2013 Proposal for an Aquatic Plant Survey For Clear Lake, Mecosta County, MI

Project No. 657-4880

Prepared for:

The Clear Lake Association

May 16th, 2013

Prepared by:

EnviroScience
Excellence In Any Environment

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Project Description

Many riparian property owners in the northern United States face similar problems with maintaining the quality of the beautiful natural resources of lakes and ponds. Lakeside property owners range from municipalities to private citizens, and nearly everyone can enjoy some type of recreational activity during both summer and winter months. However, sometimes, a problem arises in the chemical or biological balance of a lake. Human activities can be detrimental to water quality, aquatic plant community growth, or fish habitat. Without careful monitoring and management, beautiful lakes can become unsightly and unpleasant to visit.

Clear Lake is a 130 acre lake in Mecosta County, Michigan, which has undergone an expansion of aquatic vegetation including the invasive species, Eurasian watermilfoil (milfoil). Because of this, the Clear lake Association has requested the following proposal from EnviroScience to implement a survey in 2013 in order to establish baseline conditions of the aquatic plant community and develop a management plan. Based on results of the 2013 survey, EnviroScience will include recommendations if any aquatic plant management should be required.

EnviroScience is committed to helping lake owners develop and implement environmentally sound recommendations for ecologically friendly lake management. This is evident in our cornerstone service called the Milfoil Solution® (formerly MiddFoil® program), a biological control process that utilizes a native aquatic insect, the milfoil weevil, to control milfoil infestations. In 2006, the Clear Lake Association implemented a one-time stocking of 15,000 weevils within four milfoil beds. A follow-up survey is recommended every few years to determine the current status of the weevil population.

The following proposal includes a few survey options for the Clear Lake Association to consider depending on management goals and budget. The options range with intensity and are outlined below:

> Option I: Point Intercept Aquatic Plant Survey – Based on Michigan Department of Environmental Quality (MDEQ) protocol and designed to document the entire plant community - native and invasive - within a lake. In a long-term management plan, aquatic plant surveys should be done every year or two to track any changes over time.
>
> Option II: Invasive Species Mapping – Designed to be a cost-conscious way to quantify invasive species including the milfoil, the biggest threat to

the overall health to Clear Lake. Our biologists will tour the entire lake to document the invasive species using Geographic Informational System (GIS) technology and generate a map to quantify the infestation.

Option III: Weevil Population Survey - In July of 2006, the Clear Lake Association stocked 15,000 weevils within four milfoil beds. EnviroScience recommends a weevil population to determine the current status of the weevil population and its effectiveness at controlling the milfoil. This survey can be conducted at the same time as options I or II.

Each survey option is outlined below in greater detail and includes associated costs.

Option I: Point Intercept Aquatic Plant Survey Methods

In order to develop a baseline strategy for future management, EnviroScience proposes to conduct a comprehensive aquatic vegetation survey during the month of July when both the milfoil and native aquatic plant species are at their peak growth.

As recommended by the Michigan Department of Environmental Quality (MDEQ), EnviroScience proposes to conduct a Point Intercept survey following standard protocols outlined in “Point Intercept and Line Intercept Methods for Aquatic Plant Management”(Madsen, 1999). This survey will profile aquatic plant species abundance throughout the entire lake using methods that are easily replicable for subsequent years.

Methods

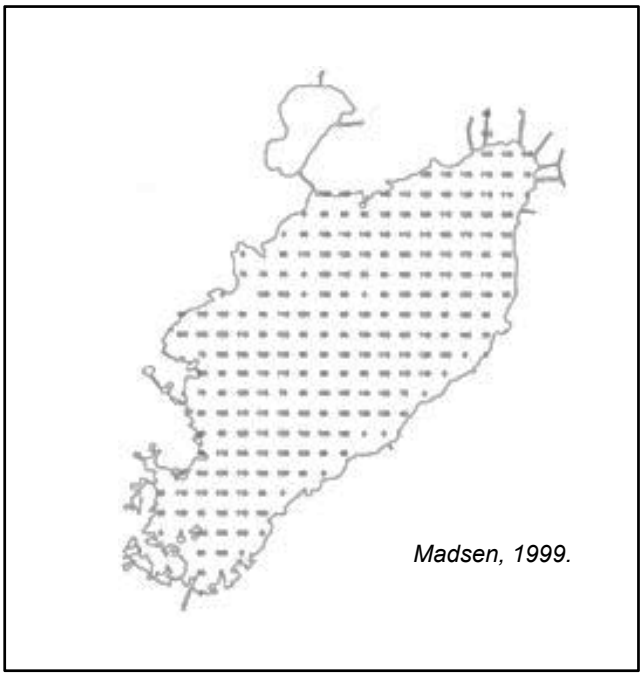
EnviroScience biologists will locate evenly-distributed sampling points along a GPS grid of the entire lake (Figure 1). A weighted rake throw will occur at each sampling point and the resulting aquatic plant species (both native and invasive) will be identified. Each plant species observed will be identified and assigned a relative density code using the following key:

(a) = found: One or two plants of a species found at a sampling point, equivalent to less than 2% of the total rake throw.
(b) = sparse: Scattered distribution of a species in a sampling point, equivalent to between 2% and 20%of the total rake throw.
(c) = common: Common distribution where the species is easily found in a sampling point equivalent to between 21% and 60% of the total rake throw.

(d) = dense: Dense distribution where the species is present in considerable, dominant quantities at a sampling point. Equivalent to greater than 60% of the total rake throw.

The outlined sampling protocols will be repeated at all points along the GPS grid.

Figure 1. Point Intercept Survey Grid Sample



Report, Map Generation, Management Program Assessment

Once data gathered have been compiled and analyzed, a written report will be submitted to the Clear Lake Association. This report will include:

- An inventory of the aquatic plant community and abundance of each species
- detailed Geographic Information System (GIS) maps identifying the location of sampling sites and major beds of aquatic plants
- a description and map of invasive species identified including approximate acreage of each found
- Management recommendations if any plant species are found to be at nuisance level.

The report will also include a framework for an aquatic plant management plan if needed and/or exotic plant species are found. Early detection and rapid, cost-effective response will prevent any potentially problematic species from

becoming a much larger, costly issue. The plan will discuss and identify priority lake areas and species requiring active management, a summary of management options, and detailed recommendations for implementation.

We believe that a formal management plan will serve as a framework for funding priorities, provide useful information to residents, and provide an outlet for comments and even criticism, thereby alleviating some of the pressure which typically falls on the Association's board and a few individuals.

2013 Costs for Option I: Point Intercept Aquatic Plant Survey

Task 1: Point Intercept Survey	**Unit Rate**	**Unit**	**Total**
Biologist I	$69.45	6	$416.70
Field Tech	$57.90	6	$347.40
Total Hours			12
Total Salaries			$764.10
Equipment Rental	$100.00	1	$100.00
Mileage	$0.56	70	$39.20
Total Direct Costs			$139.20
Total Task 1			**$903.30**
Task 2: Reporting / Map Generation	**Unit Rate**	**Unit**	**Total**
Biologist I	$69.45	4	$277.80
GIS Technician	$79.80	3	$239.40
Total Hours			8
Total Task 3			**$517.20**
Total Project Cost for Point Intercept Survey			**$1,420.50**

Option II: Invasive Species Mapping

For Option II, EnviroScience proposes to map the locations of the invasive species including the milfoil. At this time, it is known that Eurasian watermilfoil is present within the lake. Any other exotic species found will also be identified and mapped. EnviroScience personnel will tour the lake and map the exotic species using GIS technology.

Hybrid Milfoil is a new threat! In recent years, hybrid watermilfoil (northern watermilfoil, a native plant, crossed with Eurasian watermilfoil, an exotic plant)

has become of increasing concern across Michigan because of its aggressiveness and resistance to some herbicides. However, it is often very difficult to identify this hybrid watermilfoil without genetic testing. If genetic testing of suspected hybrid watermilfoil is desired, EnviroScience can send samples at $40/each to Dr. Ryan Thum at the ANNIS Water Research Institute in Grand Rapids, Michigan.

Map Generation

Once data gathered have been compiled and analyzed, EnviroScience will provide a map of Clear Lake with locations of the invasive species with a relative density. The map will also provide approximate acreage of the infestation.

