

Wisconsin Department of Natural Resources
Aquatic Invasive Species Grant Program
Grant # ACEI-150-14

Lac Vieux Desert Aquatic Invasive Species Control Program

Lac Vieux Desert - Vilas County, WI and Gogebic County, MI

Final Reporting - DRAFT

Submitted To:
Lac Vieux Desert Home Owners Association
P.O. Box 432
Land O' Lakes, WI 54540

And

Wisconsin Department of Natural Resources
Attention: Kevin Gauthier, Sr. – Lake Coordinator
8770 Hwy J, Woodruff, WI 54568
Phone: 715.356.5211; Fax: 715.358.2352

Submitted By:
Many Waters, LLC
2527 Lake Ottawa Road
Iron River, MI, 49935
906.284.2198

Contact: Bill Artwich; billartwich@gmail.com
Barb Gajewski; skih2o@hotmail.com

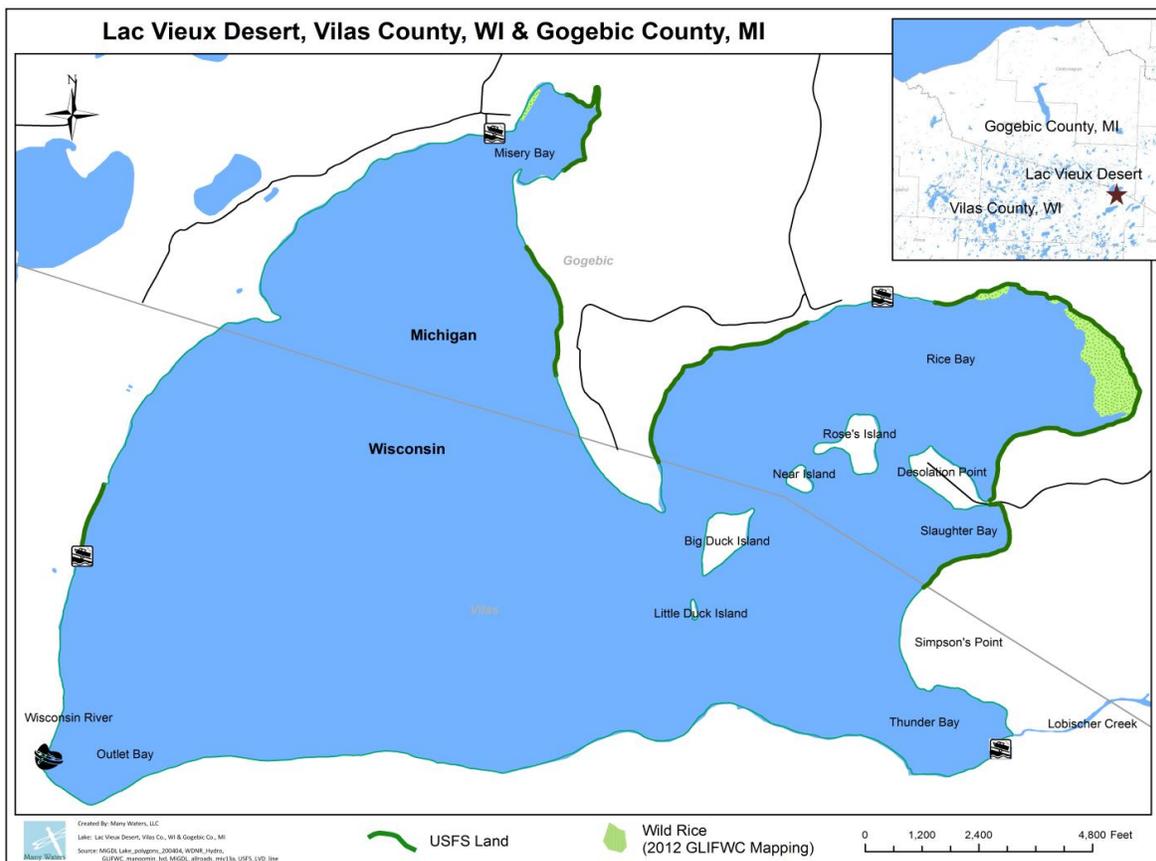
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PROJECT OVERVIEW

This report summarizes WDNR ACEI-150-14 grant activities for aquatic invasive species (AIS) management from 2014 to 2018 and serves as the final grant deliverable. Though sponsored by the Lac Vieux Desert Lake Association (LVDLA), additional funds from a WDNR AEPP54618 grant (LVDLA sponsored), and a USDA Secure Rural Schools Title II project (herein referred to as RAC) #14-PA-11090700-011 sponsored by the Invasive Species Control Coalition (ISCCW) contributed to this project. In addition, partner match (“local-share”) includes the ISCCW, USFS – Ottawa National Forest and Great Lakes Indian Fish and Wildlife Commission (GLIFWC).

