# Invasive Aquatic Plant Management in WI: Are we making a difference?



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WI Department of Natural Resources

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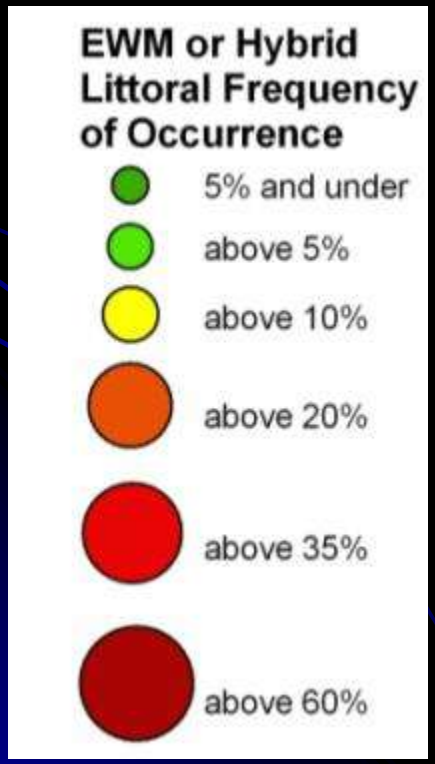
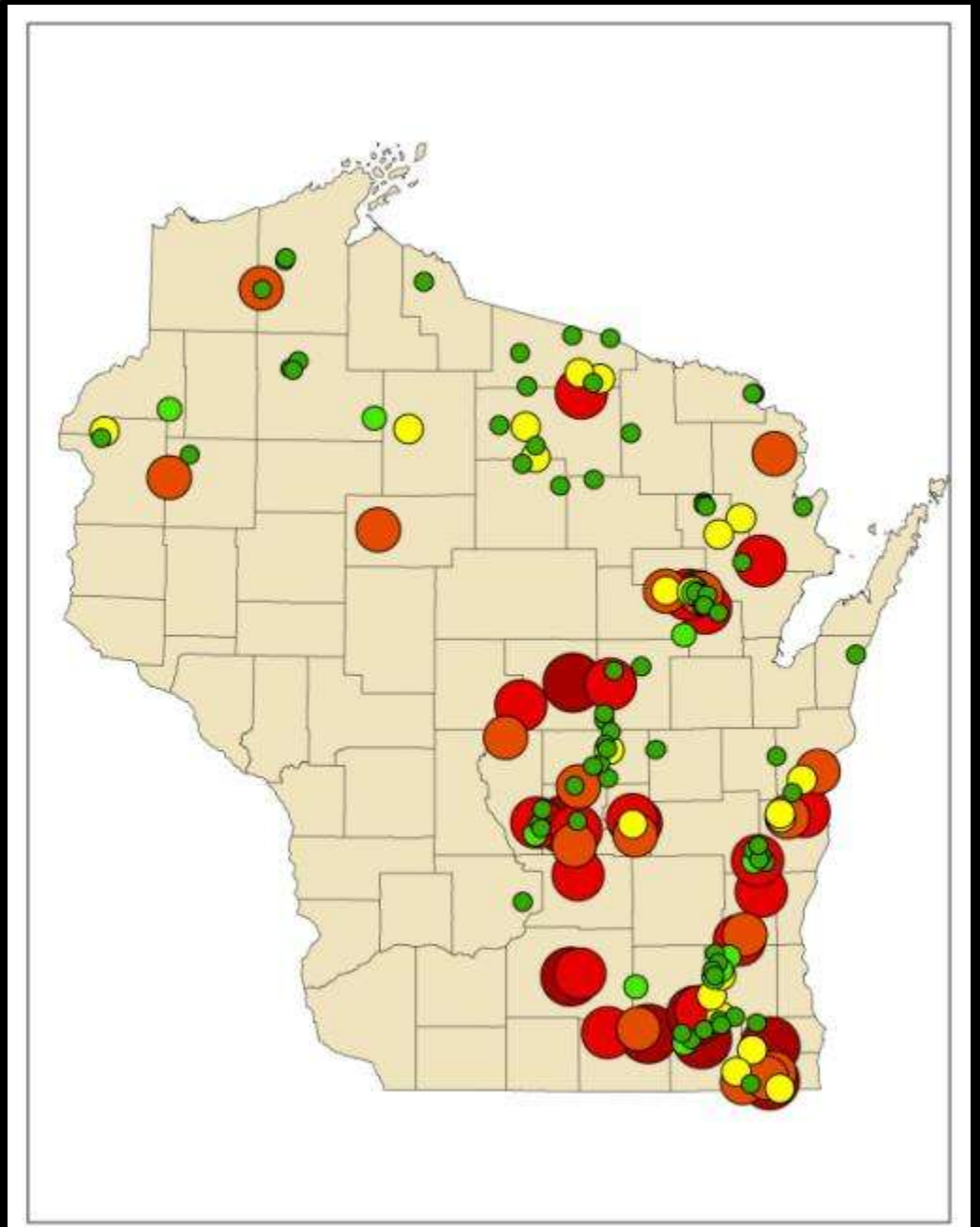
WI Lakes Convention, Green Bay WI

