SQUASH LAKE ASSOCIATION'S
2011-2013 EARLY DETECTION AND RAPID RESPONSE PROJECT
FINAL REPORT

APRIL 2013

Sponsored by

Squash Lake Association and
Wisconsin Department of Natural Resources

Wisconsin Department of Natural Resources Grant ID AIRR-111-12

Project Dates: July 1, 2011 through June 30, 2013

Prepared and Submitted by Stephanie Boismenue, Volunteer Aquatic Invasive Species Coordinator and Eurasian Water milfoil Hand Harvesting Project Coordinator, Squash Lake Association

Eurasian Water Milfoil survey results provided by Onterra, LLC.
Photos by Stephanie Boismenue

INTRODUCTION

In the summer of 2009, Eurasian watermilfoil (EWM) was discovered in the pristine waters of Squash Lake, located in Oneida County. In the fall of 2009, Lakes Management Company, Onterra LLC, surveyed the lake and found light occurrences of EWM upwind of the boat landing. The EWM totaled roughly 7.2 acres of the 394 acre lake and the granular herbicide 2,4-D was the recommended treatment. After carefully studying all treatment options, the Squash Lake Association voted to remove, reduce, and manage the EWM in the most environmentally sound method available by hand-harvesting the EWM and its root mass, rather than use the recommended herbicide treatment.

The Squash Lake Association developed and implemented a EWM hand-harvesting project, which began on May 10, 2010. It consists of two unique components: a phenomenal crew of hired SCUBA divers, who carefully hand-harvest each plant by its entire root mass, and a dedicated team of Volunteer Milfoil Monitors, who provide lake-wide AIS and EWM monitoring, education, and assistance to the divers. To date, the combined efforts of the divers and the Monitors have been successful at significantly reducing, and managing, the volume of EWM from the lake. Amazingly, and most importantly, **this was done without using a single herbicide**!

OBJECTIVE

The Squash Lake Association has sponsored a second Aquatic Invasive Species (AIS) Early Detection and Rapid Response Project (ID AIRR-111-12). This project consists of:

- Paid Scuba divers and volunteer snorkelers, who carefully hand-harvest each plant by its entire root mass
- Volunteer Milfoil Monitors who provide lake-wide EWM monitoring and education
- AIS education and prevention
- Yearly EWM survey completed by Onterra, LLC
- EWM mapping provided by Onterra and the Squash Lake Association.

EWM HAND-HARVESTING RESULTS

With the exception of one area which expanded in 2012, the scuba divers hand-harvesting efforts have prevented the EWM population from expanding to new areas within the lake and were successful at removing/reducing some of the densest areas of the EWM. For a complete report of the EWM survey report and maps, please refer to Onterra's Squash Lake 2012 EWM Survey Report – previously submitted to WDNR Lakes Management Coordinator, Kevin Gauthier Sr.

FINANCIAL INFORMATION

Funding for Squash Lake Association's Hand-harvesting Project was made possible by Wisconsin Department of Natural Resources (WDNR) Aquatic Invasive Species Early Detection and Rapid Response Grant, Squash Lake Association's fundraisers and donations, and a Wisconsin Public Service grant.

The Squash Lake Association appreciates the WDNR's generous financial support to assist with the EWM hand-harvesting and management efforts. The Squash Lake Association's project expenses exceeded the original project cost, resulting in the request of additional funds from the WDNR (see Table 1 below). The Association felt that is was vital to continue with the harvesting efforts, as it would have been disastrous to have stopped harvesting only because of expenses.

Table 1 - Project Cost for Grant ID AIRR-111-12

Amended Project Cost (Feb 2013)	Original Amount	Increase by	To	
Increase total cost from	$22,863.00	$3,803.66	$26,666.66	
Increase the State's Share from:	$17,147.25	$2,852.75	$20,000.00	
Increase the SLA's share from:	$5,715.75	$950.91	$6666.66 (555.55 hours)	

Estimated Expenses	Project Cost	Volunteer Hours	Volunteer Value ($12/hours)	
	$26,666.66	**555.55**	**$6,666.66**	
Completed Expenses	**Project Cost**	**Volunteer Hours**	**Volunteer Value**	
07-01-2011 through 01-31-2012	$10,244.03	317.25	$3,808.20	
02-01-2012 through 12-31-2012	$19,176.45	470.25	$5,643.00	
Total Completed	**$29,420.48**	**787.50**	**$9,451.20**	

For complete details of the project expenses, please see the Grant ID AIRR-111-12 Payment Requests submitted to WDNR Lakes Management Coordinator, Kevin Gauthier Sr. (requests dated 05/30/2012 and 02/07/2013)

HAND-HARVESTING STRATAGY

Scuba Divers: Working Together to Protect Our Lake

Squash Lake Association's highly experienced scuba divers are trained in AIS and EWM identification, and are stewards of our lakes. The majority of the divers have attended Squash Lake Association's yearly Volunteer Milfoil Monitor training, and new divers who are unfamiliar with EWM identification, receive training from the other divers and myself. I find the dive crew to be a very creative group of thinkers, as they've developed new strategies and techniques to make harvesting more efficient, and less expensive. An example of this is shown through the Harvesting Grid System (see page 6).

The divers had a busy 2012 season because of the early ice-out and warm temperatures. This created ideal conditions for EWM to grow at extremely rapid rates, as well as growing for a longer than normal duration. Needless to say, the divers had their work cut out for them. With the exception of one area (South Bay) that expanded in 2012, the diver's hand-harvesting efforts prevented the EWM population from spreading throughout the lake and they were successful at removing and reducing some of the densest areas of the EWM.

Table 2 - Summary of Scuba Diver Hours and Pounds of Harvested EWM

Year	1st Day of Harvesting	Last Day of Harvesting	Number of Divers	Hours Worked	Pounds of EWM Harvested (wet weight)
2010	05/10/2010	08/01/2010	2 divers 1 snorkeler	716.50	808
2011	05/25/2011	08/25/2011	4 divers	788.25	965
2012	05/14/2012	10/02/2012	7 divers	804.75	4673
			Totals	**2309.50**	**6446**

Table 2 (above) shows that in 2012, the number of divers increased, yet they worked only 2% more total hours than the previous year. The pounds of EWM that were harvested in 2012 increased by 484% compared to the previous year. The reason for this interesting result is because in 2012, there was more EWM to harvest, and because the divers developed better harvesting techniques which increased the harvesting efficiency. Another factor that increased the diver's efficiency was the fact that there were additional Volunteer Milfoil Monitors compared to the previous years.

2012 Harvesting Activities

In 2012, the divers made significant progress at clearing out EWM locations, especially in the challenging areas of Sawmill Bay, Finger Bay, and the north section on North Bay. These bays present diving difficulties since the sediment is a silt muck, which stirs up very easily, significantly reducing the diver's visibility.

The divers harvested EWM from May 14th through October 2nd, logging a total of 804.75 hours. The map below (Figure 1) is from Onterra's September 2012 EWM survey report. It indicates where 650.50 of those total diving hours were spent at each of the EWM harvest areas. The remaining 154.25 hours were either spent outside of the EWM harvest areas, or were inadvertently unrecorded. See figures 7 & 8 (page 15-18) for a breakdown of dates and locations of divers harvesting activity in 2012.