Lac Vieux Desert (LVD), located in Vilas County, WI and Gogebic County, MI, is 4,017-acre shallow lowland lake with a mean depth of 12 ft and a maximum depth of 38 feet (WDNR, 2011). It is the largest lake in Vilas County, WI and the second largest lake in Gogebic County, MI. Riparian ownership includes USFS Ottawa NF, USFS Chequamegon-Nicolet NF, the Lac Vieux Desert Band of Lake Superior Chippewa, MI-DNR, WDNR, Wisconsin Valley Improvement Company (WVIC), and MI and WI riparians. WVIC owns and operates a water level control structure at the outlet to the Wisconsin River.



Adjacent public lands and vast open water vistas make LVD a year round recreational attraction by locals and visitors alike. Five access points allow for both boat/trailer and carry in access. The WDNR, MI-DNR, WVIC, Lac Vieux Desert Band of Lake Superior Chippewa, and the USFS Chequamegon-Nicolet NF own these access points. The USFS Chequamegon-Nicolet NF operates a campground with 31 campsites and a picnic and beach area. WVIC has a park located at the headwaters to the Wisconsin River. In addition to public access points, there is a private campground and six private resorts on LVD.

The WDNR considers LVD an exceptional resource under NR 102 Fisheries program and an Outstanding Resource Waters. Located in the Tamarack Pioneer River Watershed, this watershed consists mainly of forests (63%), wetlands (18%) and open water (10%) and ranked medium for non-point source issues affecting lakes. The most recent (2012) vegetation assessment gives a Floristic Quality Index of 43.8, which is above average for the Northern Lakes Eco-Region.

Since 2012, concerned stakeholders review annual AIS management strategies and efforts. Past meeting participants include LVDLA, WDNR, Vilas County LWCD, GLIFWC, LVD Band of Lake Superior Chippewa, USFS-Ottawa NF, and ISCCW (Appendix A). Current consensus amongst stakeholders concerning the management of AIS, specifically Eurasian watermilfoil (EWM), will not include the use of aquatic herbicides, due to unknown environmental impacts, including those to wild rice. Throughout the course of this project, management of EWM included hand removal with the use of divers, snorkelers, and DASH.

AQUATIC INVASIVE SPECIES MONITORING

Aquatic invasive species (AIS) monitoring from 2014 to 2018 was a combined effort with Great Lakes Indian Fish and Wildlife Commission (GLIFWC), the Invasive Species Control Coalition of Watersmeet (ISCCW) and Many Waters, LLC. Two surveys annually focused mainly on Eurasian watermilfoil and curly leaf pondweed, but included other aquatic and wetland plant species. GLIFWC and the ISCCW completed early season surveys, whereas Many Waters completed the second round of mid-late season surveys. The first survey, timed during the first half of the growing season, focused on reconfirming previous EWM locations to refine management strategies and monitor for EWM and curly leaf-pondweed (CLP), mainly in shallow waters. The second survey, timed to capture EWM plants at or near the greatest growth potential, occurs during the second half of the growing season and includes deeper waters and off shore locations where vegetation grows.

Monitoring efforts are qualitative in nature, meaning information collected describes the condition or population of the target AIS rather than relying on measured or quantitatively collected and calculated values. For example, smaller sites are geo-referenced with a GPS point and extent is determined by visually estimating coverage in foot-circumference. This is an observed estimate of exact extent, not footprint. On average, these sites are less than a 0.10 of an acre in size. Larger sites, typically greater than a 0.10 of an acre in size, are circumnavigated and extent in acres is calculated and represented with a polygon.

In 2017 and 2018, RAC funds included nearshore wetland and terrestrial invasive species monitoring. These efforts focused mainly on USFS Ottawa National High and New Invader/High priority species adjacent to Ottawa National Forest lands (Appendix B). These efforts detected curly leaf pondweed, Eurasian watermilfoil and a small stand of phragmites. Based on the Lac Vieux Desert lake management plan (2012) this stand of phragmites is believed to be native and has changed very little in size since detection. In 2015, a EPA GLRI funded project through Michigan State University looked at early detection of AIS with the use of eDNA technology. Lac Vieux Desert was included in this research (Appendix C). Prior to this project, GLIFWC conducted spiny waterflea surveys on LVD, as recent as 2012. No spiny waterfleas were detected. In 2018, a sample of milfoil tested for a hybridism between Northern watermilfoil and Eurasian watermilfoil returned from the lab as Northern watermilfoil.

Curly Leaf Pondweed

From 2014 to 2018, monitoring efforts detected sporadic colonies of CLP with locations and abundance varying from year to year. Overwhelming the majority of CLP in Lac View Desert historically occurs within Outlet bay near the outlet to the Wisconsin River. Intermittent detection included a few off shore areas along the west shore, Slaughter Bay, Rice Bay (2013), Thunder Bay and Lobischer Creek. In 2018, no CLP was detected in Outlet Bay. The phenological window for CLP detection in 2018 was appropriate and consistent with previous surveys; however, a late ice season and delayed vegetation growth may have contributed to a non-detect. The only CLP detected on LVD in 2018 was east of Misery Creek located in Misery Bay and consisted of a few scattered plants.