# Littoral Frequency of Occurrence of EWM

Littoral Frequency of Occurrence =

$$\frac{\text{\# of sites with EWM}}{\text{\# sites shallower than the maximum depth of plant colonization}} \times 100$$

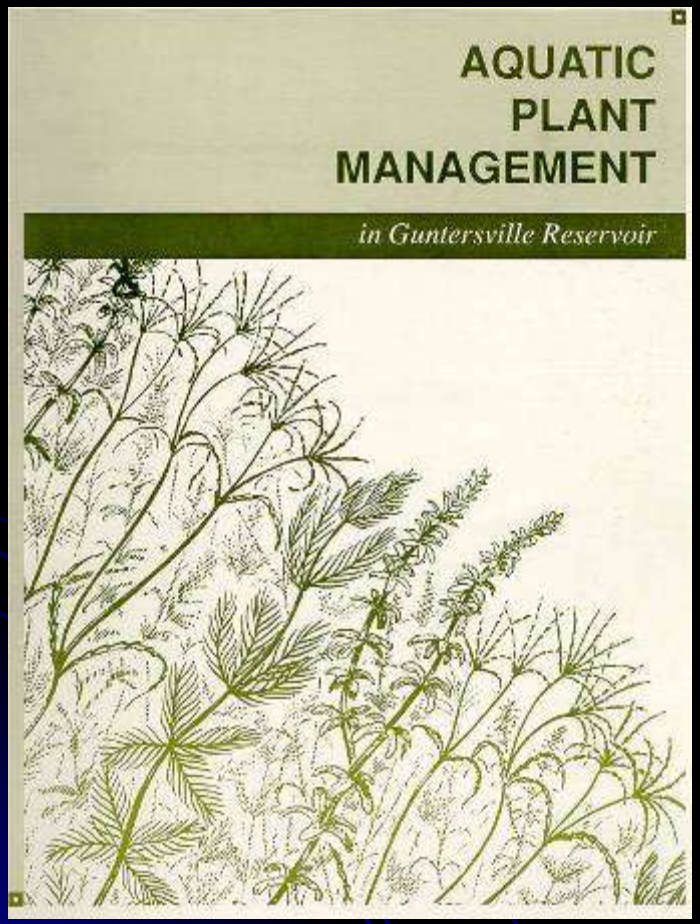


# Wisconsin's Aquatic Invasive Plant Strategy

- **Aquatic Invasive Species Grants**
  - $4 million/year as of July 1, 2008
  - State provides up to 75% cost share
  - New research and demonstration category
- Since 2004:
  - Over *$8 million in prevention and planning projects* for the development of integrated management plans, boating inspection and education projects.
  - *$1,200,000 in early detection and response projects* to curtail spread and provide follow up monitoring, planning and prevention.
  - Approximately *$5 million for chemical, biological and mechanical control* of established AIS

# Aquatic Plant Management Plan




- Goals & Objectives
- Lake Information
- Analysis
- Alternatives
- Recommendations
- Implementation
- Monitoring & Evaluation

**http://www.uwsp.edu/cnr/uwexlakes/ecology/APMguide.asp**

# Post-treatment monitoring and evaluation (compliance)

- Aquatic plant surveys (treatment effectiveness and native impact/response)
- Dissolved oxygen (negative impacts on DO levels from decaying vegetation)
- Water quality (clarity, chl a, TP, pH, etc: algal response to nutrients released from decaying vegetation or less competition from macrophytes)
- Residuals (effectiveness of treatments and safety thresholds)

# Ongoing AIS Research


- Long-term EWM dynamics
- EWM and CLP treatment efficacy
- Residual monitoring
- Weevil study
- Smart Prevention
- Improving communication strategies

