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

2017 Lac Vieux Desert Aquatic Invasive Species Control Program

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

Annual Reporting

Submitted To:
Lac Vieux Desert Home Owners Association
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And

Wisconsin Department of Natural Resources
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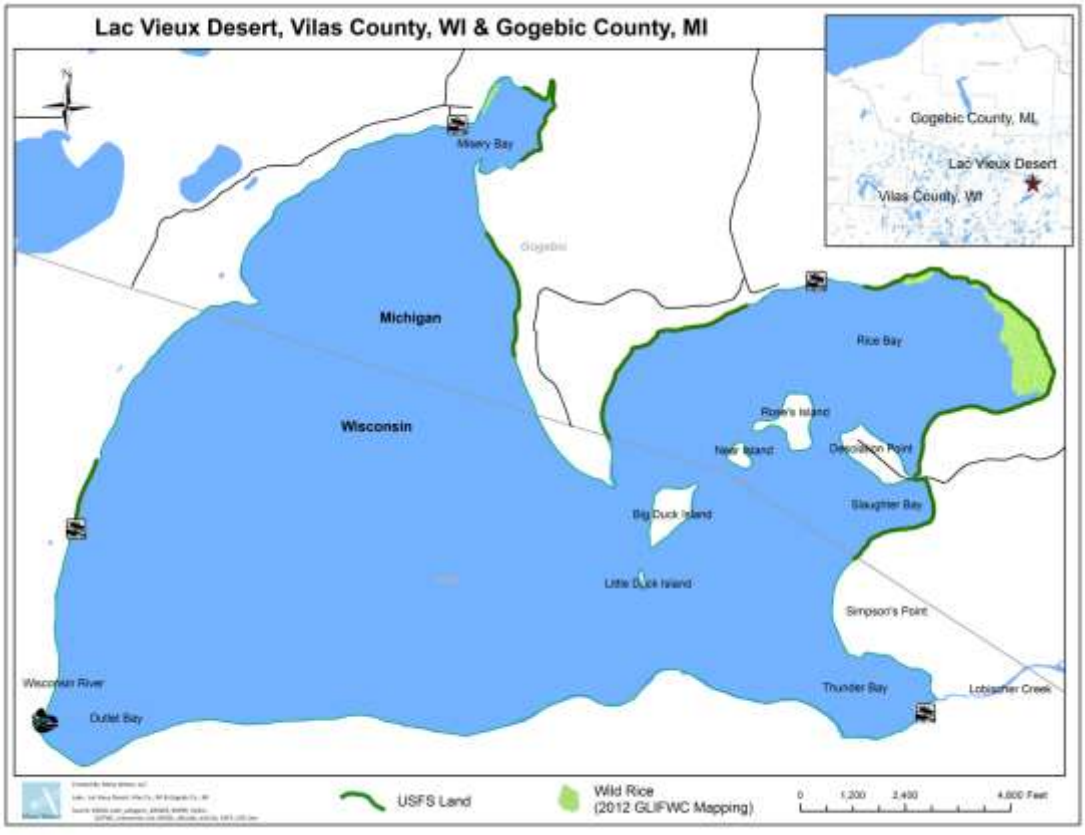
PROJECT AREA

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 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 public access points allow for both boat/trailer and carry in access. These access points are owned by the WDNR, MI-DNR, WVIC, Lac Vieux Desert Band of Lake Superior Chippewa and the USFS Chequamegon-Nicolet NF. 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, there is a private campground and six private resorts on LVD.

LVD is considered 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 is ranked medium for non-point source issues affecting lakes. Based on 2012 vegetation assessment, LVD has a Floristic Quality Index of 43.8, which is above the average for the Northern Lakes Eco-Region.

Project Location



OVERVIEW

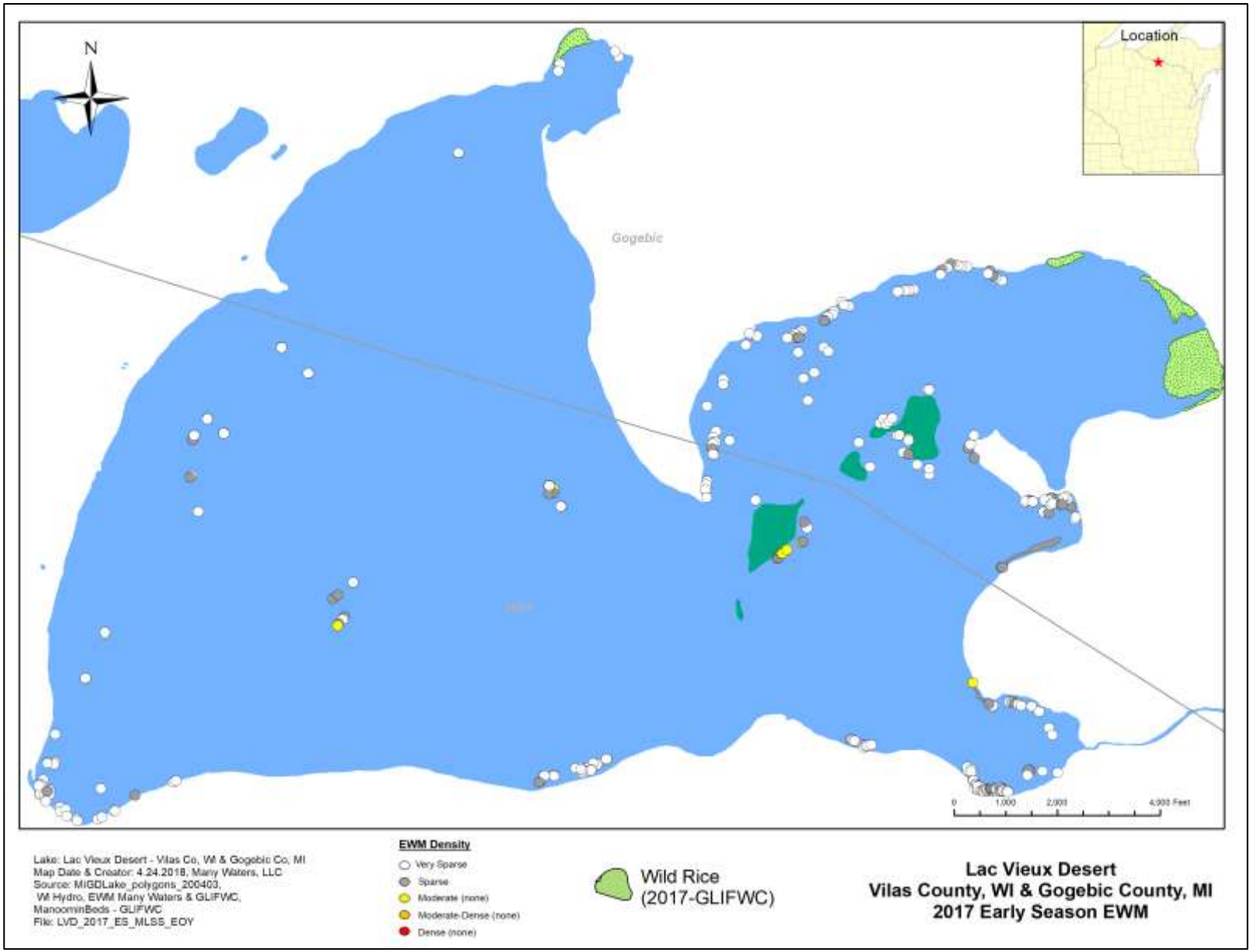
This report is a summary of AIS activities completed in 2017 and includes work funded by the WDNR Aquatic Invasive Species Grant # ACEI-150-14 and a USDA Secure Rural Schools Title II project (herein referred to as RAC) sponsored by the Invasive Species Control Coalition and the Lac Vieux Desert Lake Association (LVDLA). Generally, Gogebic County RAC projects shall provide specific benefit to USFS lands and adjacent lands. The LVD RAC project is primary focused on Eurasian watermilfoil (EWM) monitoring and management, however includes mapping nearshore terrestrial and wetland invasive species with emphasis on USFS Ottawa NF high priority and new invader/high priority plant species.

