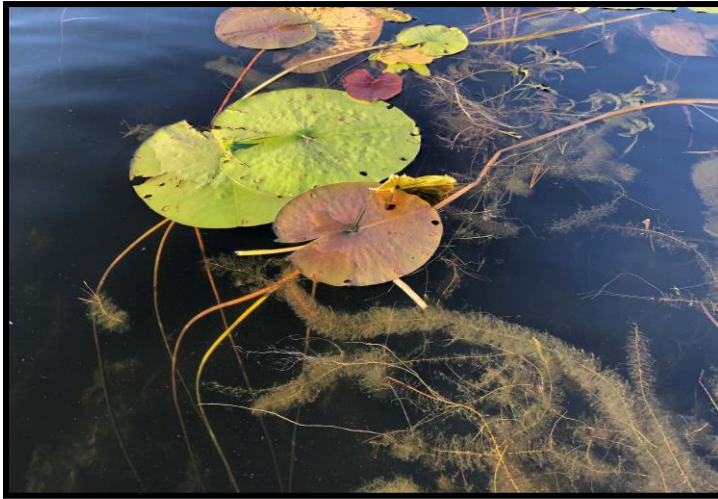


**Eurasian Water-milfoil (*Myriophyllum spicatum*)
Boat Landing and Meandering Littoral Zone Surveys
Pipe/North Pipe Lakes - WBIC: 2490500 and 2485700
Polk County, Wisconsin**



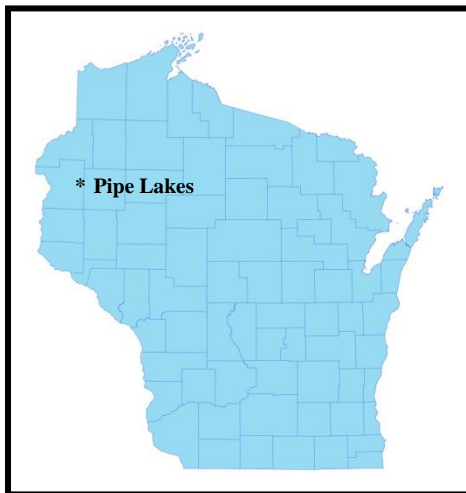
Farwell's water-milfoil – an EWM look alike on Pipe Lake



Aerial with Survey Tracks – 10/1/23

Project Initiated by:

Pipe Lakes Protection and Rehabilitation District and the
Wisconsin Department of Natural Resources



EWM plant/whorl of four leaves/each leaf with >26 leaflets (Berg 2007)

**Landing Monitoring and Shoreline Surveys
Conducted by and Report Prepared by:**

Endangered Resource Services, LLC
Matthew S. Berg, Research Biologist
St. Croix Falls, Wisconsin
June-October, 2023

LIST OF FIGURES.....	ii
INTRODUCTION.....	1
BACKGROUND AND STUDY RATIONALE.....	1
METHODS.....	2
RESULTS AND DISCUSSION.....	3
CONSIDERATIONS FOR FUTURE MANAGEMENT.....	5
LITERATURE CITED.....	6
APPENDIX.....	7
I: Pipe Lakes Fall Survey Tracks.....	7

LIST OF FIGURES

	Page
Figure 1: Pipe and North Pipe Lakes Bathymetric Map.....	1
Figure 2: Boat Landing and Typical Survey Transects.....	2
Figure 3: October 1, 2023 Visible Littoral Zone AIS Survey Tracks.....	3
Figure 4: Eurasian and Farwell’s Water-milfoil Identification.....	4
Figure 5: Close-up of Flowers/Fruit/Rooted Fragment from Farwell’s Water-milfoil.....	4
Figure 6: Spiny Hornwort Identification.....	5
Figure 7: Common Bladderwort Identification.....	5

INTRODUCTION:

Pipe Lake (WBIC 2490500- 293-acre seepage lake) and North Pipe Lake (WBIC 2485700 – 64-acre drainage lake) are located in east-central Polk County, Wisconsin in the Town of Johnstown (T35N R15W). Pipe reaches a maximum depth of 68ft in the north basin and has an average depth of approximately 27ft (WDNR 2023). The lake is mesotrophic in nature with Secchi readings averaging 12.8ft over the last ten years (WDNR 2023). The bottom substrate is predominately sand and rock along the shoreline, but this gradually transitions to sandy muck in most deep areas (Figure 1) (Busch et al. 1966).