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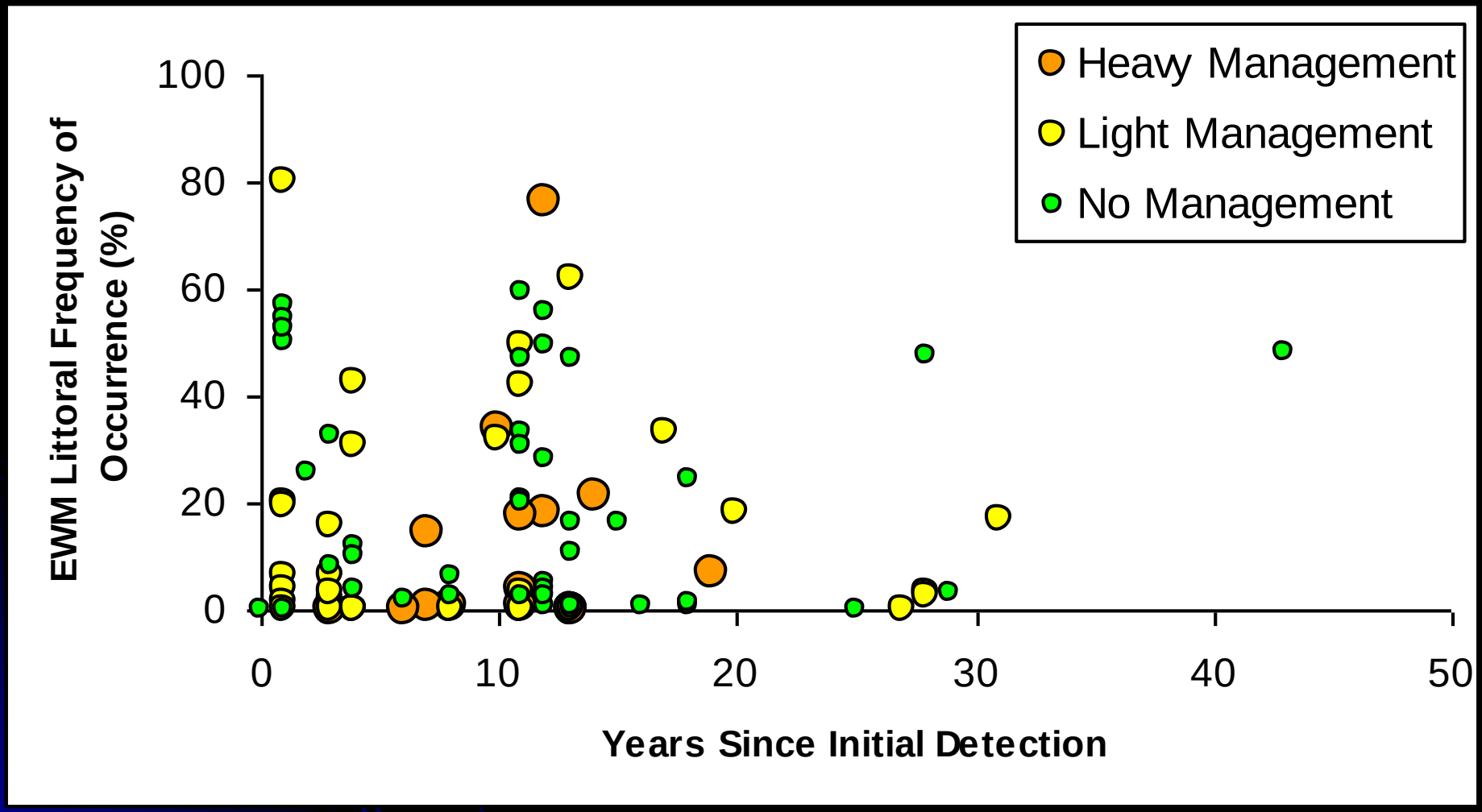
# 2005-2006 Research Results