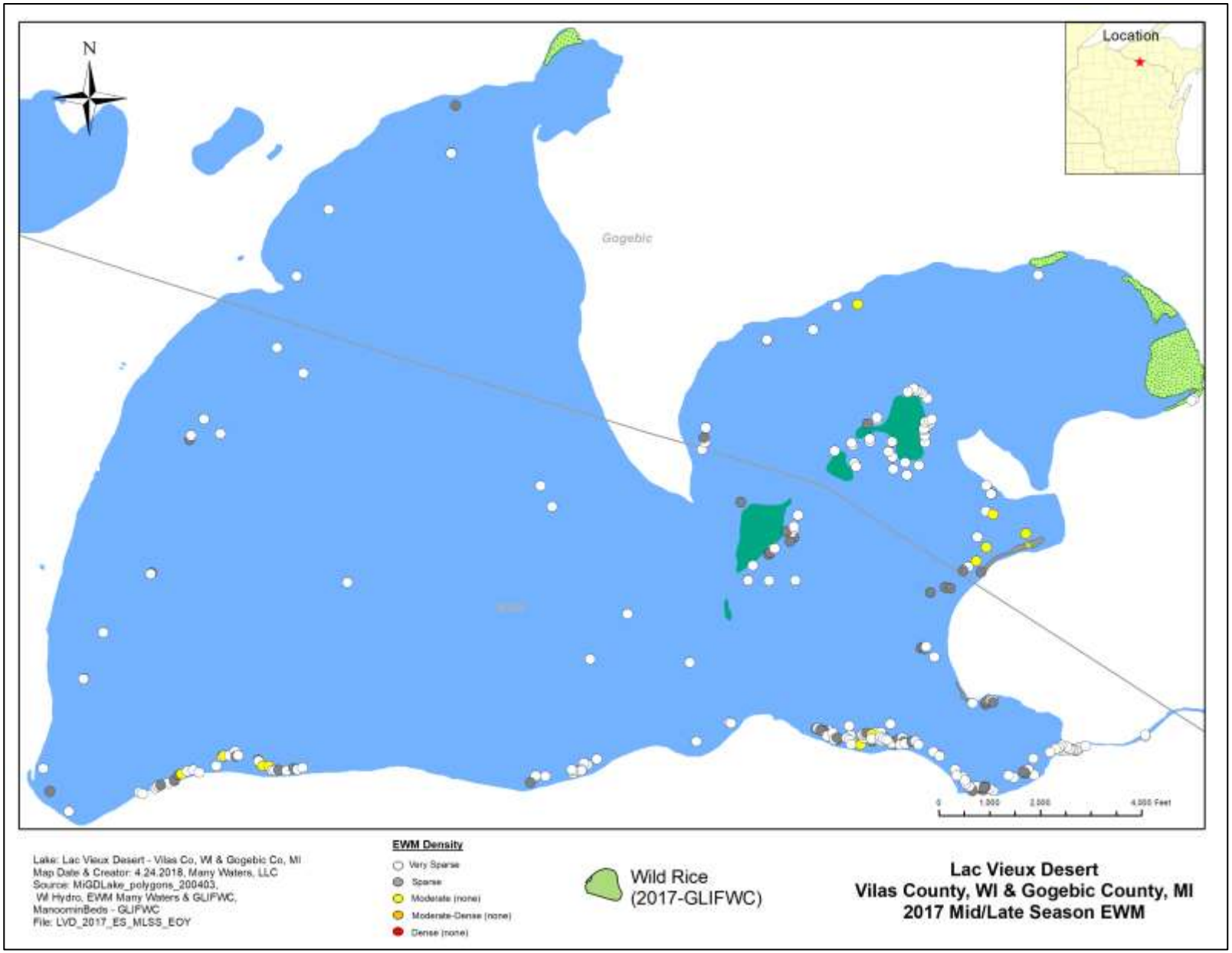
MONITORING

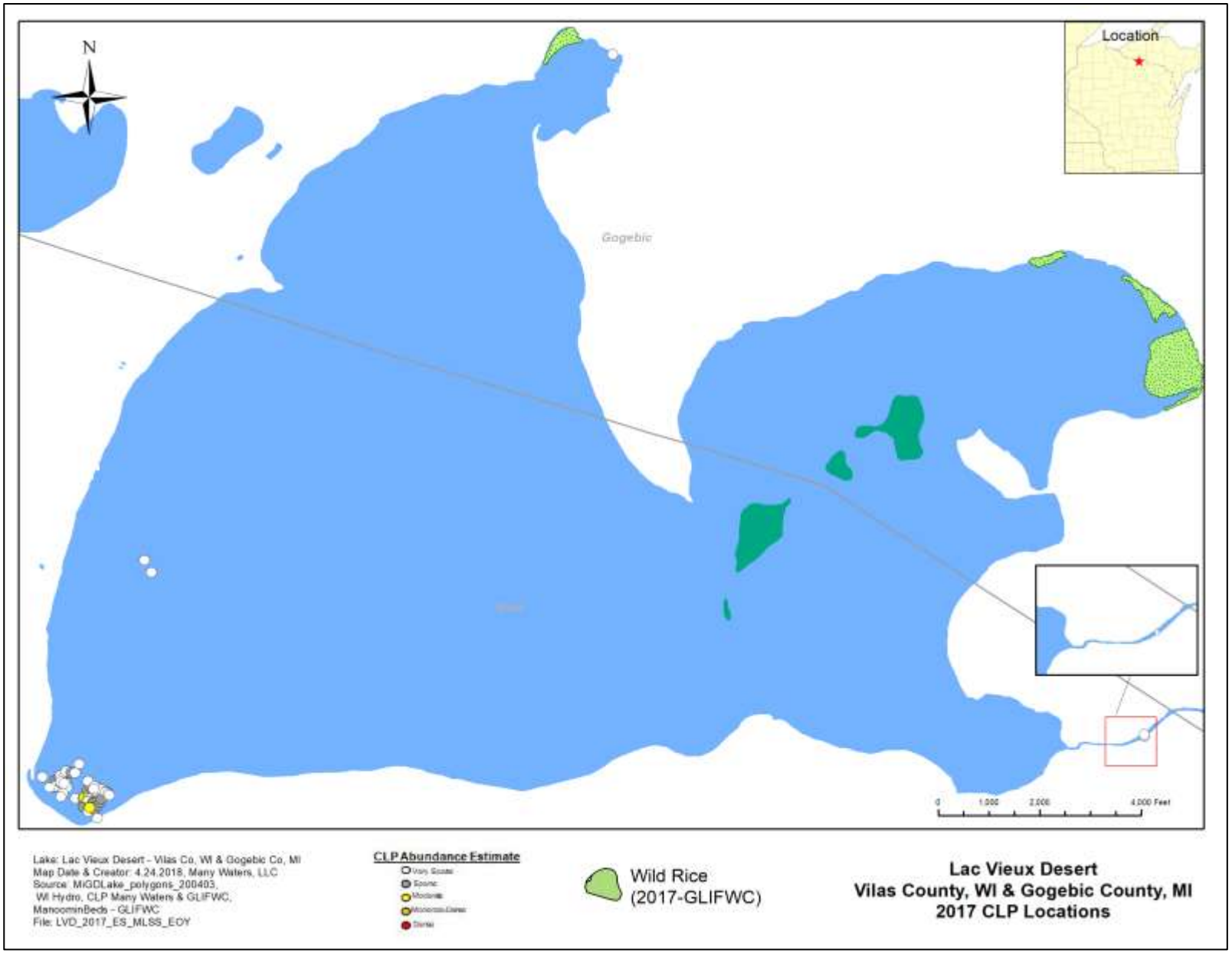
Aquatic invasive species (AIS) monitoring in 2017 was a combined effort with Great Lakes Indian Fish and Wildlife Commission (GLIFWC), the Invasive Species Control Coalition of Watersmeet (ISCCW) and Many Waters, LLC. GLIFWC and the ISCCW has been providing local-share matching funds under the current AIS grant. GLIFWC and the ISCCW (contracted to Many Waters, LLC) contributed to the first or early season portion of efforts which took in May and June, whereas Many Waters, LLC complete the second portion or mid-late season survey.

