Boat Landing Exotic/Invasive Species Inspections and Shoreline AIS Survey
Balsam Lake WBIC: 2620600
Polk County, Wisconsin

Purple loosestrife on First Island 8/10/24

Yellow iris near the HWY 46 Landing 6/11/24

Project Initiated by:

Balsam Lake Protection and Rehabilitation District and the
Wisconsin Department of Natural Resources – Grant ACEI21218

Zebra mussels covering the HWY 46 sampler 10/19/24

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INTRODUCTION:

Balsam Lake (WBIC 2620600) is a 2,054-acre stratified drainage lake in central Polk County, Wisconsin in the Towns of Balsam Lake, Milltown, Georgetown, and Apple River (T34N R17W) (Figure 1). It reaches a maximum depth of 37ft north of Cedar Island in the western basin and has an average depth of 20ft (Hopke et al. 1964). The lake is mesotrophic bordering on eutrophic in nature, and water clarity is fair with summer Secchi readings over the last 10 years averaging 3.4ft in East Balsam, 5.9ft in Little Balsam, and 10.8ft in the deep hole north of Cedar Island (WDNR 2024). The lake's bottom substrate is variable with organic muck in most bays, and rock/sand in the Big and Little Narrows and around the lake's many islands.

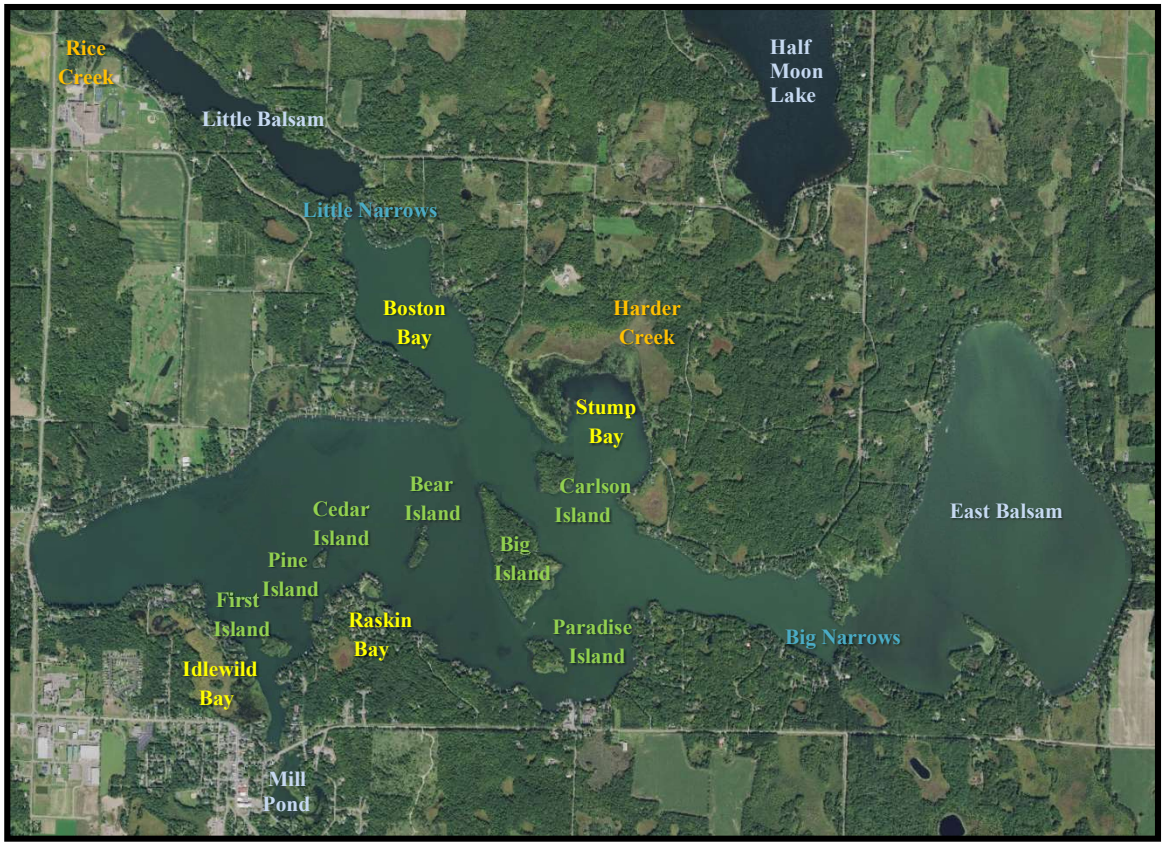

Figure 1: Aerial Photo of Balsam Lake

The Balsam Lake Protection and Rehabilitation District (BLPRD) and the Wisconsin Department of Natural Resources (WDNR) commissioned a series of 2024 Aquatic Invasive Species (AIS) landing and shoreline surveys in accordance with the lake's 2015 Aquatic Plant Management Plan (Clemens 2015). This report is the summary analysis of the five landing inspections conducted on June 10th and 11th, July 3rd, August 10th, September 22nd, and October 19th, and the full shoreline surveys on June 11th and September 22nd.