## 100 lakes survey (25% of EWM lakes statewide)

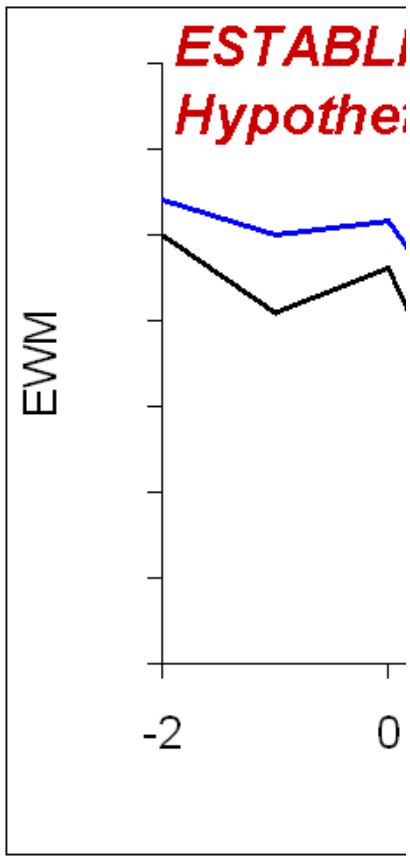


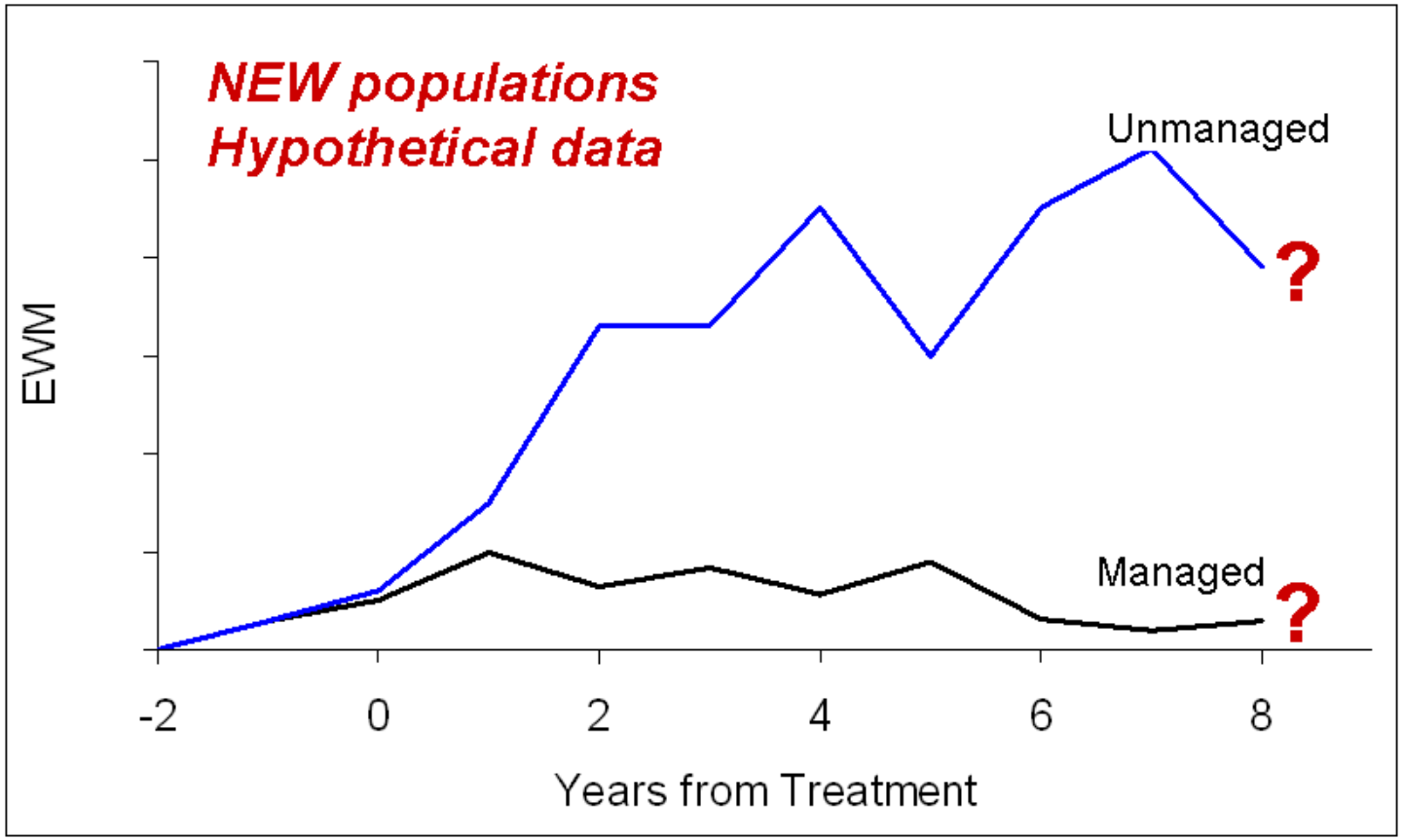

Any management approach can result in wide variation in current EWM

# 24 Lake Long-term EWM Management Study

-How does *strategic* management affect long-term EWM population levels?

Annual aquatic plant survey and biomass collection on 24 lakes over time
3 ecoregions, established and new populations, managed and unmanaged



# Ongoing Treatment Evaluations

- Sandbar & Tomahawk Lake, Bayfield Co.
- Turville Bay, Lake Monona, Dane Co.
- Half Moon Lake, Eau Claire
- Eagle Lake, Racine Co
- Eagle River Chain, Vilas Co.
- Town of Phelps lakes
- Legend Lake
- Kettle Moraine Lake, FdL Co.
- Loon Lake, Shawano Co
- Partnerships with MN and MI

US Army Corps of Engineers

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# Objectives & Approach

- Significantly reduce area infested with Eurasian water milfoil
- Protect the native aquatic plant community density and diversity
- Long term, whole lake management of aquatic plant communities (3-5 years)
- Early season, low dose treatment methodology
- Persistence and concentration of herbicides are being monitored in order to evaluate both effectiveness and risks

