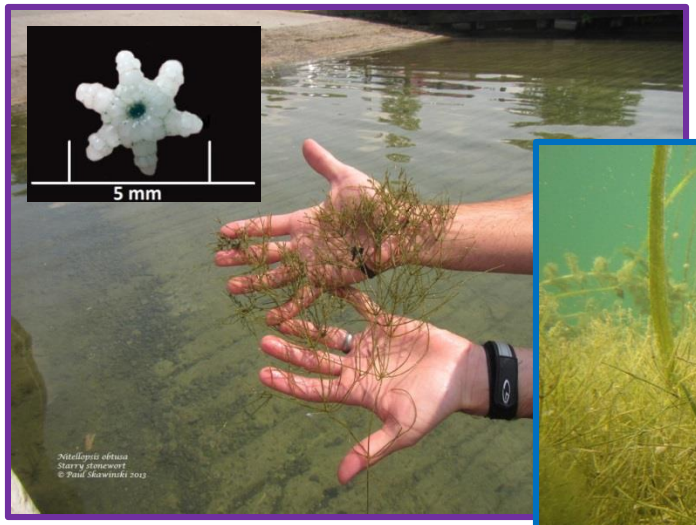
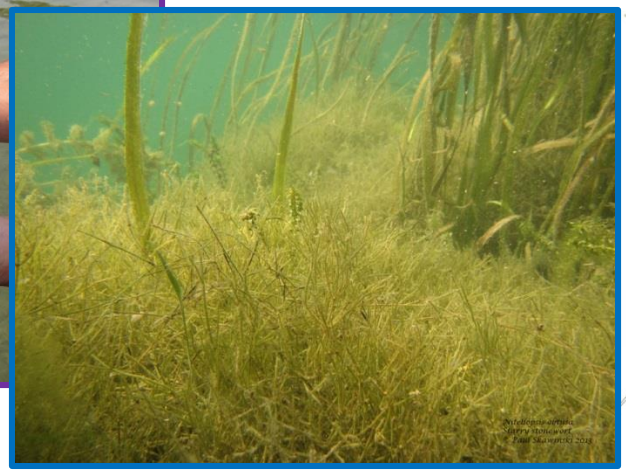
Management of starry stonewort, *Nitellopsis obtusa*

Tim Plude, WI-Department of Natural Resources

What is starry stonewort?

- Starry stonewort, *Nitellopsis obtusa* is a member of the Characeae family
- Characeae are macrophytic green algae that can range in size from centimeters to meters
- *Chara* and *Nitella* species are found around the world.





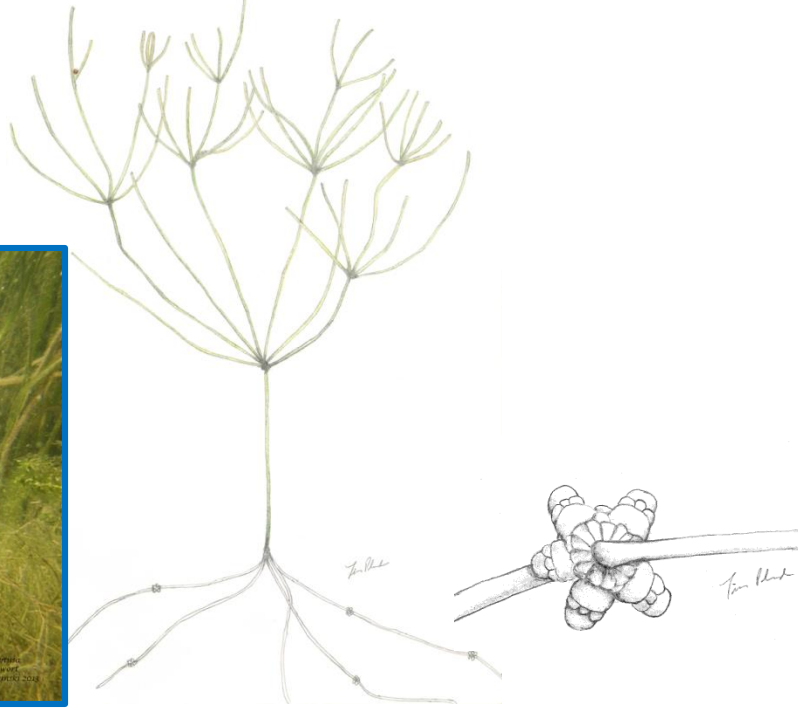


Photo credit: Paul Skawinski

Why is it a Problem?

- Bulbils are small and easily hid
- Bulbils are not susceptible to herbicide
- Nodes can form into bulbils
- Species is hard to ID

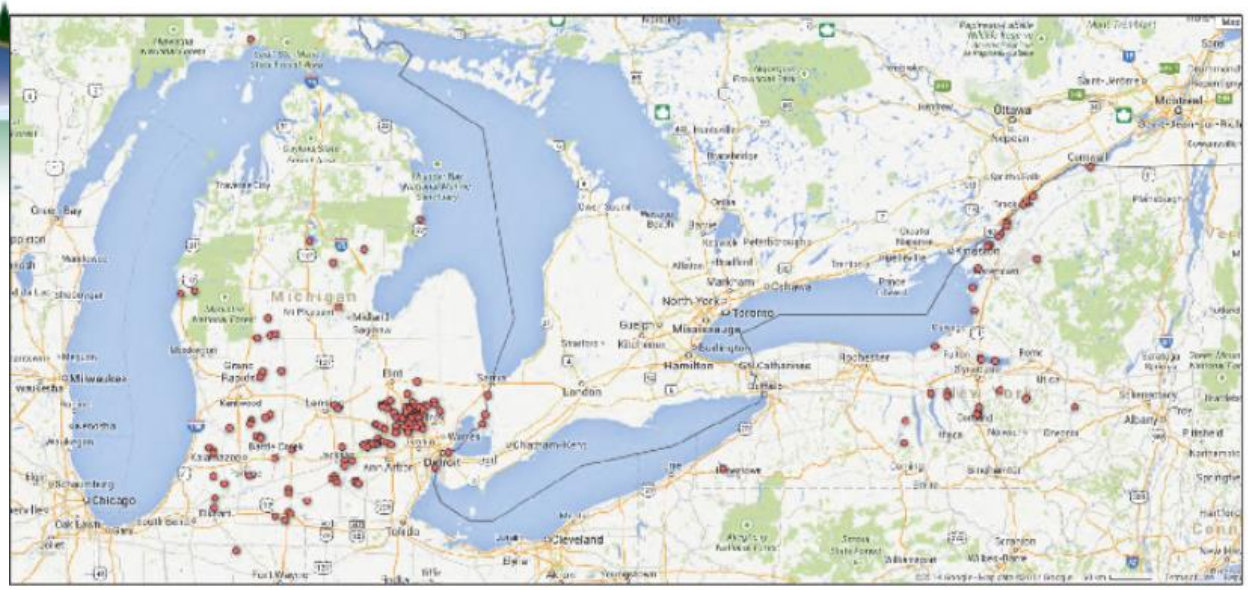
<u>One Positive Note:</u>

Only Male plants have been found in USA = only reproducing via asexual means

<u>Photo Credit:</u> right-hand side Brad Steckart, left-hand side Paul Skawinski

