

## **Eurasian Watermilfoil Treatment Monitoring and Evaluation Protocol (Updated 8/8/07)**

In April of 2006, the Idaho State Legislature and the Governor approved \$4 million for the purpose of eradicating Eurasian watermilfoil (*Myriophyllum spicatum* L.) from bodies of water in the state of Idaho. Eurasian Watermilfoil (EWM) Phase III funding projects in 2008 will be required to follow specific sampling protocols that will allow for the monitoring and the evaluation of EWM projects. Sampling using these protocols is intended to produce quantifiable data that will be used to statistically evaluate the effectiveness of EWM treatments, to correctly identify and map EWM populations (especially new infestations) and to monitor aquatic plant community characteristics.

Recipients of funds through the 2008 EWM Phase III Funding Program will conduct aquatic plant surveys and sampling following the methods described below. **Idaho State Department of Agriculture (ISDA) will provide maps and sampling plans for each project.** All coordinates and maps provided will be in UTM NAD 1983 projections in zones 11 (West Idaho) and 12 (East Idaho). Specific sampling plans will vary due to the size of the body of water and the area of EWM treated. ISDA will assist with the training and implementation of these protocols. Data collected under this program will be provided to ISDA and the survey results will be provided to the public on the ISDA website at [www.agri.idaho.gov](http://www.agri.idaho.gov).

The goals and objectives of this program are as follows:

1. To identify and delineate populations of EWM in bodies of water receiving treatments from the EWM Phase III Funding Program.
2. To quantify the plant distribution and frequency of EWM populations before and after treatments to gauge treatment effects.
3. To quantify the distribution and frequency of all aquatic vegetation on a lake-wide scale.
4. To identify new populations of invasive aquatic and emergent plants.
5. To identify new populations of other invasive aquatic species.

### **Required Surveys for Water Bodies Receiving 2008 Treatments**

Sampling and monitoring will be conducted by groups or individuals that are not affiliated with a contractor applying EWM treatments.

#### **Littoral Survey**

In order to identify EWM and other exotic plant populations, a survey of the lake's entire littoral area will be conducted. The littoral zone is defined as the shallow area near the shore of a body of water that extends from the shoreline lakeward to the limit of occupancy of rooted plants. This survey may be conducted from a boat using rake throws and/or underwater viewers, by snorkeling, or by SCUBA divers. The entire littoral zone will be surveyed by navigating in a regular pattern so that the entire bottom is observed. If surveying from a boat, use regular rake throws to check for EWM in areas with limited

visibility. As water clarity decreases, increase the frequency of rake sampling. Pay special attention to boat ramps and, if possible, snorkel or SCUBA survey in these areas. When EWM or other exotic aquatic species are found, record the GPS location, outline the area of EWM growth with the GPS, and estimate the percent EWM cover. Cover estimates will be recorded as either dense, sparse or no EWM cover. When the bottom cannot be seen use underwater viewers and rake throws to determine the percent of cover. Also note with GPS coordinates the location of invasive emergent shoreline plants as they are detected (purple loosestrife, garden loosestrife, phragmites, yellow iris, tamarisk, Russian olive, etc.). Littoral surveys will be conducted by groups or individuals that are not affiliated with the contractor applying control treatments. Contractors may, however, provide aerial images to assist in the littoral survey. If the system has some kind of stage measuring device (downstream dam, stage gage) include a stage reading in the survey data set.

### Point Intercept Survey

The point intercept method is a relatively quick and effective way of quantifying the distribution and frequency of aquatic vegetation. Points are pre-selected and are placed in a regularly spaced grid or at random points on a GIS generated map of the water body. Sampling in this manner tracks changes over time in the aquatic plant community by repeatedly returning to the same points for sampling (Madsen 1999).

A point intercept survey of a body of water is typically conducted in two person teams. One person navigates the boat with a GPS to the proper point and a second person makes observations. Upon arrival at a sampling point, record the depth and, if possible, determine the sediment type (mud, sand, rock or organic). The reader then observes an area of water over the side of the boat using the same side of the boat every time. Species observed from the surface within the area will be recorded on a data sheet. Use a sample rake in areas where the bottom cannot be clearly seen. Sample with two rake throws in a crossing pattern within the 1m x 1m sampling area and record all additional species (Parsons et al. 2001). Note any EWM that is observed while traveling between sampling points and record the GPS coordinates.