Figure 1: Change in CLP Abundance and Distribution Outlet Bay, from 2014 to 2018 – LVD

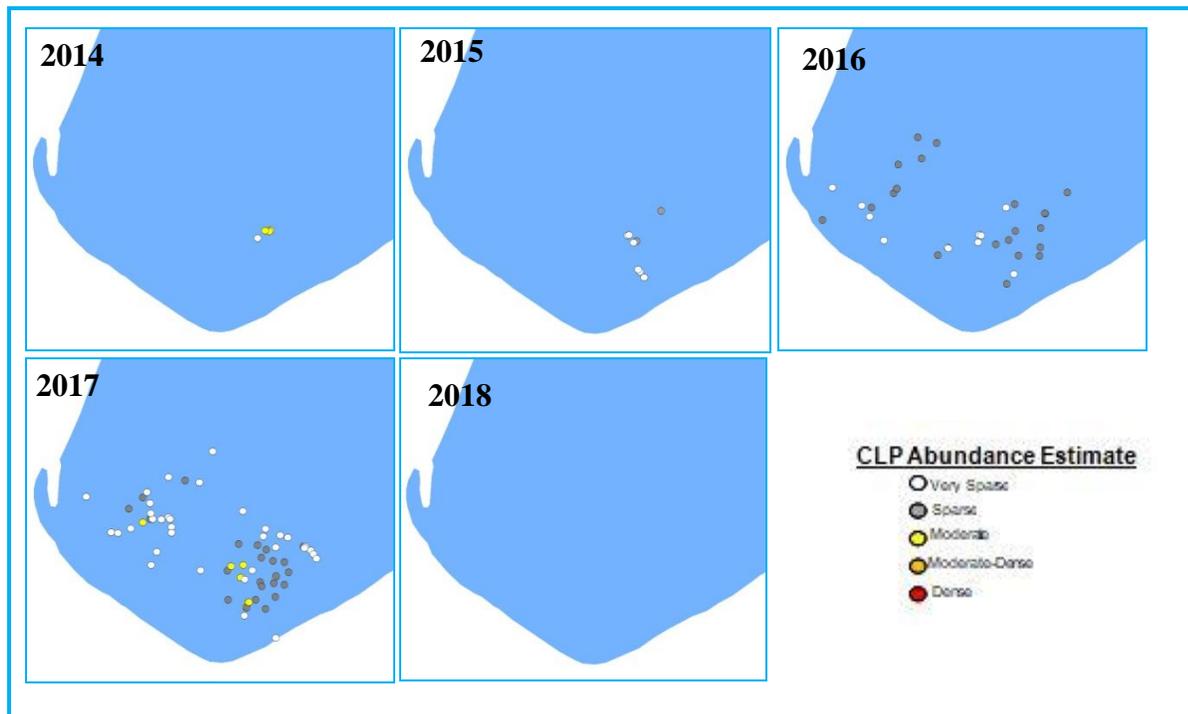


Figure 2: CLP Location 2018 – Misery Bay, LVD



Eurasian Watermilfoil

2008-2013

The initial discover of Eurasian watermilfoil in Lac Vieux Desert occurred near the Thunder Bay boat landing in 2008 and consisted of approximately seven locations of single to small clusters of plants. By 2009, several small yet contiguous colonies of EWM were identified in two areas and treated with herbicides. A treatment of 1.8 acres occurred in early summer (2009), using granular 2,4-D at an application rate of 150 lbs./acre, which is the equivalent of 2.10 ppm (ae) based on an average depth of 5 feet (Onterra, 2012).

Four locations of EWM were relocated within the 2009 treatment areas. Each of these consisting of a few individual plants and were hand removed. Lake wide monitoring efforts in May did not locate any additional occurrences of EWM (Onterra, 2012). By September of 2011, three new EWM locations consisting of one plant each were located along the south central area of Slaughter Bay (ISCCW). These locations were hand removed by the USFS on September 26th 2011. Conditions during removal efforts were poor, with blowing wind and sleet. USFS botanist Ian Shackelford and John Pagel were able to re-locate and hand pull two of the three locations with somewhat success reported. The depth and weather conditions made hand removal that day difficult.

From 2012 to 2013, EWM expanded from its previously known locations within Thunder Bay and Slaughter Bay to several sites along Simpson's Point and into Rice Bay. In 2012, 33 locations of EWM were identified: 28 locations of single to few plants to small moderate-dense plant colonies (Onterra, 2012). In 2013, 143 locations of EWM were identified, all of these locations consisted of low to moderate dense EWM ranging from five to 30 plants at each site.