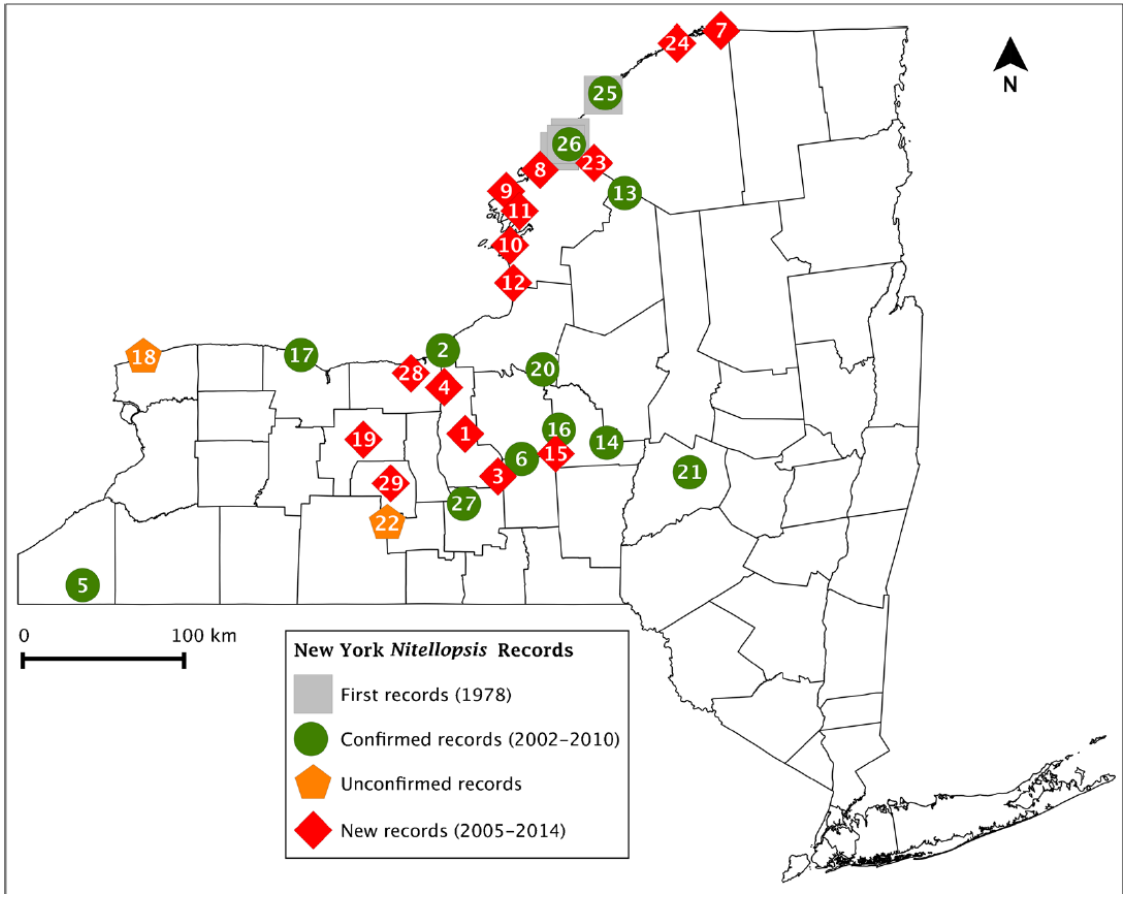
US Distribution

NY, VT, PA, MI, IN, WI, MN



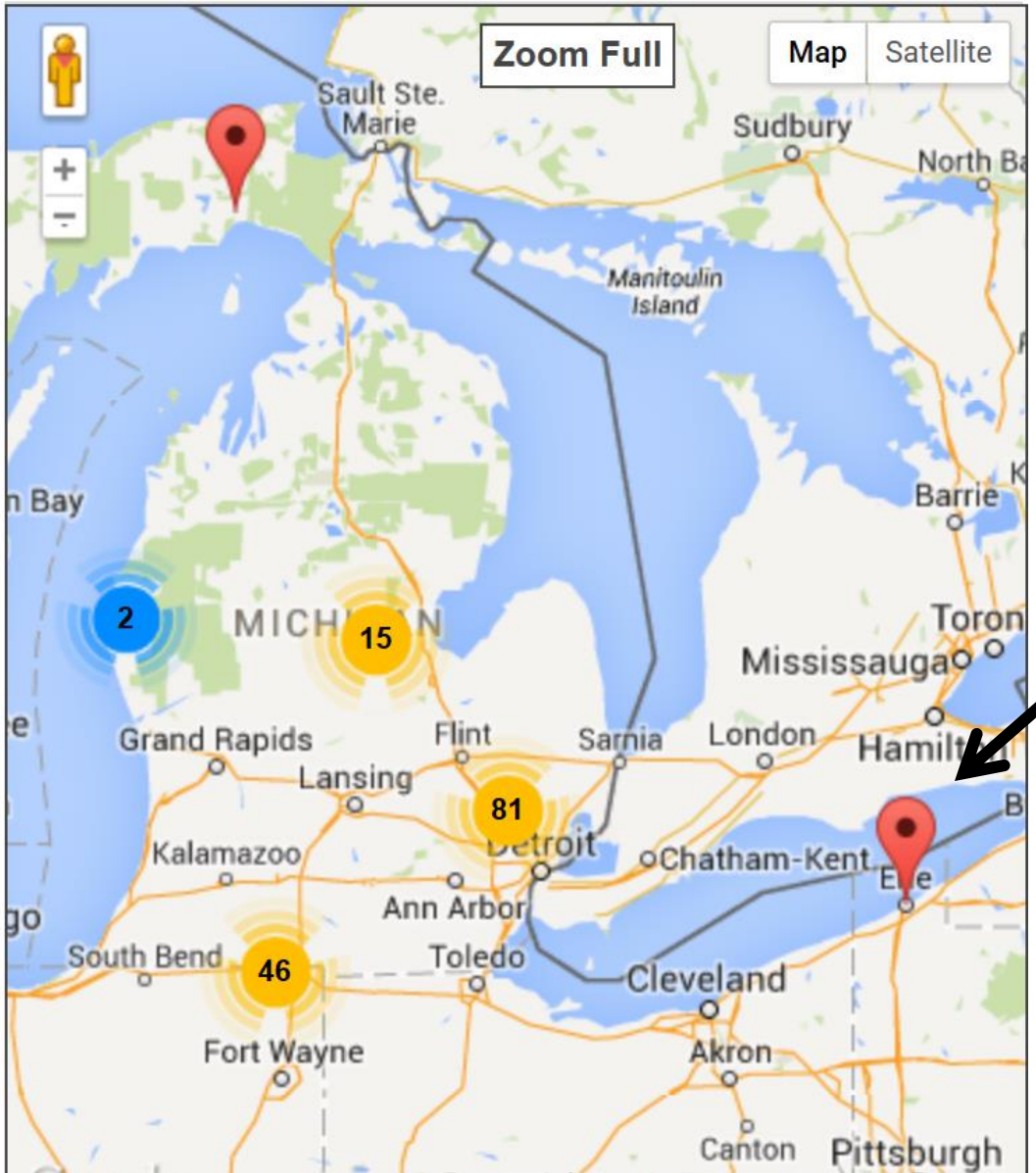
Worldwide Distribution

New York



Sleith R.S. et al (2015)

