AQUATIC VEGETATION REPORT FOR
WASH POND (SUNSET LAKE)
HAMPSTEAD
NEW HAMPSHIRE
2012

SUBMITTED: SEPTEMBER 23, 2012

BY:

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1.0 Introduction

Wash Pond, also known as 'Sunset Lake', is a 168-acre water body situated in Hampstead, New Hampshire. The New Hampshire Department of Environmental Service (DES) reports an average depth of twelve (12) feet for this pond. A maximum depth of nearly thirty (29.9) feet was noted during Lycott's 2012 Aquatic Vegetation Survey.

The Wash Pond sub basin is approximately three (2.72) square miles and is located within the Merrimack River Watershed. This water body is recharged by numerous sources including overland runoff and contributions from several unnamed streams and wetlands. A dam structure was observed at the southwest corner of the pond and functions as the sole outlet for this water body. Water flows westward from this outlet for approximately one-fifth of a mile (0.22) until it empties into Big Island Pond.

Wash Pond is intensively developed with numerous permanent and seasonal residencies. During the peak-season (i.e., June – August), Wash Pond serves as a tourism hotspot by offering many recreational opportunities (e.g., water skiing, camping, swimming, fishing, and boating) to residents and visitors to the pond.

Over the past several years, the Sunset Lake Association (SLA) has expressed concern over the rising Clasping-Leaf Pondweed (*Potamogeton perfoliatus*) population in Wash Pond. The SLA is concerned that this species is becoming a nuisance – impeding recreational activities and threatening the pond's ecosystem – and will only worsen over time. In an effort to protect this water body from noxious plant growth, the SLA has hired Lycott Environmental, Inc. to document and evaluate the vegetative community in Wash Pond.

2.0 Survey Methods

On August 2, 2012, two Lycott biologists; Joy Trahan-Liptak and Brittany Laginhas, performed a general littoral zone survey utilizing visual inspections and rake-tosses from a small boat to identify aquatic vegetation species and their associated relative abundances in Wash Pond (detailed methodology pertaining to **species identification** and **relative abundance** is provided in the following paragraphs). Precise locations of the aforementioned observations were documented utilizing a hand-held GPS unit. Following the survey, GPS points and the written observations were transferred into a GIS-program (ArcGIS 9.3.1) to produce several GIS-based maps indicating the distribution and relative abundance of aquatic plant species in Wash Pond. A GIS-based map indicating the generalized extent of Clasping-Leaf Pondweed in Wash Pond was also generated in the event that management of this species is pursued in subsequent years.

2.1 Species Identification

The rake toss method, based on protocols developed by Cornell University, was used to retrieve submersed aquatic vegetation. One rake toss was performed at each sampling point. Each species found on the rake was identified and recorded. Plant species observed in the immediate area, but not collected with the rake toss were also recorded. Any species not readily identified *in situ* was placed into a plastic bag labeled with the data point number and returned to the lab for further analysis.

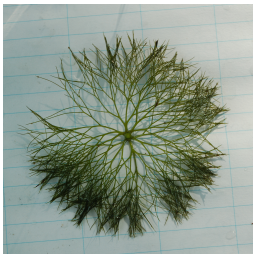

Image 1. *Megalodonta beckii*

2.2 Relative Abundance

The abundance scale, developed by the US Army Corps of Engineers and modified by Cornell, was used to categorize total growth and is provided below:

Notation	Description
Z	Zero: no plants on rake
T	Trace: fingerful on rake
S	Sparse: handful on rake
M	Moderate: rakeful of plants
D	Dense: difficult to bring into boat

3.0 Results

3.1 Species Identification

Fourteen (14) indigenous aquatic plant species were observed during the 2012 evaluation. These species are listed in the table that follows:

Table 1. List of indigenous aquatic plant species present during the 2012 Aquatic Vegetation Survey.

Common Name	Scientific Name
Aquatic Vegetation Species	
American Tapegrass	*Vallisneria americana*
American Waterweed	*Elodea canadensis*
Clasping-Leaf Pondweed	*Potamogeton perfoliatus*
Common Bladderwort	*Utricularia sp.*
Common Waternymph	*Najas guadalupensis*
Coontail	*Ceratophyllum demersum*
Fern-leaf Pondweed	*Potamogeton robbinsii*
Quillwort	*Isoëtes sp.*
Ribbon-Leaf Pondweed	*Potamogeton epihydrus*
Snailseed Pondweed	*Potamogeton bicupulatus*
Water Bulrush	*Scirpus subterminalis*
Water Marigold	*Megalodonta beckii*
White Water Lily	*Nymphaea odorata*
Yellow Water Lily	*Nuphar variegata*

In addition to aquatic plant species, emergent plant species; Cattails (*Typha* sp.), Pickerelweed (*Pontederia cordata*), Pipewort (*Eriocaulon* sp.), Purple Loosestrife (*Lythrum salicaria*), and Spikerush (*Eleocharis* sp.); and algae species; Stonewort (*Nitella* sp.) and Muskgrass (*Chara* sp.) were present at the time of the 2012 Aquatic Vegetation Survey. Purple Loosestrife is a non indigenous aggressive invader. Left unmanaged, it is possible for this species to proliferate along the perimeter of the pond.