Eurasian watermilfoil monitoring surveys using a meander approach are primarily completed with visual observations, but also include the use of rake tosses and underwater cameras. Monitoring efforts are qualitative in nature, meaning that information collected describes the condition of the target AIS rather than using measured or quantitatively calculated values. For example, smaller sites are geo-referenced with a GPS point and extent is determined by using a visually estimated circumference converted to acres. This is an observed estimate of exact extent and 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 by a polygon.

Each year two surveys are completed. The first survey, timed during the first half of the growing season, focuses on reconfirming previous years EWM locations to refine management strategies and monitor for EWM and 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.


N
Location
Gogebic
0
1,000
2,000
4,000 Feet
Lake: Lac Vieux Desert - Vilas Co, WI & Gogebic Co, MI
Map Date & Creator: 4.24.2018; Many Waters, LLC
Source: MIGDLake_polygons_200403,
WI Hydro, EWM Many Waters & GLIFWC,
ManoominBeds - GLIFWC
File: LVD_2017_ES_MLSS_EOY
EWM Density
Very Sparse
Sparse
Moderate (none)
Moderate-Dense (none)
Dense (none)
Wild Rice
(2017-GLIFWC)
Lac Vieux Desert
Vilas County, WI & Gogebic County, MI
2017 Early Season EWM

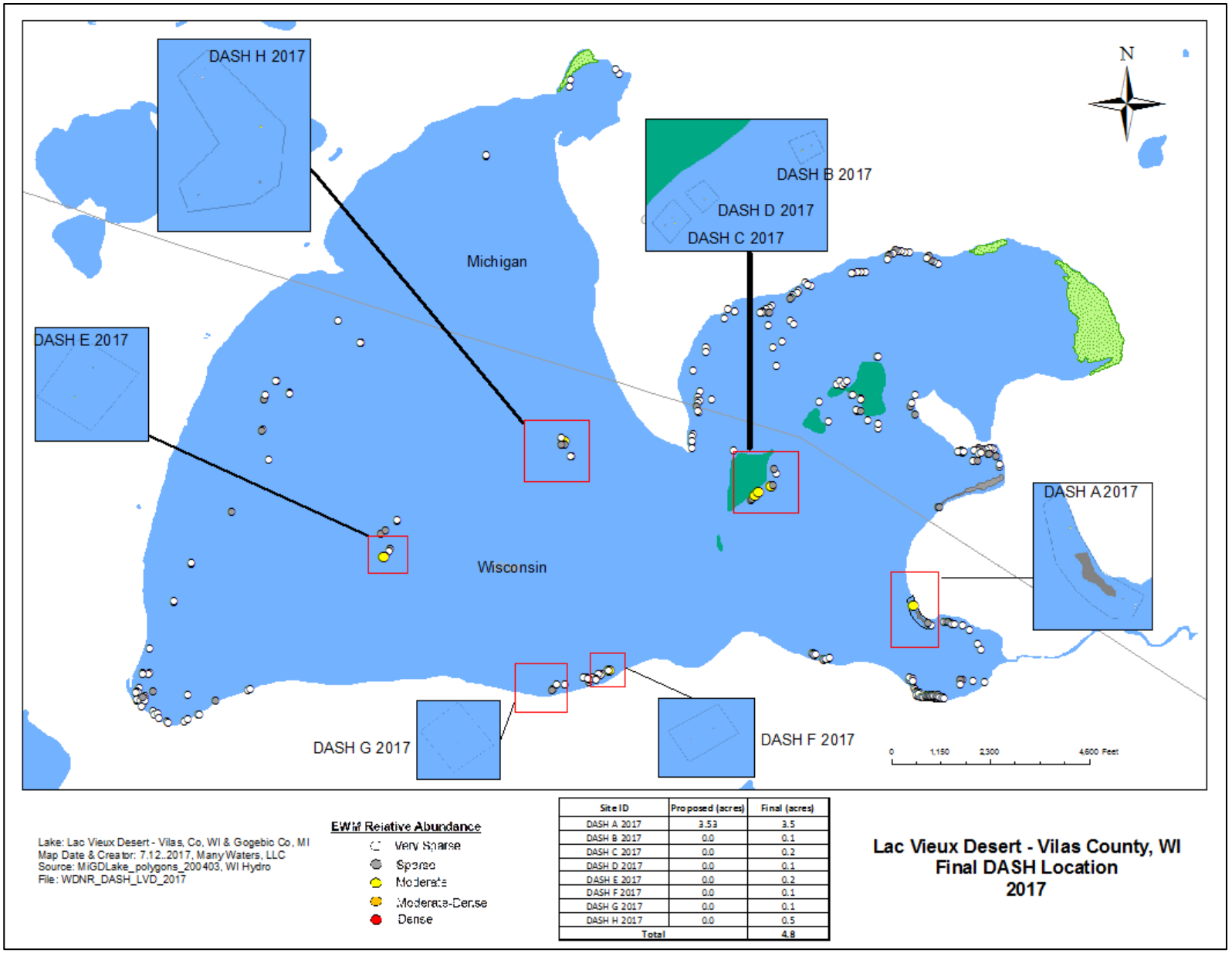

N
Location
Gogebic
0
1,000
2,000
4,000 Feet
Lake: Lac Vieux Desert - Vilas Co, WI & Gogebic Co, MI
Map Date & Creator: 4.24.2018, Many Waters, LLC
Source: MiGDLake_polygons_200403,
WI Hydro, EWM Many Waters & GLIFWC,
ManoominBeds - GLIFWC
File: LVD_2017_ES_MLSS_EOY
EWM Density
Very Sparse
Sparse
Moderate (none)
Moderate-Dense (none)
Dense (none)
Wild Rice
(2017-GLIFWC)
Lac Vieux Desert
Vilas County, WI & Gogebic County, MI
2017 Mid/Late Season EWM