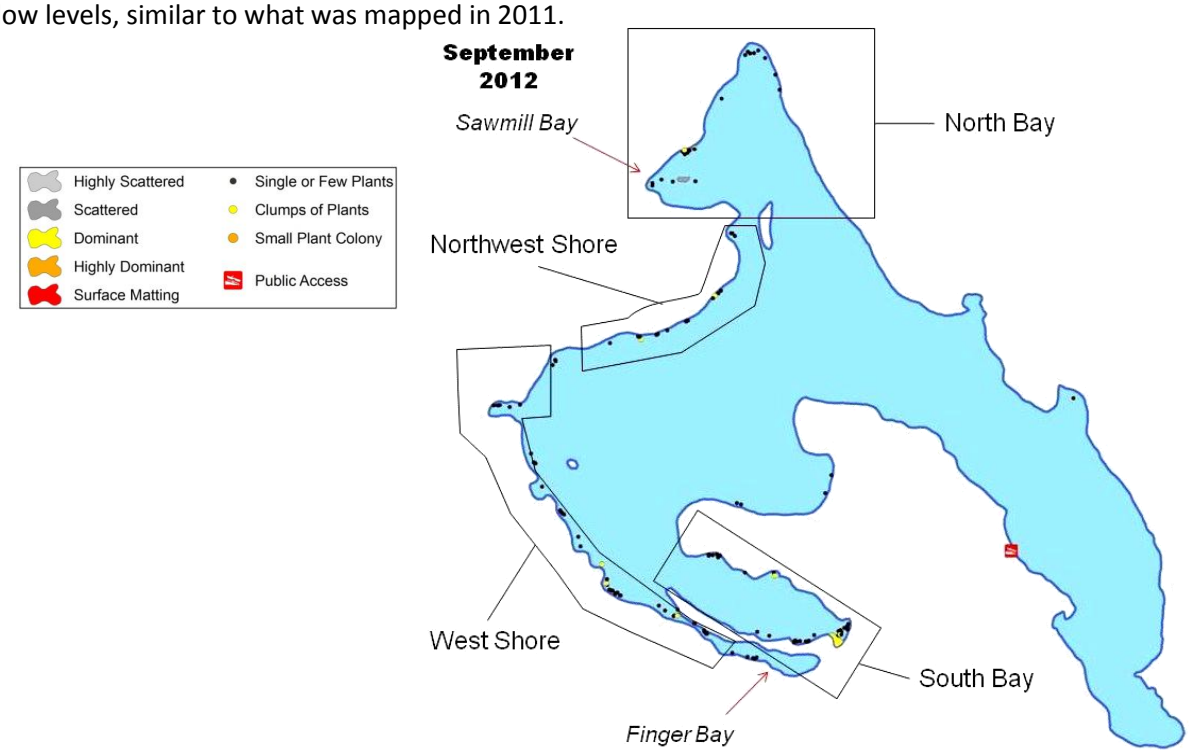
Figure 1

North Bay
Diver hours in this area: 439.5 hours
Results: Hand-harvesting proved to be effective at targeting the densest, colonized areas of EWM. The colony of *highly dominant* EWM was completely removed, while the previously *dominant colony* of EWM was reduced to a density rating of *scattered*.

Northwest Shore
Diver hours for this area: 81 hours
Results: EWM densities were "maintained" at low levels, similar to what was mapped in 2011.

West Shore
Diver hours for this area: 89 hours
Results: EWM densities were "maintained" at low densities of EWM, similar to what was mapped in 2011.

South Bay
Diver hours for this area: 41 hours
Results: Unfortunately the re-growth rate was greater than the removal rate which resulted in an increase in EWM occurrences and/or densities.



Deciding Where to Harvest When Every EWM Location is a Priority

The daily harvesting locations are based on Onterra's EWM survey maps, as well as the EWM locations reported by Squash Lake Association's Volunteer Milfoil Monitors. Every EWM location in the lake is considered a high priority, which makes it difficult to decide where to begin. Setting priorities and formulating a plan has been absolutely necessary and vital to the lake's future.

- In the spring, the priority harvesting locations are areas where instillation of boat lifts, piers, and rafts will soon take place.
- Next are the high risk areas which have been identified as areas where the plants can easily be fragmented such as:
  - Shallow waters that receive frequent foot traffic by humans, dogs, or wild mammals, as well as areas of heavy recreational use.
  - Plants that are near or at the surface.
  - Areas where fragments can easily float to the main part of the lake and travel to new areas.
  - Plants located directly under parked boats motors, boats on lifts, swim rafts, or piers.
- Areas that have become large and/or dense.
- Areas the crew didn't get to finish the prior fall.

Additional factors that determine each day's harvesting location are: wind and wave direction, sediment disturbance, cloud cover, and impending storm warnings. For example: the main part of the lake may have raging whitecaps from a howling north wind, while some of the protected bays in the north remain calm. Water temperature hinders productivity as well because some divers may have dry suits and others only have wetsuits. Dry suits can accommodate divers who harvest just after ice-out, when the surface water is still below 50 degrees.

The Harvesting Process

The divers are extremely cautious to minimize fragmentation during the harvesting, handling, and transporting process, as well as maneuvering around the work areas. To control the plant during the harvesting process, the divers wrap the plant stem around their arm until their hand reaches the base of the plant. With a good grip on the base of the plant, and their fingers under the roots, they carefully remove the EWM plant by its root mass, including stray roots, and fragments. They then place the plant in the harvesting bag that they carry with them. This process greatly reduces the risk of plants breaking and escaping.

Volunteers Marj and Dan Mehring assisting Scuba divers Dan Jesse and Mike Mack. June 2, 2012

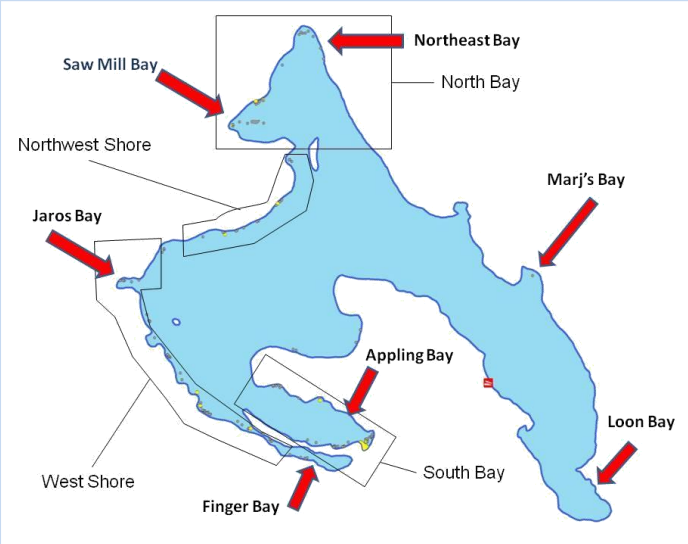
The harvesting bag is a tightly woven, 24"x30", heavy mesh bag with a stiff wire through the top hem. The wire allows the bags to stay open underwater and the divers keep the bag closed by gripping the bag just below the wire. The harvesting bags hold several pounds of milfoil, which allows the divers to continue harvesting until the bag is full. When the bag becomes full, the divers transport the bag to the harvesting boat, the Milfoil Terminator, and exchange it for an empty bag. At the end of the day, each harvesting bag is weighed, loaded into the back of the diver's trucks, and transported to compost pile

located over 1000 feet away from the lake. The divers also record each day's harvesting locations, the weight of EWM harvested, and if possible, the water temperature.