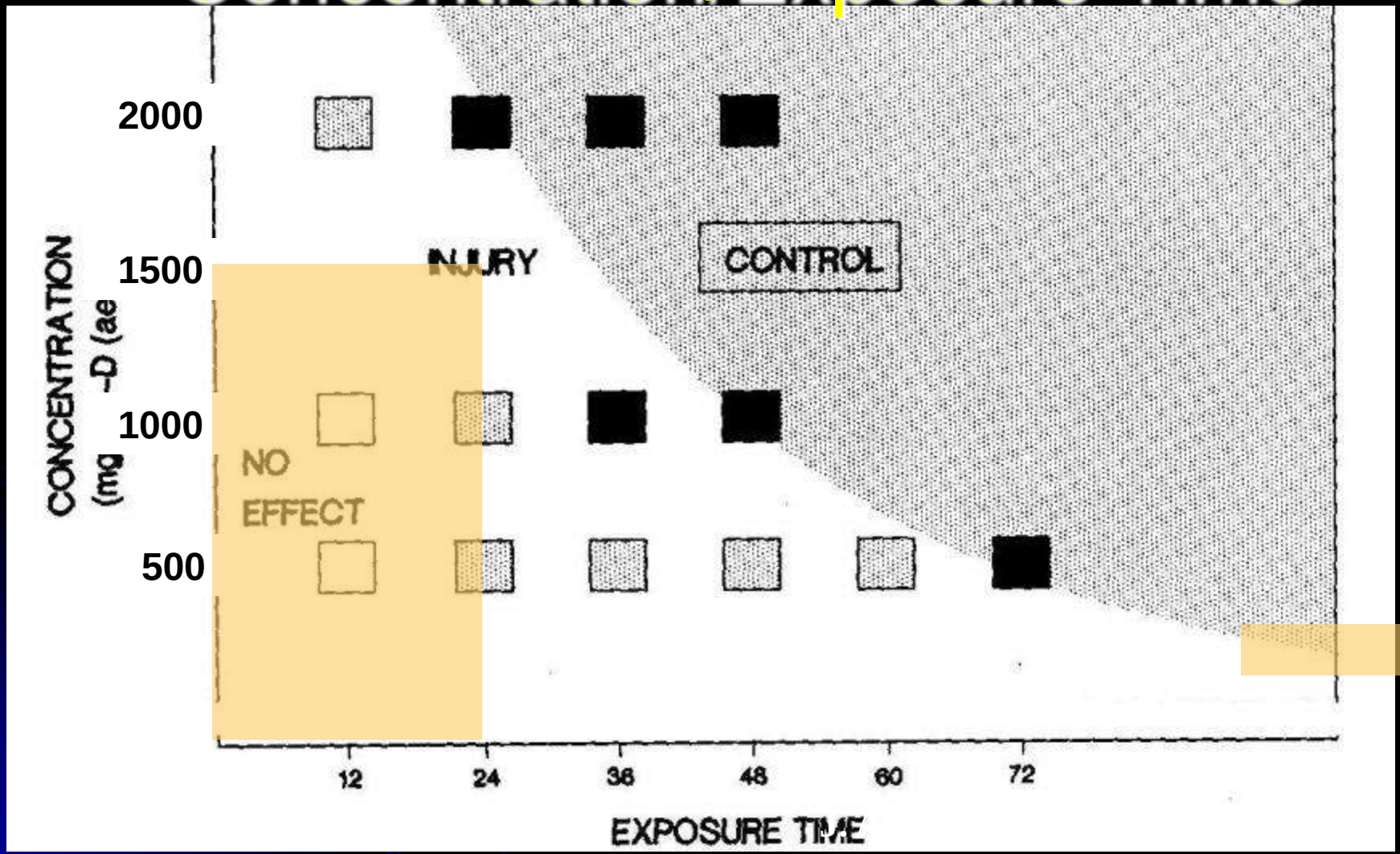
# 2010 Herbicide Residual Sampling, 25 lakes

- Monona, Dane
- Half Moon, Eau Claire
- Loon, Shawano
- Kettle Moraine, Fond du Lac
- Big Sand Vilas
- Long, Vilas
- South Twin, Vilas
- Eagle River Chain (3), Vilas
- Little St Germaine, Vilas
- Frog, Iron
- Eagle, Racine
- Jordan, Portage
- Metonga, Forest
- Minocqua, Oneida
- Kawaquesaga, Oneida
- Tomahawk, Oneida
- Bridge, Oneida/Lincoln
- Mohawksin, Lincoln
- Connors, Sawyer
- Lower Spring, Jefferson
- Kathan, Oneida
- Enterprise, Langlade
- English, Manitowok