N
Location
Gogebic
0 1,000 2,000 4,000 Feet
Lake: Lac Vieux Desert - Vilas Co, WI & Gogebic Co, MI
Map Date & Creator: 4.24.2018, Many Waters, LLC
Source: MiGDLake_polygons_200403,
WI Hydro, CLP Many Waters & GLIFWC,
ManoominBeds - GLIFWC
File: LVD_2017_ES_MLSS_EOY
CLP Abundance Estimate
Wild Rice
(2017-GLIFWC)
Lac Vieux Desert
Vilas County, WI & Gogebic County, MI
2017 CLP Locations

EWM MANAGEMENT

Hand removal with the use of divers commenced on Lac Vieux Desert on June 13th 2017 and continued with weekly visits until September 21st, 2017. Hand removal efforts focused on areas identified during the spring and mid-late summer surveys where EWM densities ranged from very sparse to moderate. Hand removal efforts totaled 172(2-3 divers) dive hours removing approximately 3,303 EWM plants weighing roughly 530 pounds wet weight. In addition to weekly visits, the USFS Ottawa supported hand removal efforts by spending one day within Thunder Bay pulling EWM. Hand removal efforts within Gogebic County were funded by RAC, whereas hand removal efforts in Vilas County were funded under the current WDNR AIS grant.

DASH efforts focused on locations identified along the south shore, east shore of Big Duck Island and Slaughter Bay. Just under 38 hours of DASH removed 2,217 pounds of EWM. (WDNR DASH Permit # NO-2017-64-71M, MDEQ Permit # WRP 7923) Again, DASH efforts within Gogebic County were funded by RAC, whereas DASH efforts in Vilas County were funded under the current WDNR AIS grant.



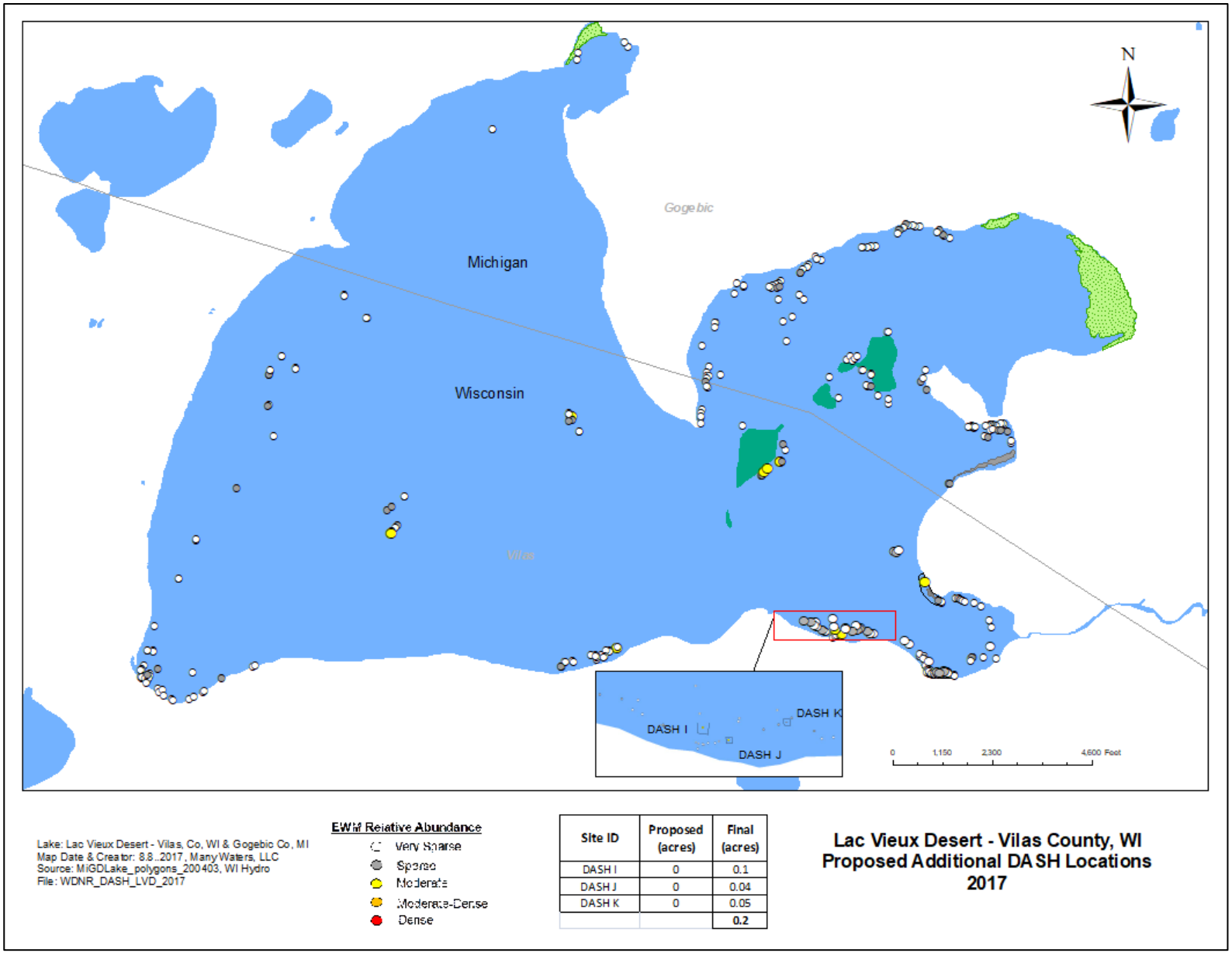
Lake: Lac Vieux Desert - Vilas, Co, WI & Gogebic Co, MI
Map Date & Creator: 7.12..2017, Many Waters, LLC
Source: MiGDLake_polygons_200403, WI Hydro
File: WDNR_DASH_LVD_2017

EWM Relative Abundance

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

Site ID	Proposed (acres)	Final (acres)
DASH A 2017	3.53	3.5
DASH B 2017	0.0	0.1
DASH C 2017	0.0	0.2
DASH D 2017	0.0	0.1
DASH E 2017	0.0	0.2
DASH F 2017	0.0	0.1
DASH G 2017	0.0	0.1
DASH H 2017	0.0	0.5
Total		4.8

Lac Vieux Desert - Vilas County, WI
Final DASH Location
2017



Lake: Lac Vieux Desert - Vilas, Co, WI & Gogebic Co, MI
Map Date & Creator: 8.8..2017, Many Waters, LLC
Source: MiGDLake_polygons_200403, WI Hydro
File: WDNR_DASH_LVD_2017

EWM Relative Abundance

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

Site ID	Proposed (acres)	Final (acres)
DASH I	0	0.1
DASH J	0	0.04
DASH K	0	0.05
		0.2

