

# Bantam Lake Aquatic Management Program

## 2010 Project Completion Report

**December, 2010**

Prepared for:



Prepared By:



*In association with  
Northeast Aquatic Research  
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## **Introduction**

This year (2010) was the fifth year in the ongoing vegetation management program at Bantam Lake. Aquatic Control Technology (ACT) has been working with the Bantam Lake Protective Association (BLPA) for many years to manage nuisance aquatic vegetation in Bantam Lake. Initially, our involvement focused on contract weed harvesting, however in 2003, a decision was made to implement a more comprehensive plant management program, which included the use of herbicides along with yearly plant surveys and a comprehensive Diagnostic Study of the lake. After much planning with the BLPA, DEP and other parties, treatments began in 2006. The previous four years of treatment were successful in managing invasive plant species (see respective Year-End Reports) and this year's program endeavored to maintain and expand upon those improvements.

Bantam Lake is considered to be one of the most valuable fishery and recreational resources in the State. The lake contains two State listed, rare and endangered aquatic plant species: slender-leaf watermilfoil (*Myriophyllum alterniflorum*) and water marigold (*Megalodonta beckii*). While the lake undoubtedly supports a diverse population of beneficial aquatic plant species, there is also a significant presence of non-native and invasive weeds, most notably Eurasian watermilfoil (*Myriophyllum spicatum*) and to a lesser extent, fanwort (*Cabomba caroliniana*) and water chestnut (*Trapa natans*). It is these species in particular that threaten the lake's habitat and recreational use.

This report summarizes the Aquatic Management Program at Bantam Lake in 2010, including the documentation of pre & post treatment inspections, description of the actual treatment protocol, discussion of other management tasks and presentation of recommendations for 2011.

## **Summary of Management Plan**

The 2010 Management Program was carried out based on the same general approach as previous years. Herbicide treatment areas were designated to target a majority of the problematic weeds in the lake, which included mostly Eurasian watermilfoil, with some selected areas targeted for pondweed (*Potamogeton spp.*) and naiad (*Najas spp.*) control taking into account treatment limitations given the location of state listed plants and nearby public wells. No new or different areas were treated in 2010 that had not been previously treated in one of the prior years.

As with last year, the 2010 program used two separate treatments to better match the growth patterns of the target plants. The first treatment on June 16<sup>th</sup> targeted primarily milfoil in areas 3, 6 and 11 with the Reward (diquat) herbicide. Plants that emerged later in the season, mostly naiad, were treated with the Reward (diquat) herbicide on July 27<sup>th</sup>. The second treatment was conducted in areas 4, 7a, 7b & 7c. Treatment areas are depicted in Figure 1.

The move to a two-treatment approach was a result of problematic plant growth, mostly naiad, that emerged later in the season. Treatment area and dates were set based on direct observation of the lake plant populations. The pre-treatment survey in May set parameters for the first treatment and an added survey conducted in early July served to guide the second treatment.

### **Implementation of Treatment**

Following extensive notification of the pending chemical treatment(s) to the public, including resident mailings, newspaper notices and shoreline posting, the herbicide treatments were performed on June 16<sup>th</sup> and July 27<sup>th</sup>, 2010. The treatments were conducted with the Reward® (diquat) herbicide as depicted in Figure 1. Two staff members from Aquatic Control, one of which was a Supervisory Level Applicator, performed the treatments from Aquatic Control's specially designed Airboat, equipped with a sub-surface spray boom and GPS guidance system. The treatments proceeded smoothly and without incident.

### **Herbicide Testing**

As a condition on the DEP permits, testing of nearby water supply wells and the outlet was required post treatment. Sample collection and analysis were coordinated by the BLPA. No concentrations of the permitted chemicals (diquat & endothall) were found in either the pre & post treatment well sampling. A small amount of diquat (1.6 ppb) was detected in the 48-hour post-treatment sample collected from the outlet following the first treatment, which is not unexpected and is well under the EPA's drinking water standard of 20 ppb.

### **Aquatic Plant Surveys**

The plant survey methodology for this project was approved by DEP as part of the "Authorization for Incidental Taking of Endangered or Threatened Species", which was submitted to the State in support of the DEP herbicide permit application. Dominic Meringolo with Aquatic Control and Dr. George Knoecklein (NEAR) again performed the plant surveys as they did in past years. A series of 128 data points were located with a Trimble Differential GPS (DGPS) unit, in and adjacent to the survey areas. Points were set along transects that bisected the treatment areas such that most transects had at least one point that was located outside of the potential treatment area. Transects were located so that the potential treatment areas were bracketed by observations points. Both the treatment area and the area around the outside of the treatment area were surveyed. The points used this year were the same as last year.

The following data was collected at each point, 1) latitude/longitude, 2) water depth, 3) plant species present, 4) % cover of each species, 5) approximate biovolume. At each point, vegetation data was collected using a weed rake and underwater video camera. The weed rake was used to bring plant specimens into the boat for identification, while the underwater camera was used to estimate the percent cover and the relative biovolume of each species at the point. Biovolume is measured on a scale of 0-5 with: 1 = low growing, mostly within a few inches of the bottom, 2 = some height in the water column but less than half the water column, 3 = tall growth better than half the water column, 4 = growth to the water surface, 5 = topped out, matted growth and/or floating leaf plants. Percent cover is an estimate of the abundance of a plant species in a given area while the percent occurrence is calculated from the number of points where the plants was observed divided by the total points in the area.

There were six survey areas, South Bay, Marina Cove, Deer Island, Keeler Cove/North Shore, Outlet Cove, and North Bay. Each area was visited twice during the 2010 season. A pre-treatment visit was on May 27<sup>th</sup> and a post treatment survey was made on September 21<sup>st</sup>. As mentioned previously, a cursory inspection was performed on July 7<sup>th</sup>, to assess the success of the first treatment and set the requirements for the second treatment.

Figures 2-7 show the location of the data points at each of the six different survey areas in Bantam Lake. Appendix 2 presents the data collected at each point. Figure 8 & 9 show summaries of pre & post treatment conditions at Bantam Lake. The following is a discussion and interpretation of the survey data.

**Table 1 – Number of Observation Points in Each Treatment Area**

<i>Treatment Area</i>	<i># of Observation Points</i>
South Bay (Area 11)	28
Marina (Area 7c)	15
Deer Island (Area 7, 7a-c)	26
North Shore (Area 4)	18
Outlet Cove (Area 3)	16
North Bay (Area 1)	25
<b>Total</b>	<b>128</b>

### **South Bay Results**

**Target Plants: Eurasian watermilfoil, naiad; Herbicide(s) Applied: Reward (June)**

During the pre-treatment survey, naiad, Eurasian milfoil and curlyleaf pondweed, occurred with high frequency, and two pondweeds, largeleaf pondweed and whitestem pondweed, occurred at moderately frequency. Naiad was also present at high abundance. Milfoil and curlyleaf pondweed although frequently found did not occur at high levels of abundance as noted by the lower percent cover values.

Post treatment, milfoil and curlyleaf pondweed were absent from the plant community indicating excellent control of these two invasive species. Naiad frequency was reduced somewhat but overall density remained the same and the height of the plants in the water column (biovolume) did not noticeably increase. Both pondweeds were present less frequently after treatment but largeleaf pondweed showed an increase in abundance.

No state listed plants were found in the area during either pre or post surveys

**Table 2 - Percent Occurrence Values, Average Percent Cover and Average Volume for Species found in South Bay**

<b>South Bay</b>	<b>Percent Occurrence</b>		<b>Percent Cover</b>		<b>Biovolume</b>	
	<b>27-May</b>	<b>21-Sep</b>	<b>27-May</b>	<b>21-Sep</b>	<b>27-May</b>	<b>21-Sep</b>
<b>Species Name</b>						
Najas guadalupensis	54	75	60	67	2	2
Myriophyllum spicatum	36		18		3	
Ceratophyllum demersum	4	4	1	5	2	1
Nitella sp.	7	4	1	5	1	1
Nuphar variegata	4		40		5	
Potamogeton amplifolius	14	7	23	25	2	3
Elodea canadensis	4		10		3	
Potamogeton crispus	46		15		3	
Potamogeton praelongus	18	4	9	1	3	3
Ludwigia sp	4		1		1	

### **Marina Results**

**Target Plants: naiad, milfoil ; Herbicide(s) Applied: Reward (July)**

Pre treatment there was extensive growth of naiad present at almost all of the survey points at nearly 100% cover. Naiad growth was however fairly low to the bottom and not problematic in late May but by the time of the treatment in July it was at or near the water surface throughout much of the marina and adjacent area. Eurasian milfoil although present did not occur with high frequency and when present was at low density indicating that in most cases the milfoil was present as individual plants not clumps of plants. Both water lilies are common in this area with large beds occurring on both the northern and southern ends of the area. Nitella was found with moderate frequency and density in the Marina area. Largeleaf pondweed and whitestem pondweed were present in this area at low frequency and abundance.

