Pre and Post AIS Chemical Herbicide Treatment Monitoring

(April 10, 2007)

Purpose

This protocol is used to determine the need for, and evaluate the results of herbicide application to reduce aquatic invasive plant species. The following protocol is applicable for introducing new treatments to lakes where the treatment size is greater than 10 acres or greater than 10% of the lake littoral area and more than 150 feet from shore as well as any AIS grant funded treatments or where performance results are needed where restoration is a goal i.e. for science or for financial accountability. This protocol is written for Eurasian water-milfoil (EWM) but can be adapted for Curly-leaf Pondweed and other AIS. This protocol may be appropriately adapted to evaluate non-herbicide controls. The adaptation will retain the goal of science and financial accountability of AIS grant funded projects.

Proposed treatment surveys. To determine:

- Target areas where EWM is found and within which treatment is proposed for a conditional APM permit
- Target and native species presence/absence and abundance.

Pre-treatment surveys. To determine:

- The extent of the AIS both in distribution and density – refinement of proposed treatment areas.
- The need for an herbicide treatment or whether another method of control is more appropriate at this time.
- Cost of treatment both in product and labor.
- Proper acreage for permit conditions and public notice.
- Adjustments in application rates based on proximity to native plants.

Post-treatment surveys: To determine:

- The effectiveness of the herbicide application, both in density and distribution.
- If herbicide is the desired control method.
- The response of native plants.
- If adjustments need to be made to application rates.
- Future direction of plant management activities

Protocol for Established Infestations

Base YR

Recent (within 5 years) summer point/intercept (P/I) survey to characterize entire plant community and identify potential treatment areas.

YR 1 Season before treatment (may be base year)

1. *Proposed treatment survey.*
    a. During the summer growing season map areas as polygons using GPS to outline beds and pinpoint individual target plants.
        i. The initial Point/Intercept survey is unlikely to identify every stand of EWM. The sponsor or applicant must use additional, less formal strategies to find stands of this invasive such as:
            1. Define beds by sub-sampling with a rake at greater frequencies (to determine presence only around the points where target plants were found).

2. If clarity is good (to the depth of rooted plants) and bed is topped out, identification can be visual but thoroughly augmented with rake tosses to verify species.
3. For lower clarity waters, sub sample with a rake on a series of denser points. Augmenting with scuba and underwater video is highly recommended.
4. Boat or walk around the shoreline looking for the invasive in the shallow water areas. EWM is less likely to be found on hard sediments, but may occur anywhere.
5. Look for plant fragments wind-rowed on shore as indication plants floated in from further off shore.
6. When trying to see into the water, use brown polarized sun glasses or use an Aqua-View Scope.

b. Confirm EWM with vouchers, 1 per large (> 5 acres) treatment area or polygon or site visit by DNR personnel (who should also voucher).

c. In order to assess the effect of chemical treatment on natives, there must be a survey of <u>all</u> plant species before treatment. However, since natives will be largely absent at the time of the spring pre-treatment survey, the natives must be assessed the summer before treatment. Therefore, after defining the proposed treatment polygons (1a), perform a presence/absence and rake fullness assessment of all plants at a sub sample of points within and near the polygons determined by:

i. A reference table. Sample polygons greater than 5 acres unless the proposed treatment areas are smaller than 5 acres

Acres of Polygon	# of Sampling Points
0.50	1
1.00	4
2.00	8
3.00	12
4.00	16
5.00	20
7.00	28
10.00	40
15.00	60
20.00	80
30.00	120
40.00	160
50.00	200

<u>YR 2 First treatment</u>

2. *Pre-treatment Survey*

a. Using the established *proposed treatment* polygons from YR 1, repeat the methods in proposed treatment survey as needed sampling only for EWM to confirm the appropriateness of the treatment area. Plants will be small, and may be very sparse this time of year. Underwater visual/video of the middle and edges of the proposed polygon is highly recommended.

3. CONDUCT TREATMENT after the target specie is actively growing but before native species are active. Generally, this will be prior to water temp of 60 degrees F. Best results are generally obtained when biomass is still low, thus earlier treatment within the treatment time window is better than later.

4. *Post-treatment Survey*. Conducted at least four weeks after treatment For CLP, post treatment survey needs to be completed before CLP seasonal growth ends. For EWM, post treatment should be delayed until native plants are well established, generally during mid-July-mid-August. For the summer post-treatment survey, repeat steps 1.c. This will be used to identify effectiveness on target plants, determine if there was any harm or benefits to native plants and identify next year's potential treatment areas for target plants.
    a. Compare summer surveys. If there are chemical treatments in subsequent years, compare summer surveys for treatment effects on natives and long-term effects on target species.

5. Conduct visual survey to look for new colonies.

<u>YR3 and Yr 4</u>

6. Repeat YR 2 procedure. Be sure to resample all areas treated in all years even if treatment area declines in size over time so that an accurate record of control <u>*and results*</u> can be established.

<u>YR 5</u>

7. Repeat YR 2 procedure if necessary.
8. Conduct a lake wide P/I survey (repeat base year) to gauge overall lake community response.

Notes :

Summer to summer post treatment comparison is for assessing native and target species response. Conversely spring to spring is for assessing target AIS response. Comparing spring to fall in the same year is not a valid assessment of native response. A fall survey may be added, however, to locate potential new EWM spring treatment areas.

Once established and repeated monitoring indicates that the beds of target species stay in the same location year to year and only density varies, pre-treatment surveys on repeated nuisance control treatments may be less rigorous.

During initial P/I survey of lake, assess weevil damage, northern water milfoil abundance and shoreland habitat and consider need for treatment or scale of treatment given bio-control potential. Use CLMN (Herman) guidance on weevil monitoring.

The plant surveys should be conducted by an independent party not directly affiliated with the herbicide applicator to prevent bias or appearance of bias.

<u>Measuring of success or the need to change course.</u>

- Chose a percent change in the target plant area coverage or frequency of occurrence for an annual goal of at least 50% for restoration projects.
- For an overall long term goal, a reduction to less than large scale treatment (less than 10 acres or 10% of lake littoral area) where annual spot treatments can sustain low

level occurrences is reasonable. Alternatively, a goal of reducing dense beds to scattered plants using a density measurement might be appropriate.

- Acceptable native response is no net loss and ideally some gain. However, some loss may be purely sampling variance or inter-annual variation.