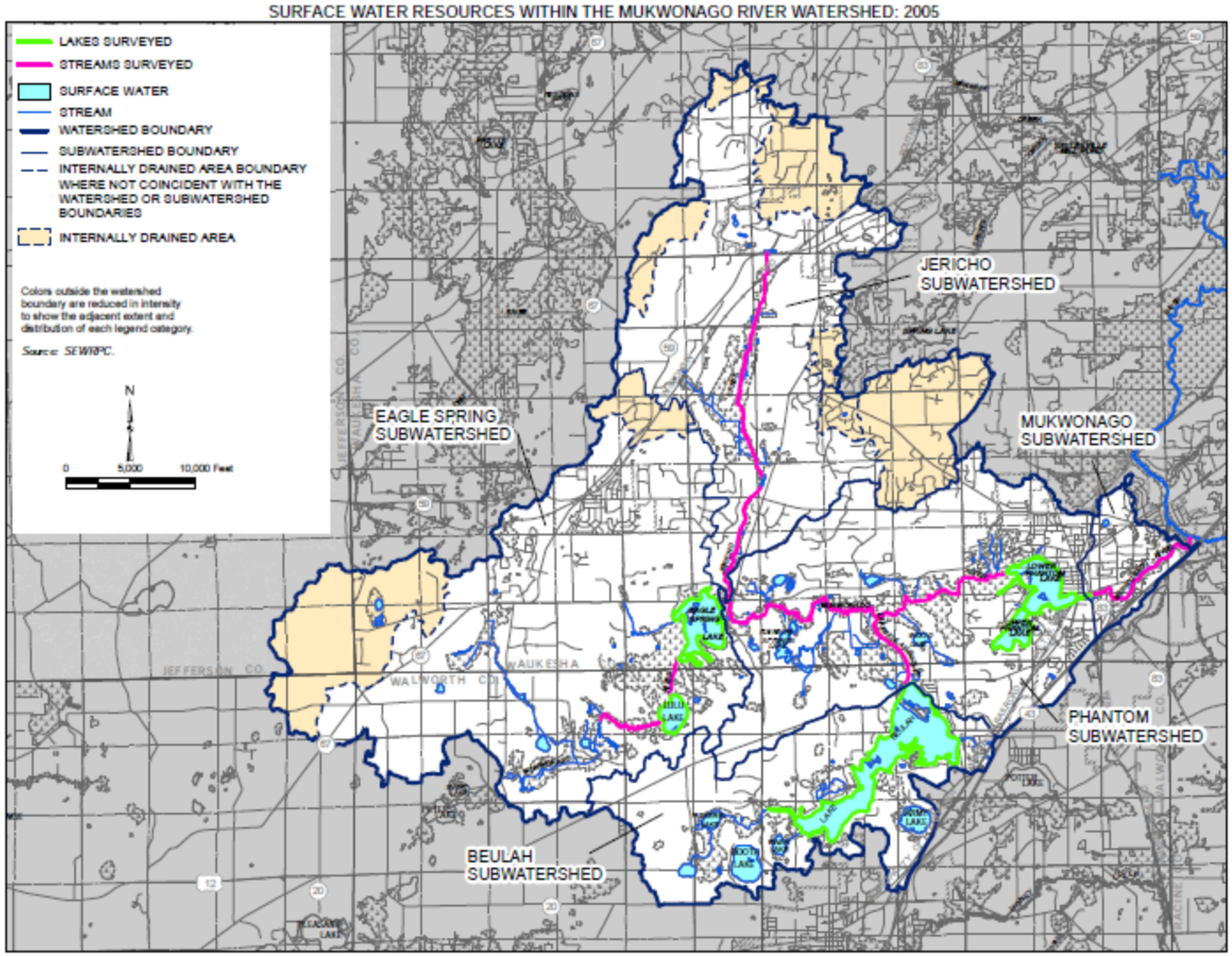
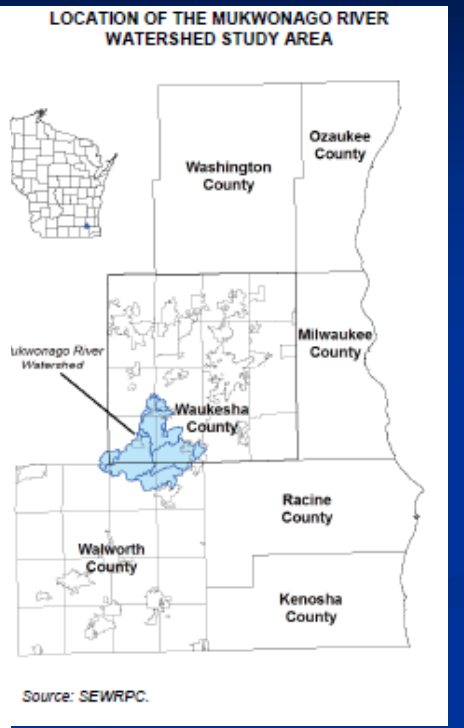
Mukwonago River Watershed Protection Plan Recommendations & Implementation Update

Friends of Mukwonago River
March 16, 2013
Mukwonago, WI

Thomas M. Slawski, Principal Specialist Biologist
Southeastern Wisconsin Regional Planning Commission

Mukwonago River Watershed





Goals:

1. Protect and improve land, wildlife, surface water, and ground water resources

2. Minimize impacts of land development by controlling agricultural and urban pollution, runoff, and flooding

3. Build partnerships and inform public to promote protection and sustainable use of natural resources

Mukwonago River continues to sustain a highly diverse fishery and aquatic community

Objectives

Review key concepts in the plan-framework of protection

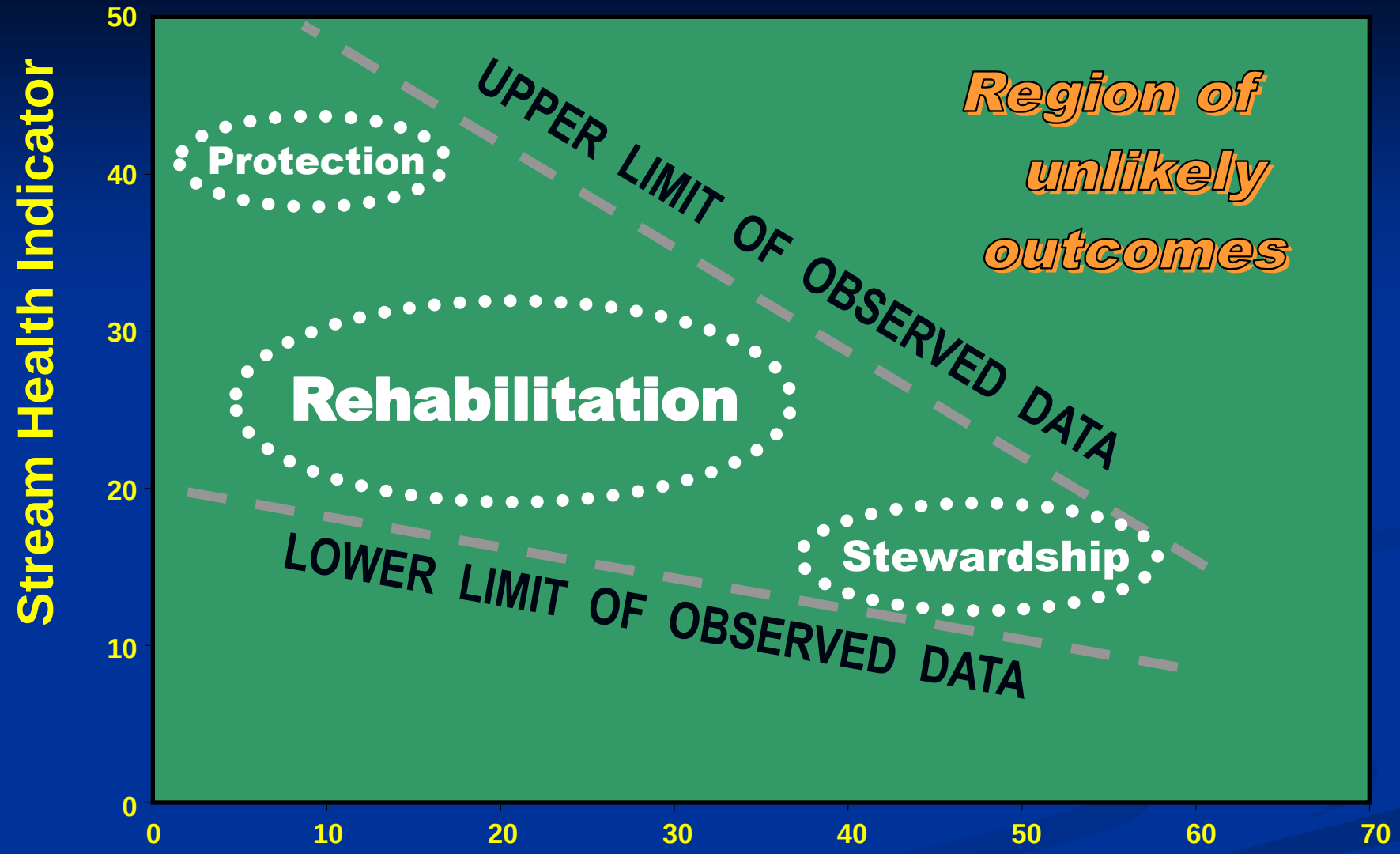
Ideas to continue implementation of the Plan

