



2527 Lake Ottawa Road

Iron River, MI 49935

906.284.2198

Summary of Diver Assisted Suction Harvesting Efforts

Lost Lake – Vilas County, WI

2015 WDNR Mechanical Harvesting Permit Annual Report

Permit ID: NO-2015-64-88M

Date: 11.28.2015

Submitted To:

Lost Lake Preservation and Rehabilitation District
and
Wisconsin Department of Natural Resources

Submitted By:

Many Waters, LLC
2527 Lake Ottawa Road
Iron River, MI 49935

Contact:

Bill Artwich: billartwich@gmail.com, 906.367.3206
Barb Gajewski: skih2o@hotmail.com, 715.617.4688

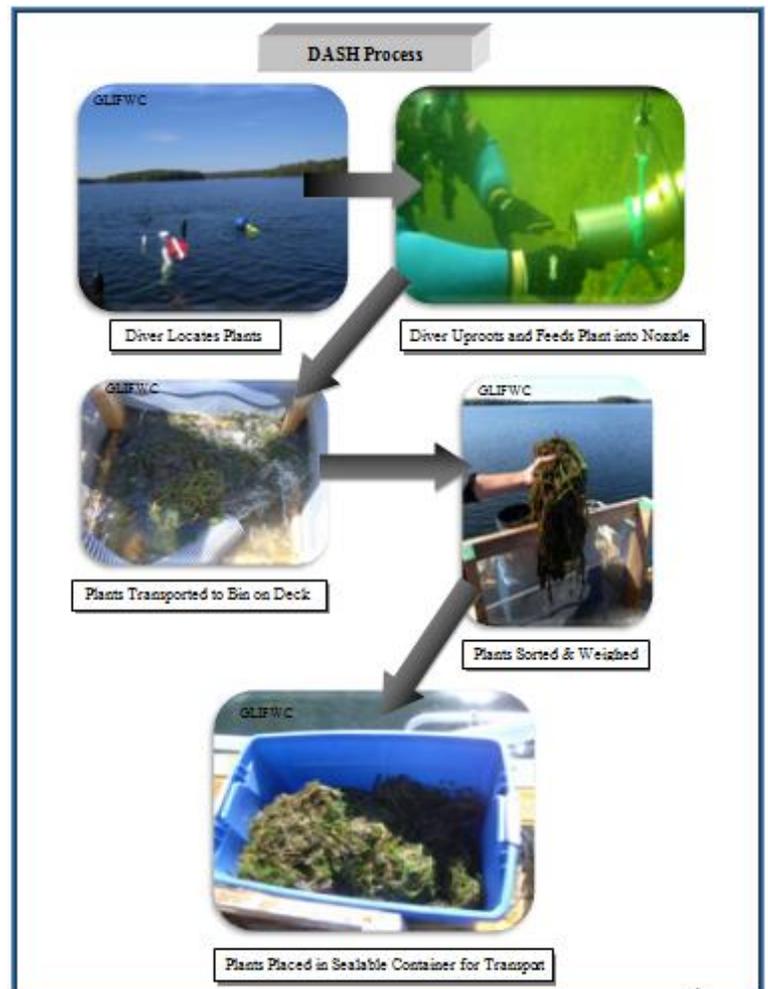
Introduction

The Lost Lake Preservation and Rehabilitation District solicited the services of Many Waters, LLC to use Diver Assisted Suction Harvesting (DASH) to manage for Eurasian watermilfoil (EWM) on Lost Lake, located in Vilas County, WI. 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 WDNR Permit ID is NO-2015-64-88M.

