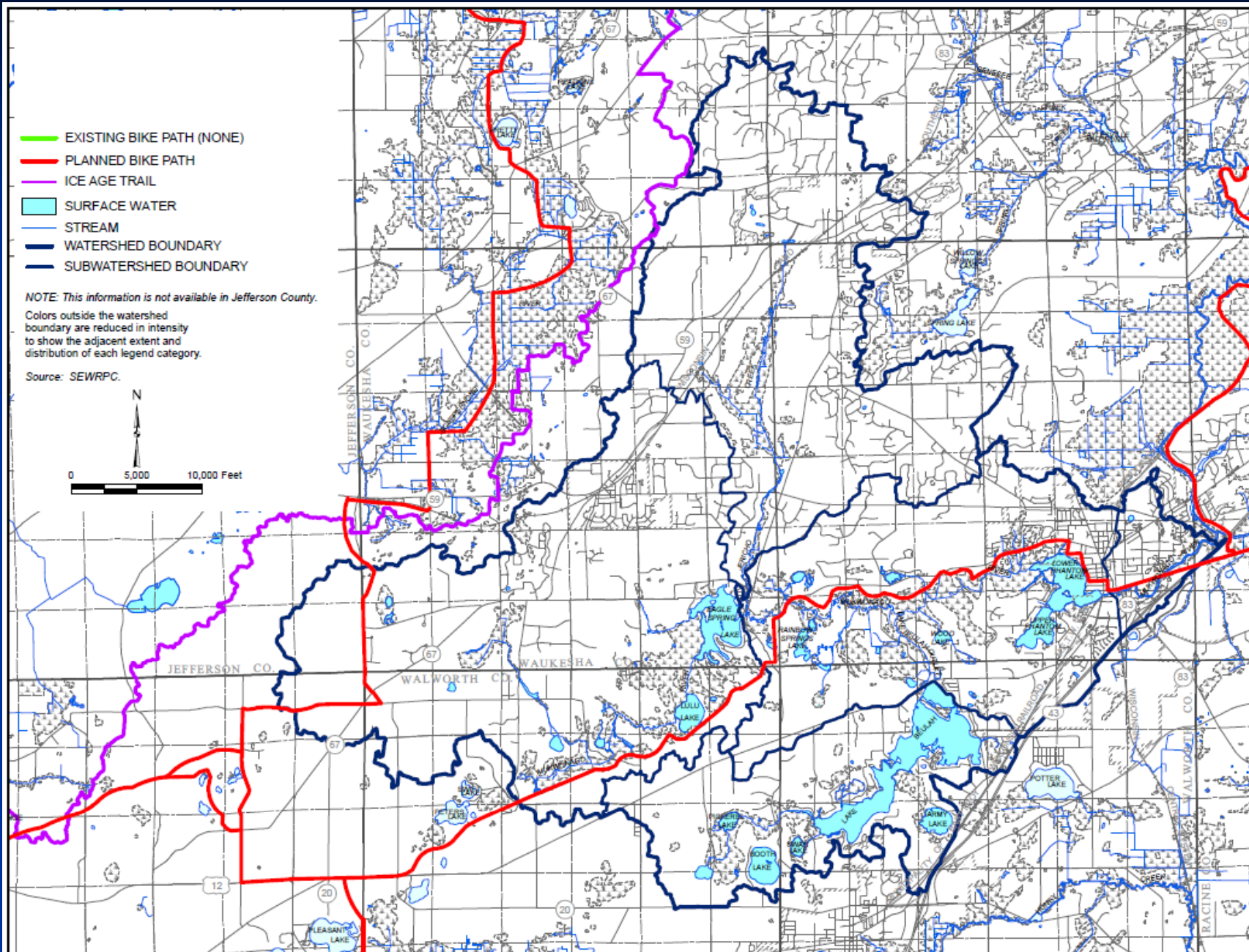
Fox River Commission

Schools & Libraries

Municipalities

Wisconsin Department of Natural Resources

# Recreational Trails



# Thank you