Stakeholder success in watershed partnerships

2002

2004

Management Strategies

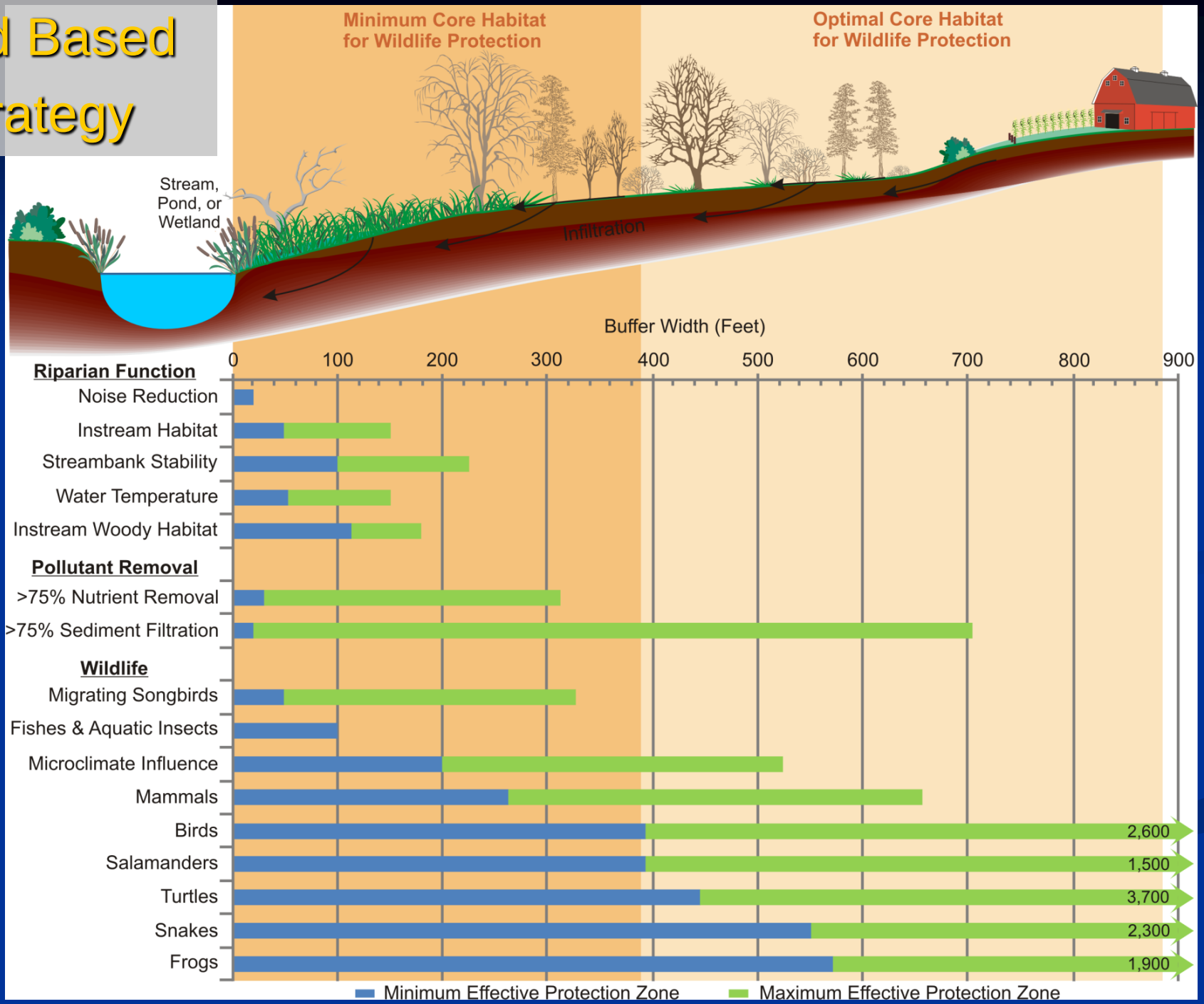


Key-researchers have begun to determine the mechanistic drivers of degradation

Upper Kelly Lakes Tributary Restoration

Jeffrey Thornton , Thomas Slawski, Sara Teske, Walter Rast, and Michael Cascio. 2007. The World Lake Vision and ecohydrology: case study from Wisconsin, USA. Ecohydrology & Hydrobiology, Vol 7(2), 113-124