Post treatment, milfoil was not present in the area. The percent cover of naiad was similar to the spring survey but its frequency decreased by about 30% and bio-volume was greatly reduced. Largeleaf pondweed was also not present during the post treatment survey. Whitestem pondweeds showed increases in both frequency and abundance indicating that this species was not impacted by the treatment probably because it primarily grows in deeper waters that are along the outer edge of the treatment area. Both water lilies showed no change in frequency but increases in abundance consistent with pad formation during the summer.

No state listed plants were found in the area during either pre or post surveys

**Table 3 - Percent Occurrence Values, Average Percent Cover and Average Biovolume for Species found in Marina Cove**

Marina <i>Species Name</i>	Percent Occurrence		Percent Cover		Biovolume	
	27-May	21-Sep	27-May	21-Sep	27-May	21-Sep
Najas guadalupensis	93	60	74	63	2	2
Myriophyllum spicatum	13		4		2	
Ceratophyllum demersum	7	20	10	7	2	2
Nitella sp.	40	27	58	22	2	1
Fontinalis sp.						
Nymphaea odorata	27	20	10	30	5	5
Nuphar variegata	20	27	12	44	5	5
Potamogeton amplifolius	13		15		4	
Potamogeton praelongus	7	13	5	11	3	2

### **Deer Island Results**

**Target Plants: Eurasian watermilfoil, naiad and pondweed**

**Herbicide(s) Applied: Reward (June – Area 6 / July – Area 7a, 7b, & 7c)**

Milfoil was present at low frequency but high abundance during the pre treatment survey. This indicates a few patches or large clumps of dense milfoil were present in specific locations.

Curlyleaf pondweed was also present in this area but at only one location and at low density. Naiad, was the most frequent plant occurring abundantly throughout the area. Whitestem pondweed was frequent and moderately abundant in deeper waters.

Post treatment both Eurasian milfoil and curlyleaf pondweed were absent from the area. Naiad was reduced in frequency of occurrence but it increased in abundance where it remained. Whitestem pondweed showed no change. Dense mats of filamentous algae were found covering the bottom in some areas along the southeast side of the island.

No state listed plants were found in the area during either pre or post surveys

**Table 4 - Percent Occurrence, Percent Cover Values and Average Biovolume for Species found in Deer Island**

Deer Island <i>Species Name</i>	Percent Occurrence		Percent Cover		Biovolume	
	27-May	21-Sep	27-May	21-Sep	27-May	21-Sep
Najas guadalupensis	42	27	71	39	1	1
Myriophyllum spicatum	12		78		4	
Ceratophyllum demersum	4	19	1	8	1	2
Vallisneria americana		4		5		2
Nitella sp.	12	8	13	20	1	2
Nymphaea odorata	4	8	60	25	5	5
Potamogeton amplifolius	8	12	3	29	1	2
Elodea canadensis	4		10		2	
filamentous algae		15		100		1
Potamogeton crispus	4		5		2	
Potamogeton gramineus		4		5		1
Potamogeton praelongus	31	8	32	6	3	2

**Keeler Cove – North Shore Results**

**Target Plants:** naiad

**Herbicide(s) Applied:** Reward (July)

Pre treatment naiad and largeleaf pondweed were most frequently observed species, however several other natives were also common, tape grass, nitella, both water lilies, the sterile sagittaria, robbins and whitestem pondweeds and elodea. No invasive species were found during the pre treatment survey.

Post treatment naiad showed increases in both frequency and density from the spring survey, indicating that the plant spread dense beds throughout the area, however biomass was diminished greatly due to the July treatment. Eurasian milfoil was found at few points located on the eastern end of the area within the shallows of the Folly Cove, a location that is outside the treatment area. All native species found during the pre treatment survey were present after the treatment. There were 9 additional native species noted for a total of 19 species of native

plants observed during the post treatment survey making this the most florally diverse of all the treatment areas.

The state listed plant megalodonta beckii was observed at one point along the eastern end of the treatment area.

**Table 5 - Percent Occurrence, Percent Cover and Average Biovolume Values for Species found in Keeler Cover – North Shore**

Keeler Cove/North Shore <i>Species Name</i>	Percent Occurrence		Percent Cover		Biovolume	
	27-May	21-Sep	27-May	21-Sep	27-May	21-Sep
Najas guadalupensis	28	33	50	71	1	1
Myriophyllum spicatum		11		8		4
Ceratophyllum demersum		6		10		2
Utricularia vulgaris		11		38		3
Vallisneria americana	17	33	2	9	1	2
Nitella sp.	17	22	12	24	1	1
Nymphaea odorata	6	11	40	78	5	5
Nuphar variegata	6	6	85	20	5	5
Sagittaria cristata	17	11	4	1	1	1
Potamogeton robbinsii	6	6	5	40	2	3
Megalodonta beckii		6		10		3
Zosterella dubia		17		40		2
Potamogeton amplifolius	28	39	38	34	2	2
Elodea canadensis	11	17	21	10	2	3
filamentous algae		6		50		1
Potamogeton gramineus		33		41		2
Potamogeton praelongus	6	6	5	30	4	3
Eleocharis acicularis		17		2		1
Ludwigia sp		6		5		2
Myriophyllum tenellum		11		3		1

### **Outlet Cove Results**

**Target Plants:** Eurasian watermilfoil, naiad

**Herbicide(s) Applied:** Reward (June)

Pre treatment survey showed naiad was the most frequent and abundant plant species in this area forming a dense cover over most of the bottom. Eurasian milfoil was common but was present at low density. Curlyleaf pondweed was present at low frequency and density. The two water lilies were also common as were a few other native species but all secondary to the naiad.

Eurasian milfoil and curlyleaf pondweed were absent during the post treatment survey. Naiad increased in frequency occurring at almost all of the points within this area, but showed some decrease in overall abundance. The site showed some shifts in native species with coontail, and tape grass becoming common and abundant. White water lily also increased in abundance

as pad development progressed during the season. Elodea and the sterile bureed were not present during the post survey but this was probably attributed to the expansion of the waterlilies and the naiad. Two pondweeds, largeleaf and grassy pondweed showed little change between pre and post surveys.

No state listed plants were found in this area.

**Table 6 - Percent Occurrence, Percent Cover and Average Biovolume Values for Species found in Outlet Cove**

Outlet Cove <i>Species Name</i>	Percent Occurrence		Percent Cover		Biovolume	
	27-May	21-Sep	27-May	21-Sep	27-May	21-Sep
Najas guadalupensis	53	87	94	78	2	3
Myriophyllum spicatum	20		5		2	
Ceratophyllum demersum		7		45		5
Vallisneria americana	13	53	13	34	3	3
Nymphaea odorata	20	13	22	80	5	5
Nuphar variegata	13	13	15	28	5	5
Sagittaria cristata	7		5		1	
Potamogeton robbinsii		13		3		2
Potamogeton amplifolius	7	27	5	10	3	3
Elodea canadensis	13		1		2	
Potamogeton crispus	7		2		2	
Potamogeton gramineus	13	13	15	5	2	3

### North Bay

**Target Plants:** Typically, pondweed, naiad and milfoil

**Herbicide(s) Applied:** No Treatment

Pre treatment survey showed naiad was the most frequent species in this area although not the most abundant. Both Eurasian milfoil and whitestem pondweed showed higher initial density of growth than did the naiad. This indicates that in a few of the locations within this area Eurasian milfoil occurs in high density clumps. Other natives that were present during the pre treatment survey were bladderwort, tapegrass, and robbins, largeleaf, whitestem, and grassy pondweeds. There was little largeleaf pondweed in this area pretreatment showing continued control from the treatment in 2006.

Post treatment naiad showed increased frequency and abundance. Eurasian milfoil was still present although overall density was reduced. These remaining plants occurred alongside the southern edge of the treatment at the Morris Town Beach. Post treatment survey showed yellow star grass becoming locally dense. Both Whitestem and grassy pondweeds showed increases in density although these plants generally did not co-occur with the whitestem present in water depths of between 5 and 9 feet while grassy pondweed was found mainly along the

shallow shoreline in water depths of only a foot or so. Within this shallow water area the yellow star grass was moderately dense.

Both state listed plants were present in this treatment area. These plants were both found along the northern edge of the treatment area where they were found in the shallow waters along the shoreline. *Megalodonta beckii* was locally abundant with moderate density of growth.