2013 Costs for Option II: Invasive Species Mapping

Task 1: Invasive Species Mapping	**Unit Rate**	**Unit**	**Total**
Biologist I	$69.45	4	$277.80
Field Tech	$57.90	4	$231.60
Total Hours			8
Total Salaries			$509.40
Equipment Rental	$100.00	1	$100.00
Mileage	$0.56	70	$39.20
Total Direct Costs			$139.20
Total Task 1			**$648.60**
Task 2: Map Generation	**Unit Rate**	**Unit**	**Total**
Biologist I	$69.45	1	$69.45
GIS Technician	$79.80	2	$159.60
Total Hours			3
Total Task 3			**$229.05**
Total Project Cost for Invasive Species Mapping			**$877.65**

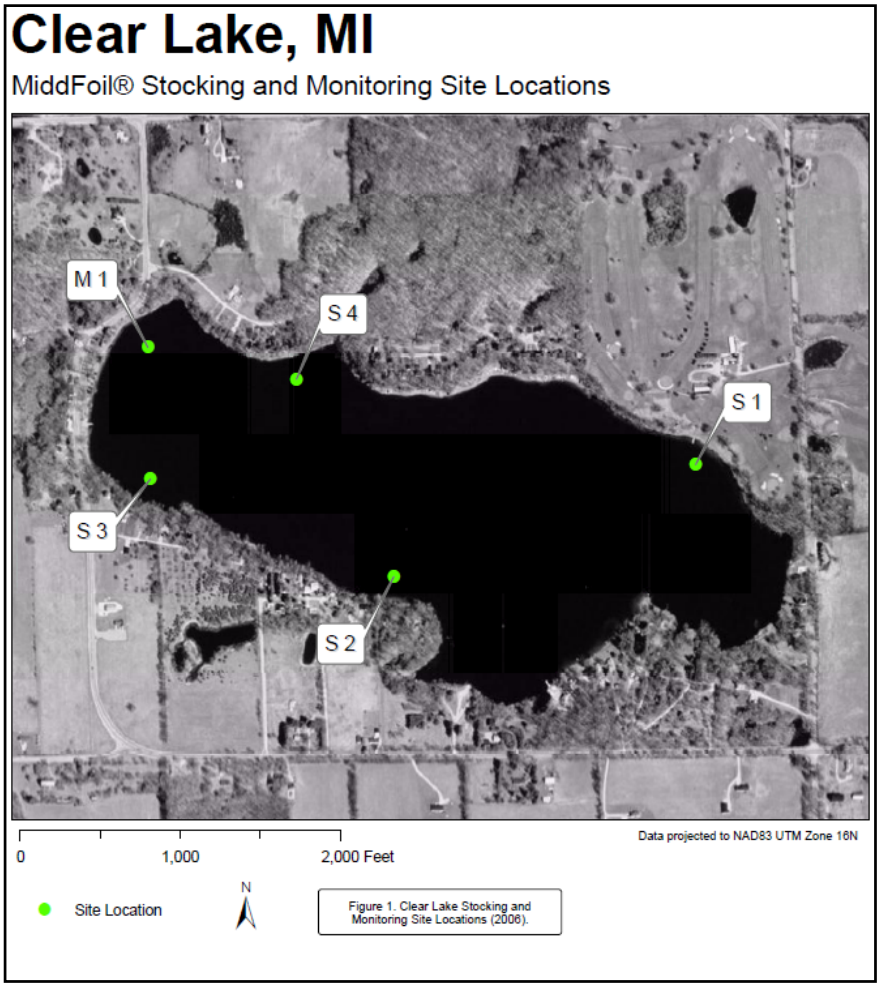
Option III: Weevil Population Survey

The **Milfoil Solution® Weevil Population Survey** is designed to measure the weevil density within the previous stocking locations, S S1-4, M1 (See map below) and surrounding area to determine the status of the population. The data collected from the survey will also aide in determining future milfoil management

decisions. Both the aquatic plant surveys and the weevil population can be conducted at the same time which will save on travel costs.

Methods

The best time to survey the weevil population is in July when the population can be found at higher levels. To determine weevil density, an EnviroScience staff biologist will swim a transect line perpendicular to shore across specific beds of milfoil. They will collect the tops of two randomly selected plants at five evenly-spaced intervals, for a total of ten plants along each line. If the milfoil bed is large enough, three transects will be removed for a total of 30 stems. If the milfoil is in smaller beds, more single transects will be taken throughout the lake. Stems will be placed in Ziploc bags in the field and transported to the lab for microscopic examination for all weevil life stages.



2006 Weevil stocking sites that will be re-assessed

Summary Generation

Results of the weevil population survey will be presented in a one-page summary generated at the end of the year, between September and December 2013. Survey data, a discussion of the current weevil population and EWM density, comparisons with previous years, and future recommendations will be reported. In addition, a map with GPS locations of the survey will be provided.

