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Summary of Diver Assisted Suction Harvesting Efforts

Lac Vieux Desert – Vilas County, WI & Gogebic County, MI

2015 WDNR Mechanical Harvesting Permit Annual Report

Permit ID: NO-2015-64-90M

Date: 11.30.2015

Submitted To:

Lac Vieux Desert Lake Association
and
Wisconsin Department of Natural Resources

Submitted By:

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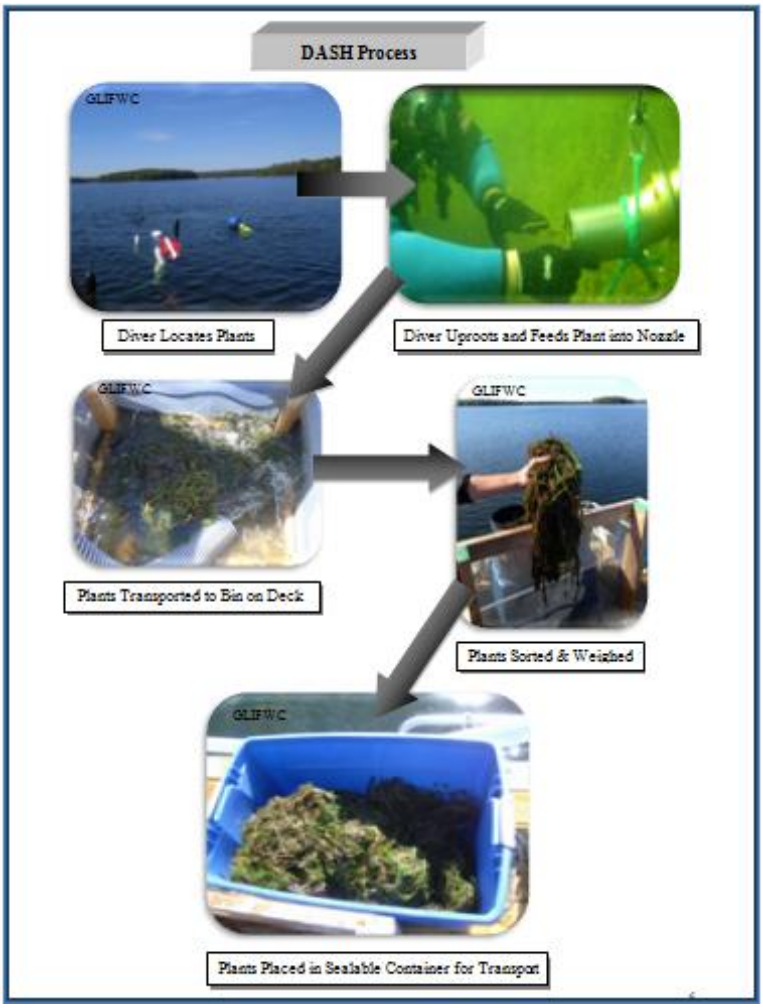
Introduction

The Lac Vieux Desert Lake Association solicited the services of Many Waters, LLC to use Diver Assisted Suction Harvesting (DASH) to manage for Eurasian watermilfoil (EWM) on Lac Vieux Desert, located in Vilas County Wisconsin and Gogebic County Michigan. DASH is a mechanical process and requires a mechanical harvesting permit (Form 3200-113 (R 3/04)) from the Wisconsin Department of Natural Resources (WDNR). The 2015 Permit ID is NO-2015-64-90M.

Dive Methods

While using DASH, a diver typically will begin by locating the invasive plant such as Eurasian watermiloil plant from the surface, and then descend next to the plant while simultaneously lowering the nozzle. Divers works along the bottom by using fin pivots, kneeling on the bottom or hovering above the bottom at a distance where the root mass of the plant is within hands reach. The diver will either feed the top of the plant into the hose first and then uproot the plant or uproot the plant and feed it root wad first into the hose. It is very important that the diver shake as much sediment from the root wad before getting the root wad near the nozzle. Shaking the root wad away from the nozzle helps maintain visibility for the diver and minimizes debris and sediment in the holding bins. As plants are fed into the nozzle, the diver carefully observes for possible fragments. Fragments are caught by hand and fed into the nozzle.