2014-2018

Between 2014 and 2015, the distribution of EWM remained primarily along the eastern half of the lake with most populations located from Slaughter Bay south to Thunder Bay. Most colonies consisted of sparse to very sparse abundance with relative low spatial presence ranging from 5 feet in circumference to twenty-five feet.

The largest expansion of EWM polygon-mapped beds (greater than a .10 acre in size) occurred between 2015 to 2016. Polygon-based beds increased from 0 acres in 2015 to 4.44 acres in 2016. At season's end in 2016, most beds consisted of sparse to very sparse abundance with the largest concentration occurring along the southern shore of Slaughter Bay and the far southern region of Simpson's point. Pockets of plants began to become more frequent along the southeastern shoreline. The largest expansion of point-based mapping occurred from 2017 to 2018 with roughly 4.8 acre of EWM estimated in 2017 rising to 12.5 in 2018. Frequent colonies of EWM concentrated along the southern shore were detected in addition to several off shore locations. EWM beds along the south shore of Slaughter Bay remained relatively similar to 2017, an expansion in the bed located along South Simpson's point was observed.

Figure 3: Change in EWM point based mapping acreage 2013-2018 – Lac Vieux Desert. (Note: This is a visual estimate of exact extent, not total footprint.)

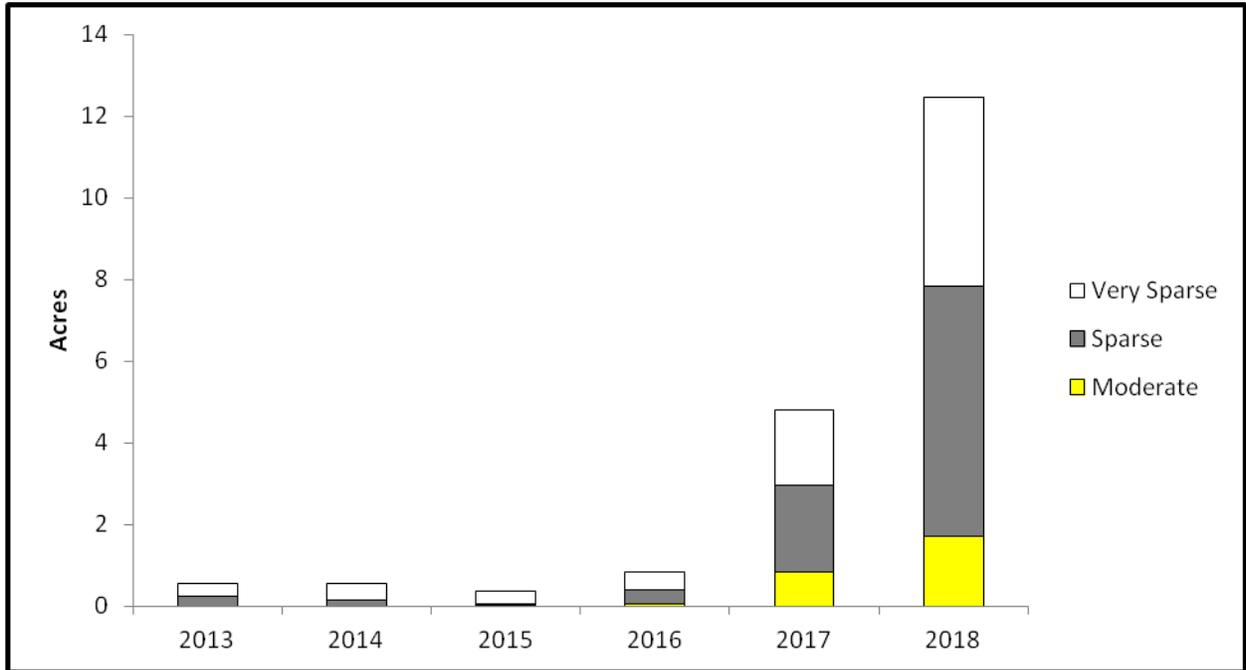
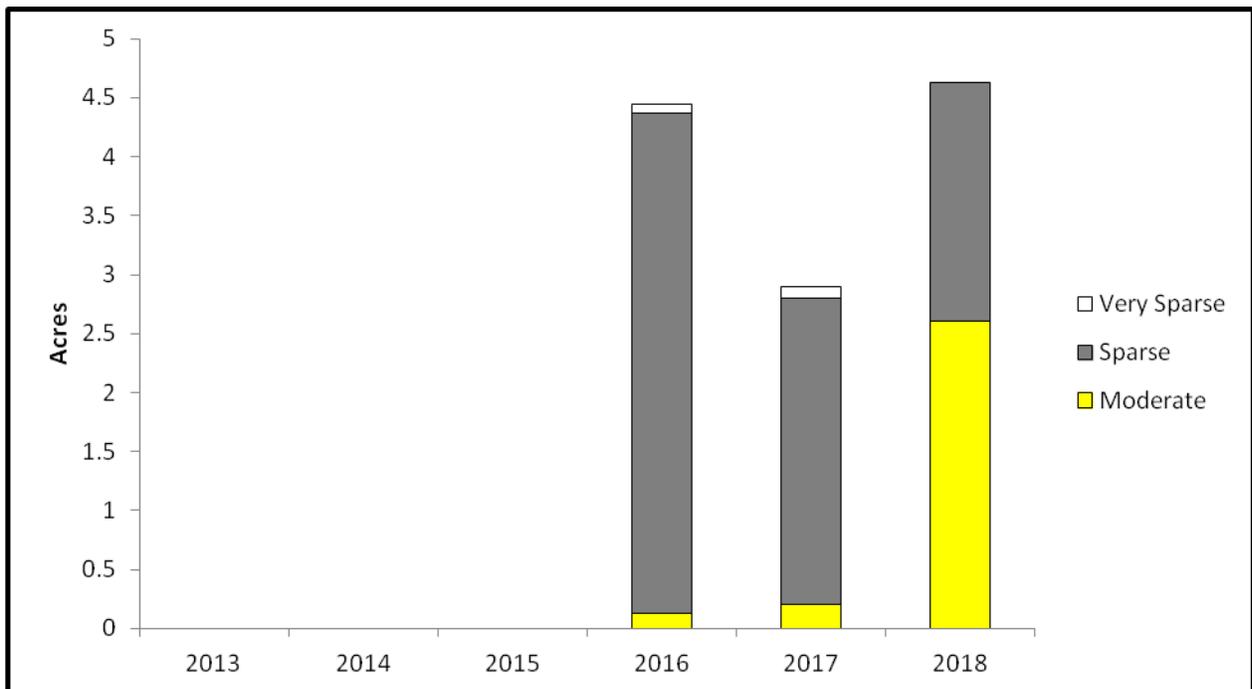
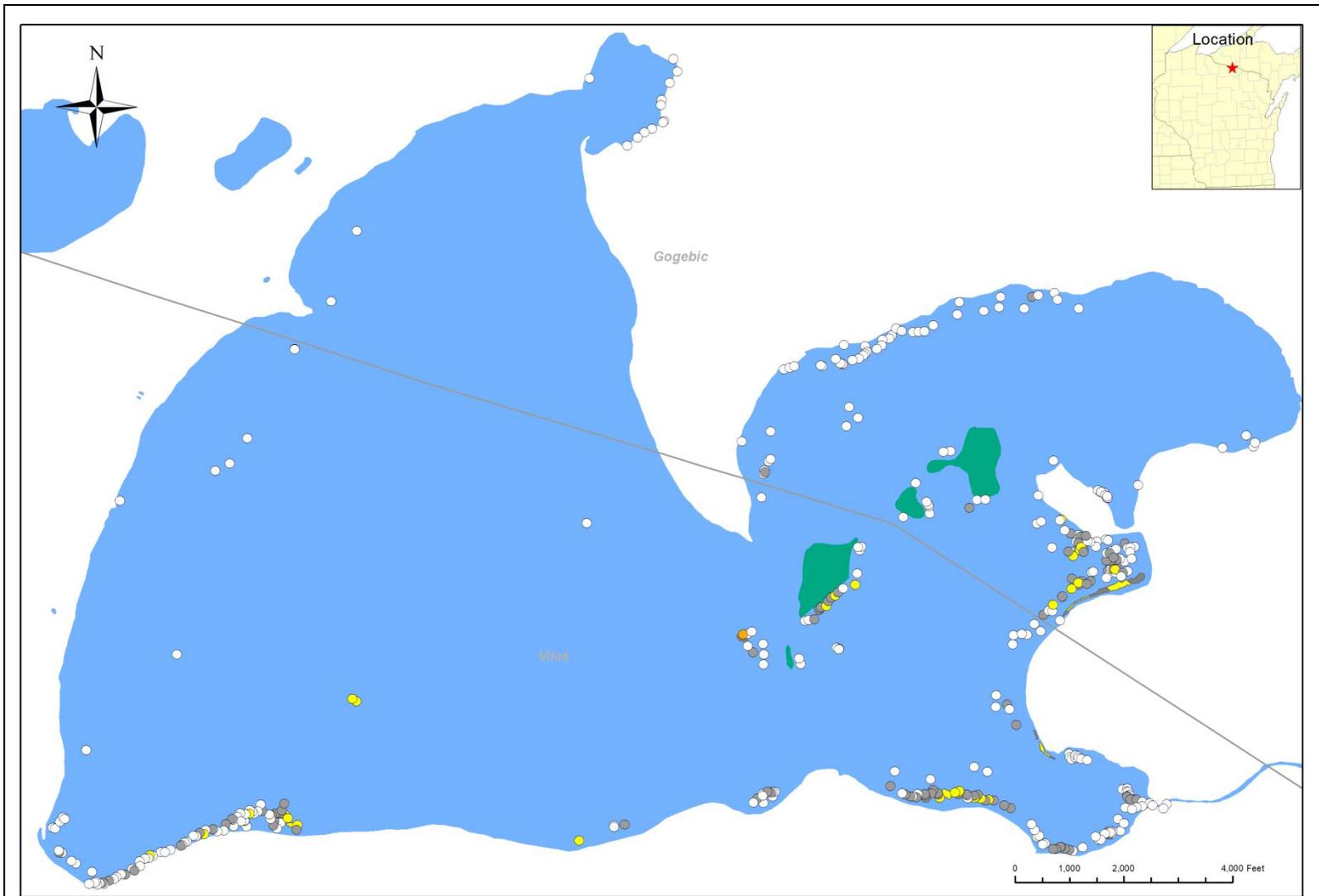