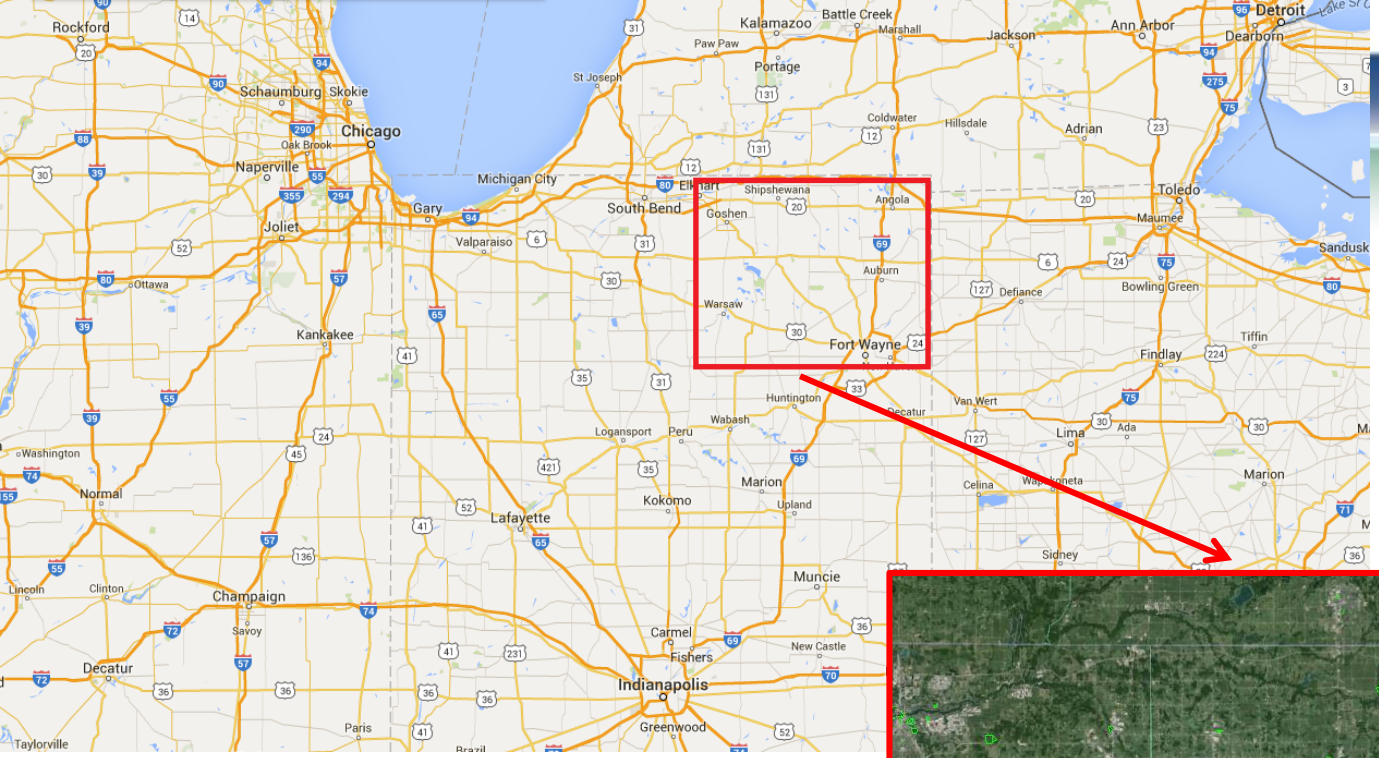
Michigan and Pennsylvania



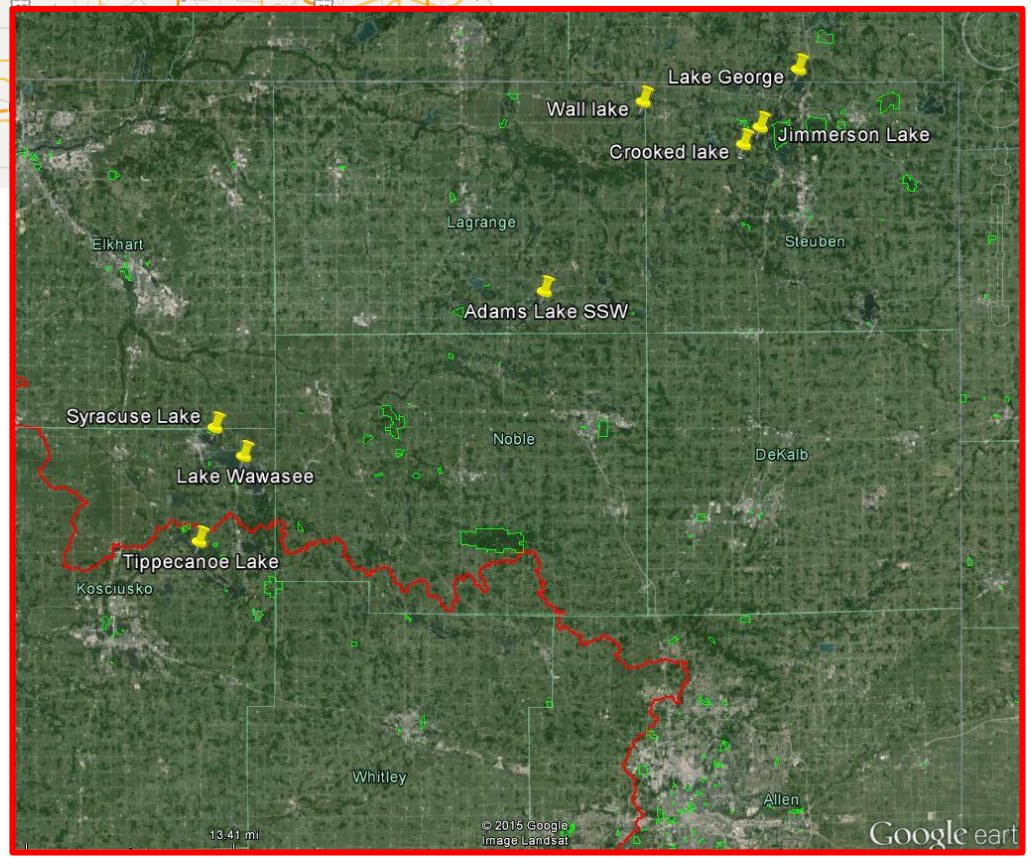
PA's only discovered population

Michigan

- Aquatic Nuisance Control tracking system is under construction- no data to show
- Contractor conversations: Doug Pullman, Jeff Knox, Scott Brown, Paul Hausler
- Unpredictable behavior,
- exponential increase in infested lakes identified,
- 70-75°F for active growth,
- few anecdotal accounts of eradication (one with no management),
- one account of growth from 10 to 250 acres in 3 years (Lake Templane)


Rockford
Schaumburg
Skokie
Chicago
Oak Brook
Naperville
Joliet
Gary
Michigan City
Valparaiso
Kankakee
Ottawa
Kalamazoo
Battle Creek
Marshall
Jackson
Ann Arbor
Detroit
Dearborn
Paw Paw
Portage
St Joseph
Coldwater
Hillsdale
Adrian
Toledo
Maumee
Elkhart
Shipshewana
Goshen
South Bend
Angola
Auburn
Warsaw
Fort Wayne
Defiance
Bowling Green
Findlay
Tiffin
Huntington
Wabash
Logansport
Peru
Decatur
Van Wert
Lima
Ada
Marion
Kokomo
Upland
Celina
Sidney
Muncie
Lafayette
Champaign
Savoy
Decatur
Carmel
Fishers
New Castle
Indianapolis
Greenwood
Paris
Taylorville
Lincoln
Clinton
Normal
Washington

Indiana


Lake George
Wall lake
Jimmerson Lake
Crooked lake
Lagrange
Steuben
Elkhart
Adams Lake SSW
Syracuse Lake
Noble
DeKalb
Lake Wawasee
Tippecanoe Lake
Kosciusko
Whitley
Allen
13.41 mi
© 2015 Google
Image Landsat
Google eart