**Table 7 - Percent Occurrence, Percent Cover and Average Biovolume Values for Species found in North Bay**

North Bay <i>Species Name</i>	Percent Occurrence		Percent Cover		Biovolume	
	27-May	21-Sep	27-May	21-Sep	27-May	21-Sep
<i>Najas guadalupensis</i>	44	52	32	60	1	2
<i>Myriophyllum spicatum</i>	20	16	35	1	3	4
<i>Utricularia vulgaris</i>	4		1		1	
<i>Vallisneria americana</i>	28	8	3	18	1	3
<i>Nitella</i> sp.	4		5		1	
<i>Potamogeton robbinsii</i>	8	16	3	14	2	3
<i>Megalodonta beckii</i>		4		40		3
<i>Zosterella dubia</i>		36		38		3
<i>Myriophyllum alterniflorum</i>		12		7		2
<i>Potamogeton amplifolius</i>	12	16	13	11	2	3
<i>Elodea canadensis</i>	8	4	8	5	2	3
<i>Potamogeton gramineus</i>	12	40	6	35	1	2
<i>Potamogeton praelongus</i>	16	4	45	60	4	4

### ***Vegetation Results Summary***

- The dominant nuisance plants in Bantam Lake are Eurasian watermilfoil, curlyleaf pondweed and naiad. Early season survey shows abundant and tall milfoil plants and scattered curlyleaf plants. Naiad is extensive in the spring survey but biomass is low.
- Mid-Summer survey conducted in mid-July showed excellent control of the milfoil from the June treatment. Curlyleaf pondweed was also absent. Naiad growth in treated areas continued to be reduced in biomass, however naiad in non-treated areas increased in abundance and biomass, especially in the Marina Cove area and along the North Shore area.
- The September survey showed that milfoil was still successfully controlled in all of the treatment areas. Naiad growth was widespread and abundant but the two treatments worked well to suppress biomass from reaching nuisance levels.

- The diversity and abundance of native species in the treatment areas continues to be favorable as shown in the following table.

**Table 8 – Native Species Richness (# of species) by Survey Area (2006-2010)**

Year	South Bay	Marina	Deer Island	North Shore	Outlet Cove	North Bay
2006	8	-	10	14	9	12
2007	6	8	7	11	5	15
2008	7	8	9	9	7	12
2009	8	6	6	12	8	11
2010	8	7	10	19	10	12

- Treatments are working well to reduce biomass and provide seasonal control of nuisance vegetation while still maintaining adequate bottom cover of plants for fish habitat. The total acreage treated has fluctuated from year to year but we are seeing a decline since 2008 when the two-treatment approach was adopted (2008 – 69.1 ac, 2009 – 56.8 ac, 2010 – 50.3 ac).
- Due to the timing of the quantitative surveys, the plant data tables are not fully indicative of the changes in plant populations as a result of the two treatments, particularly for naiad. The May survey occurred early in the growing season and well before the plants had reached their pre-treatment peak biomass in July. The two treatments served to prevent the plants from appreciably increasing in density and biomass, so the September survey data is actually very similar to May. With no herbicide treatment, plant biomass would have filled much of the water column and “topped-out” by mid-late summer.
- Existing populations of state-listed species appear to be fairly stable, but are not specifically quantified through this project due to the relative location of the treatment/survey areas. In fact, the treatment areas were designated to avoid the major beds of the state listed plants. A good indication that the treatments are not adversely affecting the state-listed species can be seen in North Bay, where extensive beds of both water marigold and slender watermilfoil continue to flourish just to the north of the treatment area.

### **Management of Fanwort (Cabomba)**

In 2010, Connie Trolle, BLPA President as Project Manager and Dr. Knoecklein began implementing a fanwort study and control program using grant funding from the State. Part of this program included installing fragment barriers and benthic (bottom) barrier in and around the fanwort infestation located near the Bantam River inlet. Additional work under this program is planned for 2011.

An aggressive and well organized “Weed Watcher” program also needs to be strengthened. In order to be successful, someone will need to take the lead on this effort for BLPA. Dr. Knoecklein would provide guidance and overall supervision but in order to be successful, both BLPA and the lake residents need to become vested in the effort. Fanwort distribution and

abundance must be closely monitored in the lake and action taken (if appropriate and permitted) to at least contain and/or manage it, if eradication is not attainable.

### **Recommendations for 2011**

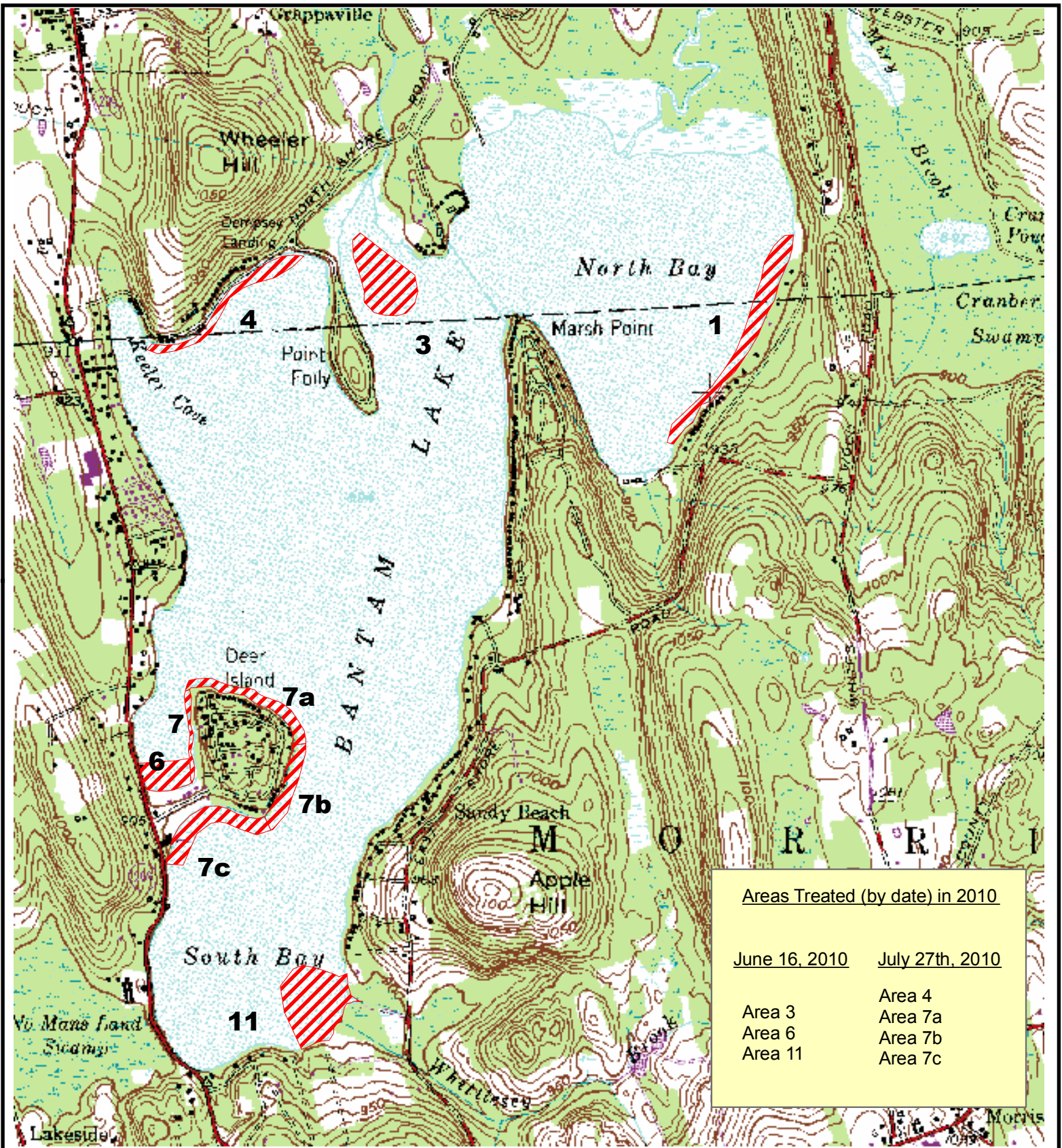
The targeted milfoil and broad-leaved pondweed treatment program at Bantam Lake, continues to proceed smoothly, in large part, to the close cooperation received from BLPA, DEP, the Towns and lake residents. This past year's program did not result in significant adverse effects to most native vegetation including state listed plants. No adverse effects of treatment on fish/wildlife that inhabit Bantam Lake were observed or reported. No herbicide residue was detected in any of the community/non-community water supply wells that were tested.