Scuba Divers New Harvesting Technique: Harvesting Grid System

Saw Mill Bay, located in the western section of North Bay (Figure 2) is considered our "problem child" bay because it is expansive and shallow. The sediment is muck that stirs easily, and it has individual EWM plants scattered across it as well as a few small colonies. Regarding Saw Mill Bay, the question that the dive crew and I kept asking each other was "how do we know that we've hit every single foot of this bay?" and "how do we know where we have already been in this bay?" These questions resulted in one of our divers developing the Harvesting Grid System. This system insures that every square foot of the bay is checked. I'll try to explain it and hopefully it will make sense:

Figure 2



To understand the concept, think in terms of swimming lanes. The harvesting grid involves making dive/swimming lanes that are 150 feet long by 30 foot wide and each lane is marked off by a 150 foot rope that sinks. Dive flags and/or jugs mark the ends of the each rope. Starting on the outside end of the first marked lane, three divers swim together on the outside of the rope and remain at a distance of 8-10 feet apart from each other. This gives them each a 10 foot wide section to check. They go slow and wait for each other. When they come to the end of the 150' rope, they continue down the other side, then up the next lane, etc.

Since the rope that sinks is expensive, there is only enough to set-up three 150 foot lanes at a time. Therefore, as soon as the divers have completed both sides of the first lane, the volunteer on the surface (me in my kayak) retrieves the first lane rope and jumps ahead of the 3rd lane to lay out the 4th lane. Note: before we begin this process, I've already premeasured (using the GPS) and marked the ends of about 8 lanes with makers and jugs, which makes laying down the rope go a lot faster. Needless to say, this procedure is only done on days when I'm available to help. Though it's a little technical, it works!

In this photo, SCUBA Diver Mike Mack and I are installing a "trial run" of the Harvesting Grid System that Mike developed.
Mike volunteered 5 hours that day to help me set up the Grid System and determine if it was going to be a viable technique.
Saw Mill Bay, July 22, 2012

Squash Lake Association's EWM Harvesting Boat "The Milfoil Terminator"

For the 2012 season, my personal pontoon boat was used as the interim Milfoil Terminator (EWM harvesting pontoon). The reason for this is because the original Milfoil Terminator, which the Squash Lake Association purchased in 2011, had to retire from her call of duty last spring. Her pontoons were simply too old and too thin, and no longer held the repairs. This was becoming costly and delaying harvesting progress. In the spring of 2012, a very old pontoon boat was donated to the Squash Lake Association to become the new Milfoil Terminator. However, it was not able to be used last summer because it was in need of work; the floor had rotten, it did not have a steering column, electrical wiring, nor did it have a motor. Schroeder's Marina removed the old Terminator's steering column and motor and installed them on the new Terminator. Of note: the outboard motor that has been used on both Terminators belongs to me and is on permanent loan to the Squash Lake Association.

Recently, several Squash Lake Association volunteers have helped dismantle and rebuild the new Milfoil Terminator. This undertaking consisted of removing the floor, installing a new one with new marine grade plywood, new hardware, and then applied a sealant over the wood. Once the sealant was dry, outdoor carpet was installed and the boat was put back together. Then the scuba diving crew meticulously customized the entire Terminator to suit their needs, which will allow for more efficient transport of the divers, dive tanks, gear, and the bags of harvested EWM.

VOLUNTEER MILFOIL MONITOR PROGRAM

Volunteers Working to Protect Our Lake

In 2010, the Squash Lake Association developed and implemented a Volunteer Milfoil Monitoring Program. This program has proven to be a successful lake wide EWM detection system that has kept EWM at low densities and stopped it from spreading throughout the lake. Additionally, without the help of the Volunteer Milfoil Monitors, our scuba divers hand-harvesting efforts alone would not keep the EWM at manageable levels. This program is cost savings for the Squash Lake Association and the state of Wisconsin and has contributed to the success of our hand-removal efforts and grants.

The Volunteer Milfoil Monitor Program continues to thrive and the addition of newly trained volunteers each year has set an example that Squash Lake Association has an unprecedented commitment to the long haul. Since the inception of the program in 2010 the Volunteer Milfoil Monitors have spent *547.50 hours* searching the lake for EWM. Benefits of the Volunteer Milfoil Monitor Program are:

- Provides lake-wide monitoring for EWM and other aquatic invasive species
- The monitors receive hands-on training by the Citizens Lake Monitoring Network
- Monitoring data is entered into Wisconsin Department of Natural Resources Surface Water Integrated Monitoring System (SWIMS).
- Volunteers monitor during their own time, every two weeks from ice-out to ice-in.
- Monitoring helps stop EWM from spreading throughout the lake and other water bodies.
- Monitoring the littoral zone of the entire lake parameter frequently allows us to keep track of where EWM is and is not growing.
- Monitoring is frequent and ongoing, and will continue indefinitely.
- Monitors track existing EWM areas, re-growth in previously harvested areas, and monitor the rest of the lake to locate new areas.
- A discovery of new EWM areas results in divers being sent to these new areas in a timely manner. The earlier EWM is found, the easier it is to control.
- Monitors assist the divers as needed.
- Monitoring data provided by the Volunteer Milfoil Monitors has helped gage EWM removal and management efforts.

- Monitoring efforts saves Squash Lake Association money because: Squash Lake Association cannot afford to have divers (at $20.00 per hour) spending time searching for EWM in areas where there may not be any EWM.
- Monitors provide AIS education and prevention to their neighbors, lake users, and throughout the community. They also provide current EWM locations of lake users and recruit additional volunteers.
- Their efforts contribute greatly towards preserving Squash Lake's natural aquatic plant and animal community, which helps maintain the interdependence of Squash Lake's ecosystem.
- The uniqueness of our Volunteer Milfoil Monitor Program is gaining attention resulting in becoming a model program that's recently been implemented by several lake associations around Wisconsin.

Figure 3 – Accumulative Volunteer Hours

Accumulative - Per Grant	Monitoring Hours (logged into SWIMS)	Other Volunteer Hours	Total Volunteer Hours	Value of Volunteer Hours ($12 per hour)
Grant ID AIRR-089-10 (Project Dates 08/13/09 - 06/30/11)				
Year 2009-2010	116.50	137.75	254.25	$ 3,051.00
Year 2011 (ending 06/30/11)	71.50	273.50	345.00	$ 4,140.00
Total for AIRR-089-10	**188.00**	**411.25**	**599.25**	**$ 7,191.00**
Grant ID AIRR-111-12 (Project Dates 07/01/11 - 06/30/13)				
Year 2011 (beginning 07/01/11)	103.00	214.35	317.35	$ 3,808.20
Year 2012	256.50	213.75	470.25	$ 5,643.00
Total for AIRR-111-12	**359.50**	**340.10**	**695.60**	**$ 8,347.20**

Accumulative - Both EDR Grants	Monitoring Hours (logged into SWIMS)	Other Volunteer Hours	Total Volunteer Hours	Value of Volunteer Hours ($12 per hour)
AIRR-089-10	188.00	411.25	599.25	$ 7,191.00
AIRR-111-12	359.50	340.10	695.60	$ 8,347.20
Total	**547.50**	**751.35**	**1294.85**	**$ 15,538.20**

Figure 4 (following page) is the Volunteer Milfoil Monitoring Report Form that I developed and is used for the Volunteer Milfoil Monitors to report their EWM monitoring activities on. When monitoring ends at ice-in, the data is compiled and entered into SWIMS. I developed the grid map (Figure 5) to assist both the Volunteer Milfoil Monitors and Scuba divers with identifying their monitoring and harvesting areas.