North Pipe reaches a maximum depth of 37ft in the central basin and has an average depth of approximately 18ft (WDNR 2023). The lake is eutrophic in nature with Secchi readings over the last ten years averaging 5.4ft (WDNR 2023). The bottom substrate is predominately sand and rock along the east/west shorelines and a nutrient rich organic muck in the north and south bays (Figure 1) (Busch et al. 1966).

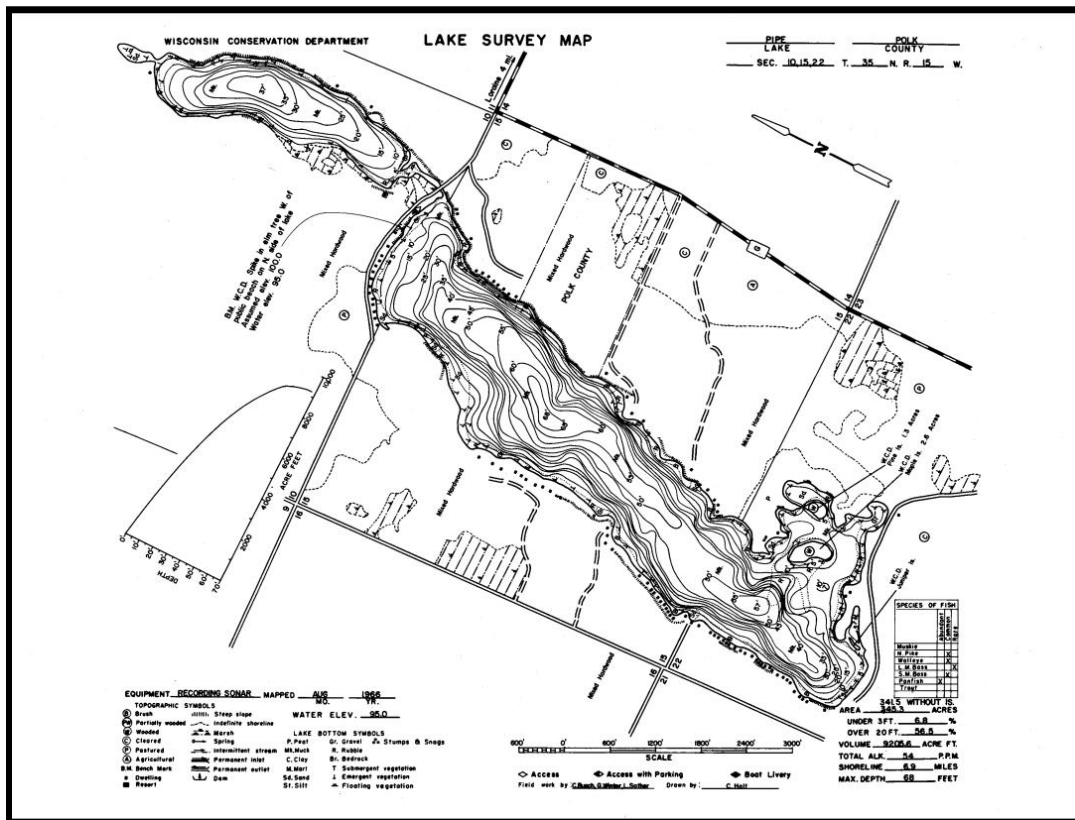


Figure 1: Pipe and North Pipe Lakes Bathymetric Map

BACKGROUND AND STUDY RATIONALE:

During the summers of 2007 and 2013, extensive point-intercept plant surveys found no evidence of Eurasian water-milfoil (*Myriophyllum spicatum*) (EWM) or Curly-leaf pondweed (*Potamogeton crispus*) (CLP) in the Pipe Lakes. However, because many neighboring lakes in Polk/Barron County have EWM infestations, the Pipe Lakes Protection and Rehabilitation District (PLPRD) decided that monthly transect surveys at the lakes’ landing during the growing season would be a prudent measure. This report is the summary of our five 2023 surveys.