Spot or partial treatment (as required) within the same areas is recommended for 2011. Additionally, we have added a new treatment area along the western side of the lake between Keeler Cove and Deer Island (Area 12). This area was added based on consistent complaints from residents and frequent observations of nuisance growth (mostly naiad) by us and Dr. Knoecklein. A final change is the southerly expansion of Area 1 to include the adjacent Sunset Beach where some milfoil has been observed in recent years (See Figure 10). These significant changes in treatment areas will need to be presented in the DEP permit application to be submitted this winter and will likely trigger review by the Natural Diversity Data Base Program pursuant to listed species and by the Department of Public Health in regards to drinking water wells.

Final treatment area recommendations will be discussed with the Association following the pre-treatment survey. We suggest continuing the two treatment approach as well, including a mid-summer survey to designate areas for the second round of treatment. This approach minimized recreation impairment and optimized timing of control for the different target plants based on their growth patterns.

A new herbicide, Clipper (flumioxazin) has passed registration by USEPA and it's our understanding that a label will be issued in the near future. If and when the herbicide is then registered for use in Connecticut, it may be a valuable new tool for treatment of fanwort (*Cabomba caroliniana*) and we will likely propose a "pilot" treatment at Bantam Lake. We understand the field trials of flumioxazin performed under EUPs (Experimental Use Permits) in several states have demonstrated good control of fanwort as well as Eurasian watermilfoil. Reportedly, flumioxazin requires a short contact time with the plants and can be used effectively for smaller, shoreline or partial lake treatments. If approved by BLPA, we will plan to discuss more details on a proposed treatment.





# Bantam Lake

Morris/Litchfield, CT

## 2010 Treatment Areas

Legend:

 Treatment Area



0 600 1,200 2,400 3,600 4,800 Feet

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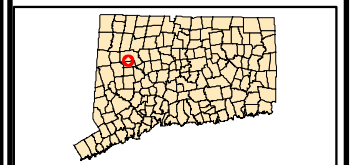
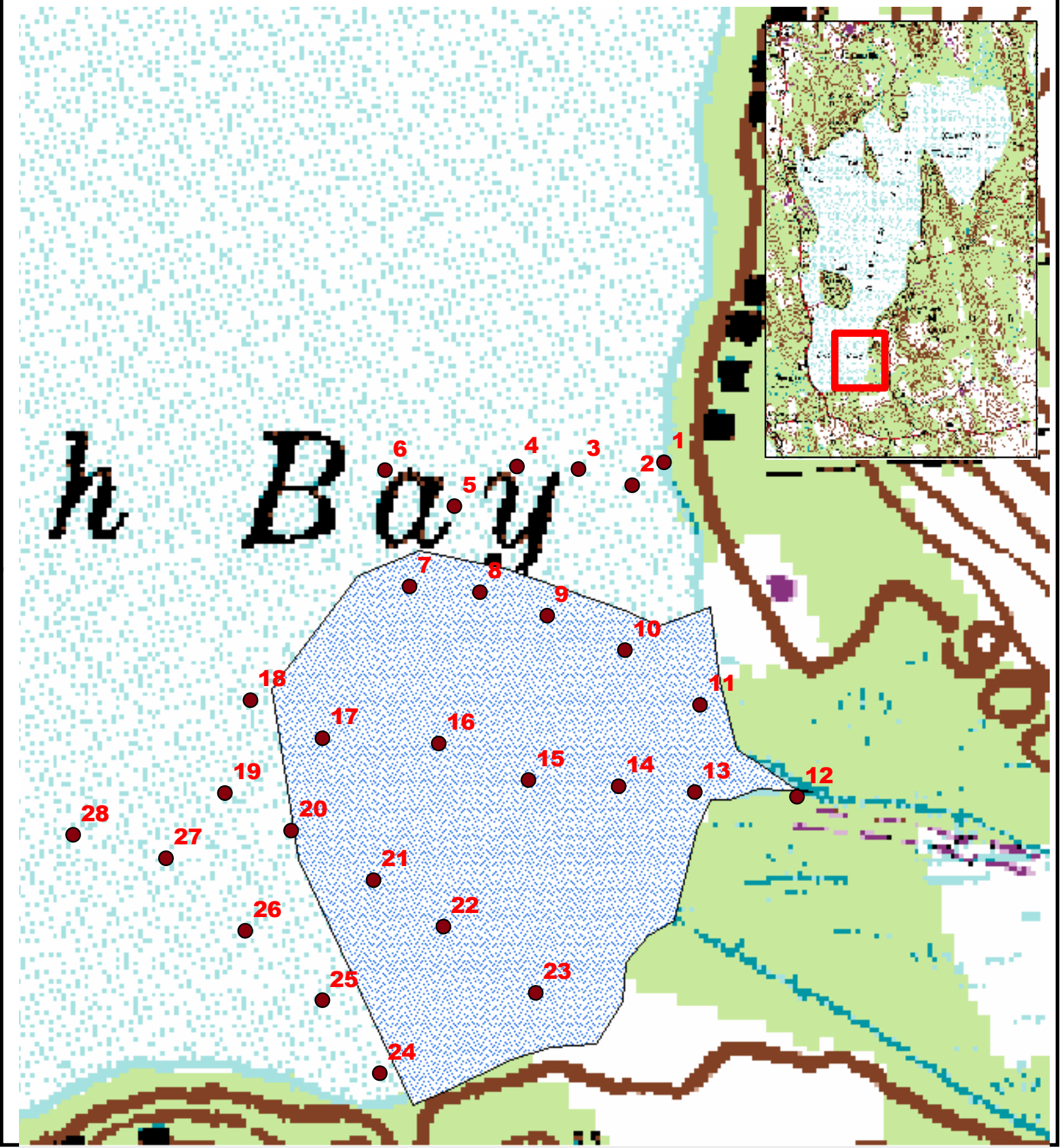


FIGURE:	SURVEY DATE:	MAP DATE:
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1		12/2010
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# Bantam Lake

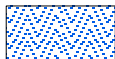
Morris/Litchfield, CT

## 2010 Survey Points

South Bay

FIGURE:	SURVEY DATE:	MAP DATE:
2	5/27 & 9/21	12/2010

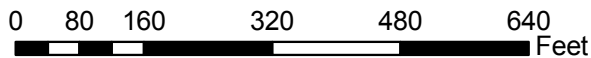
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Proposed Treatment Areas