Work sites that have dense monotypic beds of EWM, the initial DASH efforts are quite simple. The diver will descend adjacent to the bed and begin hand pulling or harvesting systematically across the bed to dismantle the bed. Once the majority of the bed is removed, a more systematic approach follows to target remaining clustered, scattered or outlier plants in the work site. As part of our method for covering a work area while using DASH (or divers alone), a grid pattern is used. A diver will start at either the port or starboard side of the boat and work to and from the boat perpendicular to the direction the boat is facing. For example, with the boat facing north and the diver starting on the port side, the diver begins by heading west. The diver will continue to work perpendicular to the boat until reaching the end of the suction hose. The diver then works back to the boat on a new transect line. Distance between each transect is dictated by visibility, density of EWM, and obstructions. This process is repeated on the opposite side and in front of the boat. Depending on the site, once the diver has adequately covered the area, which the suction hose can reach, they will signal the deckhand to let out more anchor line or determine that the boat needs re-positioning.



Once plants reach the surface, a hose dispenses the plant material into a series of screened bins located on the deck of the boat. These bins capture plants and allow water to drain out back into the lake. Plants on deck are sorted into two categories: the targeted invasive plant and native vegetation. A wet weight of both the invasive plant and all native species combined is taken. Plants are placed in sealable containers or bags for transport to the dumping site. The dumping site is a pre-determined site upland, away from any water body.