Land Based Strategy



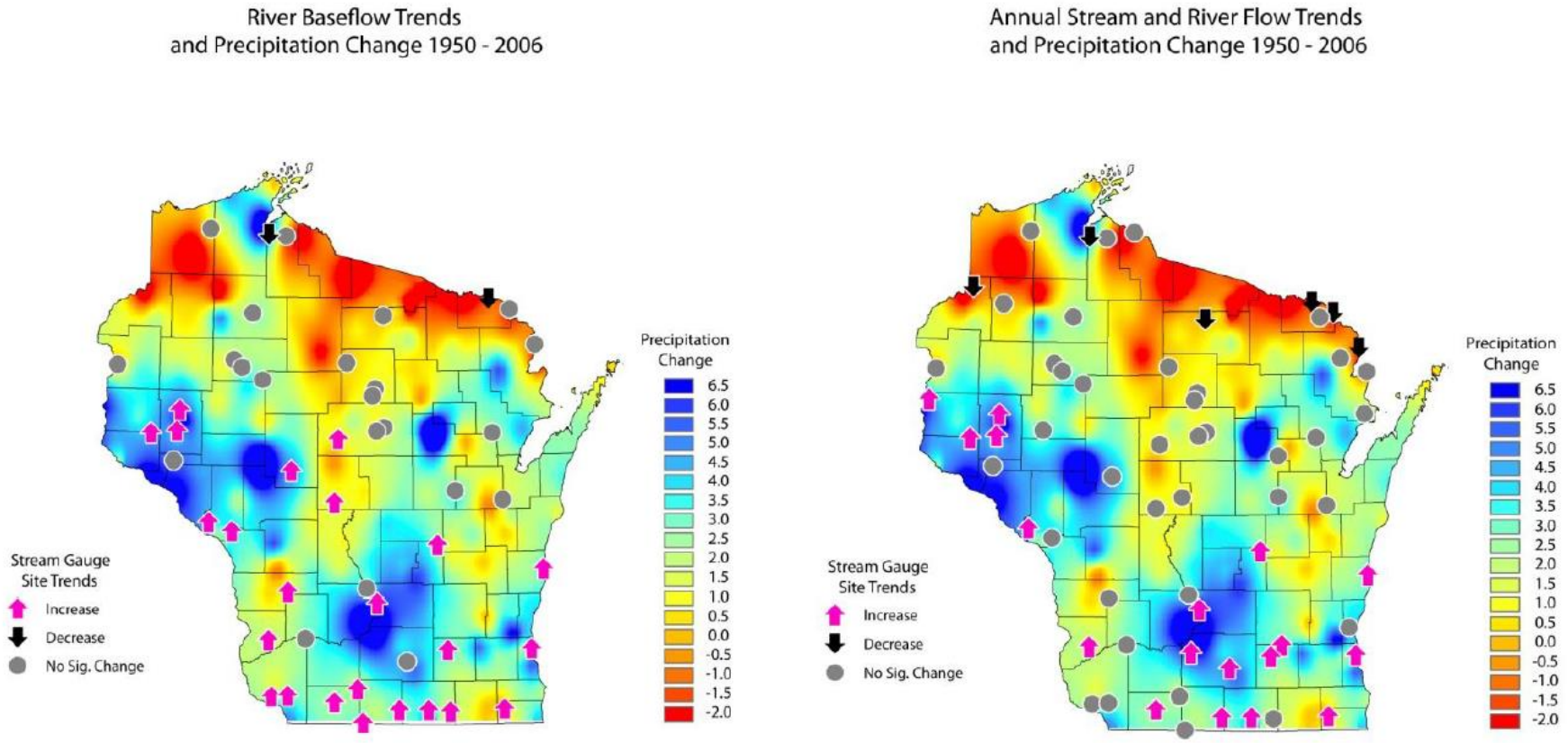


Figure 19. From 1950 to 2006, Wisconsin as a whole became wetter, with an increase in annual precipitation of 3.1 inches. This observed increase in annual precipitation was primarily in southern and western Wisconsin, while northern Wisconsin was drier (Center for Climatic Research & Center for Sustainability and the Global Environment, Nelson Institute, University of Wisconsin-Madison). The southern and western regions of the state had increases in baseflow (left) and annual flow (right) between 1950 and 2006, corresponding to the areas with greatest increases in precipitation (Greb, unpublished data; maps prepared by Eric Erdmann, 2010).

“Temporary Streams are channels that lack surface flow during some portion of the year. Positioned at the interface between fully aquatic and fully terrestrial ecosystems, they are among the most abundant , widely distributed, and dynamic freshwater ecosystems on earth.”

McDonough et al (2011)