2013 Costs for Option III: Weevil Population Survey

Task 1: Weevil Population Survey	**Unit Rate**	**Unit**	**Total**
Biologist I	$69.45	2	$138.90
Field Tech	$57.90	2	$115.80
Total Hours			4
Total Salaries			$254.70
Equipment Rental	$100.00	0	$0.00
Mileage	$0.56	0	$0.00
Total Direct Costs			$0.00*
Total Task 1			**$254.70**
Task 2: Transect Analysis in Lab	**Unit Rate**	**Unit**	**Total**
Field Tech	$57.90	2	$115.80
Total Hours			2
Total Task 2			**$115.80**
Task 3: Summary	**Unit Rate**	**Unit**	**Total**
Biologist I	$69.45	3	$69.45
Total Hours			3
Total Task 3			**$208.35**
Total Project Cost for Weevil Population Survey			**$578.85**

***The Weevil Population Survey can be conducted at the same time as either of the two aquatic plant surveys, so there is no additional travel expense for this survey.**

Terms and Agreement

EnviroScience, Inc. will provide ecological consulting services for the Clear Lake Association as outlined in this proposal for the fees stated above. The price in this proposal is valid for 90 days. Invoices will be prepared and submitted upon completion of each task. Payment terms are net 30.

Respectively Submitted by:

Rebecca McMenamin
Marketing Manager
EnviroScience, Inc.

Accepted and Authorized to Proceed (please select from the following):

2013 Clear Lake Aquatic Plant Survey Proposal, Project No. 657-4880

___Option I: Point Intercept Aquatic Plant Survey - $1,420.50

___Option II: Invasive Species Mapping - $877.65

___Option III: Weevil Population Survey - $578.85

_____

Signature

_____ _____

Print Name **Date**

Send invoices to:

_____

Name, Title and Address or Email (if preferred)

Standard Terms and Conditions

1. General
The following Standard Terms and Conditions, together with the attached Proposal and Fee Schedule constitute the Agreement between EnviroScience, Inc. ("ES") and the entity or person to whom the proposal is addressed ("Client") for the performance of professional services outlined in the proposal. The Standard Fee Schedule may be omitted for Lump Sum type Agreements.

2. Performance of Services
ES's services will be performed in accordance with generally accepted practices of engineers and/or scientists providing similar services at the same time, in the same locale, and under like circumstances. No warranty, express or implied, except as specified in Section 9 below, is included or intended by this Agreement.

3. Invoices, Payments
ES will submit Invoices to Client monthly for work completed during the previous month and a final invoice upon completion of services. Payment will be due within thirty (30) days from invoice date. Client agrees to pay a service charge of one and one-half (1½) percent per month (18% per annum) on past due payments. If an invoice remains unpaid for a period in excess of sixty (60) days, ES reserves the right to pursue all appropriate remedies including stopping work and retaining all drawings and information without recourse. In the event ES must engage counsel to enforce overdue payments, Client will reimburse ES for all reasonable attorney's fees and court costs.

4. Insurance
ES is protected by Workers' Compensation Insurance, Commercial General Liability Insurance, Professional Liability and Automobile Liability Insurance coverages. ES will furnish certificates of insurance upon Client's request. Client agrees that ES will not be liable or responsible for any loss or damage beyond the amounts, limits, exclusions, and conditions of such insurance.

5. Disclosure of Hazards
ES will take reasonable precautions for the health and safety of ES's employees while at the Client's Site with consideration for the available information regarding existing hazards. Client will furnish to ES at the time of the Client's authorization to proceed, all information known to the Client, Client's Counsel, or Site Owner concerning physical hazards, oil, hazardous, toxic, radioactive or asbestos material in, on or near the site. If hazards are known to exist and the Client fails to advise ES of such substance or condition, and during the course of the work they are discovered, and such discovery in ES's opinion results or may result in injury or a health risk to persons, whether ES's employees or others, Client agrees to assume full responsibility and liability and shall hold ES harmless for any and all claims, demands, suits, or liabilities for personal injury including disease, medical expenses, including but not limited to, continued health monitoring, and/or death, or property damage, and for economic loss, including consequential damages.

6. Confidentiality
ES will hold confidential all business and technical information obtained or generated in performance of services under this Agreement. ES will not disclose such information without Client's written and/or verbal consent except to the extent required for: 1) performance of services under this Agreement; 2)compliance with professional standards of conduct for the preservation of public safety, health, and welfare; 3)compliance with any court order, statute or law, or governmental directive; and/or 4) protection of ES against claims or liabilities arising from the performance of services under this Agreement. ES's obligations hereunder shall not apply to information in the public domain or lawfully obtained on a non-confidential basis from others.