Figure 4 – Volunteer Milfoil Monitors Report

Squash Lake Association - Volunteer Milfoil Monitoring Report Form

Volunteers Name: **Phone Number:**

Reports are due on the last day of each month. Please sign the bottom of this report form and return to either:

Steph Boismenue, 6981 Long Lk Rd

or

Place in the folder marked "Completed Volunteer Milfoil Monitoring Reports" located in the shed at the boat landing.

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Total of each row
	Monitoring Date:							
	Start Time:							
	End Time:							
	Total time for this day:							
	Monitor Area ID *(see map on back)*							
	Please answer each question below using the following: Y=Yes N=No N/A=Not Applicable							
Did You:	Find Eurasian water milfoil (EWM)?							
	Map or mark location of EWM?							
	Report EWM findings?							
	Remove and dispose of EWM?							
Where did you find EWM:	On the beach in 0 to 4 feet of water?							
	Up to approximately 6 feet?							
	Up to approximtely 10 feet to 15 feet?							
	On docks & boat lift structures?							
Did You:	Walk along the shoreline?							
	Observe from the surface (via boat and/or dock)?							
	Observe entire shallow water area (up to 3 ft deep)?							
	Check underwater solid surfaces (boat hulls, dock legs, rocks)?							
	Use an Aqua-View Scope?							
	Look for other AIS?							
Did you find:	Branded Mystery Snail							
	Chinese Mystery Snail							
	Curly-leaf Pondweed							
	Rusty Crayfish							
	Zebra Mussels							
	Other							

I hereby certify that the document services have been performed and that this claim is fair and correct.

Volunteers Signature: *Date:*

Signature of Project Manager: *Date:*

Page # of

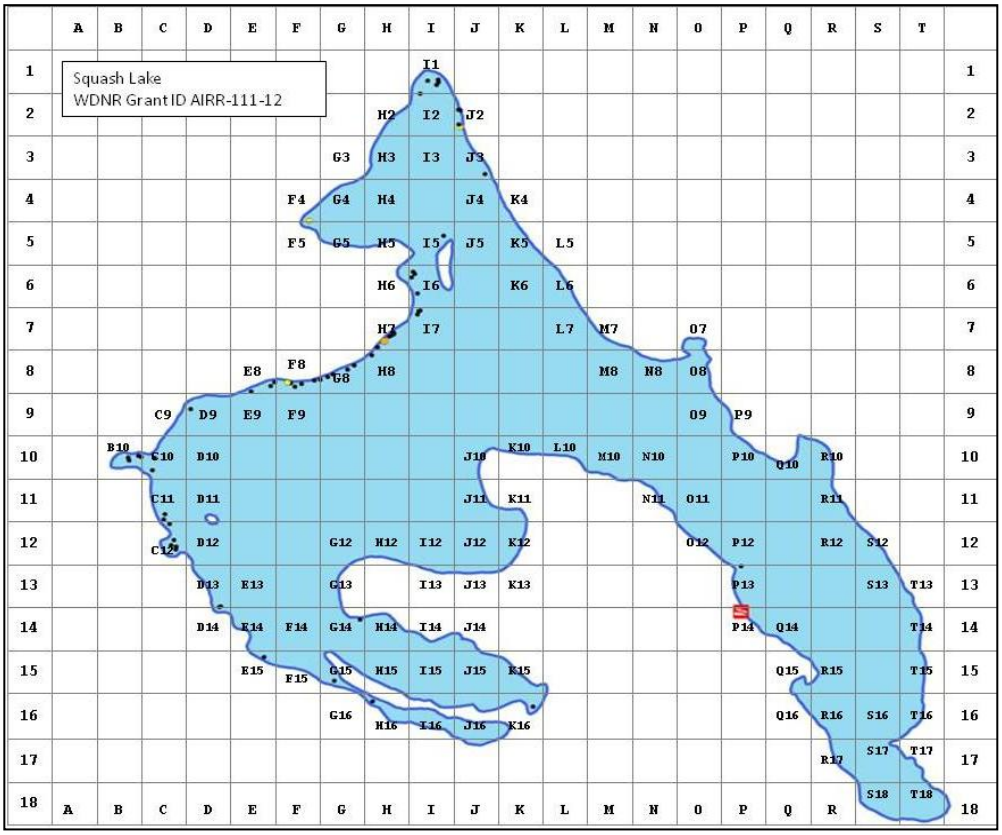
Total hours of this page:

x $12.00 per hour =

Squash Lake Association's Early Detection and Response Project

WDNR Grant ID AIRR-111-12

Figure 5 – Monitoring and Harvesting ID Map (used by both the Volunteer Milfoil Monitors and the scuba divers)



AIS EDUCATION

The majority of the Squash Lake Association's AIS educational activities are provided by the Association's AIS Education, Prevention, and Planning grant through the WDNR. That grant project also includes the Clean Boats Clean Waters (CBCW) boat landing monitoring program. The Early Detection and Rapid Response Project's main educational opportunity takes place each spring during Squash Lake Association's Volunteer Milfoil Monitors Workshop.

AIS Education: Volunteer Milfoil Monitors Workshop

Each spring, the Squash Lake Association host an hour long EWM and Monitoring Workshop for the Association's Volunteer Milfoil Monitors. Several of Squash Lake Association's Scuba Divers attend this workshop as well. The workshop is held at the Squash Lake boat landing and is instructed by Sandra Wickman of the Wisconsin Department of Natural Resources, Citizens Lake Monitoring Network and assisted by myself. The 2012 workshop included an additional hour long field trip, which was optional for the volunteers. The field trip consisted of a boat ride to one of the EWM locations, which gave participants ad opportunity to see EWM growing and learn more about the nature of this significant problem. The field trip was beneficial and will be offered each year.

The workshop provides instructions and updates about the following:

- Identify and monitor Aquatic Invasive Species with a focus on EWM
- How to distinguish Squash Lakes 3 native milfoil species and other look a-like plants from EWM.
- Hand-harvesting techniques.
- Past and present locations of EWM.
- How EWM is distributed around the lake.
- How to map and report their monitoring efforts on the Monitoring Report Form
- Report new findings
- How they can assist the divers
- How to use the Aqua View scopes and reference books that are available and stored at Squash Lake Association's shed located at the boat landing.
- Encouraged to educate their neighbors and recruit volunteers.

EWM Educational, Networking, and Building Public Awareness Opportunities

I have been fortunate to have had the opportunity to share Squash Lake Association's EWM Hand-harvesting Project with several lake associations, as well as with students in the local schools and colleges. My goal has been to inspire my audiences to participate in AIS proactive and reactive activities, consider all AIS treatment and management options before using herbicides, and most importantly, to become better stewards of our lakes, which is absolutely necessary and vital to the future of our lakes.

Here are some of the events that I have provided instructions to and/or participated in:

AIS and EWM Hand-harvesting Education with Rhinelander Charter School Students

On April 16, 2012, Oneida County AIS Coordinator Michele Sadauskas and I gave a presentation to Rhinelander's Charter School students in grades 9-12. The focus of the lecture was AIS education and Squash Lake Association's Hand-harvesting Project; I explained CBCW program, EWM discovery in Squash Lake, treatment and management options and how the Association decided to hand-harvesting, EWM hand-harvesting activities and outcomes, and the Volunteer Milfoil Monitor Program. The following day, Michele and the students toured Manson Lake via boat to further their AIS education.