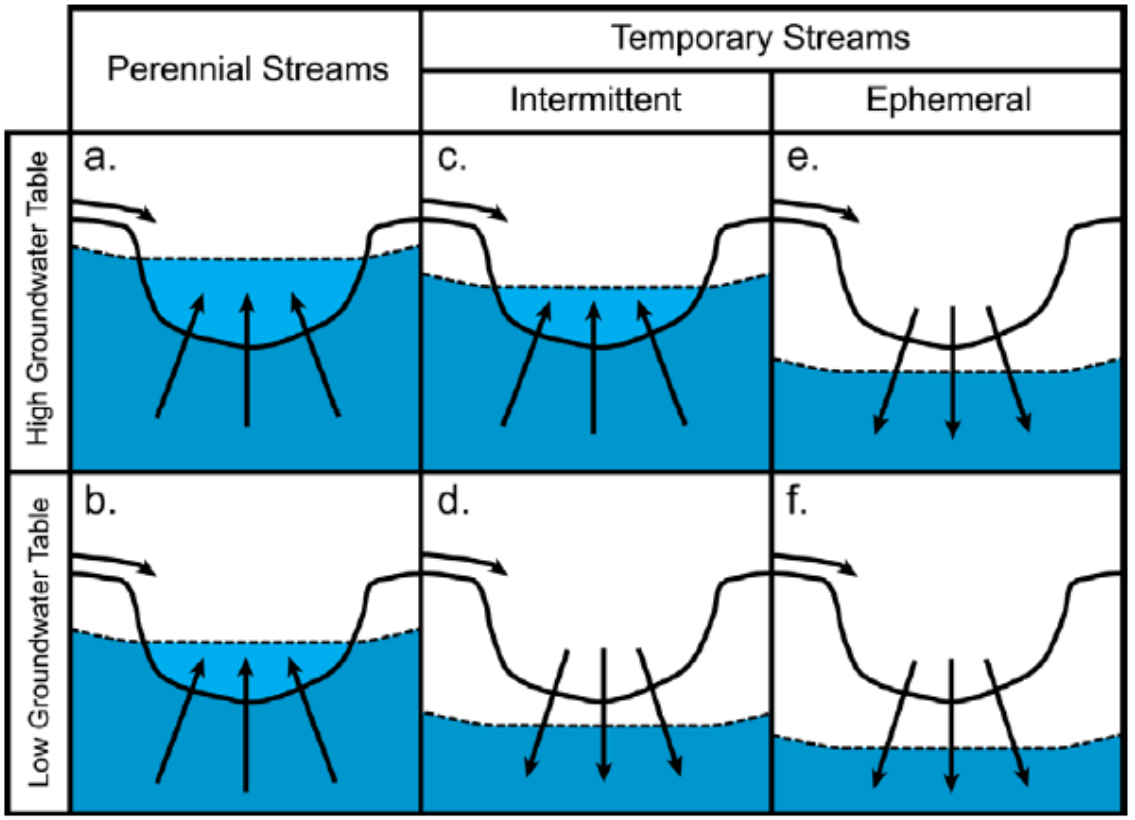


Figure 1. Channel cross-sectional schematic showing perennial, intermittent, and ephemeral streams under high and low groundwater table conditions. Dashed line indicates groundwater table elevation. Arrows indicate surface water and groundwater flowpaths. a) Perennial – High Groundwater: gaining stream. b) Perennial – Low Groundwater: gaining stream. c) Intermittent – High Groundwater: gaining stream. d) Intermittent – Low Groundwater: losing stream. e) Ephemeral – High Groundwater: losing stream. f) Ephemeral – Low Groundwater: losing stream.

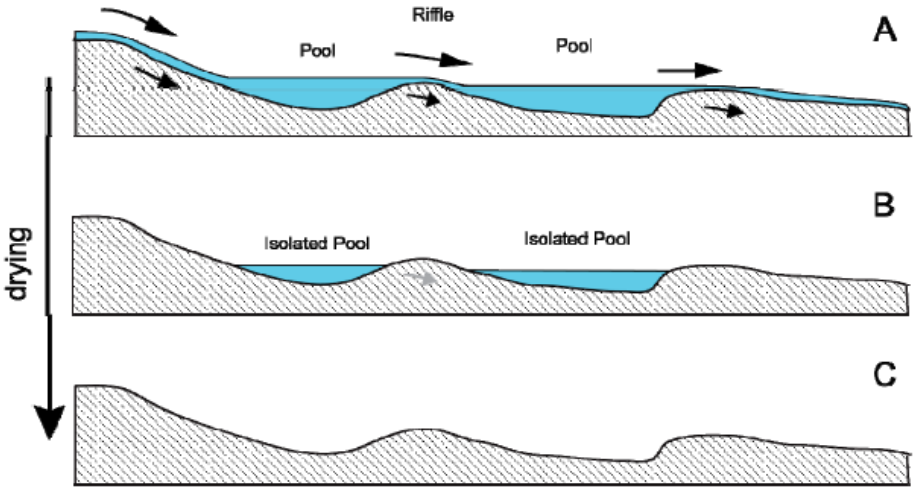


Figure 2. Contraction of a stream reach under increasingly dry conditions. Arrows indicated surface and groundwater flowpaths. A) Surface hydrologic connectivity exists throughout the reach such that pools are connected via riffles. B) As drying persists, riffles dry and pools contract until they are geographically isolated. C) If drying persists long enough, all surface water may be lost groundwater reserves or evapotranspiration.

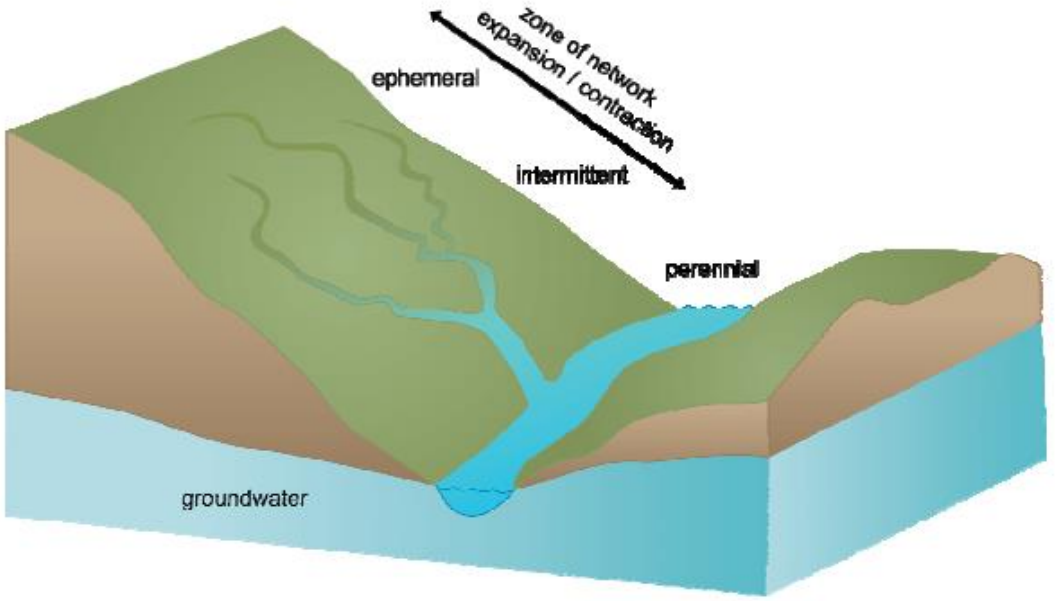


Figure 3. Typical transition from temporary to perennial streams at the headwaters of a river network. Ephemeral and intermittent reaches are a zone of network expansion under wetting conditions and contraction under drying conditions. [Modified from symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science].