Dive Methods

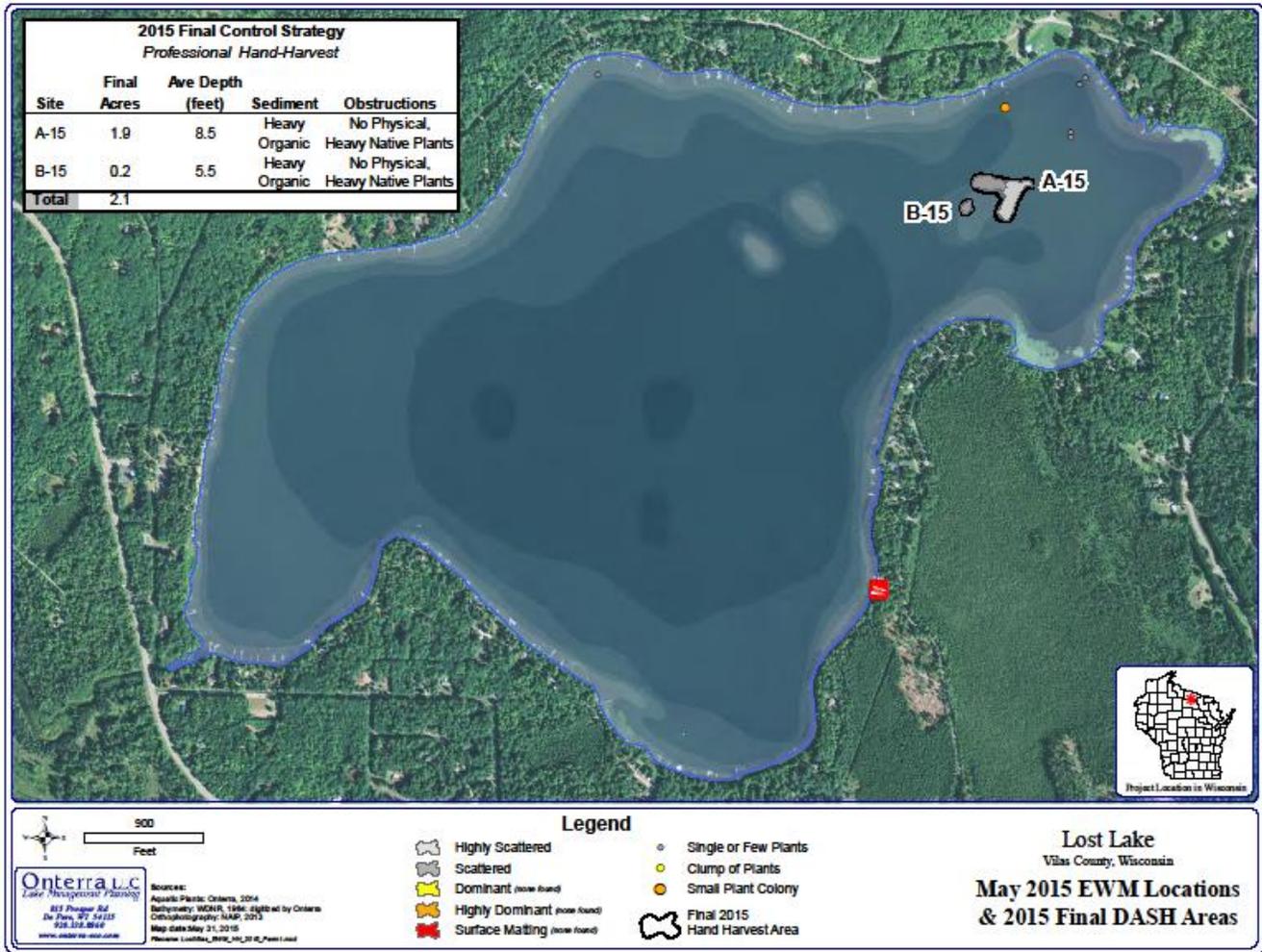
While using DASH, a diver typically will begin by locating the invasive plant such as Eurasian watermilfoil from the surface, and then descend next to the plant while simultaneously lowering the nozzle. Divers work along the bottom by using fin pivots, kneeling on the bottom or hovering above the bottom 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 its rootwad first into the hose. It is very important that the diver shake as much sediment from the rootwad before getting the rootwad near the nozzle. Shaking the rootwad away from the nozzle helps maintain visibility for the diver and minimizes debris and sediment in the holding bins. The diver carefully observes plants fed into the nozzle 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 (Onterra, 2015)



Summary

Table 1: Daily Summary of DASH Efforts

Date	Location	Size (acres)	Ave. Depth (ft)	DASH Boat Location		Working Direction	Dive Time (hrs)	EWM (lbs*)	Native (lbs*)	Incidental Native Plant Harvest (%)	Total (lbs*)
				Lat (NAD 83)	Long (NAD 83)						
7/1/2015	A-15	1.9	8.5	45.58.164	89.28.395	NNW	4.00	110.0	3.0	3%	113.0
				45.58.175	89.28.396	WNW	0.50	9.0	0.0	0%	9.0
				45.58.176	89.28.406	N & W	1.25	44.0	2.0	5%	46.0
							5.75	163.0	5.0	2% (average)	168.0

Daily Conditions

July 1st 2015

Weather – clear, 70°F, light wind

DASH efforts focused on A-15, which appeared to have denser EWM of the two designated work areas. Native vegetation did hinder diving efforts, all though not to a point where we felt incidental harvest of native plants was high nor vegetation reduced diving efforts to a degree that was unacceptable. Actual incidental harvest of native vegetation was minimal considering the degree of native vegetation present. Curly leaf pondweed was observed at most of our work sites in small colonies to individual plants. Five and three quarter dive hours removed 153 pounds of EWM. Incidental harvest of native vegetation included: white stem pondweed (*P. praelongus*), fern pondweed (*P. robbinsii*), water celery (*V.americana*), clasping leaf pondweed (*P rickarsonii*), waterweed (*E. canadensis*), flat stem pondweed (*P. zosteriformis*) and curly leaf pondweed (*P. crispus*).