METHODS:

Landing Inspection Surveys:

Throughout the 2024 growing season, we conducted landing inspections at the five main public landings (HWY 46, Little Balsam, Idlewild, City Beach, and East Balsam – yellow arrows below), two unimproved public landings (Forest Lake Circle and Northeast of the Big Narrows – orange arrows below, and the private landing at Sunnyside Marina – green arrow below (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 Eurasian water-milfoil's (*Myriophyllum spicatum*) characteristic red growth top, or any other exotic/invasive plant species we might encounter. 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.

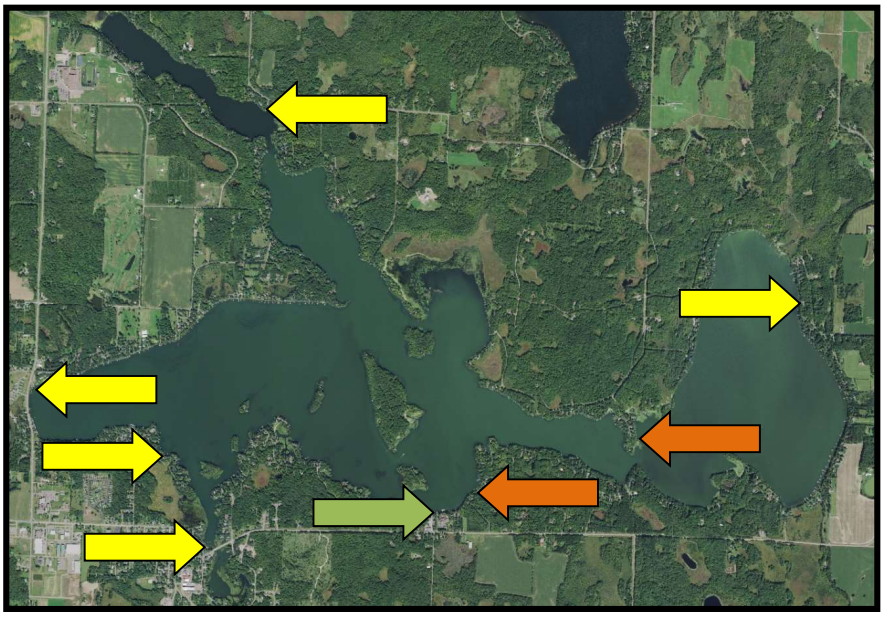

Figure 2: Balsam Lake Landings

Zebra Mussel Samplers:

Two plastic plate samplers were attached to the docks at four landings (all main landings except City Bay) in June. During each subsequent landing inspection, we visually checked these samplers for Zebra mussels (*Dreissena polymorpha*).

Shoreline Aquatic Invasive Species Survey:

In September, we complete a shoreline survey of the entire lake (including islands) to look for the presence of AIS plant species. The timing of the survey was designed to find Eurasian water-milfoil as this species has usually canopied at this point of the growing season. During the survey, we looked for EWM in the zone of growth it would most likely be found in (6-10ft bathymetric ring) and paid special attention to floating plants on the north and east shores as these are places that fragments would likely get blown to by the prevailing southwest winds before settling to the lake bottom. We also looked carefully around docks as plants that are uprooted by motors tend to settle when props are stopped.

RESULTS AND DISCUSSION:

Landing Inspection Surveys:

Yellow iris (*Iris pseudacorus*), Purple loosestrife (*Lythrum salicaria*), Common forget-me-not (*Myosotis scorpioides*), Reed canary grass (*Phalaris arundinacea*), Curly-leaf pondweed (*Potamogeton crispus*), and Narrow-leaved/Hybrid cattail (*Typha angustifolia*) are the only exotic plant species known to occur on the lake. During the 2024 surveys, we saw **no evidence** of Eurasian water-milfoil or any other new fully aquatic exotic species during any of our landing surveys.

Yellow iris (YI) was first found on the lake in 2020 by the Polk County Land and Water Resources Department (PCLWRD). In 2021, we located and helped remove a significant stand at Ward's Resort as well as a handful of other clusters around the lake. Since then, we have continued to remove seed heads on all plants found except in the Mill Pond and near HWY 46 where the species is spreading rapidly, and it would have taken considerable time and effort to dig out what is currently there (Figure 3).

Figure 3: Yellow Iris Near HWY 46 – 6/11/24

We again found Purple loosestrife (PL) near the village beach landing area and in Idlewild Bay. Most of the plants observed in these areas again had Galerucella beetles – a natural biocontrol that specializes in eating loosestrife. First released in 2014, these insects have done a highly effective job at controlling PL in this area since that time (Figure 4).

Away from City Bay, we again removed several large plants at the HWY 46 landing and a few scattered plants on First Island (Figure 5). We also revisited places where we had dug out plants in East Balsam in 2021. We were pleased to find they remained loosestrife free with the exception of the sizable stand that is growing in the cattails just across the road from the northwest finger bay.