METHODS:

During the growing season from June to October 2023, we conducted landing inspections approximately once a month along the north shoreline near the public boat landing (Figure 2). Using three 100-150m parallel transects approximately 15, 30 and 45m from shore; we motored at idle speed looking for any evidence of EWM's characteristic red growth top. Once we had finished the three transects, we returned to our starting point using a stitch pattern that crossed back and forth over all three lines to look for any plants we may have missed between the transects. As Eurasian water-milfoil primarily reproduces by shedding numerous vegetative fragments, we also walked along the north landing shoreline to look for pieces of EWM that would likely wash up if plants were present.

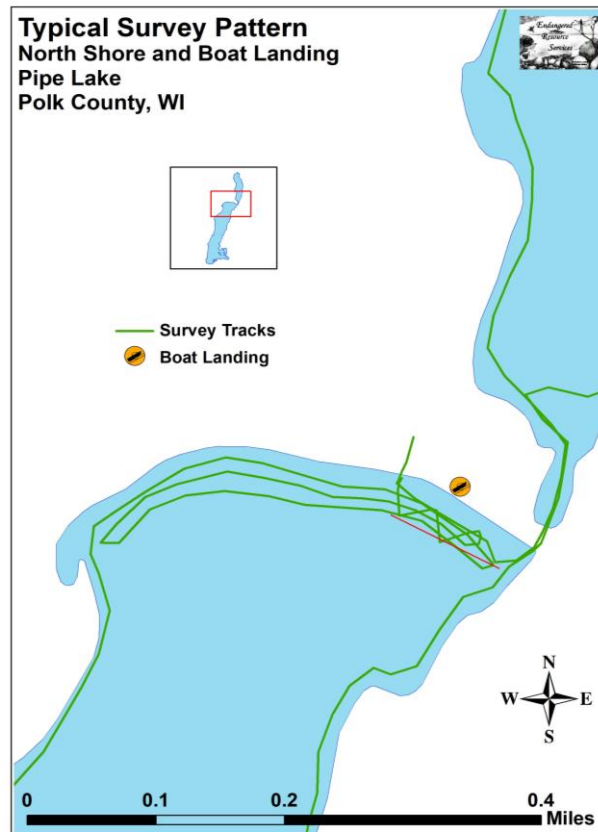


Figure 2: Boat Landing and Typical Survey Transects

Because Pipe Lake is essentially an elongated bowl and it was easy to do, on the first survey in June and the final survey in October, we searched along the shoreline of the entire lake to look for EWM in the zone of growth it would most likely be found in. We also surveyed North Pipe Lake at these times.

RESULTS AND DISCUSSION:

We conducted whole-lake aquatic invasive species (AIS) shoreline surveys on both Pipe and North Pipe on June 6th and October 1st (Figure 3) (Appendix I). We also completed transect surveys along the north shoreline near the public boat landing during the July 8th, August 6th, and September 4th surveys. Fortunately, we did **NOT** find any evidence of CLP, EWM or any other AIS in or adjacent to the lakes other than the previously reported Reed canary grass (*Phalaris arundinacea*).