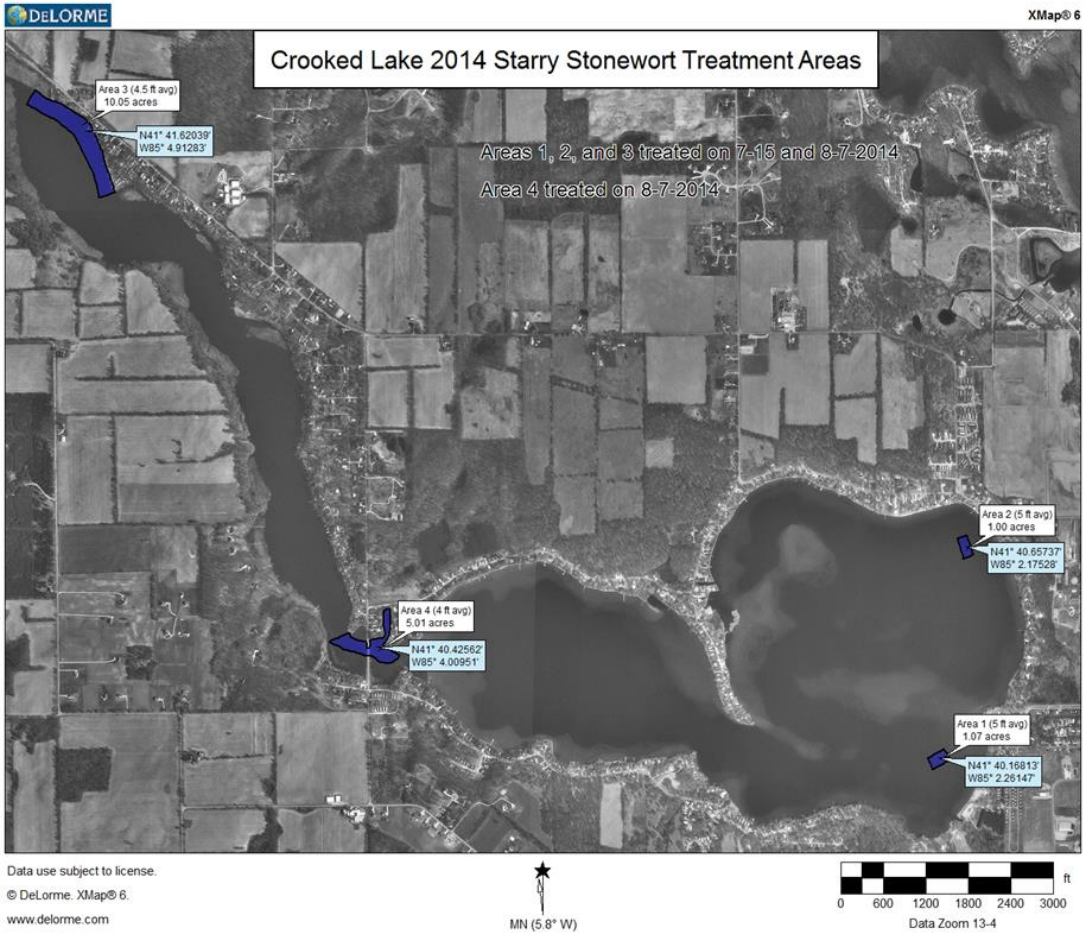
Indiana

- Source: Eric Fischer, IN-DNR AIS Coordinator
- Treating starry stonewort for 7 years
- 8 lakes in Indiana infested
- Working with Clemson Univ. and Applied Bio-chemists on algal assay
- Study Lakes: Crooked Lake & Lake George

Crooked Lake

- 2012, 3.0% freq.; June: **8.1** ac, July: **9.1** acres SSW treated
- 2013, 5.0% freq.; surveyed no treatment
- 2014, 10.0% freq.; July: **12.07**ac, August 7: **17.08** ac treated

Cutrine ultra 2.4 gallons/ac-ft & Hydrothal 191 1 quart/ac-ft



801 acres
Mean depth= 12 feet
Treating SSW since 2010
Also treats EWM and CLP

Lake George

- 2009, 1.1% freq.; **5** acres treated (Fall)
- 2010, 5.9% freq.; June 1: **5**ac., June 29: **5**ac., Aug.: **2**ac., Sept. **4.5**ac.
- 2011, 10.0% freq.; June 8: **7**ac., June 22: **7**ac., July 25: **7**ac., Aug 12: **7**ac., Sept 14: **24.7**ac.
- 2012, 6.3% freq.; May: **7**ac., June: **29.2**ac., July: **9.2**ac., Oct.: **20.8**ac.
- 2013, 15.0% freq.; July 10: **42.86**ac., Aug 22: **37.86**ac., Sept 16: **17.87**ac.
- 2014, 28.8% freq.; July 15: **90.3**ac., Aug 13: **90.3**ac., Sept 26 4.96ac (mill pond)