Figure 4: Change in EWM polygon based mapping acreage 2013-2018 – Lac Vieux Desert.





Lake: Lac Vieux Desert - Vilas Co, WI & Gogebic Co, MI
 Map Date & Creator: 1.8.2019, Many Waters, LLC
 Source: MiGDLake_polygons_200403,
 WI Hydro, EWM Many Waters
 File: LVD_2018_EOY

EWM Relative Abundance

- Very Sparse
- Sparse
- Moderate
- Moderate-Dense
- Dense

Lac Vieux Desert
Vilas County, WI & Gogebic County, MI
End of the Year EWM Locations
2018

AQUATIC INVASIVE SPECIES – MANAGEMENT

Hand removal activities commenced each year around the beginning of June, depending on the weather and continue weekly until waters cool typically at the end of September/beginning of October. Hand removal included the use of divers alone, snorkel pulling, and Diver Assisted Suction Harvesting (DASH). The USFS Ottawa National Forest provided one to two days annually hand-pulling EWM on LVD as a match portion of the project.

DASH is a mechanical process requiring a mechanical harvesting permit (Form 3200-113 (R 3/04)) from the WDNR and a Section 301 U.S. Army Corps of Engineers and MDEQ joint permit application from the MDEQ. WDNR permits were valid for one season with annual reports required (Appendix D). MDEQ permits remain open for five years with no annual reporting required.

Over the course of the project period divers tallied 944.75 dive hours between diving scuba alone and diving with DASH. Total dive hours ranged from 98 in 2014 to 249 in 2018, with a total dive hours of 855 for the project period. Dive hours include top water time when divers gear up and change tanks. Seasonal totals for plants pulled varied from 780 in 2014 to roughly 4,500 in 2018. An estimated 11,924 plants were pulled during the project period. These totals do not include USFS efforts, which in 2018 reported removing roughly 400 plants. DASH dive hours ranged from 8.75 in 2014 to 37.5 hours in 2017, with a total of 89 hours for the entire project. These hours only reflect dive time in the water, not time spent setting up and breaking down DASH equipment or mobilization from site to site.

Figure 5: Total EWM Plants and Wet Weights of Plants Hand Pulled 2013 - 2018 – Lac Vieux Desert.

