Friends of Leverett Pond

How to survey treatment plots and control plots on the Pond

The purpose of the survey is to record/measure existing aquatic vegetation on Leverett Pond in areas that have been treated with herbicides and/or hydro-raking, and areas nearby that have not been treated by either method.

Surveys will be conducted in advance of the first herbicide treatment, and again in October (end of growing season).

Most treatment "-T" survey plots are located within 15 feet (5m) of the shoreline, with a control plot "-C" offshore approximately 100 feet (33m). (See Map - Figure 1). Some of the treatment plots were chosen because they were treated by herbicides only, or herbicides and hydro-rake. There are three control plots in the north end of the pond that are not associated with the treatment plots. None of the control plots have been treated by either method.

- Locate the "treatment" survey plot – using a GPS meter or phone, (See Map Figure 1) and within a one-meter square estimate the density of each invasive plant species. Most will be marked with a small piece of surveyors tape at the shore. Measure 15 ft (5m) to the west or east as appropriate.

  Note: the first time the survey is conducted the plots will be located and GPS coordinates computed. Some will be marked with tape on the shoreline. All will have GPS waypoints recorded for use in future surveys.

- Locate the "control" survey plot – using a GPS meter or phone within a one-meter square estimate the density of each invasive plant species. The control plots are 100 ft (33m) pondward from the treatment plot, far enough distant to be unaffected from the herbicide or mechanical treatment.

- Using the provided spreadsheet, record the estimated density percentage of milfoil (Eurasian and Variable), Curly-Leaf Pondweed, and Bladderwort (all types). Use the laminated plant density key adapted from the DEP wetland guide (Figure 2).

- Record other general vegetation in the vicinity.

- Enter the recorded data on a data base for future analysis. The identity of the plot area will be the plot code and date.

Initially, the object will be a simple comparison of treated areas before and after, and a comparison with the untreated control plots. The object will also be recordation. The data will also be useful in comparing results once we are able to drawdown the water level following construction of a new dam. Questions to be asked: Does the weed density decline annually in the treatment areas? Is the decline cumulative year after year? Is there better control in areas treated by hydro-raking, than in areas where only herbicide treatment is done? There are three control plots in the north of the Pond that have never been treated by any method. How do they compare?

More rigorous statistical analysis will also be possible and will include a nested t-test, using a 'paired t-test' design with samplings stratified as case/control by geographic location, as well as a 'pooled t-test' design where all of the controls from the case/control can be compared against the 3 untreated and geographically distant controls on the north end of the pond.