AIS and EWM Hand-harvesting Education with Treehaven Students

In July 2012, I instructed 25 students from UWSP College of Natural Resources, Treehaven Campus, about AIS and Squash Lake Association's Hand-harvesting Project. This was a hands-on class that took place on Squash Lake. These students are required to spend several weeks during the summer at Treehaven to complete their undergraduate field work, which includes spending several days on Squash Lake to gain field experience about aquatic ecosystems.

I introduced them to AIS, the importance of proactive and reactive efforts, and walked them through the CBCW program. We then focused on every aspect of Squash Lake Association Hand-harvesting Program including how and why the Association decided to remove, reduce, and manage the EWM in the most environmentally sound method available, rather than use the recommended herbicide treatment. I provided EWM and native aquatic plant identification, discussed the entire hand-harvesting process/activities, monitoring process, funding, volunteer activity, equipment, reviewed Onterra's survey and survey maps, and they observed the divers at work. I taught them how to monitor for EWM and how to mark plants (from the boat) for the divers. I put the students to work searching the shoreline for EWM fragments and rooted plants - which they got really good at finding and found quite a few. It was a fun day and I really enjoyed working with the students. I will be providing the same hands-on education to the next set of Treehaven students in June and July of 2013.

AIS and EWM Hand-harvesting Education with Nicolet College PreCollege Academy - Environmental Studies Class.

In October 2011 and 2012, Laura Herman, of the Citizens Lake Monitoring Network, and I provided AIS and EWM hand-harvesting education to the Nicolet College PreCollege Academy - Environmental Studies Class. In 2011, two Saturday mornings were spent with these students on Squash Lake doing hands-on work both from my personal pontoon and from shore. In 2012, because of inclement weather, the class was held indoors on the college campus.

2012 Wisconsin Lakes Convention, Green Bay

- Tuesday: I assisted Paul Skawinski with his hand-harvesting workshop which included: displaying Squash Lake Association's harvesting equipment (harvesting and fragments nets, 2 types of Aqua View Scopes, dives flag, EWM markers, etc.) for his "Show and Tell and Tips of the Trade" and was part of his panel for the Q & A discussion.
- Wednesday: I was a poster presenter. Poster Title: *Squash Lake Association: Pulling Together to Get the Root of the Problem* (see poster abstract below and figure 6 & 7 for Poster Handout).

2012 Upper Midwest Invasive Species Conference, La Crosse

Tuesday: I was a poster presenter. Poster Title: *Squash Lake Association: Pulling Together to Get the Root of the Problem*

2013 Wisconsin Lakes Convention, Green Bay*:*

- Tuesday: I again assisted Paul Skawinski with his hand-harvesting workshop that included: displaying Squash Lake Association harvesting equipment (harvesting and fragments nets, 2 types of Aqua View Scopes, dives flag, EWM markers, etc.) for his "Show and Tell and Tips of the Trade" and was part of his panel for the Q & A discussion. In addition, I had an opportunity to explain in detail the use of the equipment, how most of the equipment was made at minimal cost, and demonstrate how it's used.
- Wednesday: Marj Mehring (of Squash Lake Association) and I were poster presenters. Poster Title: *Squash Lake Association: Pulling Together to Get the Root of the Problem*

- Thursday: I presented an oral and power point presentation. Presentation Title: *Citizen Response to AIS Discoveries: Squash Lake Association: Pulling Together to get to the Root of the Problem* (see abstract below*)*

Abstract for Poster Presentation: Without using a single herbicide, the Squash Lake Association has been extremely successful at significantly reducing and managing the volume of EWM (EWM) from Squash Lake. This poster presentation will walk you through each step of the Association's thriving EWM hand-harvesting project and explain how the combined efforts of 1) a phenomenal crew of SCUBA divers, who harvest each plant by the root mass and 2) a dedicated team of Volunteer Milfoil Monitor's have made this project a success. The Squash Lake Association, located in Oneida County, hopes to inspire your lake group to "Pull together to get to the root of the problem" and Just Say No to herbicides!

ABSTRACT for Oral Presentations: In 2009 Eurasian watermilfoil (EWM) was discovered in the pristine waters of Squash Lake, located in Oneida County. Lakes management contractor, Onterra LLC, surveyed the lake and found EWM upwind of the boat landing, which totaled roughly 7.2 acres of the 394 acre lake. After carefully studying all treatment options, the Squash Lake Association voted to hand-harvest the EWM rather than use an herbicide treatment. The hand-harvesting project consists of two unique components 1) hired SCUBA divers to harvest each plant by the root mass and 2) a Volunteer Milfoil Monitoring Program where trained Monitors scout the lake for EWM, assist divers, and educate lake users. During the summers of 2010-2012, the combined efforts of the divers and the Monitors have been successful at significantly reducing and managing the volume of EWM from the lake. Amazingly, this was done without using a single herbicide!

2013 WI Lakes Convention Poster Presenters: Steph Boismenue and Marj Mehring

2012 Upper Midwest Invasive Species Conference Poster Presenters: Steph Boismenue, Chris Hamerla, and Paul Skawinski

Treehaven students, Squash Lake, July 2012

Squash Lake's Submerged Aquatic Plants (Figure 6) is one of the documents that I developed, and use often, for a verity of educational purposes.

Figure 6 – List of Squash Lake's Submerged Aquatic Plant

Squash Lake's Submerged Aquatic Plants

Compiled by Stephanie Boismenue, Volunteer AIS/EWM Project Coordinator, Squash Lake Association

Location: Squash Lake, Townships of Crescent and Woodboro, Oneida County, Wisconsin

Resources: Wisconsin Department of Natural Resources - Point Intercept Survey from August 31 - September 3, 2009
Aquatic Plants of Wisconsin by Paul M. Skawinski

Scientific Name	Common Name(s)	Form	Life Cycle
Brasenia schreberi	Watershield, water taget	Dicot	perennial
Chara spp.	Muskgrasses	Algae	overwinters by fragments
Elatine minima	Waterwort	Dicot	annual
Eleocharis acicularis	Needle spikerush	Monocot	perennial
Elodea canadensis	Common waterweed, Canadian waterweed	Monocot	perennial
Elodea nuttallii	Slender waterweed, narrow-leaf waterweed	Monocot	perennial
Eriocaulon aquaticum	Pipewort, white buttons	Monocot	perennial
Isoetes echinospora	Spiny-spored quillwort	Fern ally	perennial
Isoetes sp.	Quillwort	Fern ally	perennial
Juncus pelocarpus f. submersus	Brown-fruited rush	Monocot	perennial
Lobelia dortmanna	Water lobelia	Dicot	perennial
Myriophyllum alterniflorum	Alternate-flowered watermilfoil	Dicot	perennial
Myriophyllum spicatum	Eurasian watermilfoil (Invasive Species discovered 7/2009	Dicot	perennial
Myriophyllum tenellum	Dwarf watermilfoil	Dicot	perennial
Najas flexilis	Slender naiad, bushy pondweed	Monocot	annual
Nitella spp.	Stoneworts	Algae	overwinters by fragments
Nuphar variegata	Bullhead pond lily, Spatterdock	Dicot	perennial
Nymphaea odorata	White water lily	Dicot	perennial
Potamogeton amplifolius	Large-leaf pondweed, cabbage, musky-weed	Monocot	perennial
Potamogeton epihydrus	Ribbon-leaf pondweed	Monocot	perennial
Potamogeton foliosus	Leafy pondweed	Monocot	perennial
Potamogeton gramineus	Variable pondweed, grass-leaved pondweed	Monocot	perennial
Potamogeton natans	Floating-leaf pondweed	Monocot	perennial
Potamogeton pusillus	Small pondweed	Monocot	perennial
Potamogeton robbinsii	Fern pondweed	Monocot	perennial
Potamogeton spirillus	Spiral-fruited pondweed	Monocot	perennial
Potamogeton vaseyi	Vasey's pondweed	Monocot	perennial
Ranunculus flammula	Creeping spearwort	Dicot	perennial
Sparganium angustifolium	Narrow-leaved bur-reed	Monocot	perennial
Utricularia intermedia	Flat-leaf bladderwort	Dicot	annual/perennial
Utricularia vulgaris	Common bladderwort	Dicot	perennial
Vallisneria americana	Wild celery, Water celery	Monocot	perennial