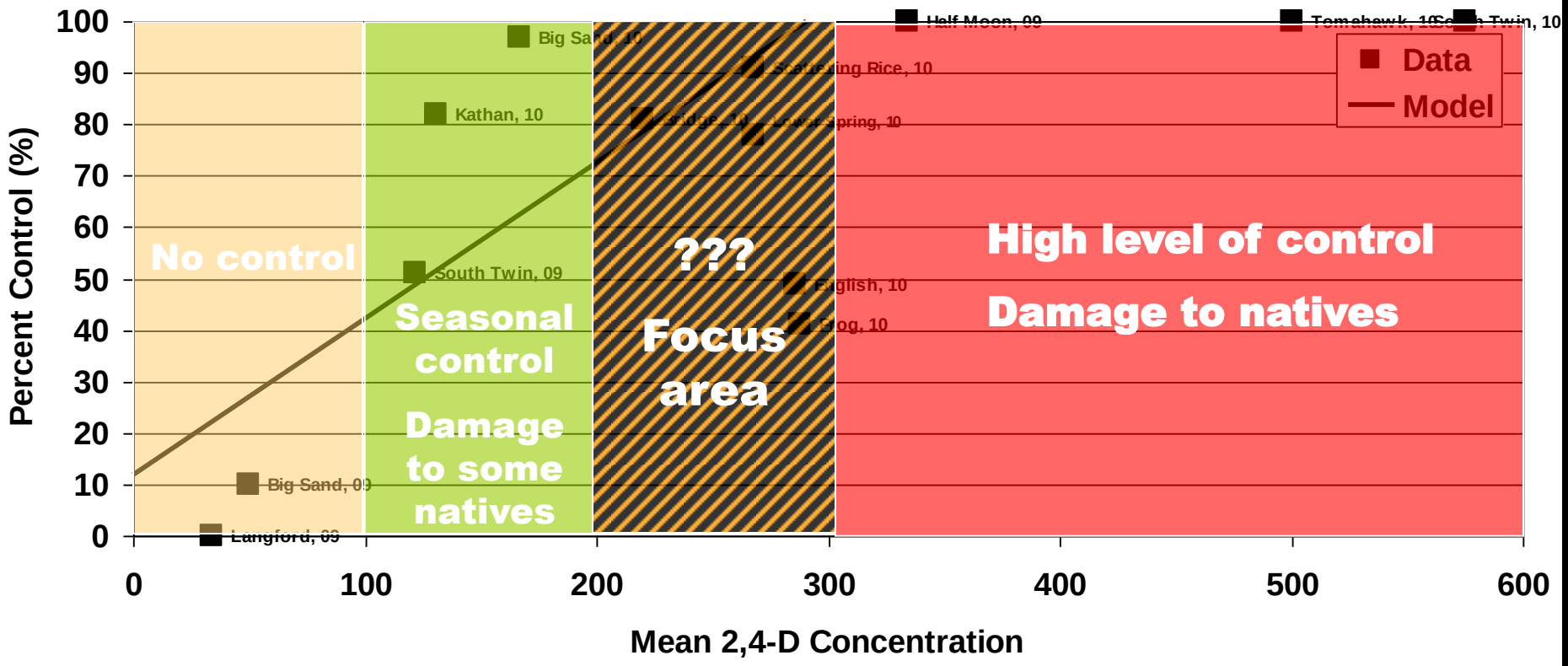
# Preliminary Findings

- Small-scale spot treatments have limited long-term effectiveness due to rapid dissipation
- Early spring, large scale treatments in northern lakes may result in longer persistence of herbicides than expected
- Application approach must be tailored to the site – label guidelines are not adequate
- Residual monitoring is important, both to understand treatment efficacy, as well as ecological risks

# 2,4-D Concentration/Exposure Time



# 2,4-D Whole Lake Treatments

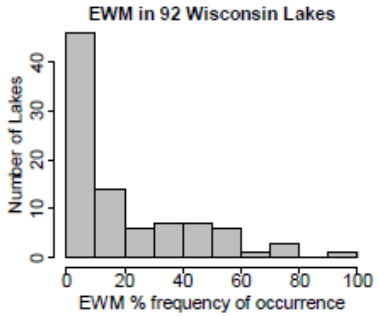



J. Skogerboe, ACOE
and M. Nault, WDNR

# EWM RESEARCH FACTS

The non-native species Eurasian watermilfoil (EWM) has been documented in 540 Wisconsin waterbodies. We know where it occurs, but what are EWM populations in Wisconsin typically like? Research scientists have surveyed 92 EWM lakes in order to answer that question. What they learned surprised them, and challenges some commonly-held EWM myths.

**EWM populations are often small in scale.**




This figure shows the number of lakes observed with different amounts of EWM (measured by frequency of occurrence in the littoral zone). In most lakes, EWM occurred at less than 10% of the sites observed.

Higher EWM levels tend to occur in:

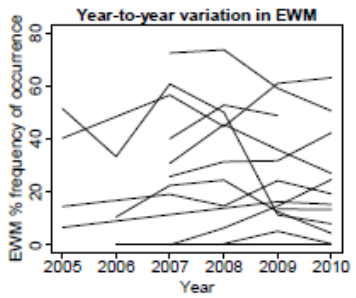
- Southern lakes
- Reservoirs instead of natural lakes
- Lakes with lower water clarity
- Lakes with shallow maximum rooting depth
- Drainage lakes

**EWM isn't always associated with lower species richness.**

EWM has been shown to displace native species, but in some cases, it may simply be taking advantage of altered environmental conditions. Additionally, several long-standing EWM populations have been observed at non-competitive levels.

**EWM distribution and abundance resembles that of several other native species (like coontail, elodea and sago).**

**EWM populations vary over time.**




This figure shows EWM % frequency of occurrence over time in the littoral zone of 13 unmanaged lakes.

Varying trajectories have been observed:

- Decrease over time
- Increase over time
- Constant low level
- Substantial year-to-year variation

**Early response can help keep populations low even in systems where EWM might be expected to do well.**

To better understand the use of strategic management to control EWM, we are tracking population trends and management actions on 24 lakes in Wisconsin. This study will help us assess costs and benefits of EWM management over the short- and long-term.