Lac Vieux Desert - Vilas County, WI
Proposed Additional DASH Locations
2017

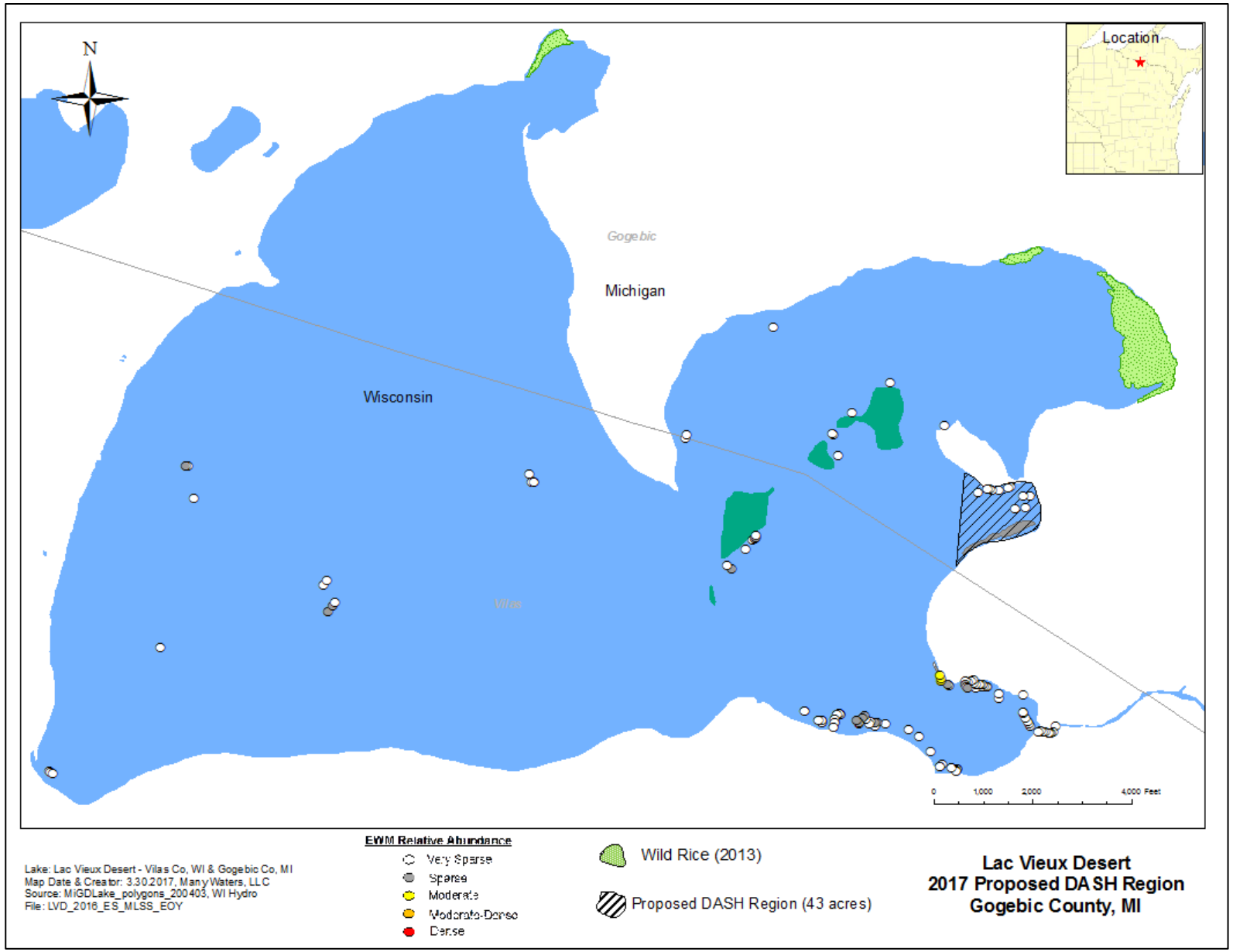
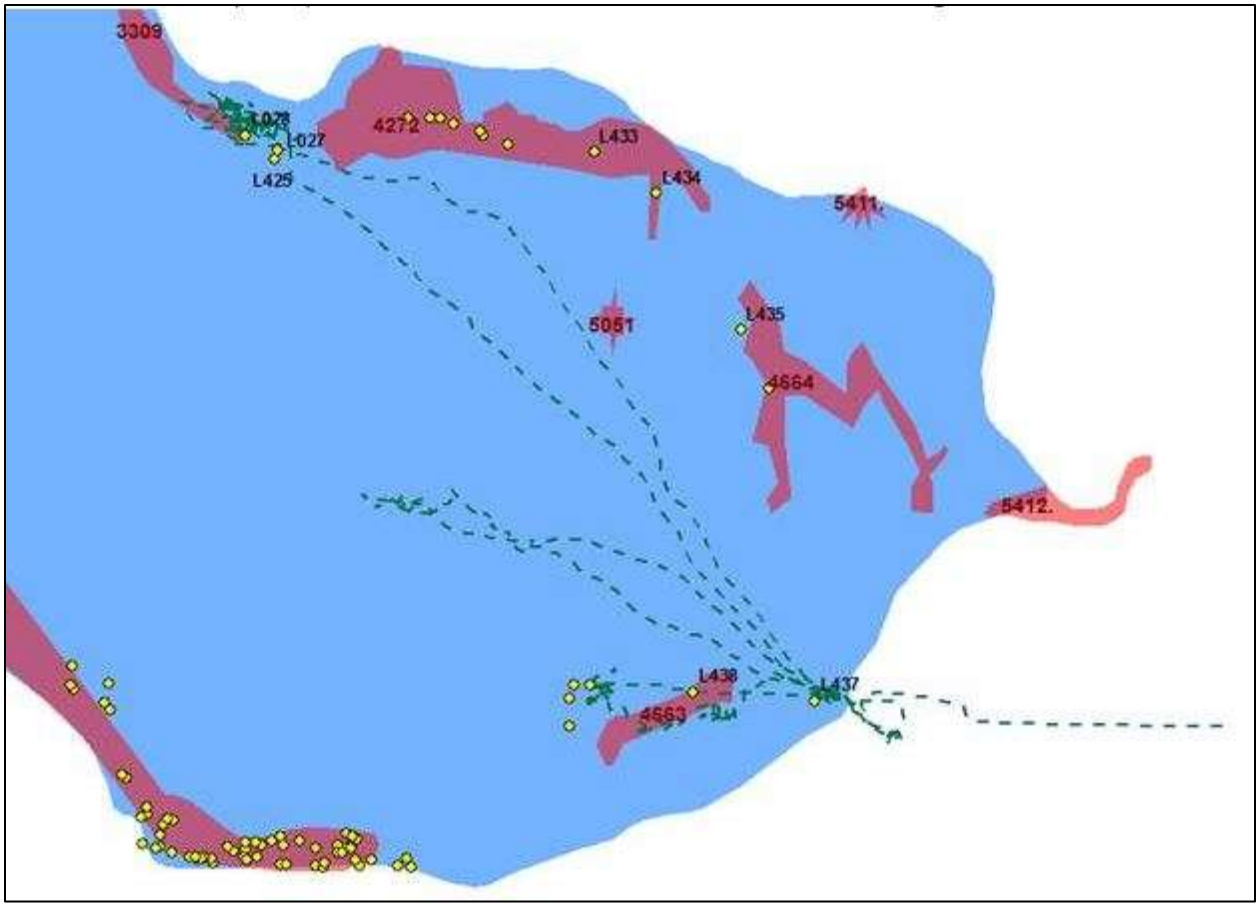

N
Location
Gogebic
Michigan
Wisconsin
Vilas
0 1,000 2,000 4,000 Feet
EWM Relative Abundance
Very Sparse
Sparse
Moderate
Moderate-Dense
Dense
Wild Rice (2013)
Proposed DASH Region (43 acres)
Lake: Lac Vieux Desert - Vilas Co, WI & Gogebic Co, MI
Map Date & Creator: 3.30.2017, Many Waters, LLC
Source: MiGDLake_polygons_200403, WI Hydro
File: LVD_2016_ES_MLSS_EOY
Lac Vieux Desert
2017 Proposed DASH Region
Gogebic County, MI