Figure 1: 2015 DASH Work Areas

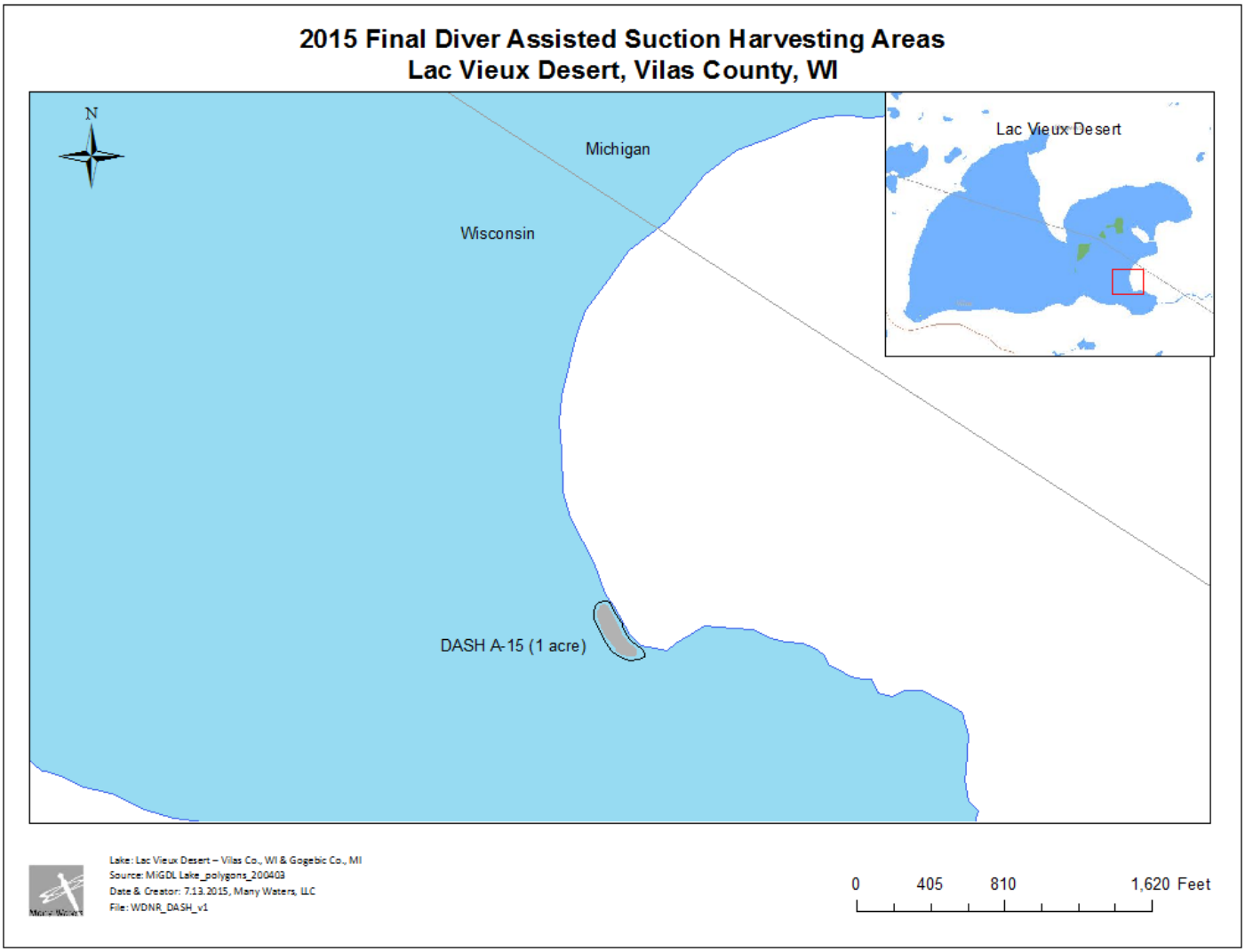
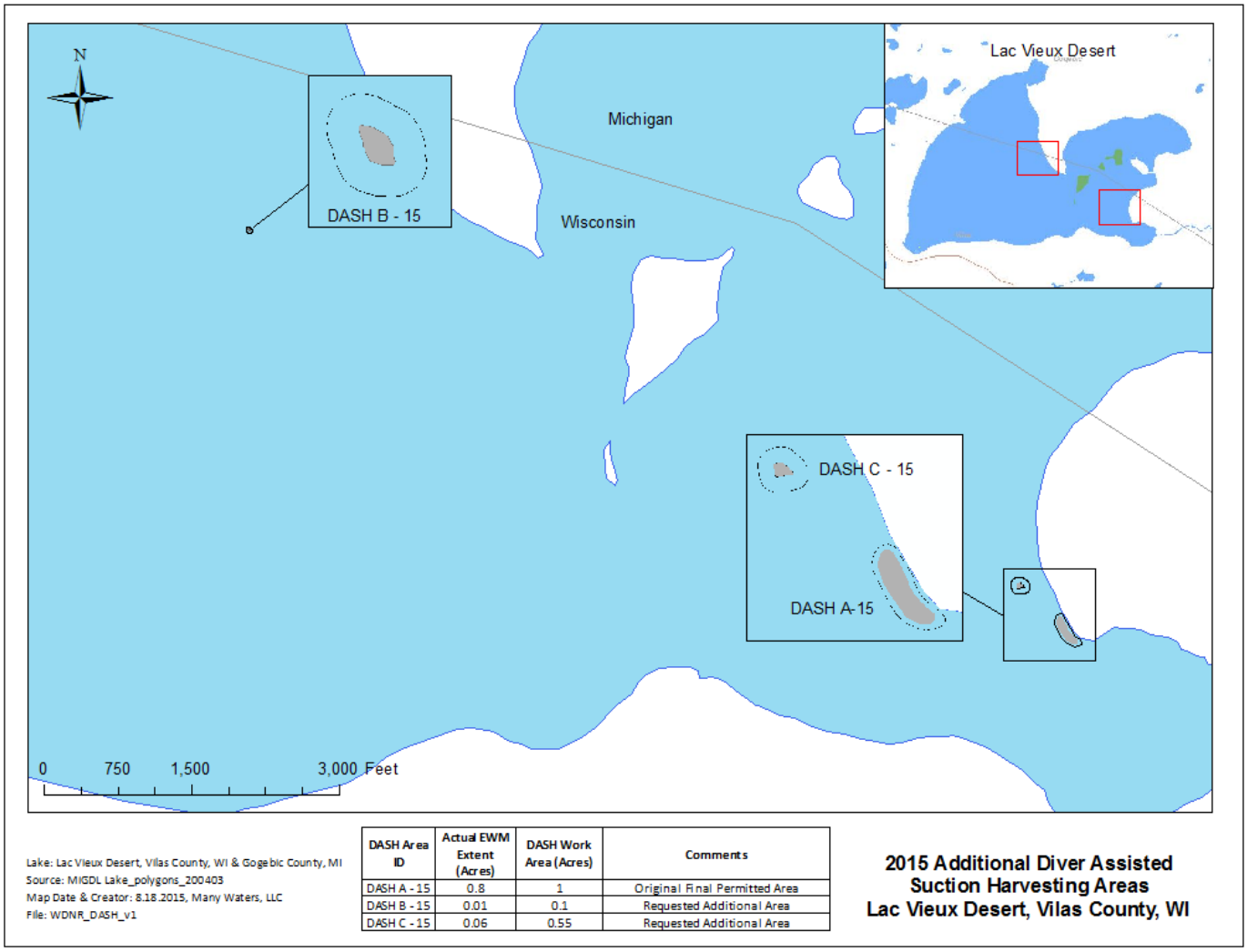