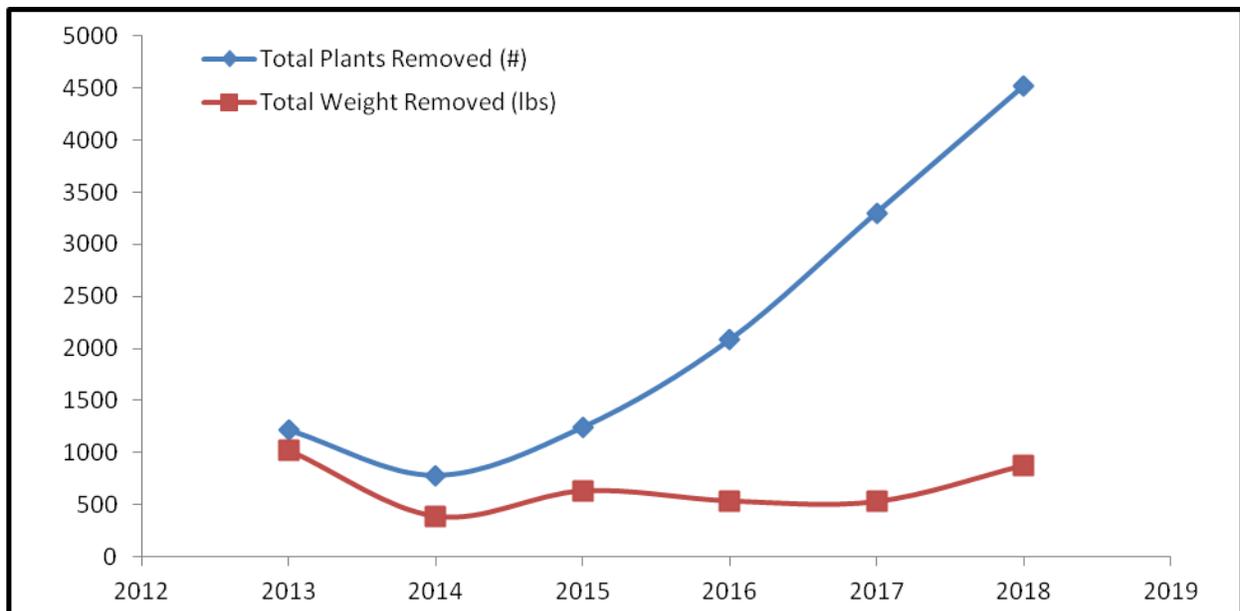
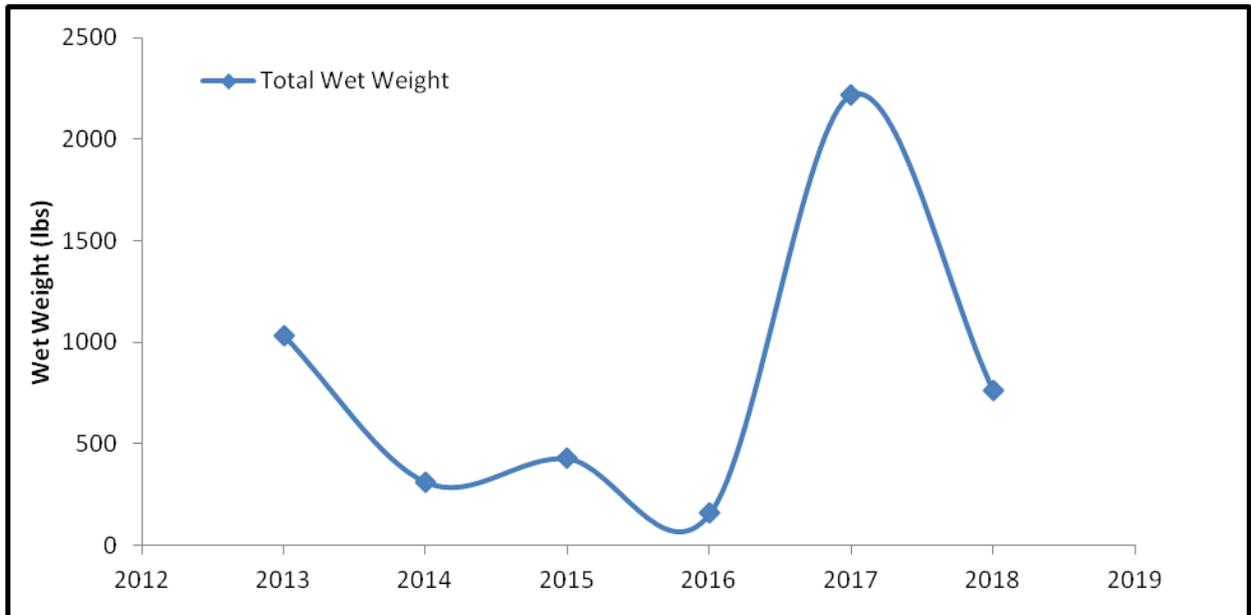


Figure 6: Total EWM Wet Weights of Plants Pulled During DASH Efforts 2013-2018 – Lac Vieux Desert.