2014 also reported a snail die-off possibly linked to treatment

Cutrine ultra 2.4 gallons/ac-ft & Hydrothal 191

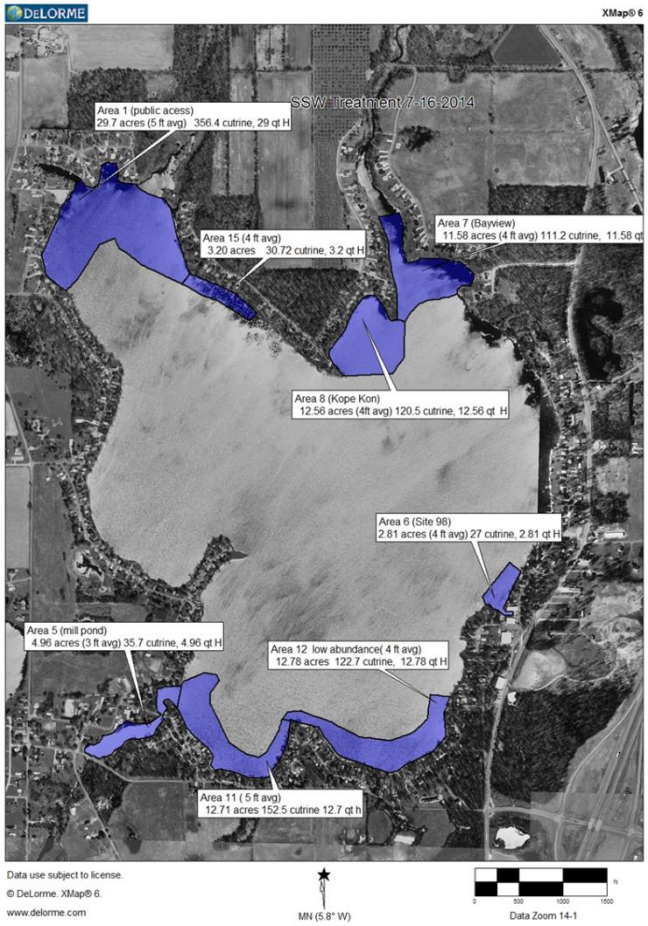
1quart/ac-ft

509 acres

Mean depth= 22 feet

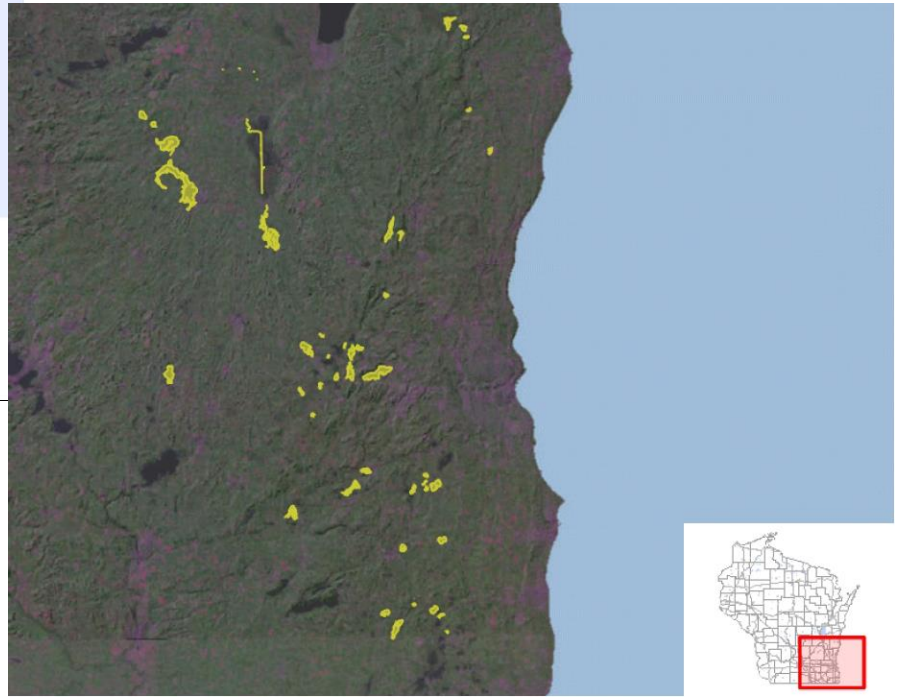
Treating SSW since 2009

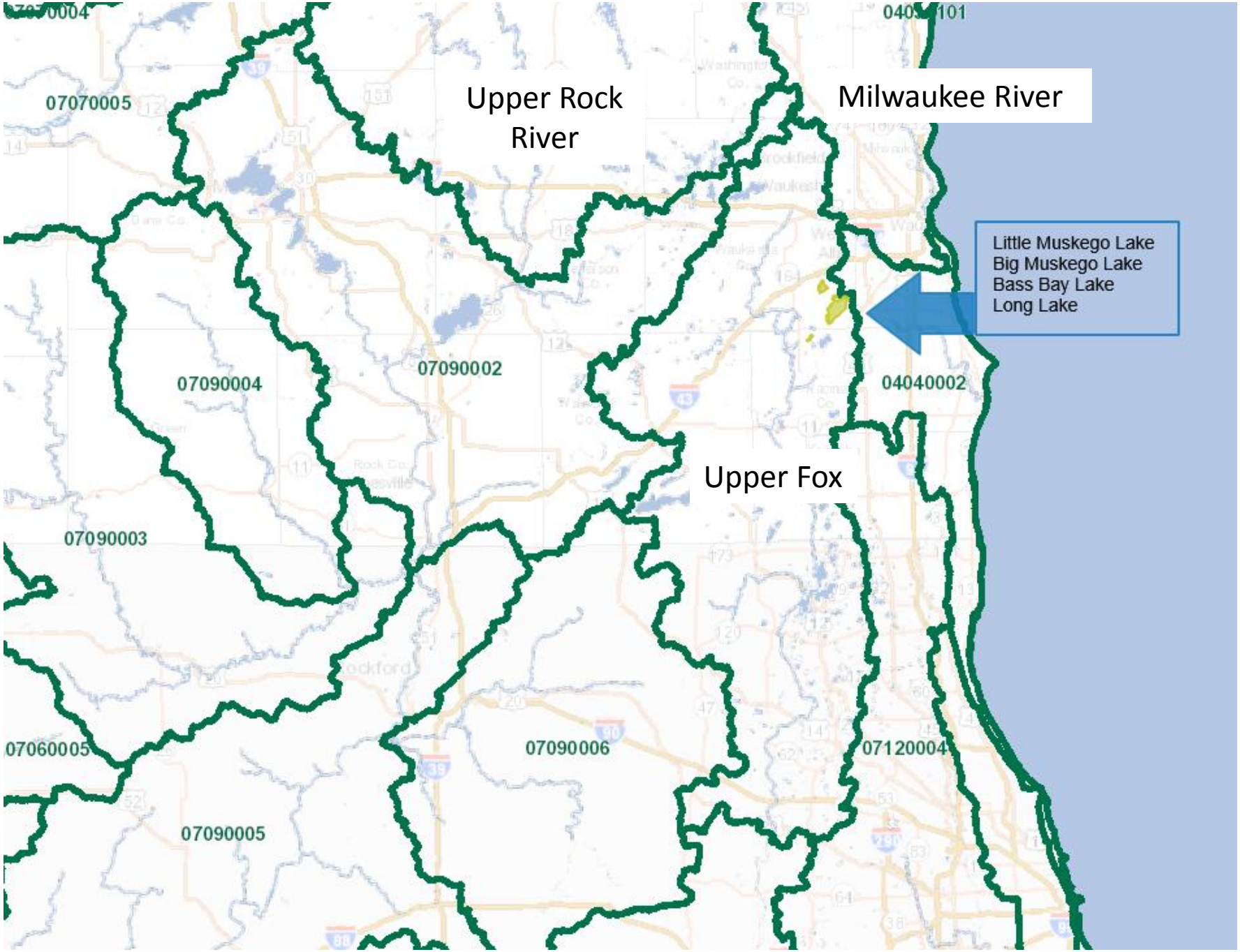
Also treats EWM



Wisconsin

Lakes searched for starry stonewort in 2015 by DNR & partners




07070004
04050101
07070005
Upper Rock River
Milwaukee River
Little Muskego Lake
Big Muskego Lake
Bass Bay Lake
Long Lake
07090002
07090004
04040002
Upper Fox
07090003
07060005
07090006
07120004
07090005

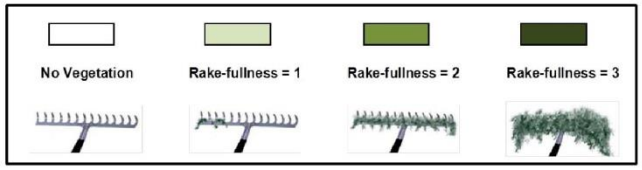
Little Muskego Lake

- Stakeholder team formed and met
- Apply for WI-DNR Rapid Response Grant
- Activities:
  - Riparian notification
  - Signage at Launches
  - CBCW
  - Multiple surveys
  - Hand-Pulling and DASH
  - Considering Drawdown & Chemical trials 2016
  - Possible Dredging 2017

Lake Attributes:

- 470 acres
- Drainage Lake
- Waukesha County
- Max depth 65 feet
- Mesotrophic
- 4 public boat landings

Nitellopsis obtusa found throughout western bay approx. 30 acres (a few satellite populations south and east)