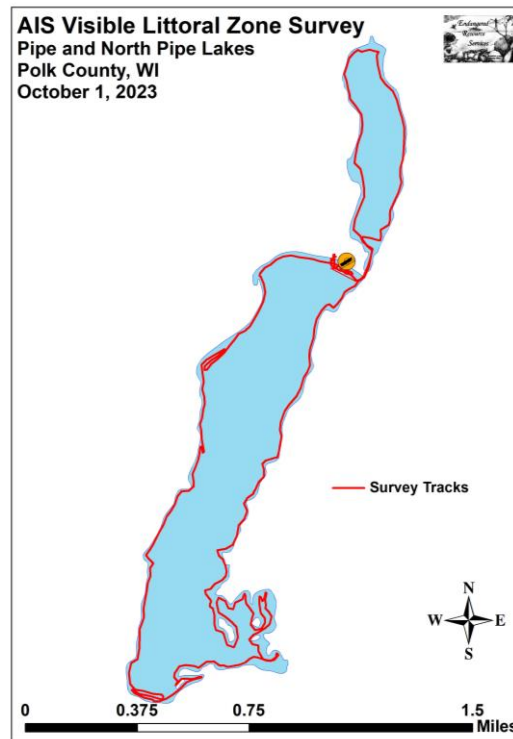


Figure 3: October 1, 2023 Visible Littoral Zone AIS Survey Tracks

As in the past, the only native milfoil we found that resembles EWM was Farwell's water-milfoil (*Myriophyllum farwellii*) – a valuable habitat producing native plant that is relatively uncommon in the state. In Pipe Lake, it grows in occasionally dense beds in the sheltered bays of the southeast corner in shallow water over thick organic muck (especially near the old beaver lodge on the east side of the northeast island). Farwell's is also found scattered through North Pipe Lake, but here it is uncommon and never bed forming. Farwell's water-milfoil can be told from Eurasian water-milfoil in that it has leaves with leaflets numbering <16 whereas EWM normally has >26 leaflets (Figure 4). Although both species can reproduce by shedding rooted fragments, EWM also has an emergent flower stalk where Farwell's flowers are scattered along the stem and look like tiny nuts (Figure 5).

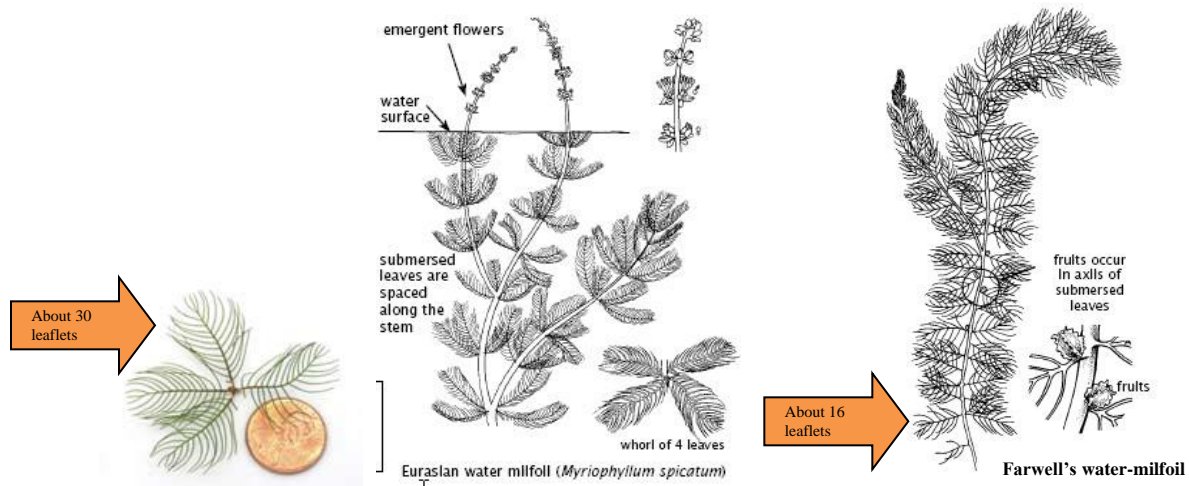


Figure 4: Eurasian and Farwell's Water-milfoil Identification
 (Hill et al. in Maine's Field Guide to Aquatic Invasive Species and Crow and Hellquist 2006)



Figure 5: Close-up of Flowers/Fruit/Rooted Fragment from Farwell's Water-milfoil (Berg 2018/2021)

We also noted two other beneficial native species that could potentially be confused with Eurasian water-milfoil: Spiny hornwort (*Ceratophyllum echinatum*) (Figure 6) and Common bladderwort (*Utricularia vulgaris*) (Figure 7). Both species are relatively common in the lakes' bays where they primarily occur in water <1.5m over organic muck substrates. Hornwort can be told from the milfoils as it has leaflets that fork repeatedly, while bladderworts have tiny "bladders" along their forked leaflets where these carnivorous plants trap and digest minute aquatic animals like mosquito larvae.