Figure 4: Purple Loosestrife with Adult Beetles/Larvae/Holes in Leaves

Figure 5: Purple Loosestrife on First Island and in City Bay

Zebra Mussel Samplers:

In 2022, the only evidence of Zebra mussels on a sampler was a single individual found at the Forest Circle site when it was removed in late October. However, in 2023 and 2024, ZM **were found on each sampler at each location**. Coverage was especially heavy at HWY 46 (Figure 6).

Figure 6: Zebra Mussel Sampler at Forest Circle – 10/18/22 and HWY 46 – 10/19/24

Shoreline Aquatic Invasive Species Survey:

On September 22nd, we surveyed transects covering 39.3km (24.4 miles) (Figure 7). We had mostly sunny skies and calm winds which made for excellent search conditions. Ultimately, we did **not** find any evidence of Eurasian water-milfoil anywhere in the lake.

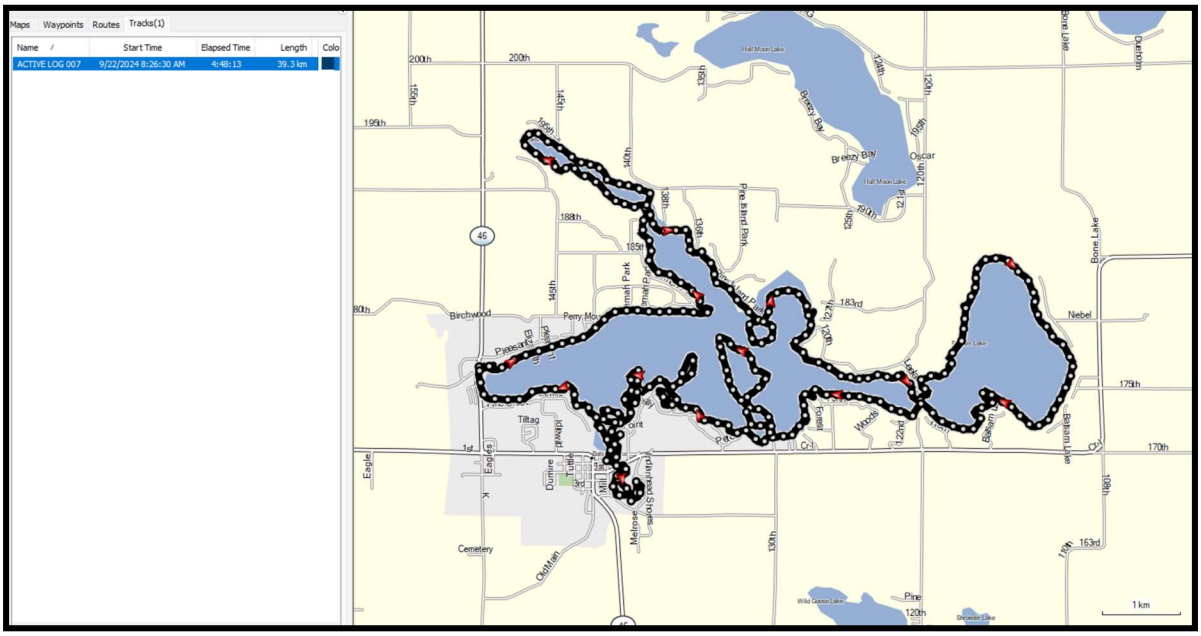

Figure 7: September 2024 Littoral Zone AIS Survey Transects

CONSIDERATIONS FOR MANAGMENT:

Eurasian Water-Milfoil:

Eurasian water-milfoil was confirmed in Half Moon Lake in the fall of 2021 making it the eighth Polk County lake with EWM and by far the closest to Balsam Lake. Because of this, continued monitoring at landings and inspections by the BLPRD's dedicated Clean Boats/Clean Waters crew are encouraged.

Yellow Iris:

Top clipping iris along the lake didn't kill many plants, but it did limit further dispersal in 2024. During our CLP bed mapping survey in the spring of 2025, we will again revisit locations that have had Yellow iris on the lake, and continue to remove them where possible. However, it is likely time for the BLPRD to consider chemical treatment near the HWY 46 Landing and in the Mill Pond to contain the aggressive spread of this species in those areas as it's quickly becoming more than private landowners will likely be able to contain on their own. Elsewhere, the plants continue to be rare so it's likely reasonable to continue having private individuals monitor their own shorelines. To facilitate this, we again encourage the BLPRD to consider placing a "wanted poster" in the spring issue of the *Dock Side* to explain to residents how to remove plants along their shoreline if they find them in June when they are easy to identify.

Purple Loosestrife:

Similar to Yellow iris, a reminder for BLPRD members to be on the lookout for loosestrife in July/August and remove it immediately if they find it would help slow the spread of this beautiful, but highly invasive wetland species.

Zebra Mussels:

Zebra mussels are now well established in the lake, and educating lake residents and visitors to be careful about not transporting them to other area lakes now becomes a priority. The signs placed at the landings and the increased awareness of the lake's Clean Boats/Clean Waters monitoring staff are two important steps the BLPRD has taken to disseminate this information to the general public.

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