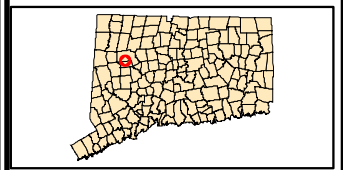


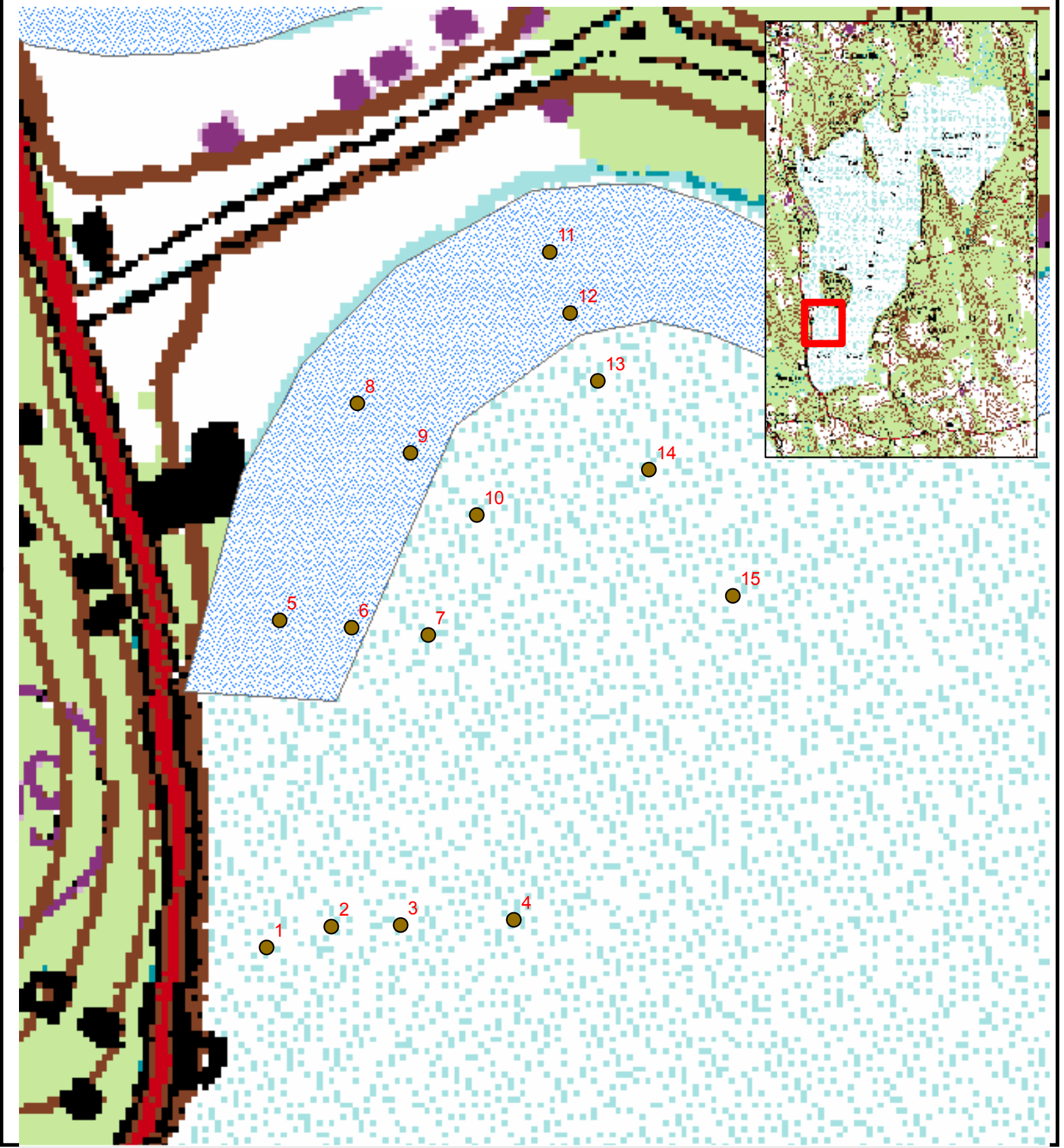
Survey Point



**AQUATIC CONTROL TECHNOLOGY, INC.**

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# Bantam Lake

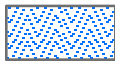
Morris/Litchfield, CT

## 2010 Survey Points

Marina Cove

FIGURE:	SURVEY DATE:	MAP DATE:
3	5/27 & 9/21	12/2010

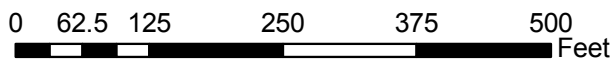
Legend:



Treatment Area

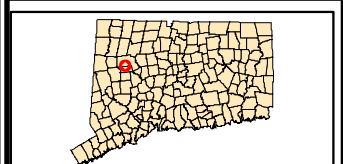


Survey Point

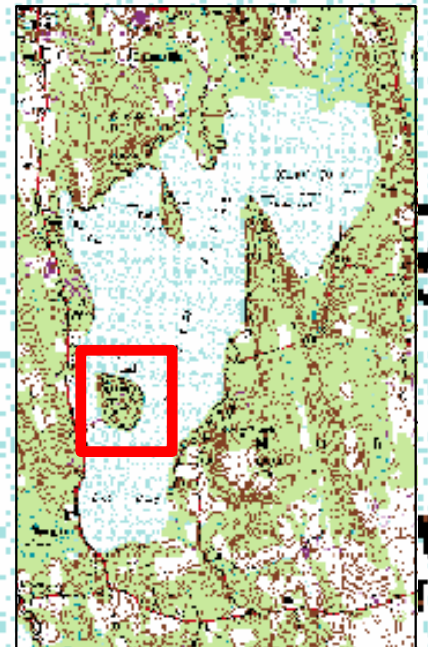
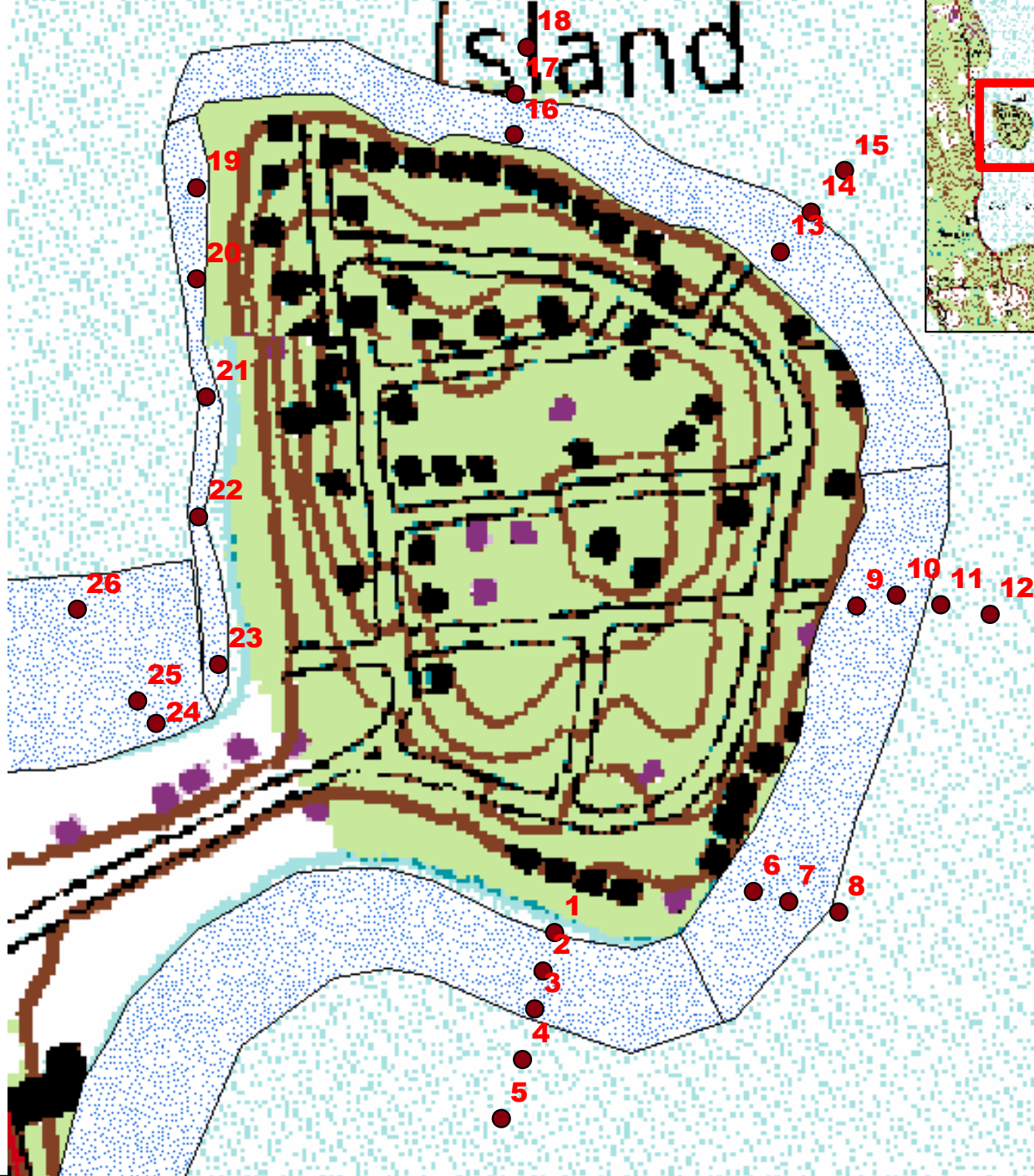


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# Deer Island



## Bantam Lake

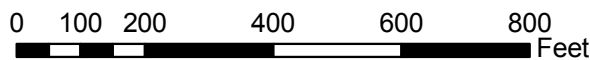
Morris/Litchfield, CT

### 2010 Survey Points

Deer Island

Legend:

- Survey Point
- Treatment Area



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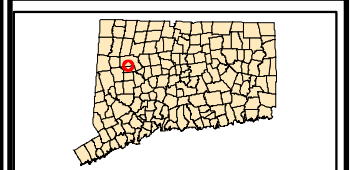
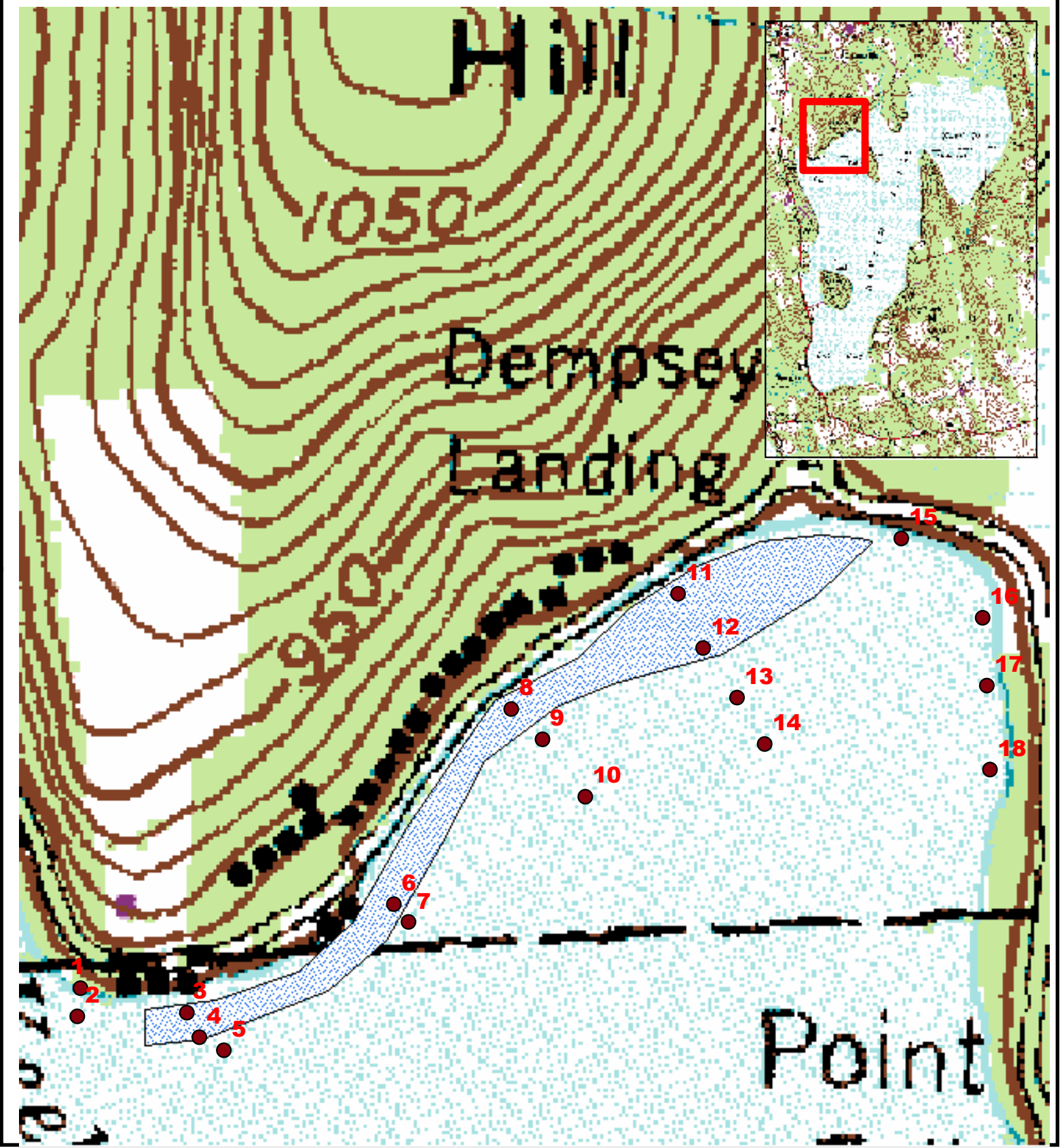


FIGURE:	SURVEY DATE:	MAP DATE:
4	5/7 & 9/21	12/2010



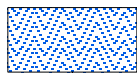
# Bantam Lake

Morris/Litchfield, CT

## 2010 Survey Points

Keeler Cove/North Shore

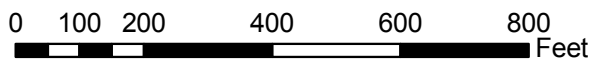
Legend:



Treatment Area



Survey Point



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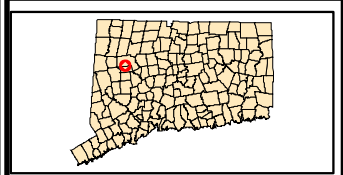
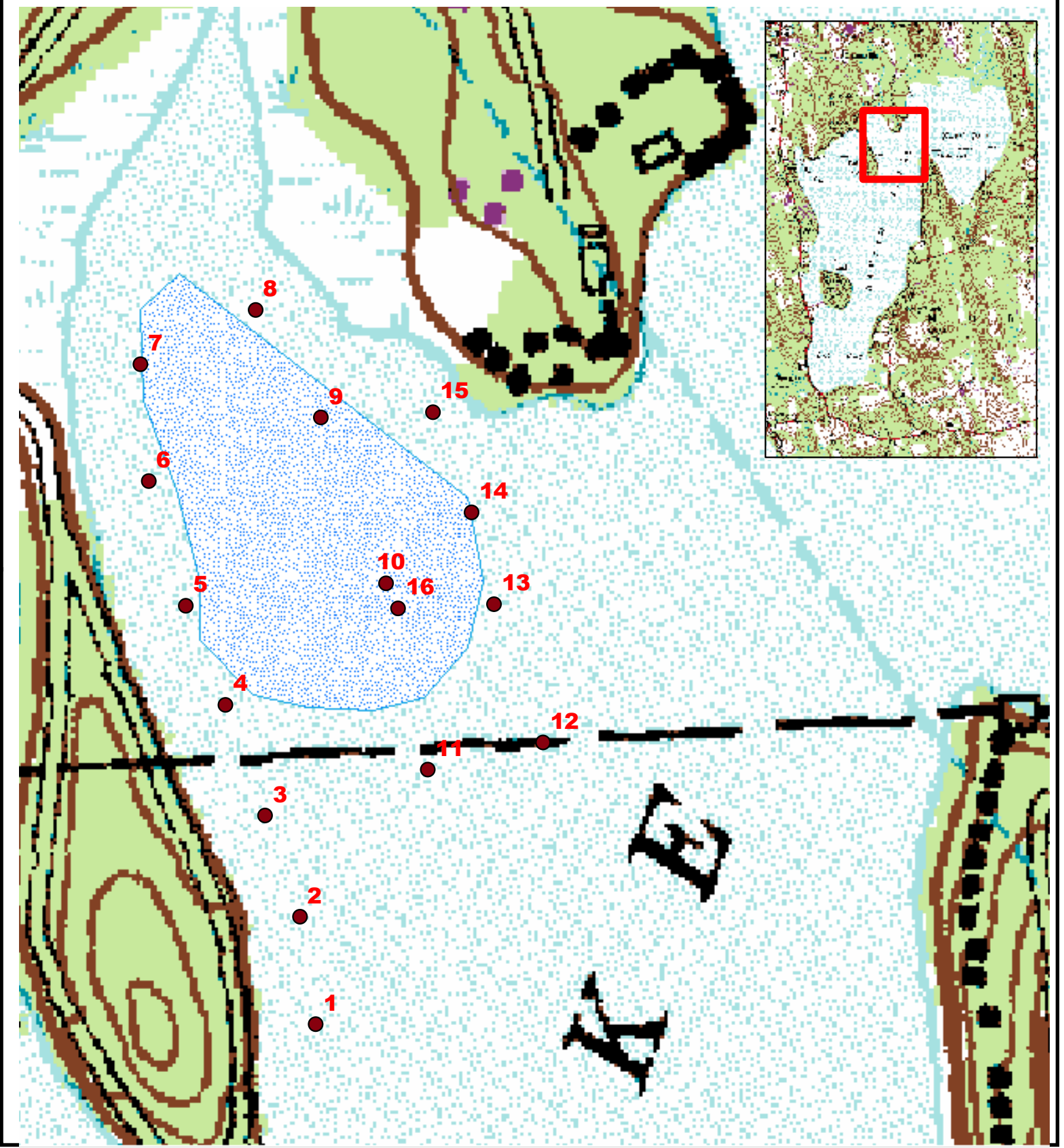


FIGURE:	SURVEY DATE:	MAP DATE:
5	5/27 & 9/21	12/2010



# Bantam Lake

Morris/Litchfield, CT

## 2010 Survey Points

Outlet Cove

FIGURE:	SURVEY DATE:	MAP DATE:
6	5/27 & 9/21	12/2010

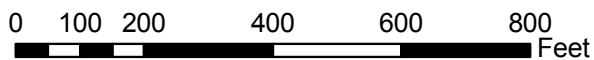
Legend:



Treatment Area

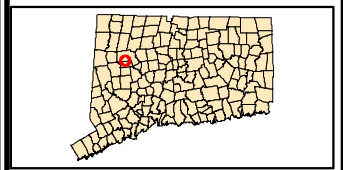


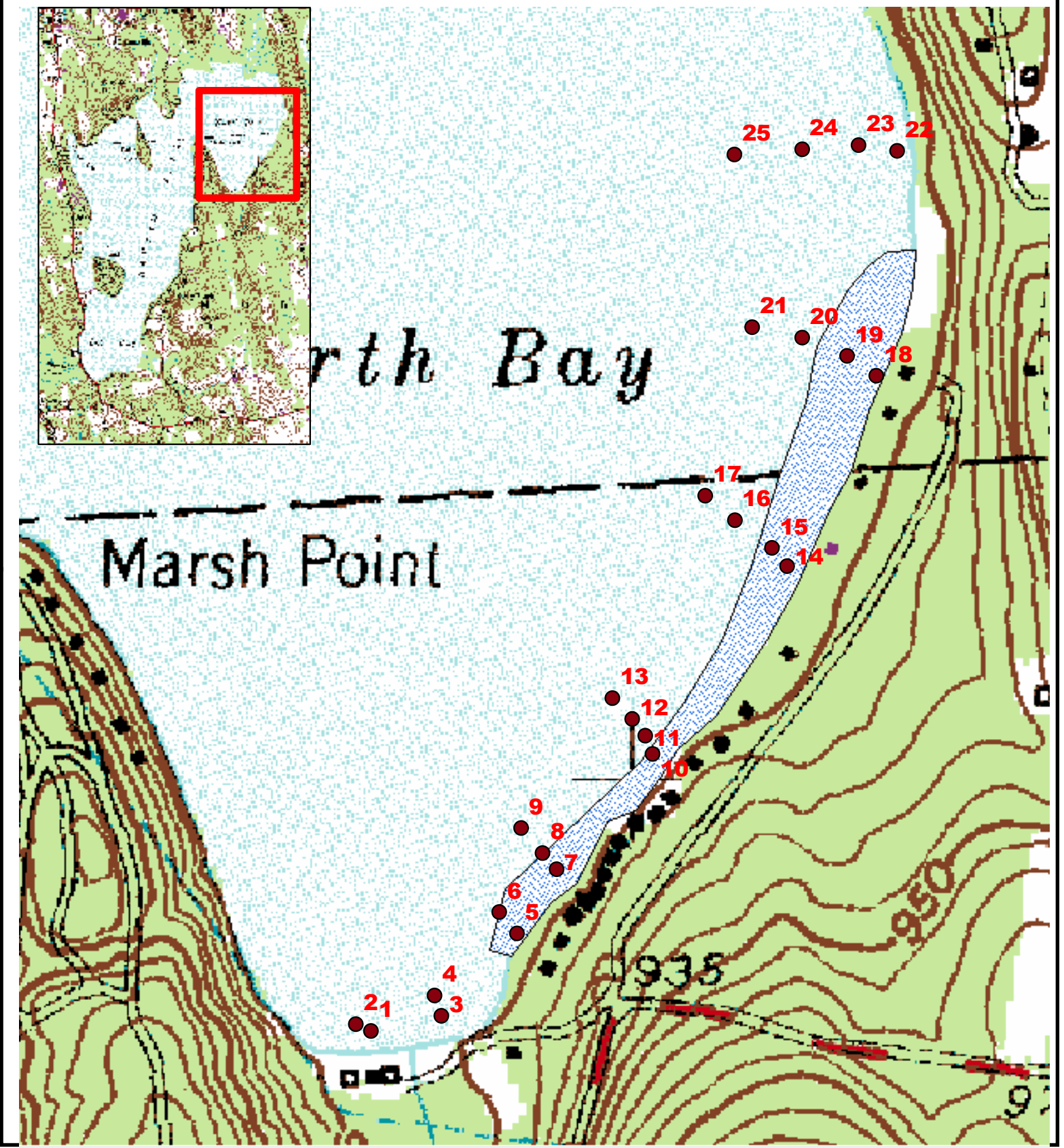
Survey Point



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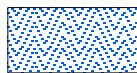
# Bantam Lake

Morris/Litchfield, CT

## 2010 Survey Points

North Bay

Legend:



Treatment Area



Survey Point



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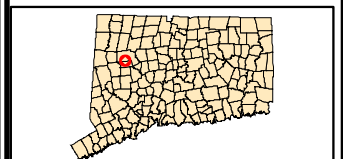
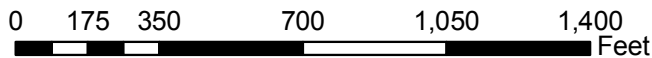


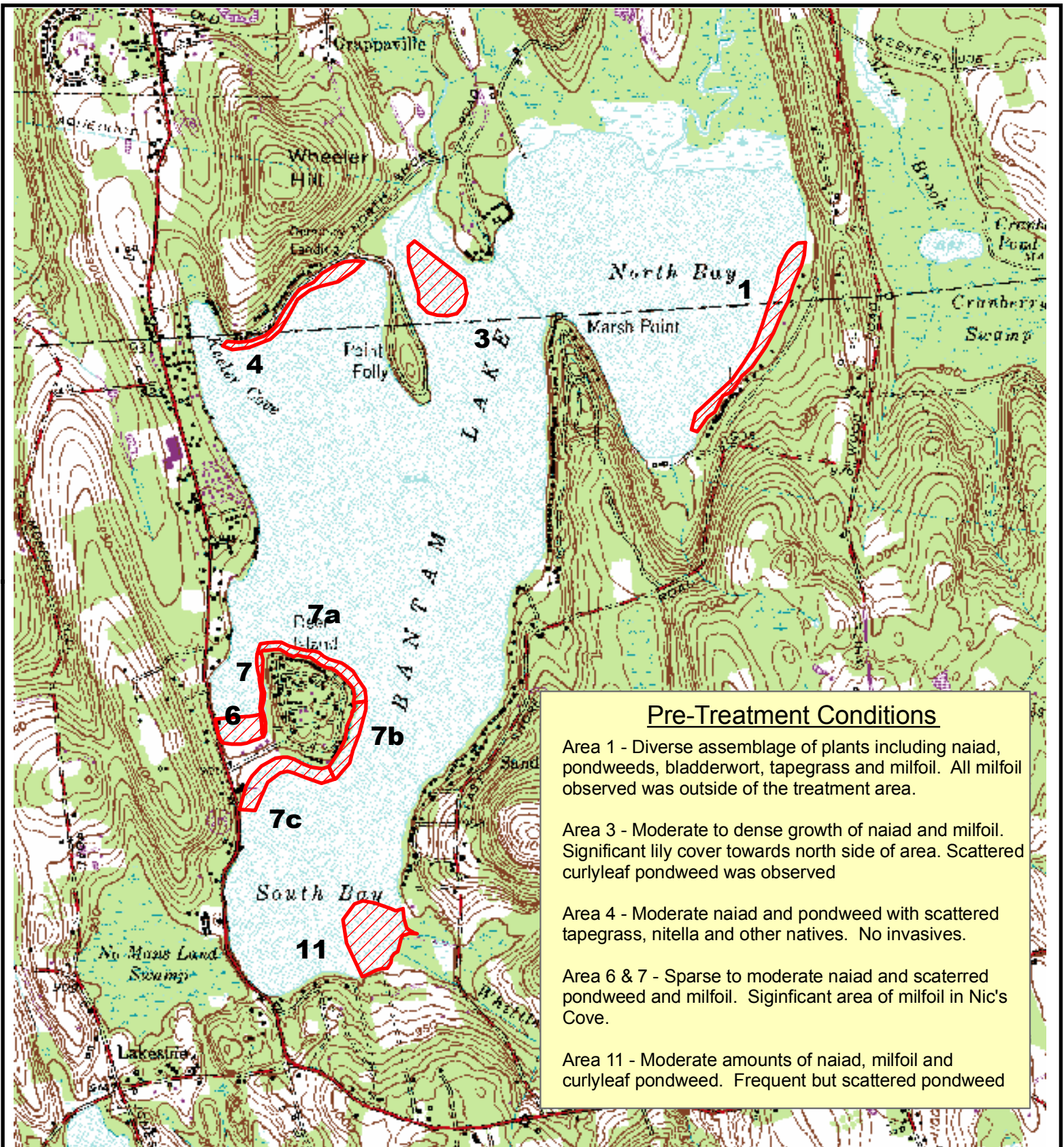
FIGURE:	SURVEY DATE:	MAP DATE:
7	5/27 & 9/21	12/2010

7

5/27 & 9/21

12/2010





# Bantam Lake

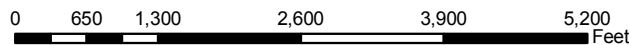
Morris/Litchfield, CT

## Pre Treatment Conditions (2010)

FIGURE:	SURVEY DATE:	MAP DATE:
8	5/2010	12/2010

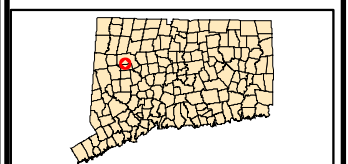
Legend:

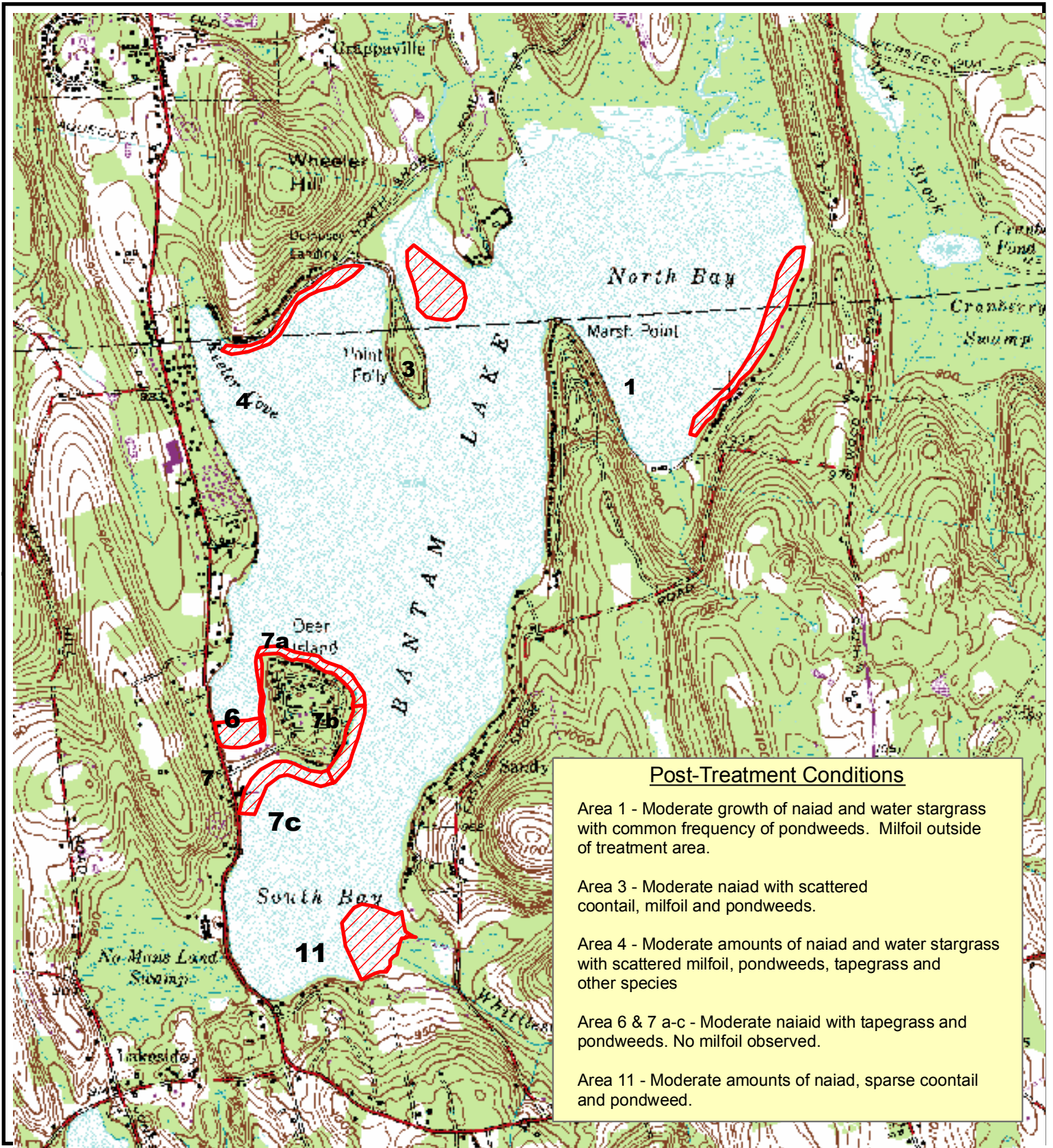
 2008 Treatment Areas



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# Bantam Lake

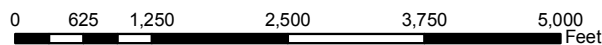
Morris/Litchfield, CT

## Post Treatment Conditions (2010)

FIGURE:	SURVEY DATE:	MAP DATE:
9	9/2010	12/2010

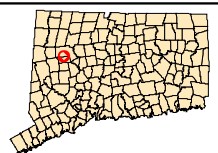
Legend:

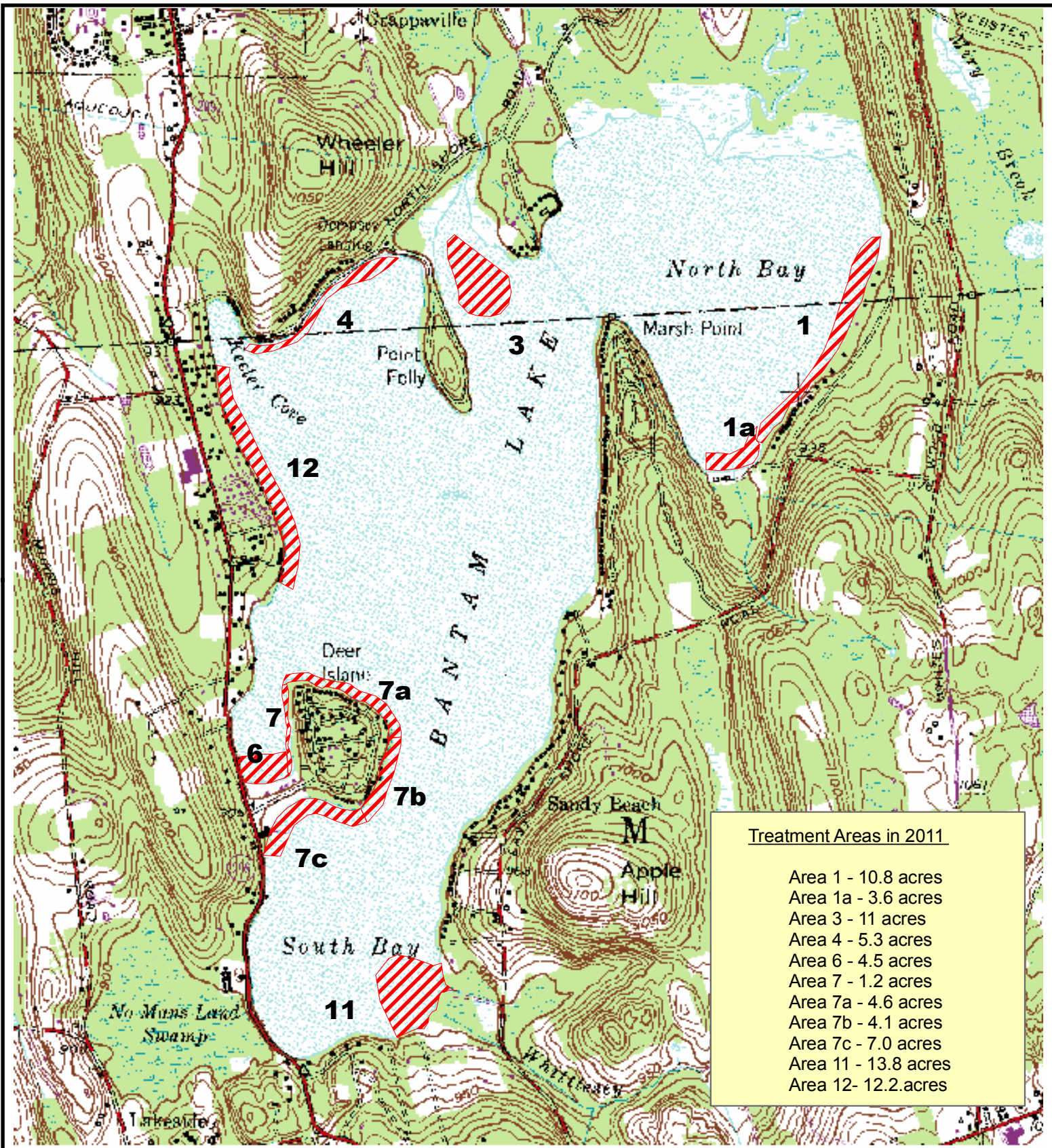
 2010 Treatment Areas



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Treatment Areas in 2011	
Area 1	- 10.8 acres
Area 1a	- 3.6 acres
Area 3	- 11 acres
Area 4	- 5.3 acres
Area 6	- 4.5 acres
Area 7	- 1.2 acres
Area 7a	- 4.6 acres
Area 7b	- 4.1 acres
Area 7c	- 7.0 acres
Area 11	- 13.8 acres
Area 12	- 12.2 acres


**Bantam Lake**  
 Morris/Litchfield, CT  
 2011  
 Proposed  
 Treatment Areas

FIGURE:	SURVEY DATE:	MAP DATE:
10		12/2010

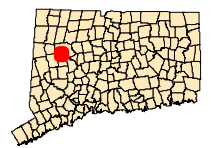
Legend:

 2011 Proposed Treatment Areas

0 625 1,250 2,500 3,750 5,000 Feet

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# Appendix 2 – Survey Data Sheets

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