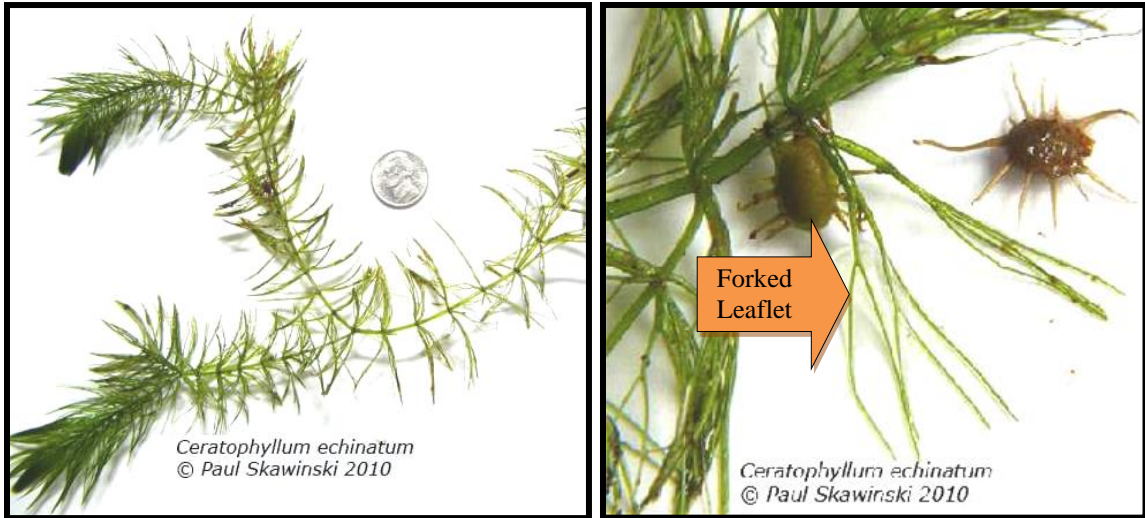


Figure 6: Spiny Hornwort Identification (Skawinski 2010)



Figure 7: Common Bladderwort Identification (Skawinski 2010)

CONSIDERATIONS FOR FUTURE MANAGEMENT:

With Eurasian water-milfoil growing in nine other nearby Barron and Polk County Lakes (Sand, Beaver Dam, Kidney, Duck, Horseshoe, Echo, Lower Vermillion, Shallow, and Pike), we encourage the PLPRD to consider continuing landing inspections on a regular basis into the foreseeable future. Early detection of EWM provides the best chance to economically contain the plant once an infestation has occurred. As always, if lake residents or boaters discover a plant they even suspect may be Curly-leaf pondweed or Eurasian water-milfoil, we encourage them to immediately contact us (Matthew Berg, ERS, LLC Research Biologist) at 715-338-7502 saintcroixdfly@gmail.com. Ideally, a fresh specimen, JPG photograph, and GPS coordinates of where the specimen was obtained would aid in the identification and location of any suspect plant(s). However, even a texted picture of the plant in question held in hand is often enough to confirm identification. Likewise, we are happy to identify ANY plant a lake resident finds that they may want identified. ☺

LITERATURE CITED

- Busch, C., G. Winter, and L. Sather. [online]. 1966. Bathymetric Map for Pipe and North Pipe Lakes - Polk County, Wisconsin. Available from <http://dnr.wi.gov/lakes/maps/DNR/2490500a.pdf> (2023, October).
- WDNR. [online]. 2023. Wisconsin Lakes Citizen Monitoring Data for North Pipe Lake - Polk County. Available from <https://dnr-wisconsin.shinyapps.io/WaterExplorer/?stationid=493105> (2023, October).
- WDNR. [online]. 2023. Wisconsin Lakes Data for North Pipe Lake – Polk County. <https://apps.dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2485700> (2023, October).
- WDNR. [online]. 2023. Wisconsin Lakes Citizen Monitoring Data for Pipe Lake - Polk County. Available from <https://apps.dnr.wi.gov/lakes/waterquality/Station.aspx?id=493097> (2023, October).
- WDNR. [online]. 2023. Wisconsin Lakes Data for Pipe Lake – Polk County. <https://apps.dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2490500> (2023, October).

Appendix I: Pipe Lakes Fall Survey Tracks

AIS Visible Littoral Zone Survey
Pipe and North Pipe Lakes
Polk County, WI
October 1, 2023