Total Monocots	17
Total Dicots	11
Total Fern Ally	2
Total Algae	2
Total Aquatic Plants (including Invasive Species)	**32**

MOVING FORWARD

If the EWM in Squash Lake is not harvested, managed, and monitored, rapid growth will cause it to become well established, and potentially consume the lake. The outcome will be a devastating loss of fish and wildlife habitat and instability of the lake's environment. Additionally, large infestations of EWM will be detrimental to property values, recreational activities, and detrimental to one of Oneida County's natural treasures and valuable resources.

The Squash Lake Association is committed to protecting the lake's ecological integrity by continuing to hand-harvest, manage, and monitor the EWM in the most environmentally sound method available. Additionally, the Association will continue to building public awareness, providing AIS education, and encouraging all lakefront property owners to become a Volunteer Milfoil Monitors and CBCW watercraft inspector.

The Squash Lake Association realizes that EWM proactive and reactive control efforts, as well as fundraising to support these efforts, will be ongoing - possibly forever. To help support future efforts, the Squash Lake Association has applied for and received an additional WDNR Early Detection and Rapid Response Grant (AIRR-0146-13) and is in the process of developing a Lake Management Plan. The Squash Lake Association will continue to pull together and remain at the root of the problem.

The photos below are of EWM that I found in Squash Lake (area B10) on August 1, 2012. This EWM looked very different from the usual EWM found in Squash Lake. The DNR sent it for DNA testing and, surprisingly, the test results concluded that it was, indeed, 100% EWM. August 1, 2012

Figure 7 - Dates the divers worked at each location.

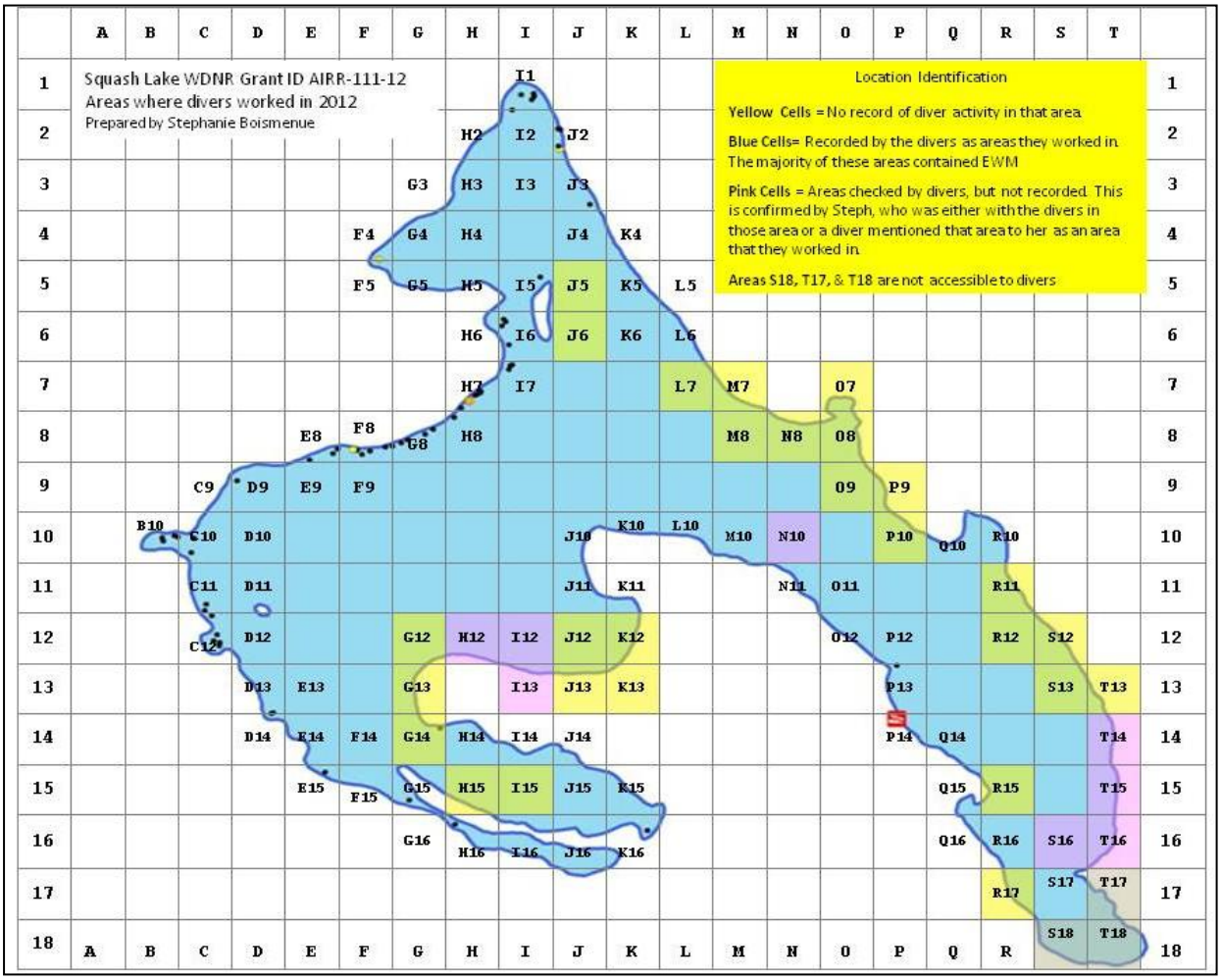
Squash Lake Association															**WDNR AIRR-111-12**
Dates and Locations of Divers Activity in 2012														Prepared by Stephanie Boismenue	
Location ID	***Dates Harvested or Checked at Each Location***														
B10	14-May	29-May	20-Jun	16-Jul	1-Aug										
C9	17-Jul	27-Aug	28-Aug												
C10	14-May	29-May	20-Jun	21-Jun	16-Jul										
C11	29-May	11-Jun	18-Jun	20-Jun	21-Jun	25-Jun	16-Jul								
C12	11-Jun	18-Jun	20-Jun	21-Jun	25-Jun	16-Jul									
D8	29-May														
D9	29-May														
D11	11-Jun	25-Jun													
D12	11-Jun	12-Jun	20-Jun	25-Jun											
D13	20-Jun														
E8	14-May	21-May	23-May	24-May	29-May	1-Jun	2-Jun	9-Jul	10-Jul						
E13	13-Jun														
E14	13-Jun	25-Jun	30-Sep	1-Oct											
E15	4-Jun	12-Jun	25-Jun	30-Sep	1-Oct										
E16	4-Jun														
F4	22-May	28-May	30-May	4-Jun	19-Jun	6-Jul	26-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug	29-Aug		
F5	28-May	30-May	4-Jun	6-Jul	26-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug					
F8	21-May	23-May	24-May	29-May	1-Jun	2-Jun	9-Jul	10-Jul							
G4	22-May	30-May	4-Jun	19-Jun	25-Jun	6-Jul	20-Jul	24-Jul	26-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug	2-Oct
G5	30-May	4-Jun	18-Jun	25-Jun	6-Jul	20-Jul	24-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug			
G8	24-May	28-May	29-May	66/1	2-Jun	30-Aug									
G12	Littoral Zone - not recorded by divers as an area worked.														
G13	Littoral Zone - not recorded by divers as an area worked.														
G14	Littoral Zone - not recorded by divers as an area worked.														
G15	25-Jun														
H2	19-Jun	20-Jul	6-Aug	7-Aug											
H3	26-Jun	20-Jul	3-Aug	6-Aug	7-Aug	2-Oct									
H4	26-Jun	20-Jul	24-Jul	30-Jul	1-Aug	2-Aug	3-Aug								
H5	23-May	28-May	18-Jun	25-Jun	9-Jul	10-Jul	24-Jul	30-Jul	1-Aug	2-Aug	3-Aug				
H6	28-Jun	9-Jul	10-Jul	26-Jul	9-Sep										
H7	14-May	28-May	27-Jun												
H12	Littoral Zone - area checked by divers, but not recorded.														
H14	15-Jun	13-Aug													
H15	Littoral Zone - not recorded by divers as an area worked.														
H16	16-Jul														
I1	2-Jul														
I2	26-Jun	27-Jun	28-Jun	2-Jul	6-Aug	7-Aug	4-Sep								
I3	27-Jun	28-Jun													