**Even though EWM can exist at low levels in certain lakes for many years, random disruptive events (like floods or sudden nutrient pulses) can cause EWM to increase.**

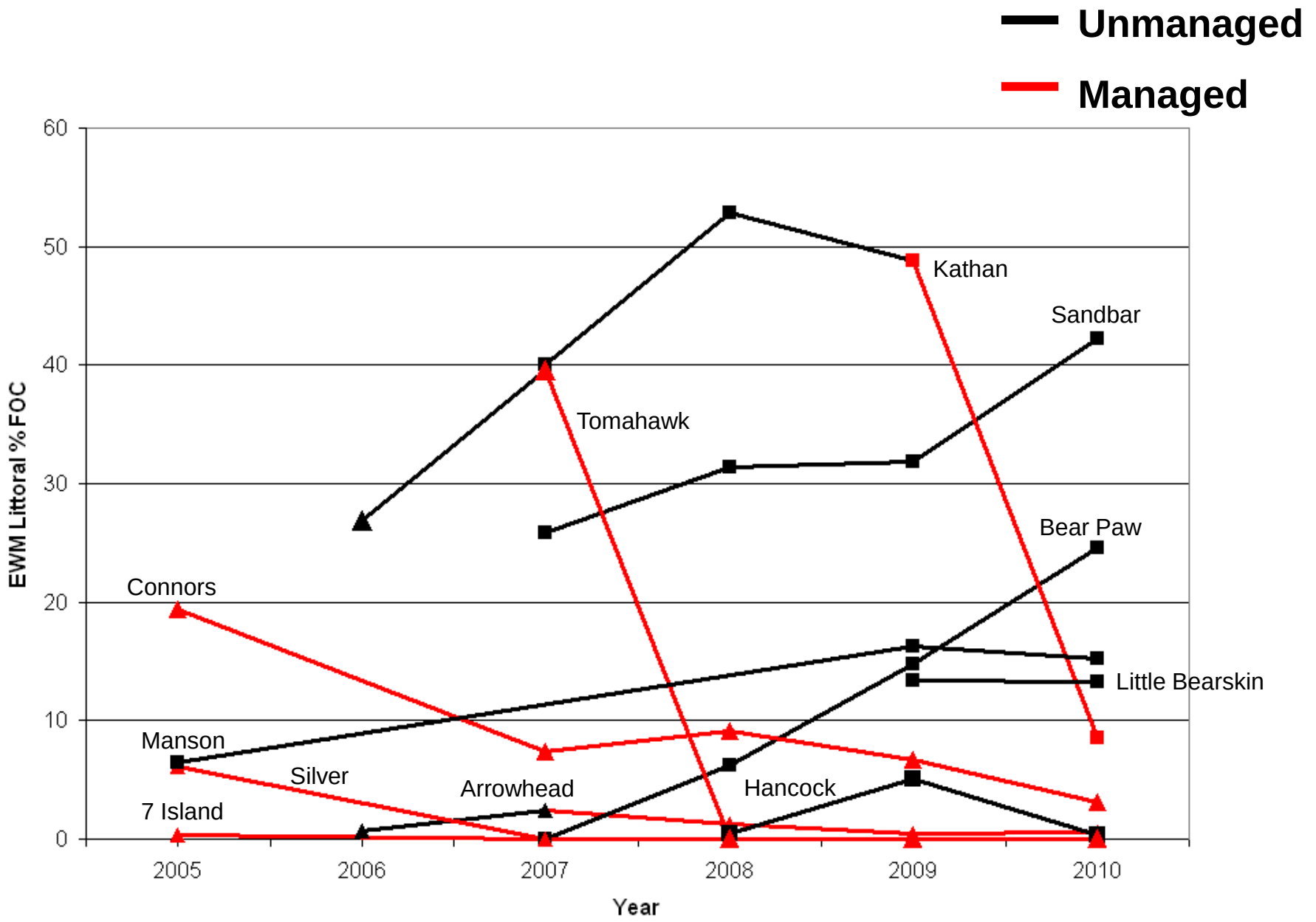
**Eradication is often an unrealistic management goal.**

Reasonable management goals should be set after careful consideration of available science as well as the costs and benefits of available treatment options.