McDonough et al (2011)

“Build ecological resilience”
through fish passage enhancement
creation and/or expansion of riparian buffers
Erosion control enforcement
Protection of groundwater recharge areas

Sometimes multiple dimensions need to be reconstructed to recreate these *Dimensions of Connectivity*

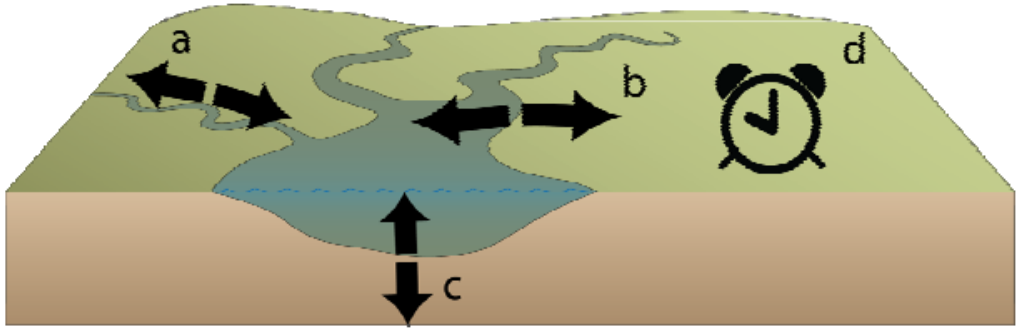


Figure 6. Four dimensions of connectivity within lotic ecosystems (after Ward 1989). a) longitudinal connectivity (channel ←→ channel). b) lateral connectivity (channel ←→ floodplain). c) vertical connectivity (channel ←→ groundwater). d) temporal connectivity (across time). [Modified from symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science].

McDonough et al (2011)

MMSD Kinnicckininic River

Case Study- WisDOT Villa Mann Creek Project

Continue to promote fish passage and recreactional passage improvements on the Mukwonago River and associated tributaries

OCTOBER 12, 2010

SEPTEMBER 15, 2011

JUNE 7, 2011

OCTOBER 27, 2011

Source: SEWRPC.

“Build resilience”
Through creation and/or expansion of riparian buffers

Thomas Slawski, Principal Planner

Southeastern Wisconsin Regional Planning Commission

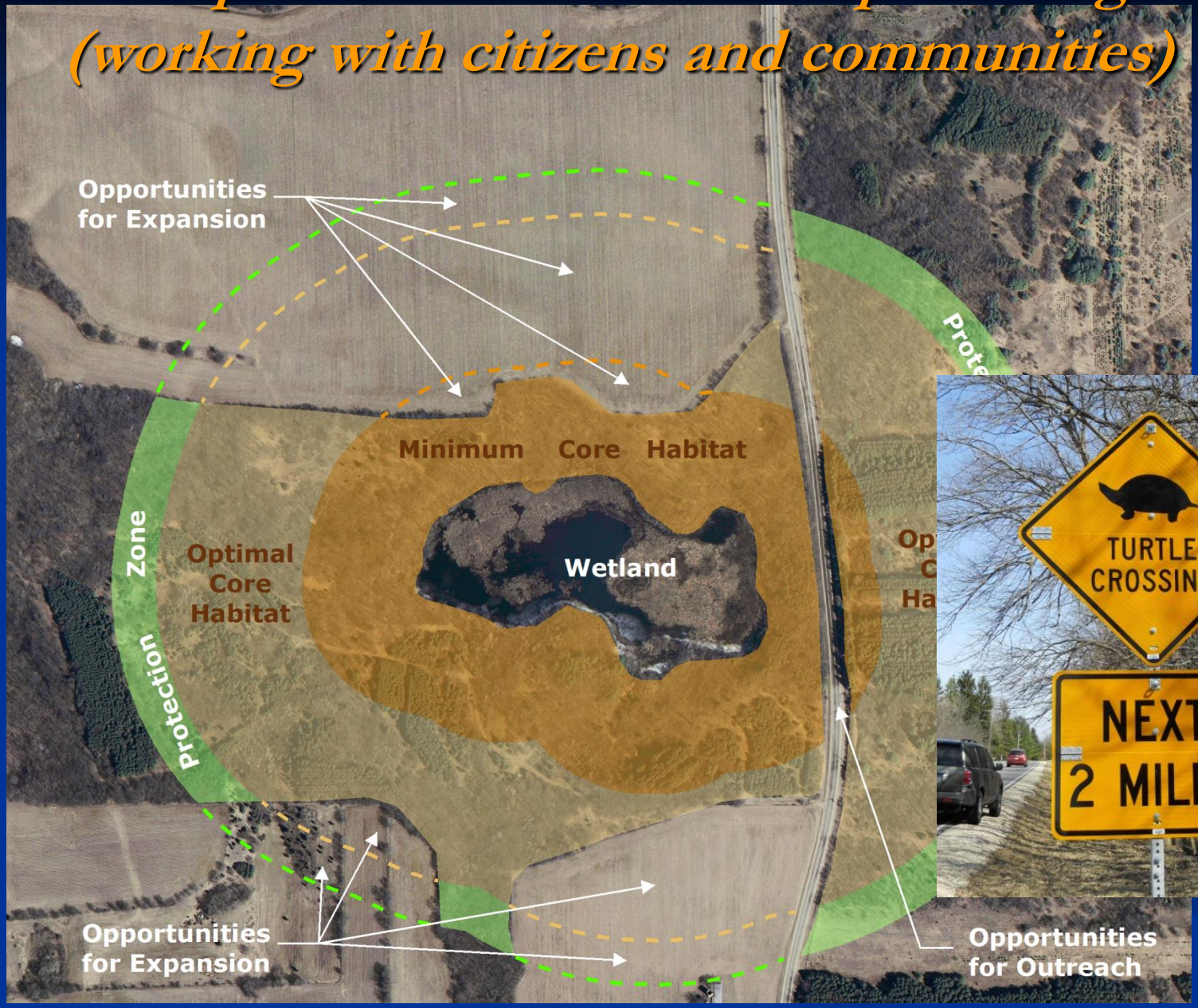
http://www.sewrpc.org/SEWRPCFiles/Environment/RecentPublications/ManagingtheWatersEdge-brochure.pdf