Figure 2: Amended Additional 2015 DASH Work Areas



Lake: Lac Vieux Desert, Vilas County, WI & Gogebic County, MI
Source: MIGDL Lake_polygons_200403
Map Date & Creator: 8.18.2015, Many Waters, LLC
File: WDNR_DASH_v1

DASH Area ID	Actual EWM Extent (Acres)	DASH Work Area (Acres)	Comments
DASH A - 15	0.8	1	Original Final Permitted Area
DASH B - 15	0.01	0.1	Requested Additional Area
DASH C - 15	0.06	0.55	Requested Additional Area

2015 Additional Diver Assisted Suction Harvesting Areas
Lac Vieux Desert, Vilas County, WI

Summary

Table 1: Daily Summary of DASH Efforts

Date	Location	Size (acres)	DASH Boat Location		Dive Time (hrs)	EWM (lbs*)	Native Plants Incidentally Harvested (lbs*)	Native Plants Incidentally Harvested (%)	Total (lbs*)
			Lat (NAD 83)	Long (NAD 83)					
8/25/2015	DASH-B-15	0.10	46.137684	89.113532	1.00	24.00	4.00	16.67%	28.00
8/26/2015	DASH-A-15	1.00	46.127930	89.080380	0.75	19.00	0.50	2.63%	19.50
8/26/2015	DASH-A-15	1.00	46.127670	89.080380	0.50	5.00	0.25	5.00%	5.25
8/26/2015	DASH-A-15	1.00	46.127490	89.080290	2.25	54.00	2.00	3.70%	56.00
8/26/2015	DASH-A-15	1.00	46.127560	89.080180	0.75	14.00	1.00	7.14%	15.00
8/26/2015	DASH-A-15	1.00	46.127390	89.080180	0.75	21.00	2.00	9.52%	23.00
8/26/2015	DASH-A-15	1.00	46.127120	89.079770	0.75	9.00	1.00	11.11%	10.00
10/1/2015	DASH-C-15	0.55	46.128640	89.082150	2.25	116.00	18.00	15.52%	134.00
					9.00	**262.0**	**28.75**	**8.91% (average)**	**290.75**

Daily Log

August 25th 2015 Weather- partly sunny, 55˚, winds NW 5-10 mph

Diving conditions remained good and visible was moderate. Diving efforts began at a couple small locations in the Slaughter Bay area along the Michigan side then proceeded to DASH-B-2015 along the Wisconsin side. Native plants were still present in good abundance but not problematic. Given this site is deeper; visibility was reduced at the bottom. Incidental non-target harvest of native plant species comprised of coontail (*C. demersum*), northern watermilfoil (*M. sibericum*), common waterweed (*E. Canadensis*) and flat stem pondweed (*P. zosteriformis*), however the majority of incidental harvest consisted of coontail. One hour of dive time yielded 24 pounds of EWM.

August 26th 2015 Weather- sunny, 68˚, winds west around 5 mph

DASH efforts continued in the southern Simpson's Point area along DASH-B-15. We began on the northeast part of the work area and moved our way to the south. Five and three quarter hours of diving removed 122 pounds of EWM. Coontail and northern watermilfoil were the most abundant species incidentally harvested.

October 1st 2015 Weather- sunny, 45˚ degrees, winds E 5-10 mph

DASH efforts focused on DASH-C-15. Due to the wind conditions, it was a popular fishing spot and we had several boats around fishing to start the day. Water temperatures were quite cold and divers wore dry suits to protect from the cold. Two and a quarter dive hours produced 116 pounds of EWM. Coontail was the most abundant native plant incidentally harvested. A very soft and dark sediment made diving difficult after the first plant was removed from the substrate.