N

Nitellopsis obtusa

starry stonewort

Rake Densities

- 0
- 1
- 2
- 3

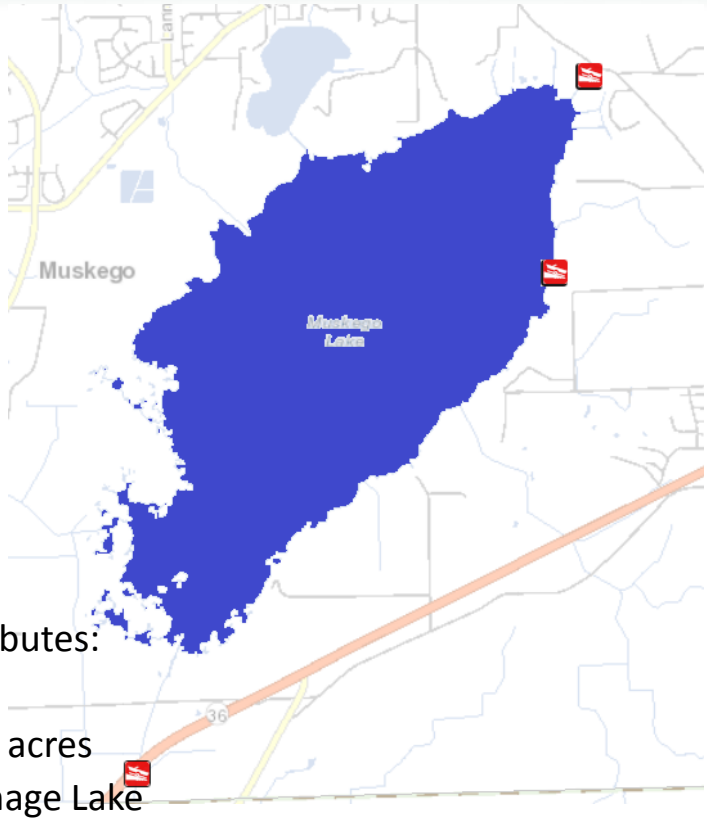
WISCONSIN DEPT. OF NATURAL RESOURCES

Map Created: Oct. 7, 2015

0 0.25 miles

Big Muskego Lake

- District, DNR and City communicate
- Apply for WI-DNR grant
- Activities:
  - Manual removal of dense beds at launches
  - Riparian notification
  - Signage at Launches
  - CBCW
  - Plant survey (PI method)
  - 2015 Experimental chemical control at launches *decrease biomass at launches



Lake Attributes:

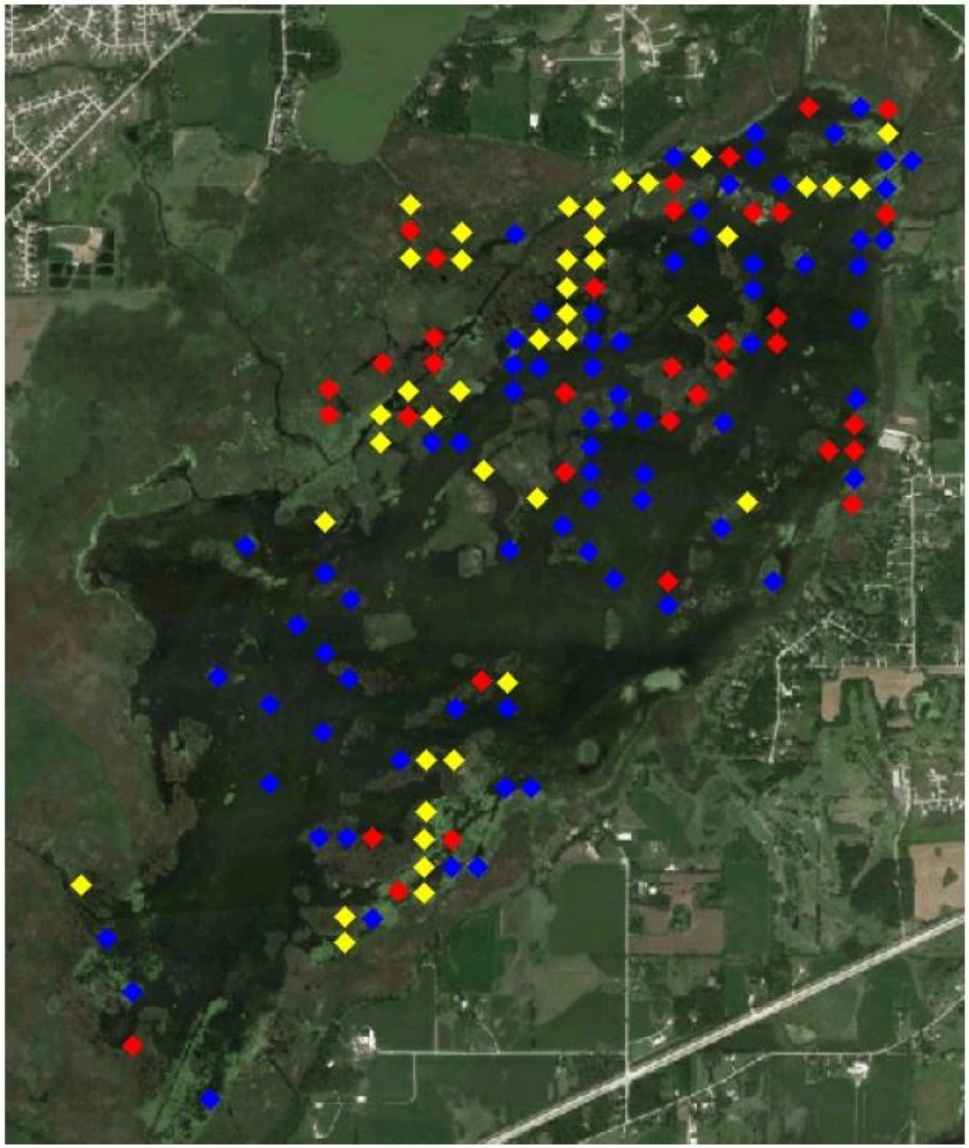
- 2194 acres
- Drainage Lake
- Waukesha County
- Max Depth 3 feet
- Eutrophic
- 2 public boat landings

0.75 ac w/Clipper 0.2ppm <u>and</u>
1.5 ac w/ Cutrine Ultra 0.8ppm & Hydrothal 191 0.17ppm Sept. 24, 2015

Nitellopsis obtusa thought to be wide spread (PI Survey results to come)

Big Muskego Lake, Waukesha County, WI

Sites with Starry Stonewort



Rake Fullness :
- 1
- 2
- 3
- (Visual)

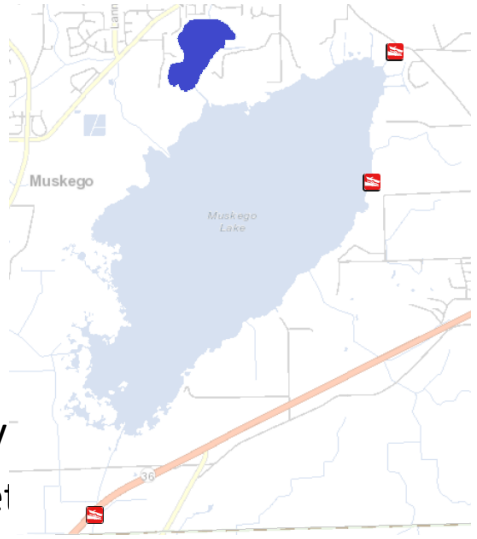
Total # Sites: 152

Source:

Marine Biochemists
6302 W. Eastwood Ct.
Mequon, WI 53092
(888) 558-5106
www.marinebiochemists.com

Bass Bay Lake

- Currently vouchering and verifying
- Will work with Bass Bay Lake/Big Muskego Lake District on planning steps



Lake Attributes:

- 104 acres
- Drainage Lake
- Waukesha County
- Max Depth 23 feet
- Eutrophic
- Boat access through Big Muskego Lake

Nitellopsis obtusa thought to be wide spread; highly dense in channel to Big Muskego Lake

Figure 11

Bass Bay, Waukesha County, WI

Sites with Starry Stonewort

Rake Fullness :
- 1
- 2
- 3
- (Visua

Total # Sites: 2

Source:

Marine Biochemists
6302 W. Eastwood Ct.
Mequon, WI 53092
(888) 558-5106
www.marinebiochemists.com