Table 1: 2017 Daily Summary of DASH Efforts

Date	Location	Size (acres)	DASH Boat Location		Dive Time (hrs)	EWM (lbs*)	Native (lbs*)	% Incidental Native Plant Harvest (lbs)*	Total (lbs*)
			Lat (NAD 83)	Long (NAD 83)					
8/7/2017	DASH B	0.1	46.135230	89.094020	1.50	86.0	7.00	8%	93.00
	DASH D	0.1	46.134790	89.095270	2.50	76.0	3.00	4%	79.00
8/8/2017	DASH C	0.2	46.134670	89.095600	2.00	93.0	17.00	18%	110.00
8/9/2017	DASH G	0.1	46.123220	89.108390	1.50	26.0	2.00	8%	28.00
	DASH I	0.1	46.124850	89.088530	1.75	188.0	1.00	1%	189.00
	DASH I	0.1	46.124800	89.088710	1.50	71.0	0.50	1%	71.50
8/14/2017	DASH J	0.04	46.124620	89.087850	1.00	15.0	0.25	2%	15.25
8/16/2017	DASH F	0.1	46.123212	89.108446	6.00	303.0	1.00	0%	304.00
10/10/2017	South Slaughter Bay**	3.7	46.135942	89.075042	6.50	337.0		<5%	337.0
10/11/2017	South Slaughter Bay**	3.7	46.13583	89.07494	5.00	346.0		<5%	346.0
10/12/2017	South Slaughter Bay**	3.7	46.13599	89.07516	4.50	336.5		<5%	336.5
10/13/2017	South Slaughter Bay**	3.7	46.13595	89.07519	4.00	340.0		<5%	340.0
					37.75	**2217.5**	**2255.25**	**5% (ave)**	**2249.25**

*** wet weight ** RAC Funded**

Using information from the early and mid-late season surveys, he USFS Ottawa National Forest hand pulled EWM found in Thunder Bay. A map depicting work locations and general footprint of treatment areas is provided below.



Track files and delineation of USFS work areas during hand pulling efforts in Thunder Bay, August 9th, 2017. Provided by the USFS Ottawa National Forest

EVALUATION

An end of the year evaluation took place between October 6th- 10th 2017. This survey assessed hand removal and DASH sites. The purpose of the end of year evaluation was to visit all known managed sites, not survey for additional EWM locations.

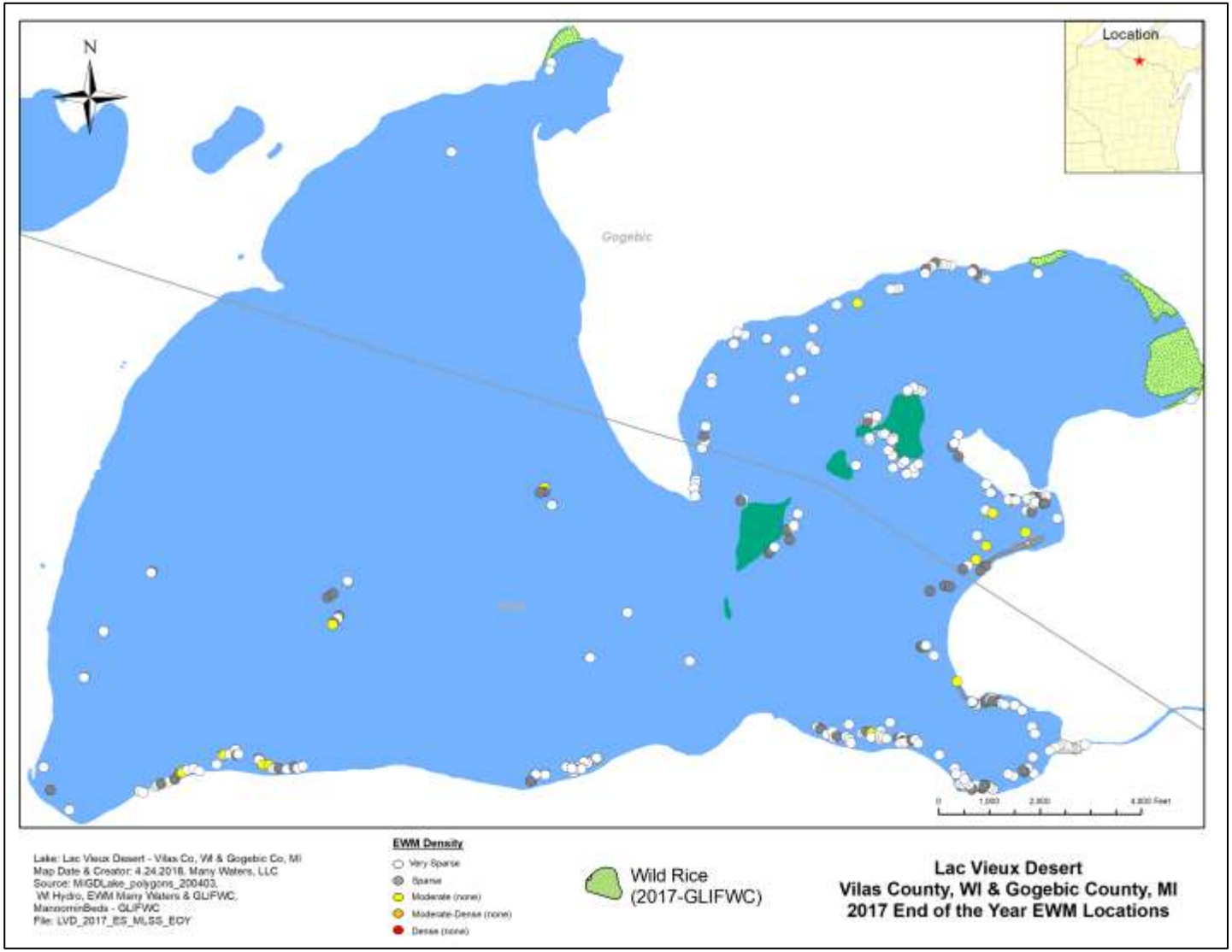

N
Location
Gogebic
0
1,000
2,000
4,000 Feet
Lake: Lac Vieux Desert - Vilas Co, WI & Gogebic Co, MI
Map Date & Creator: 4.24.2018, Many Waters, LLC
Source: MIGDLake_polygons_200403,
WI Hydro, EWM Many Waters & GLIFWC,
ManoominBeds - GLIFWC
File: LVD_2017_ES_MLSS_EOY
EWM Density
Very Sparse
Sparse
Moderate (none)
Moderate-Dense (none)
Dense (none)
Wild Rice
(2017-GLIFWC)
Lac Vieux Desert
Vilas County, WI & Gogebic County, MI
2017 End of the Year EWM Locations

Figure 1: Change in EWM point based mapping acreage categorized by estimated abundance 2013-2017 – Lac Vieux Desert. Note: This is a visual estimate of exact extent, not total footprint.