I5	18-Jun															
I6	9-Jul	10-Jul	26-Jul	2-Aug	9-Sep											
I12	Littoral Zone - area checked by divers, but not recorded.															
I13	Littoral Zone - area checked by divers, but not recorded.															
I14	15-Jun	13-Aug														
I15	Littoral Zone - not recorded by divers as an area worked.															
I16	4-Jun	16-Jul	18-Jul	13-Aug												
J1	9-Sep															
J2	21-Jun	27-Jun	28-Jun	2-Jul	9-Sep											
J3	21-Jun	27-Jun	28-Jun	9-Sep												
J4	21-Jun	28-Jun	9-Sep													
J5	Littoral Zone - not recorded by divers as an area worked.															
J6	Littoral Zone - not recorded by divers as an area worked.															
J10	12-Jul	18-Jul	22-Aug													
J11	9-Sep															
J12	Littoral Zone - not recorded by divers as an area worked.															
J13	Littoral Zone - not recorded by divers as an area worked.															
J14	15-Jun	22-Aug														
J15	15-Jun															
J16	16-Jul	18-Jul	13-Aug													
K4	28-Jun	3-Aug														
K5	14-Jun	6-Jul														
K6	13-Jun	14-Jun														
K10	11-Jun	12-Jul	18-Jul	22-Aug												
K11	18-Jul	4-Sep	9-Sep	30-Sep												
K12	Littoral Zone - not recorded by divers as an area worked.															
K13	Littoral Zone - not recorded by divers as an area worked.															
K15	29-Jun	13-Aug	14-Aug													
K16	29-Jun	16-Jul	13-Aug													
L7	Littoral Zone - not recorded by divers as an area worked.															
L6	9-Sep															
L10	11-Jun	12-Jul	22-Aug	30-Sep												
M7	Littoral Zone - not recorded by divers as an area worked.															
M8	Littoral Zone - not recorded by divers as an area worked.															
M10	22-Aug															
N8	Littoral Zone - not recorded by divers as an area worked.															
N10	Littoral Zone - area checked by divers, but not recorded.															
N11	11-Jun	22-Aug														
N12	22-Aug															
O7	Littoral Zone - not recorded by divers as an area worked.															
O8	Littoral Zone - not recorded by divers as an area worked.															

O9	Littoral Zone - not recorded by divers as an area worked.						
O11	11-Jun	22-Aug					
O12	14-May						
P9	Littoral Zone - not recorded by divers as an area worked.						
P10	Littoral Zone - not recorded by divers as an area worked.						
P12	22-Aug						
P13	14-May	12-Jul	22-Aug				
P14	12-Jul	17-Jul	22-Aug				
Q10	2-Jun	20-Jul	9-Sep				
Q14	22-Aug						
Q15	22-Aug						
R10	2-Jun	20-Jul					
R11	Littoral Zone - not recorded by divers as an area worked.						
R12	Littoral Zone - not recorded by divers as an area worked.						
R15	Littoral Zone - not recorded by divers as an area worked.						
R16	13-Sep						
R17	Littoral Zone - not recorded by divers as an area worked.						
S12	Littoral Zone - not recorded by divers as an area worked.						
S13	Littoral Zone - not recorded by divers as an area worked.						
S16	Littoral Zone - area checked by divers, but not recorded.						
S17	13-Sep						
S18	Area not accessible by divers						
T13	Littoral Zone - not recorded by divers as an area worked.						
T14	Littoral Zone - area checked by divers, but not recorded.						
T15	Littoral Zone - area checked by divers, but not recorded.						
T16	Littoral Zone - area checked by divers, but not recorded.						
T17	Littoral Zone - area checked by divers, but not recorded.						
T18	Area not accessible by divers						

Mike Mack and Dan Jesse. Squash Lake, July 2012

Figure 8 – Map of Divers Work Areas in 2012



Fred Lintereur, Mike Mack, Steph Boismenue, and Dan Jesse. Squash Lake, July 2012

Figure 9 – Poster Presentation Handout (page 1)

Figure 10 – Poster Presentation Handout (page 2)

Squash Lake Association's EWM Hand-Harvest Supplies

- **Harvesting Bags -** mesh/nylon drawstring laundry bags, with no more than 1/4 inch mesh spacing. ($3.99 each at Wal-Mart)
- **Wire hangers or stiff wire -** straightened out and threaded inside the top hem of the laundry bags - so the bags stay open under water. (donated)
- **Yellow Buoy Markers/Fishing Markers** for marking new EWM plants and areas. ($5 each at Wal-Mart)
- **Frabill Kwik Stow Folding Kayak Net** features 14" deep, tangle–free micro mesh netting with 3/16" mesh, and a quick latch telescoping extended handles that extends from 20" to 40". Used to retrieve fragments. ($24.99 each from local sporting goods store)
- **Buckets** and **33-36 gallon trash bags** for transporting milfoil to the compost area. (donated)
- **Berkley Digital Fish Scale** for weighing the harvested milfoil (after draining water). Weighs up to 50 lbs. ($25.99)
- **GPS Units** for obtaining new milfoil areas and marking the areas harvested. (on loan)
- **Aqua View Scopes** for visually monitoring milfoil. Purchased from www.watermonitoringequip.com
  - Aqua Scope VI with 6" diameter viewing area $120.00
  - Aqua Explorer View Bucket with 9 1/4" viewing area $87.00
  - Aqua Scope II with 4" diameter viewing area $65.50
  - Note: we found the 4" scope is too small of a viewing diameter and is the least used.
- **Air Horn -** kept on the Terminator and is used to warn boaters who come within 100' of the divers. Safety First!
- **Boat landing sign and map** - for identify EWM locations (professionally printed $120.00)
- **Fragment Barrier Net** for catching escaped EWM fragments as the divers are harvesting. The divers install the barrier down-wind from the harvesting area and is set-up and taken down in each project area.
- **Harvesting Boat**
- **Gasoline** and **oil** for the harvesting boat.