Long Lake

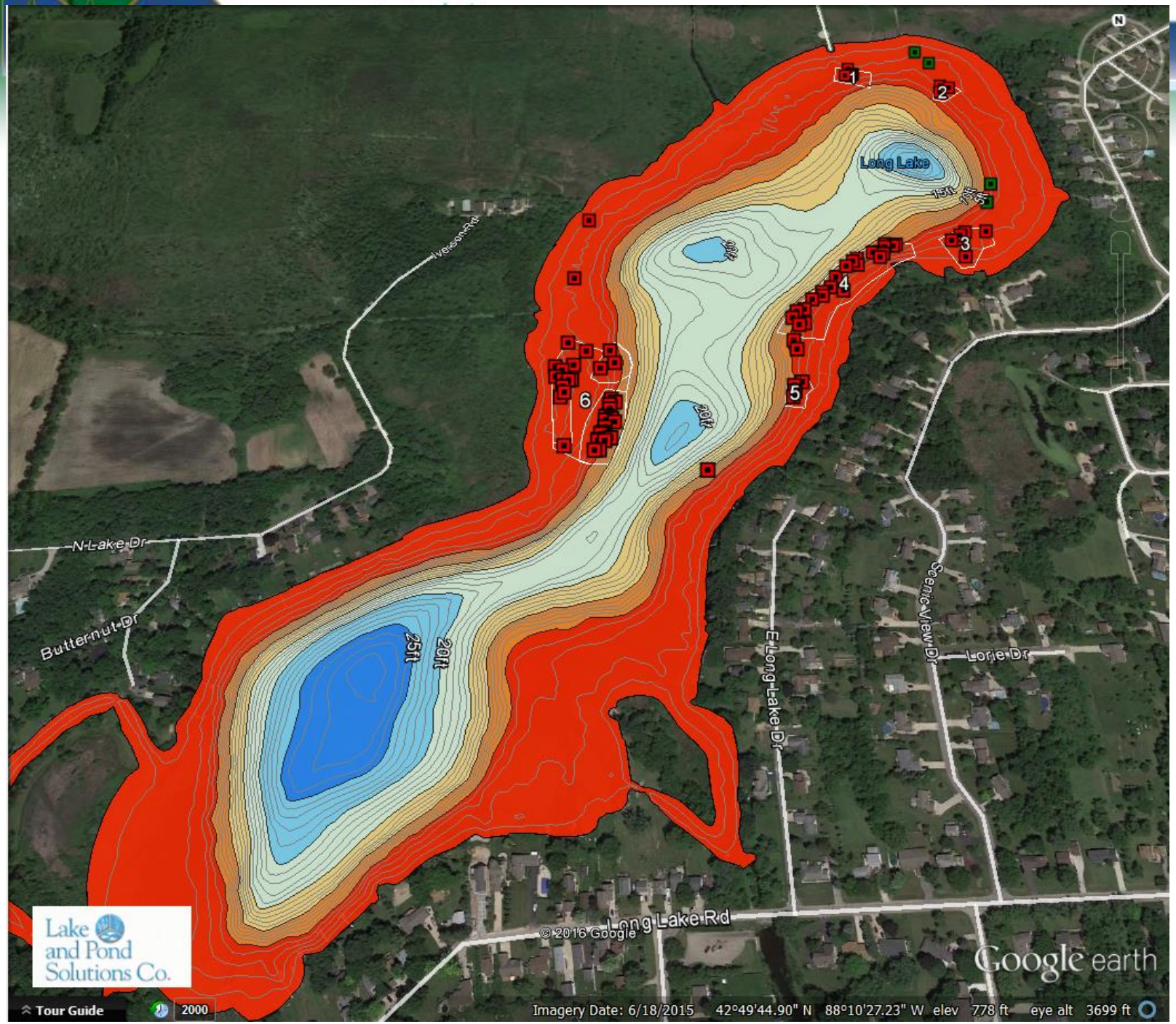
- District, DNR, Lake Manager communicate
- Apply for WI-DNR grant
- Activities:
  - Multiple surveys
  - Riparian notification
  - Signage at Launch
  - Plant height monitored over year
  - Experimental chemical control near launch

Lake Attributes:

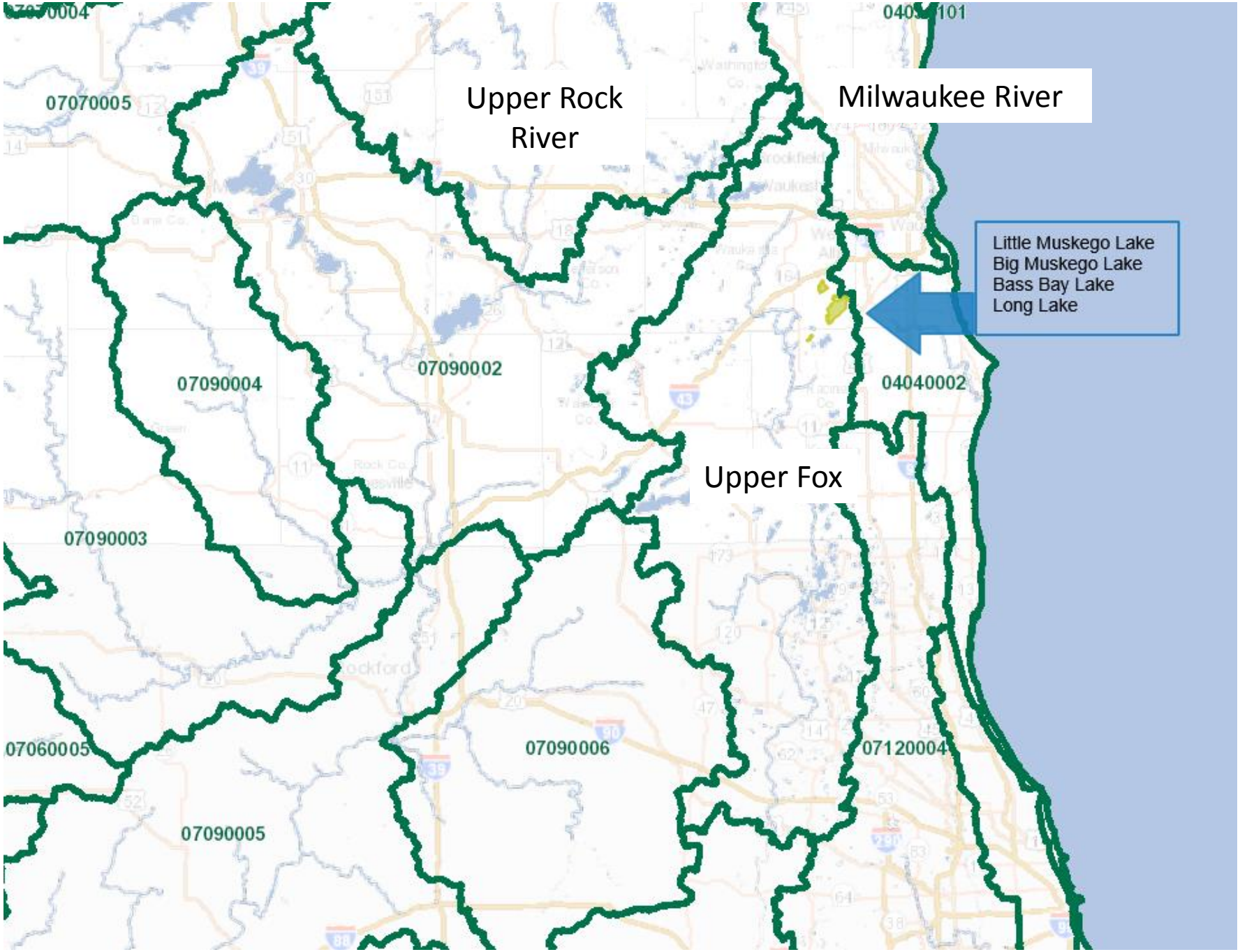
- 105 acres
- Drainage Lake
- Racine County
- Max Depth 25 feet
- Eutrophic
- 1 public boat landing