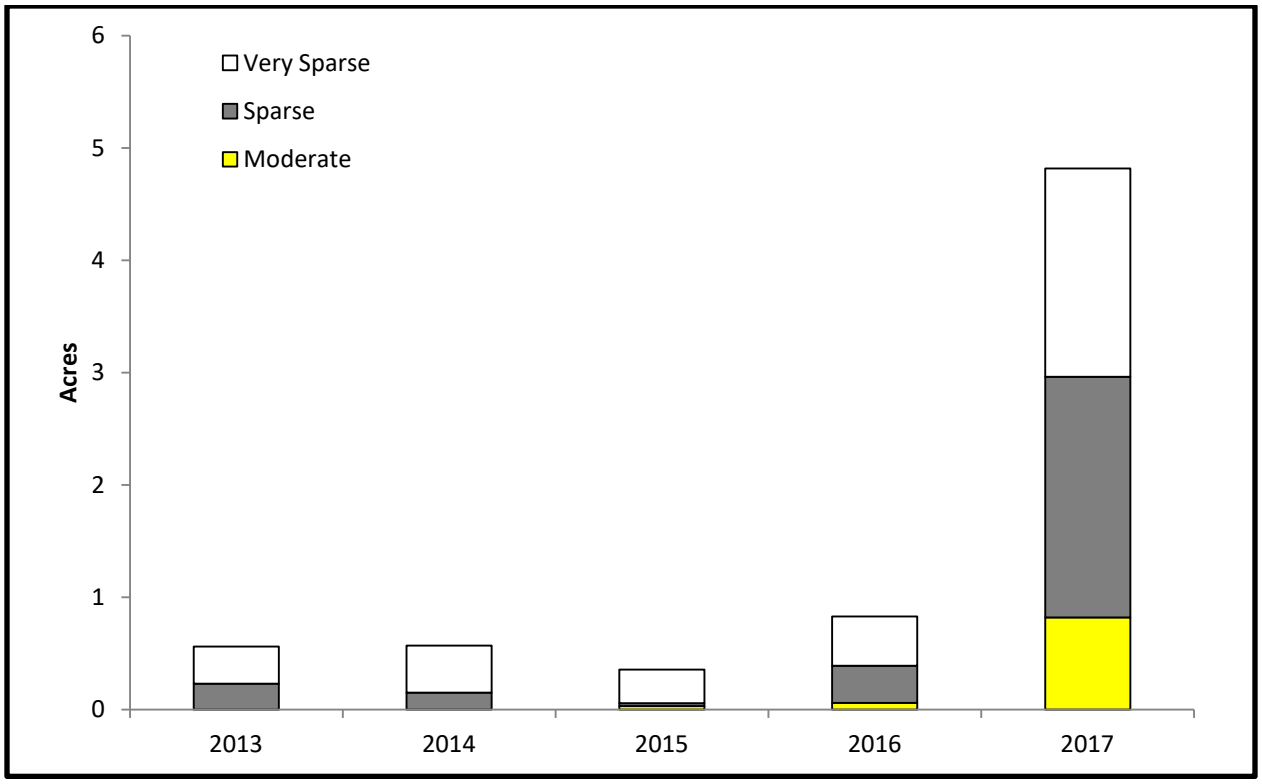
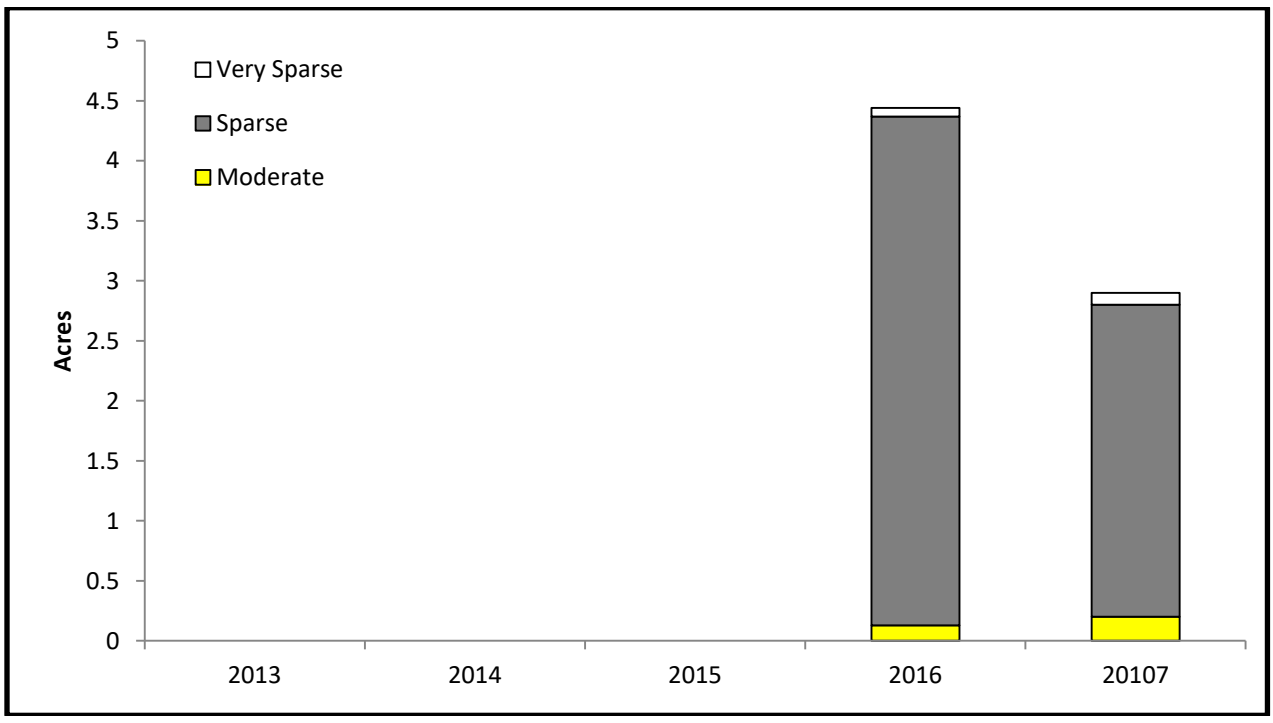


Figure 2: Change in EWM polygon based mapping acreage categorized by estimated abundance 2013-2017 – Lac Vieux Desert.



SUMMARY

Often times aquatic vegetation exhibits notable annual variations in the abundance both spatially and in biomass. Environmental factors can lead to conditions conducive to observed high aquatic plant biomass, low biomass, or what most in our region would consider "average for the year". The environmental conditions of the winter of 2017 were relatively warm, low snow fall, and early ice out. Both native and invasive plants may have taken advantage of these conditions, potentially contributing to higher observed biomass. As seen in Figure 1 the frequency of point based mapped EWM increased in 2017 even with an increase in hand removal results. Increases in frequency and abundance of EWM on LVD will not be unusual, and annual fluctuation should be expected. As EWM frequency and abundance fluctuate so will annual need in control methods.

Between 2013 and 2015, the average number of plants hand removed on LVD generally trended with total weight removed. However in 2016 and 2017, as total plants removed rose, total weight remained similar to total weights from 2013-2015. Obviously, more plants are being removed annually on LVD, suggesting that colonies may be expanding and divers are removing more recently colonized areas. Another suggestion to the difference in plants pulled and weight may be that divers are revisiting previously dove areas, pulling smaller plants either missed during initial dive efforts or pulling newly rooted plants. Finally, the difference may be due to a change in technique, which would under represent the weight of plants removed. Once locations of EWM reach a certain threshold for diving along, including larger sites or sites with many larger and robust plants, the strategy will be to switch from diving to DASH.