7. Ownership of Documents and Processes
All documents (including drawings, specifications, estimates, field notes, and other data) and all processes (including scientific, technological, software, and other concepts, whether or not patentable), created, prepared or furnished under this Agreement by ES or ES's independent contractors and consultants pursuant to this Agreement, are instruments of service in respect of the project and shall remain the property of ES whether or not the Project is completed. ES shall retain ownership of all documents, drawings, specifications, estimates, field notes, other data, and developed technology or processes and any copyright or right to patent thereto. Client may make and retain copies thereof as is necessary; however, such documents are not intended or represented to be suitable for additions, extension, alterations, or completion of the project by others, or use in any other project. Any reuse without written verification or adaptation by ES for the specific purpose intended is at Client's sole risk without liability or legal exposure to ES or its independent contractors or consultants. Client shall indemnify, defend, and hold harmless ES and its independent contractors, and consultants from all claims, damages, losses, and expenses, including attorney's fees arising out of or resulting therefrom. Any such verification or adaptation will entitle ES to further compensation.

8. Trade Secrets and Proprietary Information
Client acknowledges that ES has developed a number of protocols, techniques, and procedures, as well as specialized equipment for performing and ensuring the quality of laboratory and field services that it provides. Further, the Client acknowledges that ES regards this technical information as being its trade secrets. Client agrees not to use or disclose, directly or indirectly, any such trade secret to any person or organization, unless expressly authorized by ES.

9. Milfoil Solution® Process-specific Terms, Conditions and Warranty
a). Any written or verbal information, other than published scientific studies or written ES sales

literature, transferred by ES to the Client concerning the methodology used to rear and stock organisms used in the Milfoil Solution® process are considered proprietary by ES, and are specifically considered to be trade secrets. In addition to the conditions set forth in Section 8, to protect these trade secrets and comply with state and federal regulations, the Client agrees not to remove, transfer, culture, or otherwise use Milfoil Solution® organisms supplied by ES in any other location or for any other purpose.

b). Client hereby agrees to allow ES access to the waterbody for a period ten years from the date of this contract for the purposes of continued research. Client also authorizes ES to collect limited numbers of adult Milfoil Solution® organisms from the waterbody for culturing purposes. In the event that ES collects organisms for this purpose, ES agrees to provide a written report detailing its activities, and furthermore agrees to restock within the same season two times the number of organisms removed.

10. References
Client agrees that ES has authority to utilize Clients name and general descriptions of the project work or service performed as references to other clients.

11. Limitation of Liability/Dispute
To the fullest extent permitted by law, the total liability of ES to Client, and anyone claiming by, through, or under Client, for any and all injuries, claims, losses, expenses, or damages whatsoever arising out of or in any way related to ES's services, from any cause or causes whatsoever, including, but not limited to, negligence, errors, omissions, strict liability, breech of contract, or breach of warranty, shall be limited to an amount of $50,000 or ES's fee, whichever is greater.

If Client prefers not to limit ES's liability to this sum, ES may increase this limitation upon Client's written request.

12. Dispute Resolution
All claims, disputes or controversies arising out of or in relation to the interpretation, application or enforcement of this Agreement shall be first submitted to non-binding mediation pursuant to the Rules for Commercial Mediation of the American Arbitration Association.

13. Legal Action
All legal actions by either party against the other for any cause or causes, including but not limited to breach of this Agreement, negligence, misrepresentation, breach of warranty or failure to perform in accordance with the standard of care, however denominated, shall be barred five (5) years from the day after completion of ES's services or the time that the party knew or should have known of this claim, whichever is sooner. In the event that Client institutes a suit against ES, and if such suit is not successfully prosecuted, or if it is dismissed, or if a verdict is rendered for ES, Client agrees to pay ES any and all costs of defenses, including attorney's fees, expert witnesses' fees, and court costs and any and all other expenses of defense which may be reasonably necessary, immediately following dismissal of the case or immediately upon judgment being rendered in favor of ES.

14. Precedence
These Terms and Conditions shall take precedence over any inconsistent or contradictory provisions contained in any proposal, contract, purchase order, requisition, notice to proceed, or like document.

15. Severability
If any of the Terms and Conditions are finally determined to be invalid or unenforceable in whole or part, the remaining provision shall remain in full force and effect and be binding upon the parties. The parties agree to reform these Terms and Conditions to replace any such invalid or unenforceable provision with a valid and enforceable provision that comes as close as possible to the intention of the stricken provision.

16. Survival
These conditions shall survive the completion of ES's services on this project and the termination of services for any cause.

17. Governing Law
This Agreement shall be governed and construed in accordance with the laws of the state ofMichigan.