Buffer are the frontline defense against Climate change

"Riparian ecosystems are naturally resilient, *provide linear habitat connectivity, link aquatic and terrestrial ecosystems, and create thermal refugia for wildlife: all characteristics that can contribute to ecological adaptation to climate change."*

(N. E. Seavy and others, Why Climate Change Makes Riparian Restoration More Important Than Ever: Recommendations for Practice and Research, 2009, Ecological Restoration 27(3):330-338)

Effective Implementation is based upon being creative (working with citizens and communities)

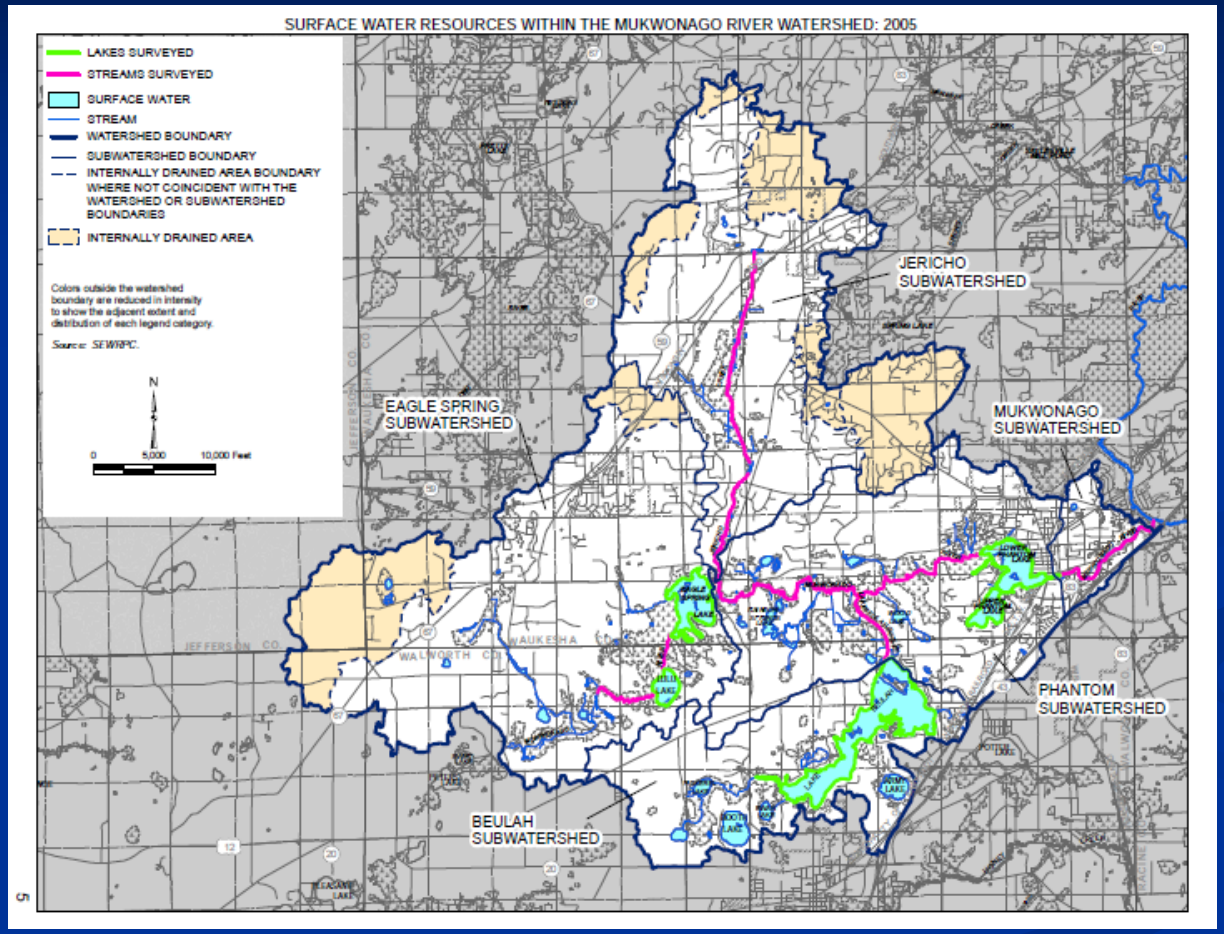


See http://www.sewrpc.org/SEWRPC/Environment.htm

"Build resilience"
Through protection of groundwater recharge

Source: SEWRPC MR 194.