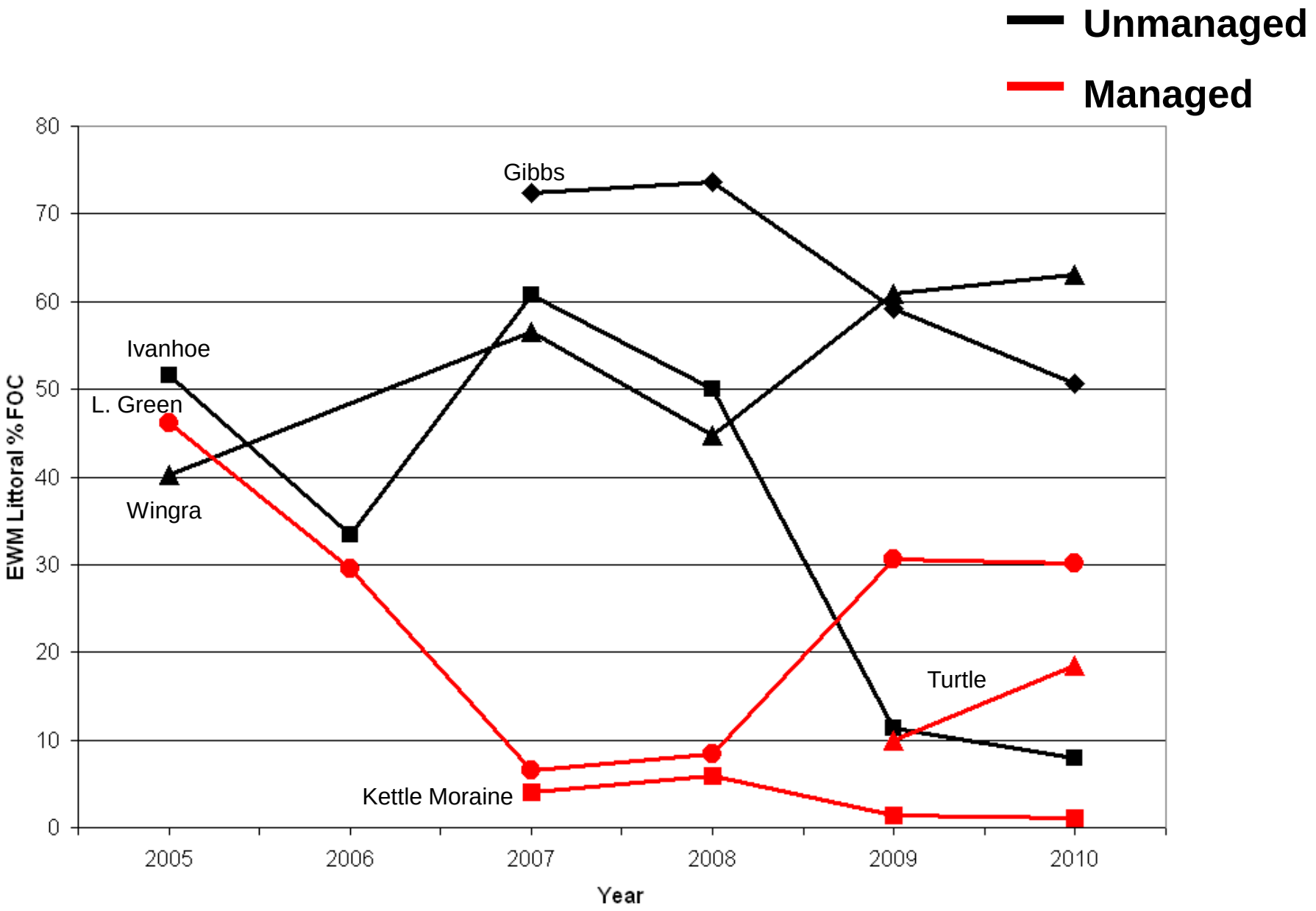
EWM Research Fact Sheet, 2010. Wisconsin Department of Natural Resources Miscellaneous Publication SS-1074 2010.

http://dnr.wi.gov/org/es/science/publications/SS_1074.pdf

# Northern Lakes & Forests



# Southeastern Till Plains



Short-term Results for EWM ☑

Long-term Results for EWM?

Short- and Long-term for Natives?

Short- and Long-term Economic Costs?

New challenges?

# Are we making a difference? Is it worth it?

- If so, what have been the keys to success?
- If not, why not? What could be improved?
- These questions can be answered from the perspective of
  1) Pure cost ($$)
  2) Management effort
  3) Ecological net benefit
- Can we sustain this over time?

# Panel Discussion

- Wayne Towne, Legend Lake
- Brad Roost, Cason and Associates
- Dan Anderson, Long Lake, Vilas Co.
- Tim Hoyman, Onterra, Inc
- Kevin Gauthier, WDNR lake coordinator

# Are we making a difference? Is it worth it?

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# Looking forward

- Can we sustain this effort over time in terms of funding, volunteers, technical support?
- Are the potential risks to native plants, people, or aquatic life acceptable?
- Should the State be spending grant money on a smaller number of projects where we know we can be successful in the long term, or spread the money out to as many projects as possible?
- How much should we invest in monitoring and evaluating new techniques?

# Food for thought

- What are the upsides of whole-lake treatments?
- What are the downsides of whole-lake treatments?
- What are the costs of not managing on a lake-wide scale?
- If we can get populations below 10% of the lake area, do our management options change?

# Food for thought

- When we start treating, how much effort for how long will we need to keep the population in check?
- What happens when we stop managing?
- When does the scale tip?
- Who decides what level of effort lakes SHOULD pursue?

# Food for thought

- Are there certain situations that should be managed with higher priority?
- What would we gain from a coordinated regional containment versus lake by lake shielding effort?
- What are the costs of not managing on a landscape or regional scale?