3.2 Relative Abundance

Clasping-Leaf Pondweed

Relative abundance of Clasping-Leaf Pondweed and the remaining aquatic vegetation species was sampled from 135 points distributed throughout the pond. The general

extent of Clasping-Leaf Pondweed expanded 45.5 acres (~27% of the total area) along the pond's perimeter and was not observed in water depths greater than approximately twelve (12.1) feet (**Figure 1**). In general, Clasping-Leaf Pondweed was observed at trace to sparse densities throughout its distribution; however, minute patches of moderate growth were observed near the southwest portion of the pond (**Figure 2**).

Individual Aquatic Plant Species

Overall, the remaining individual plant species were predominately observed at trace to sparse abundances with moderate growth limited to the eastern and northern coves of the pond. Distribution and relative abundance of the individual aquatic plant species is shown in the Appendix: **Figures 3-A**, **3-B**, and **3-C**.

3.3 Frequency of Occurrence

Frequency of occurrence was obtained by dividing the number of points where an individual species was observed by the total number of sampling points. At the time of the 2012 survey, Clasping-Leaf Pondweed was the most prevalent species and occurred at 56% of the points surveyed. American Tapegrass, Common Waternymph, Water Marigold, and Quillwort each occurred at a frequency of 15% or higher. The remaining aquatic plant species were found at frequencies less than 10% (**Table 2**).

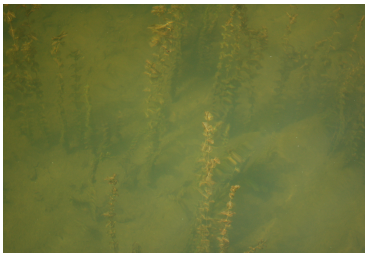

Image 2. *Potamogeton perfoliatus*

Table 2. Frequency of Occurrence of Aquatic Plant Species Observed in Wash Pond during the 2012 Aquatic Vegetation Survey.

Species	Common Name	# of Sample Points Present	Frequency of Occurrence (%)*
Potamogeton perfoliatus	Clasping-Leaf Pondweed	76	56
Vallisneria americana	American Tapegrass	44	33
Najas guadalupensis	Common Waternymph	26	19
Megalodonta beckii	Water Marigold	21	16
Isoëtes sp.	Quillwort	20	15
Potamogeton robbinsii	Fern-leaf Pondweed	18	13
Potamogeton bicupulatus	Snailseed Pondweed	7	5
Nymphaea odorata	White Water Lily	7	5
Nuphar variegata	Yellow Water Lily	7	5
Elodea canadensis	American Waterweed	6	4
Utricularia sp.	Common Bladderwort	5	4
Scirpus subterminalis	Water Bulrush	1	<1
Ceratophyllum demersum	Coontail	1	<1
Potamogeton epihydrus	Ribbon-Leaf Pondweed	1	<1

4.0 Conclusion

The SLA has expressed concern regarding the growing prevalence of Clasping-Leaf Pondweed in Wash Pond. Based on the 2012 survey findings, Clasping-Leaf Pondweed and other native vegetation were observed at extents and densities considered beneficial to the pond's

ecosystem. A diverse assemblage of vegetation – submersed to emergent, trace to moderate – is important for wildlife and fish, not only serving as the base of the food chain, but also for providing cover and escape.

The SLA's watershed management plan, which focuses on eliminating non-point source pollution in the watershed, is a great strategy for protecting and enhancing Wash Pond as a recreational and ecological resource in the future. Eutrophic conditions facilitate nuisance growth of native vegetation and algae. In addition to sustaining the watershed management plan, we recommend the SLA continues conducting annual biological surveys so that changes in growth can be tracked, and early detection of potential problems; particularly nuisance native plant species and/or invasive aquatic plant species, is possible.

Figure 1 : Generalized Extent of Clasping-Leaf Pondweed (*Potamogeton perfoliatus*)

Wash Pond
Hampstead
New Hampshire

Total Area: 168 acres*

N

August 2012

1:9,500

0 500 1,000 1,500 2,000

Feet

Data Source(s):

USGS NAIP Orthoimagery

Legend

P. perfoliatus extent

***Note**: Past surveys reported Wash Pond's total area covered 151 acres. Digitization of the USGS NAIP Orthoimagery reveals the pond's total area is slightly larger - totaling 168 acres.