Need refined maps to better identify the extent and location of all the internally drained areas throughout the watershed to protect the groundwater recharge.



Chloride protection: identify existing practices of road salting and work with municipalities to help reduce application of salt particularly at road crossings, adjacent to groundwater recharge areas, and the entire watershed.

“Build resilience” Through protection of groundwater recharge, expansion of buffers, and recreating more natural habitats

Working Together to Improve the Health of our Neighborhood

Did you know....Our neighborhood is part of the Root River and our actions can help *control pollution* between here and Lake Michigan.

To prevent damage to the prairie, and/or disturbing wildlife nesting areas, please stay in the designated mowed observation areas.

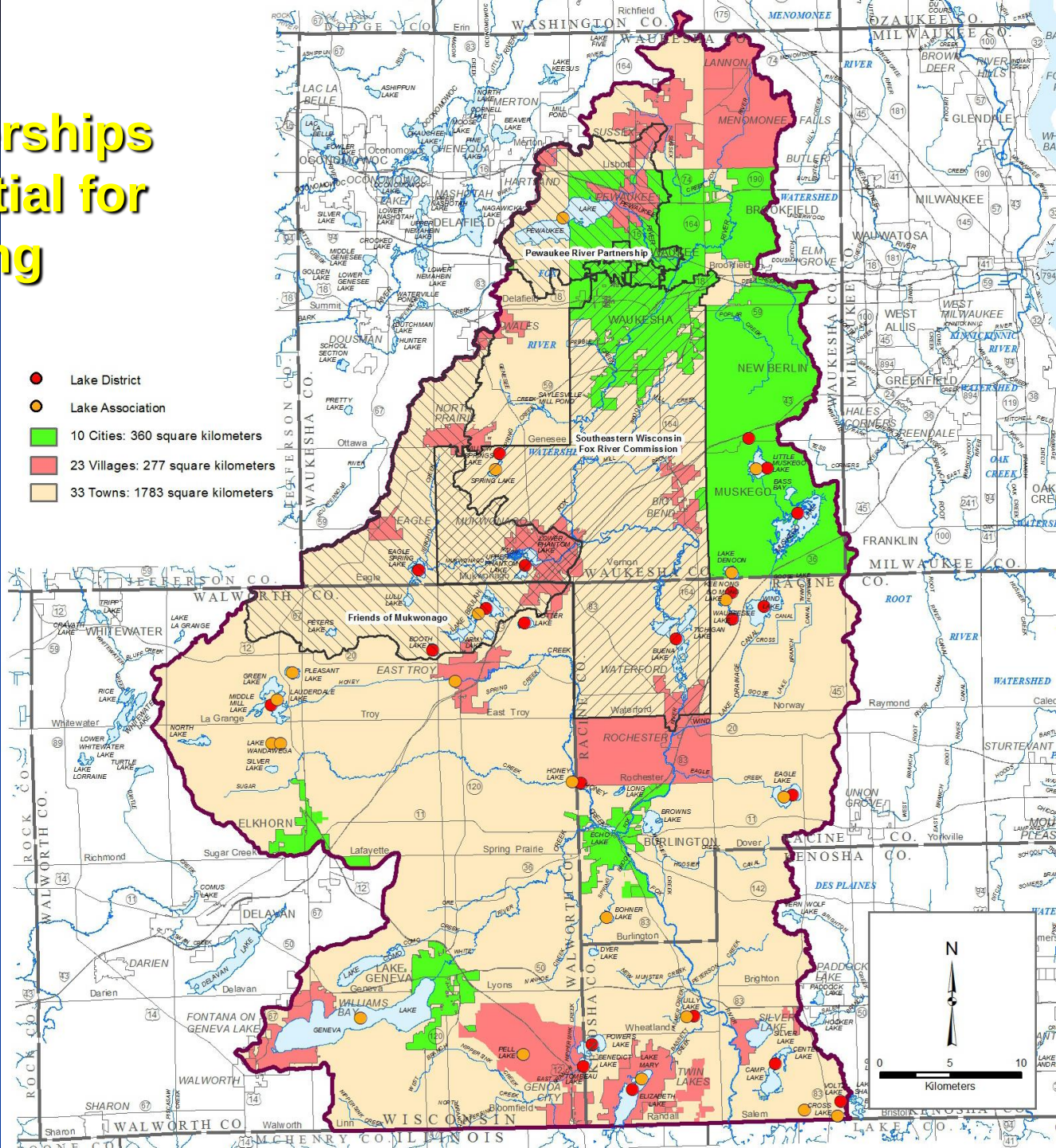
Park Central Home Owners Association
Prairie Restoration Demonstration Project

Funded in part by:
Racine Community Foundation
E.C. Styberg Foundation
Fund for Lake Michigan
Case New Holland
Ruud Lighting

Promotion of development of standards and criteria to encourage homeowners, developers, and municipalities to manage stormwater ponds and associated areas using native wetland and prairie plant species, including provisions for invasive species management:

Retrofit existing basins
Design standards for new developments

Creation of partnerships to increase potential for project funding




Come to the Fox River Summit
Next Friday March 22, 8am, Burlington, WI, Veterans Terrace
Registration is open at the front door!