Description of Fragment Barrier Net Supplies:

- **Two 4'x20' Frabill Seine Nets** lashed together at the sides to create a 4'x40' fragment net. Each seine net features 1/4" spaced-lightweight polyethylene fiber mesh netting, evenly spaced heavy duty floats at the top and weights at the bottom. ($26.99 each from local sporting good store)
- **Pipe insulation** - split down the center and zip tied to the top of the seine nets to provide additional floatation.($1.29 each from Home Depot)
- **Zip ties** - for fastening the pipe insulation onto the top of the seine nets and for connecting the two seine nets together - side by side to create on long net.
- **Ropes** - tied to bottom corners of the seine nets then attached to bricks (with holes in the center) to provide anchorage for the seine nets.

Harvesting Boat: Squash Lake Association's "Milfoil Terminator"

The Terminator is an old 18' pontoon boat found on Craig's List and purchased by the Squash Lake Association for $1,500.00. She may be old, unattractive, and lists a bit to one side, but heck, she fits our needs perfectly!

The divers customized the Terminator by stripping her down – literally. All that remains from the original boat are the side railings, the captains chair, steering column, a table, and the awning. They reinforced the floor and built a wooden chest with a hinged lid. The chest is located in the back of the boat and provides storage for: Harvesting supplies, PFD's, maps, diver supplied items (diving gear, dive flags), aquatic plant ID books, packets of WDNR aquatic invasive species wildcards (to handout to residents), tools, and last week's lunch.

Squash Lake Association
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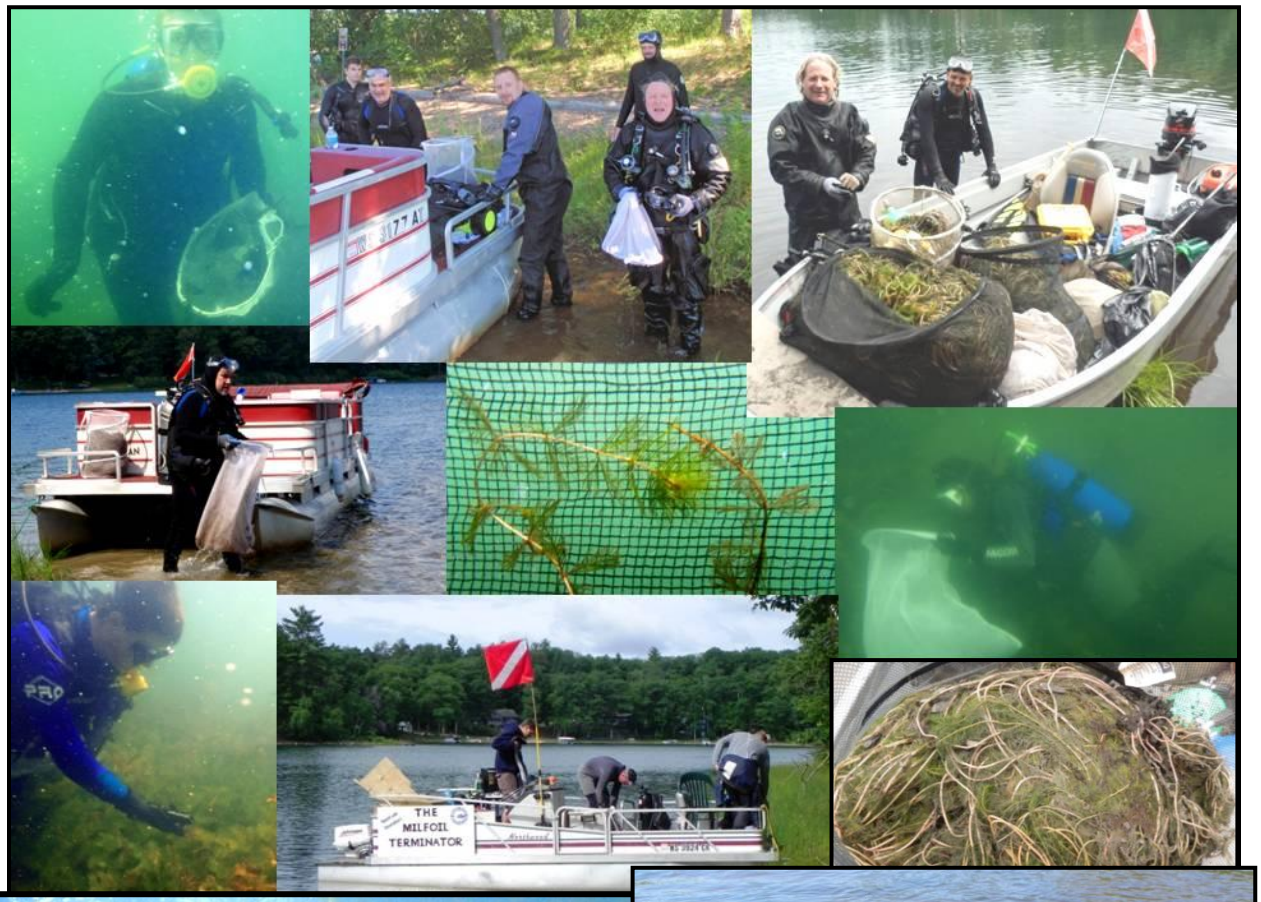
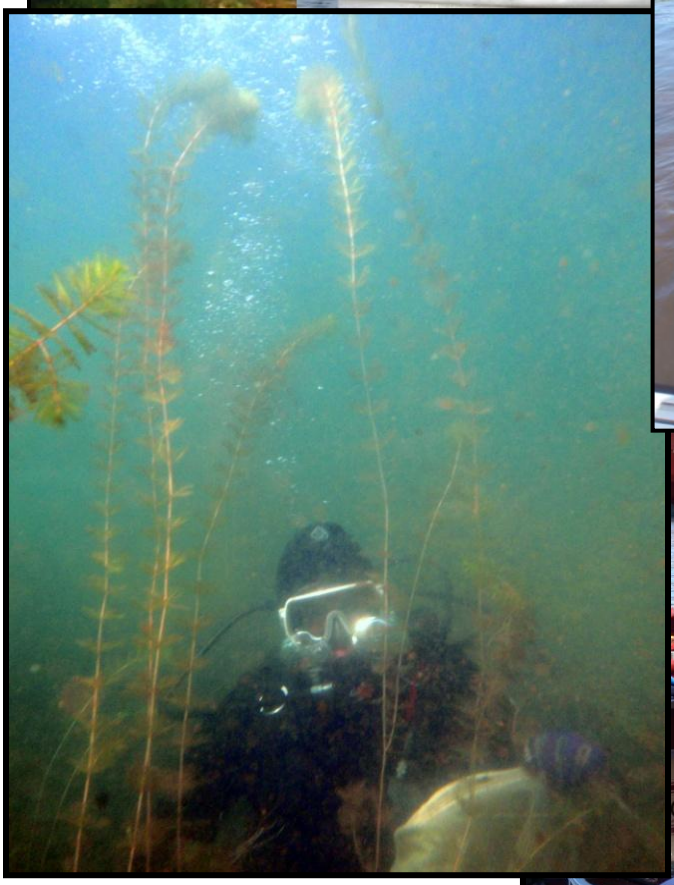
Squash Lake Association's 2011-2013 Early Detection and Rapid Response Project
WDNR Grant ID AIRR-111-12





Divers reviewing EWM. June 2, 2012

Gearing-up for one of the last dives of the season. October 29, 2012.


Volunteer Milfoil Monitor Training
Monitoring
before ice-out