Curly leaf pondweed (CLP) also increased in 2017 but was found in similar locations as previous years. CLP can be very aggressive in certain water bodies but in LVD it has remained at non-nuisance levels since monitoring began in 2012. Even though CLP in LVD has not gotten to a level where it has hindered any recreational activities continued monitoring is suggested.

Overall LVD is a very dynamic waterbody, it consists of large tracts of undeveloped land, a diverse aquatic plant community, a popular fishery, multiple states, tributaries and the headwaters of the Wisconsin River. Invasive species play a role, hopefully a small role in the overall health and pristine qualities of LVD that should be protected for generations to come.

Figure 3: Total EWM Plants and Wet Weights of Plants Hand Pulled 2013 - 2017 – Lac Vieux Desert.

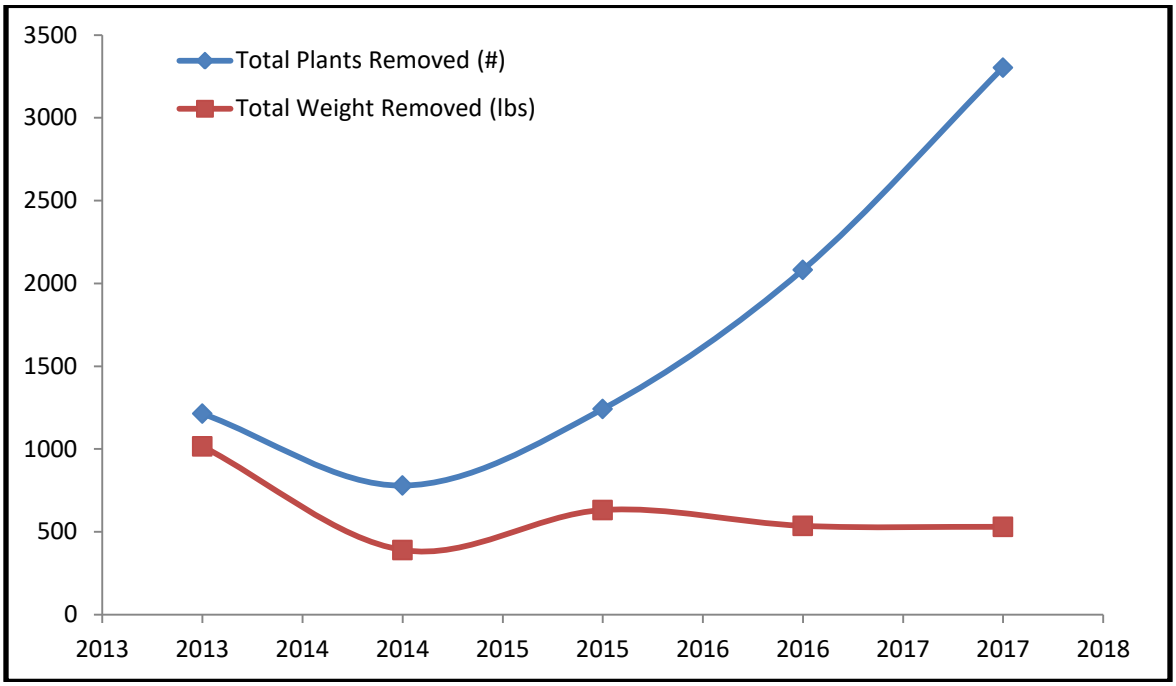
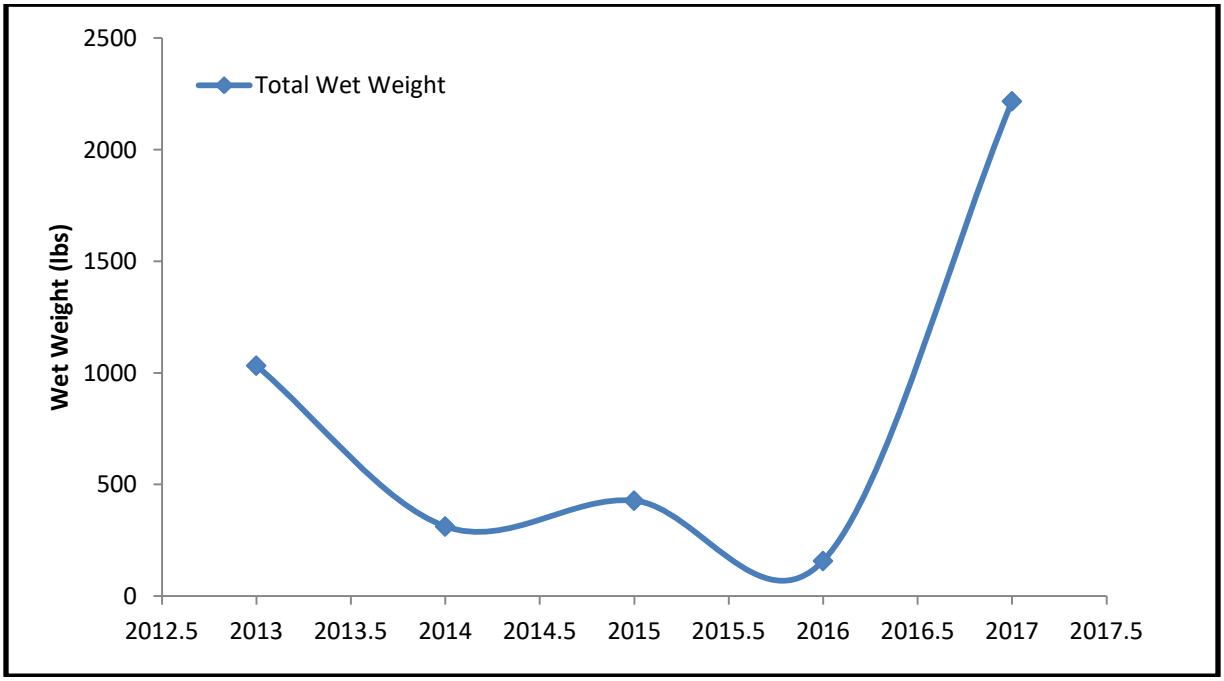


Figure 4: Total EWM Wet Weights of Plants Pulled During DASH Efforts 2013-2017 – Lac Vieux Desert.



LAKE WIDE STEWARDSHIP AND AIS PREVENTION ACTIVITIES

The LVDLA, through the WDNR Clean Boats Clean Waters program and the ISCCW, contacted 5,485 individuals, inspected 2,687 boats, and washed 1,149 boats. Total riparian pledges not to use phosphorous-based fertilizers on their properties and not to remove aquatic rooted vegetation in front of their properties continue to be estimated at 110 pledges.

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 AIS Early Detection Rapid Response grant to support efforts to control EWM and a WDNR planning grant to develop a comprehensive lake management plan. WDNR plan approval occurred in 2012. In 2014, the LVDLA was awarded a WDNR AIS Established Population grant to continue EWM/CLP management. This grant's project period is from 2014- to 2017, however, with the addition of the RAC grant there will be some carry over WDNR funds will continue the project in 2018. In, 2017, the LVDLA applied for and was awarded a WDNR AIS Planning grant. This grant will be an update to the original 2012 plan and include: AIS prevention measures, seasonal monitoring, shoreland habitat assessments, aquatic and nearshore vegetation assessments and water quality monitoring.