Nitellopsis obtusa thought to be fairly wide spread in low densities, with a few beds (PI Survey results to come)

0.61 ac w/ Captain XTR 0.78ppm & Clipper 154.8ppb Sept. 17, 2015

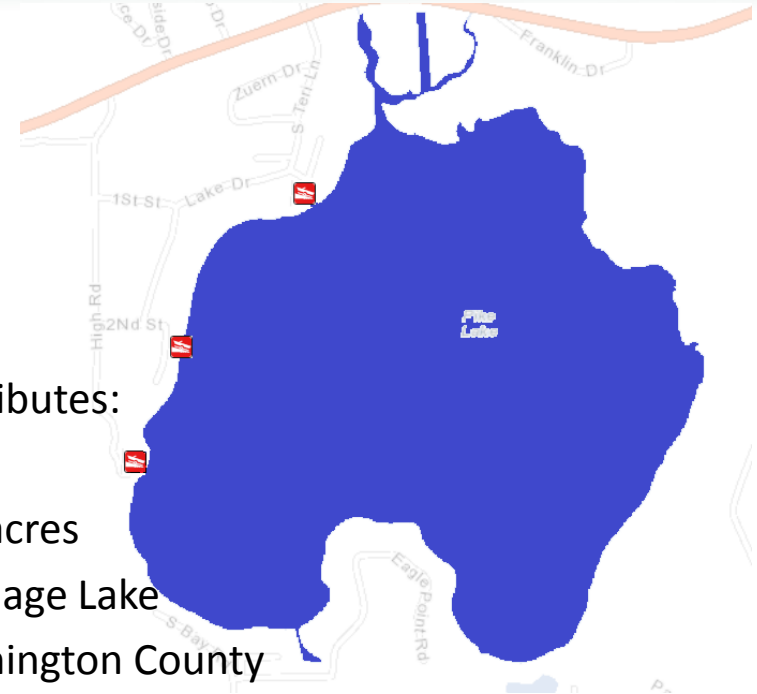


Source: Lake and Pond Solutions Co., Jeff Stelzer


07070004
04050101
07070005
Upper Rock River
Milwaukee River
Little Muskego Lake
Big Muskego Lake
Bass Bay Lake
Long Lake
07090002
07090004
04040002
Upper Fox
07090003
07060005
07090006
07120004
07090005

Pike Lake

- County, DNR and Lake District meet
- Activities:
  - Riparian notification
  - Meander survey targeting bed locations
  - Signage at Launches
  - Wait and see approach
  - Plant survey planned for 2016 (PI method)

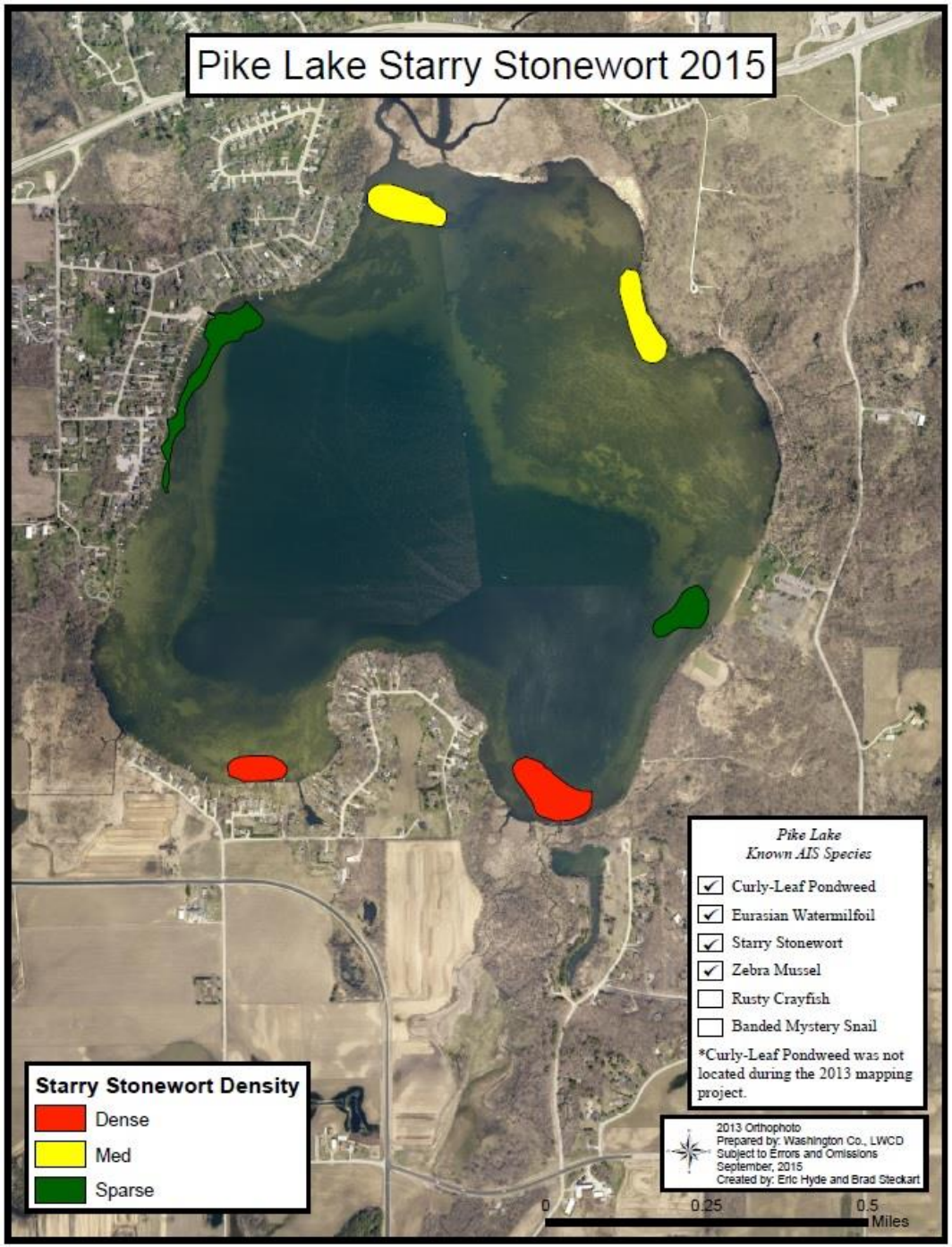


Lake Attributes:

- 461 acres
- Drainage Lake
- Washington County
- Max Depth 45 feet
- Mesotrophic
- 3 public boat landings

Nitellopsis obtusa is found around perimeter of lake in low-to-moderate density beds

*Upper Rock River Watershed



Source: Washington County Land & Water Conservation Department, Brad Steckart

Silver Lake

- County, DNR and Lake District communicate
- Apply for WI-DNR grant
- Activities:
  - Riparian notification
  - Signage at Launches
  - Wash. County closed launch after assessing risk
  - DASH
  - Multiple surveys (PI & Meander: 2015; Meander: 2016)

Lake Attributes:

- 122 acres
- Drainage Lake
- Washington County
- Max Depth 47 feet
- Mesotrophic
- 1 public boat landing

Nitellopsis obtusa found only near boat launch, approx. 1 acre

*Milwaukee River Watershed

Source: Washington County Land & Water Conservation Department, Brad Steckart

Thanks!
Photo Credit: Paul Skawinski