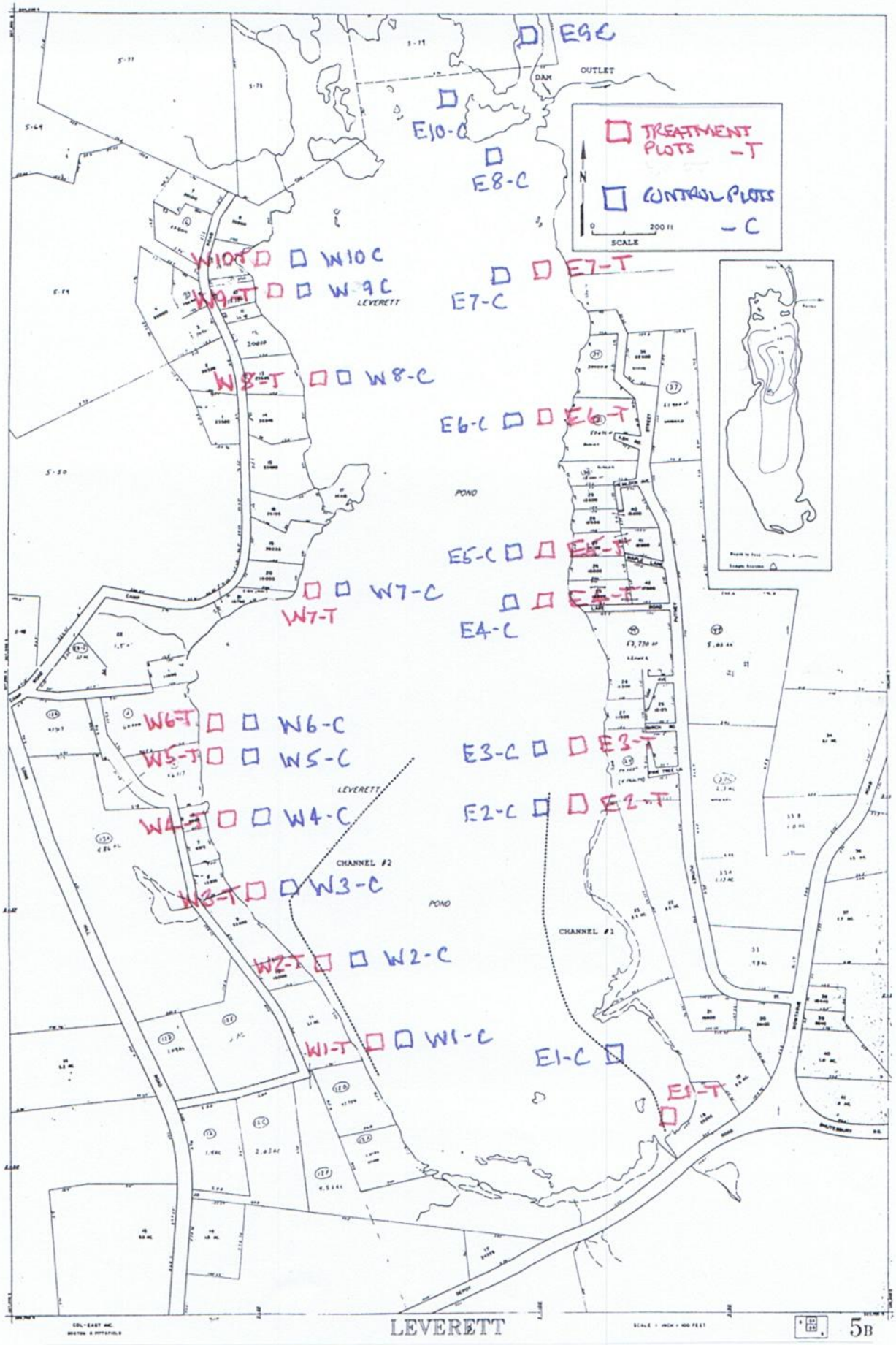


FIGURE 1

AREAS TO BE SURVEYED - (GPS Coordinates on Separate Sheet)

(Adapted from *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act*

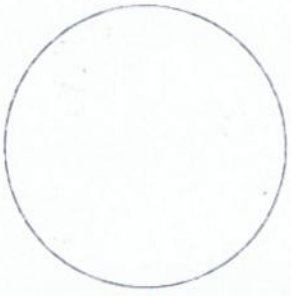
MA Department of Environmental Protection, Division of Wetlands and Waterways)

Key – Use to Identify Percentage of Aquatic Vegetation

FIGURE 2

Examples of Percent Cover, Cover Ranges, and Midpoint Values

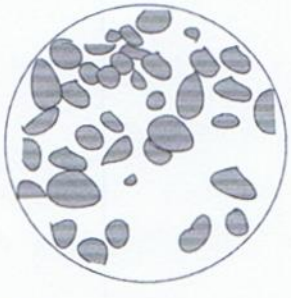
The following are examples of percent cover estimates with the associated cover range and midpoint value noted.



0%

3% cover or
1-5% cover range
(use 3.0 midpoint value)

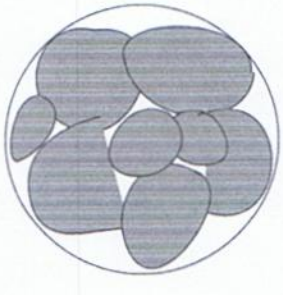
12% cover or
6-15% cover range
(use 10.5 midpoint value)



32% cover or
26-50% cover range
(use 38.0 midpoint value)

58% cover or
51-75% cover range
(use 63.0 midpoint value)

68% cover or
51-75% cover range
(use 63.0 midpoint value)



83% cover or
76-95% cover range
(use 85.5 midpoint value)

(After MA Dept of Environmental Protection, Division of Wetlands and Waterways)

Leverett Pond Nuisance Aquatic Weed Survey. Date:_____									Surveyor:_____	
Plot	Date yyyymmd	GPS Coordinates	Depth in ft.0	Herb	Mech	Milfoil	Curly-Leaf Pondweed	Bladderwort	Other:_____	Location Name
						Density-%	Density-%	Density-%	Density-%	
W01-T				Herb	Mech					Obermeier
W01-C				No	No					Offshore
W02-T				Herb	Mech					Field
W02-C				No	No					Offshore
W03-T				Herb	No					Thiebe
W02-C				No	No					Offshore
W04-T				Herb	No					Thomas
W04-C				No	No					Offshore
W05-T				Herb	Mech					Mulholland
W05-C				No	No					Offshore
W06-T				Herb	Mech					Hankinson
W06-C				No	No					Offshore
W07-T				Herb	Mech					Chakowski
W07-C				No	No					Offshore
W08-T				Herb	Mech					Dover/Reic
W08-C				No	No					Offshore
W09-T				Herb	Mech					Campbell
W09-C				No	No					Offshore
W10-T				Herb	Mech					Ryan/Free
W10-C				No	No					Offshore
E01-T				Herb	Mech					ROW
E01-C				No	No					Channel
E02-T				Herb	Mech					Church
E02-C				No	No					Offshore
E03-T				Herb	No					Freedman
E03-C				No	No					Offshore
E04-T				Herb	Mech					Woodard
E04-C				No	No					Offshore
E05-T				No	No					Roberts
E05-C				No	No					Offshore
E06-T				Herb	No					Rubin
E06-C				No	No					Offshore