A species is only recorded once at each sampling point, even if it is observed multiple times on the surface and in rake throws. The data sheets are arranged with all suspected species listed across the top and sample coordinates listed in the left column. When a species is found, a one (1) is marked in the appropriate column for that species. A zero (0) is entered to indicate the absence of a species at that point. Spaces are available for listing new species as they are found. A column will be provided to list various physical stages of EWM in order to gage the effectiveness of treatments. A scale of one through five is used to record the status of plants observed. Five indicates no live EWM present, four indicates only a small sprig of EWM (very little live EWM present), three indicates sparse EWM (plants appear stressed, sparse growth, no plants on the surface), two indicates EWM, but not on the water surface (some plants appear distressed but fairly healthy, no plants on the surface) and one indicates EWM on surface (plants appear fairly healthy with little or no apparent control effects, plants on water surface). In addition, a

column will be provided for a cover estimate. Cover will be reported as either dense, sparse, or no EWM cover.

In small lakes pre- and post-treatment point intercept surveys will be conducted over the entire water body. The pre-treatment survey will be conducted before treatments are applied, preferably within several weeks prior to treatment. The post-treatment survey will revisit the same points and should be conducted late in the year (late August or September) in order to assure the maximum treatment effect is observed. In small lakes the pre-treatment survey can be conducted concurrently with the littoral survey.

Surveys conducted in large lakes that receive EWM treatments may have two types of point intercept surveys conducted:

*Pre/Post-Treatment Point Intercept Survey:* The pre/post-point intercept survey will consist of multiple sampling points arranged in areas where EWM treatments are planned. The points will be established in the treatment areas and will be monitored before and after treatments in order to quantify treatment effects (Madsen 2006). Points will be arranged in either a regular grid pattern or in a random distribution, depending on the size of the treatment area. ISDA will provide maps and sample point locations to the surveying party prior to the scheduled survey. All pre/post-point intercept surveys will be conducted by groups or individuals that are not affiliated with the contractor applying control treatments in order to avoid the perception of bias.

*Lake-Wide Point Intercept Survey:* The second type of point intercept survey will consist of a large grid covering the entire littoral zone of the lake. Sampling in this manner will provide lake-wide sampling points that will track the lake's aquatic plant community over time. ISDA will provide maps and sample point locations to the surveying party prior to the scheduled survey. Lake-wide point sampling on larger lakes may be conducted concurrently with the littoral survey.

### Voucher Specimen Photos

Voucher specimen photos of each species of aquatic plant encountered in each lake will be taken. The group or organization receiving EWM Phase III funds will catalog and store the photos for future reference.

### Water Quality Monitoring

Basic water quality data will be collected at a single point in each water body surveyed. Secchi disk, temperature, and DO profile data will be collected in an open-water portion of the water body, in an area with minimal influence from inflowing waters. Temperature and DO profiles will be collected in the monitoring, from surface to bottom, at 0.5 meter intervals. Record the GPS coordinates at the sampling point and return to the same point for water quality sampling on subsequent visits.

## Invasive Aquatic Species Monitoring

Surveyors must be vigilant to note and sample anything strange, suspicious or out of the ordinary. Invasive species come in all shapes and sizes. Special attention must be paid to any plant or animal species exhibiting aggressive growth. Take digital photos of anything that may be of interest and collect samples if possible. Each lake, when surveyed, will also have mussel samplers deployed in order to monitor for zebra and quagga mussel infestation. Substrates should be distributed near boat launches lake-wide and must be accessible enough to be checked several times a year if feasible.

### **Safety**

Always use safe practices while operating a boat. Always wear a Personal Flotation Device (PFD) and make sure the boat is equipped with a fire extinguisher and emergency signaling devices. If using SCUBA for surveying, all divers must be certified and must follow established safety guidelines.

### **Materials**

A standard lake survey will require the following materials: a boat, weed rakes (2), an underwater viewer, a GPS unit, lake maps and data sheets, polarized sunglasses, a depth recorder (electronic depth finder / weighted tape / depth rod), a Secchi disk, a temperature / DO probe, sample bags, markers, a cooler, and an Aquatic Plant ID Guide: (<http://www.ecy.wa.gov/programs/wq/plants/plantid2/index.html>, <http://plants.ifas.ufl.edu/ie6/index.html>)

### **Literature Cited**

Madsen, J. 2006. Assessment of Lake Gaston Hydrilla Management Effort 2006. GeoResources Institute Report. Mississippi State University, Mississippi State MS. GRI# 5010.

Madsen, J. 1999. Aquatic Plant Control Technical Note MI-02: Point intercept and line intercept methods for aquatic plant management. Us Army Engineer Waterways Experiment Station. [www.wes.army.mil/el/aqua/pdf/apcmi-02.pdf](http://www.wes.army.mil/el/aqua/pdf/apcmi-02.pdf)

Parsons, J.K., K.S. Hamel, J.D. Madsen, K.D. Getsinger. 2001. The use of 2,4-D for selective control of an early infestation of Eurasian Watermilfoil in Loon Lake, Washington. J. Aquat. Plant Management. 39:117-125.