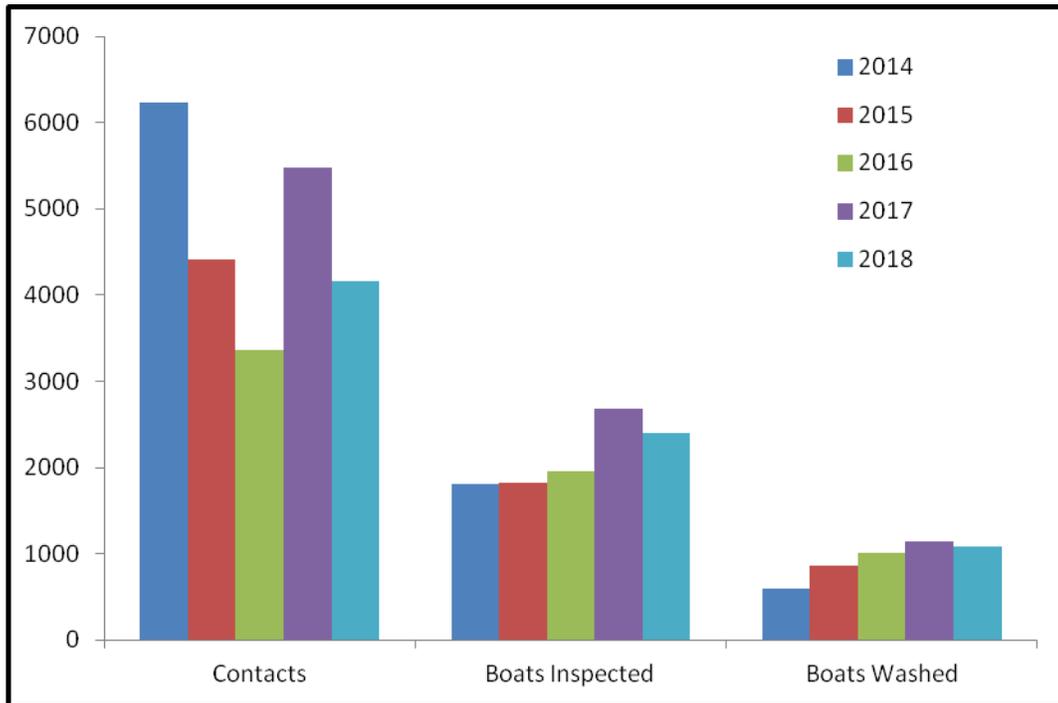


LAKE WIDE STEWARDSHIP AND AIS PREVENTION ACTIVITIES

The discovery of EWM (2008) and CLP (2009) initiated efforts by the Lac Vieux Desert Lake Association (LVDLA) to support work to minimize potential ecological and recreational impacts that these invasive species may pose. In 2009, the LVDLA received a WDNR Surface Waters Grant to develop a comprehensive lake management plan. WDNR plan approval occurred in 2012. In, 2017, the LVDLA applied for and was awarded a WDNR AIS Planning grant (WDNR AEPP54618). This grant will be an update to the original 2012 plan and include seasonal AIS monitoring, shoreland habitat assessments, aquatic and nearshore vegetation assessments, and water quality monitoring.

Acknowledging that AIS prevention is critical, the LVDLA, and its partners (ISCCW) annually participate in CBCW landing inspections (MI & WI). In 2018, roughly, 944 paid and 35 volunteer landing hours inspected 2,403 boats, decontaminated (high-pressure heat power-wash) 1,082 boats, and contacted 4,846 people (WI and MI CBCW data combined). Throughout the course of this project from 2014 to 2018 roughly 4,856 paid hours inspected 10,690 boats, decontaminated 4,704 boats and contacted 23,660 people.

Figure 7: LVD Craft Inspection Efforts 2014-2018 (Data is a combination of WDNR CBCW data reported and total ISCCW efforts for LVD including Misery Bay launch.)



Shoreland stewardship efforts over the course of this project include commitments or pledges by riparian owners not to use phosphorus-based fertilizers on their properties and not to remove aquatic vegetation below the ordinary high water mark. The goal was to have 125 riparian pledges by the end of the project. Current totals include 110 riparian property pledges. The LVDLA also offered a monetary match to landowners wanting to plant native vegetation on their properties up to \$250.00 annually. Announcements of this opportunity were included in Association newsletters and mailings. The LVDLA did not find willing participants, mainly because landowners were more than willing to pay for this type of planting out of pocket, rather than receive Association funds to offset any costs.

FUTURE MANAGEMENT OF AQUATIC INVASIVE SPECIES

The desired goals of aquatic plant management will vary from one person to the next. One individual may prefer less aquatic plants to minimize interference with swimming or boating, where another individual may prefer more aquatic plants to improving fishing. Aquatic plants are an important component of a healthy functioning ecosystem; however, they can become problematic interfering with lake access and use, especially when it comes to aquatic invasive plants. These plants are frequently targeted for management.

Eurasian watermilfoil can potentially alter native aquatic plant ecosystems and cause recreational use and impairment issues, however not all lakes may experience high populations of Eurasian watermilfoil (Nault, 2016). Recent WDNR research suggests that across the State of Wisconsin, many lakes do not reach lake wide high densities, as previously once thought, particularly in Northern Wisconsin. Nonetheless, it is important to recognize that aquatic ecosystems are dynamic, annual variation does occur and research is needed to understand how lake ecology and climate may play a role in EWM population variability.

Under the current planning grant, the LVDLA will develop updated aquatic invasive species management goals and objectives. In the case of the LVDLA, this process will use the LVDLA board and concerned stakeholders to share information and develop long and short-term strategies. Ultimately, the goal will be to create an adaptive framework using a balance of social perspective, conservation, and science to develop lake-wide and site-specific actions that meet overall goals and objective and are fiscally reasonable.

Nault, M. 2016. The science behind the “so-called” super weed. Wisconsin Natural Resources 2016: 10-12.

Onterra, 2012. Lac Vieux Desert Lake, Vilas County Wisconsin and Gogebic County, MI Comprehensive Management Plan. Lac Vieux Desert Lake Association WDNR Grant Program: LPL-1281-09 & LPL-1282-09