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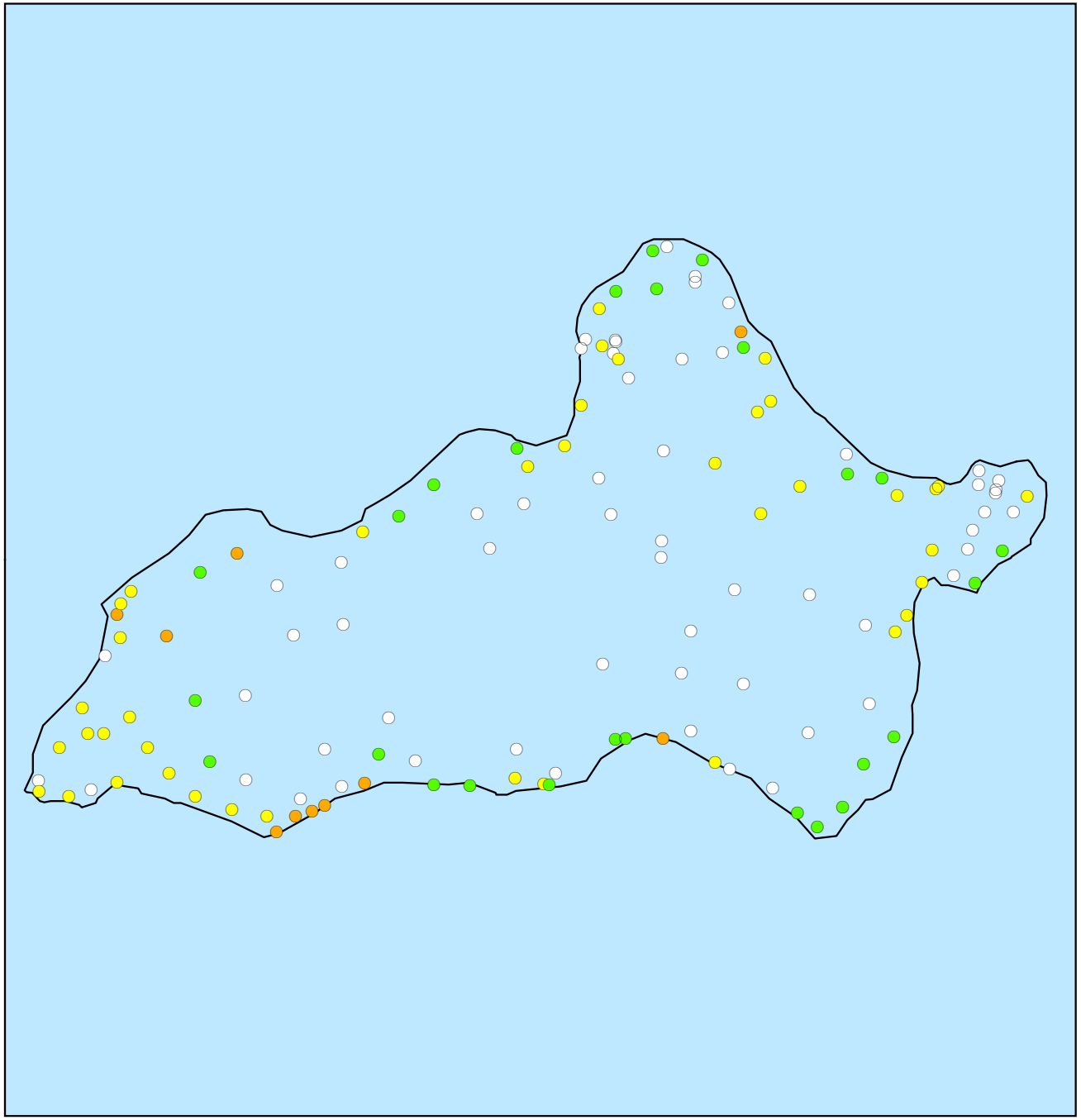
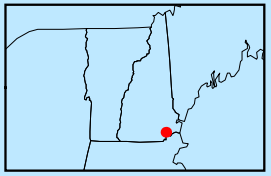
Figure 2: Relative Abudance of Clasping-Leaf Pondweed (*Potamogeton perfoliatus*)



Wash Pond
Hampstead
New Hampshire

Total Area: 168 acres



N

August 2012

1:9,250

0 500 1,000 1,500 2,000

Feet

Data Source(s):

USGS NAIP Orthoimagery

Legend

Relative Abundance

- Zero
- Trace
- Sparse
- Moderate
- Dense

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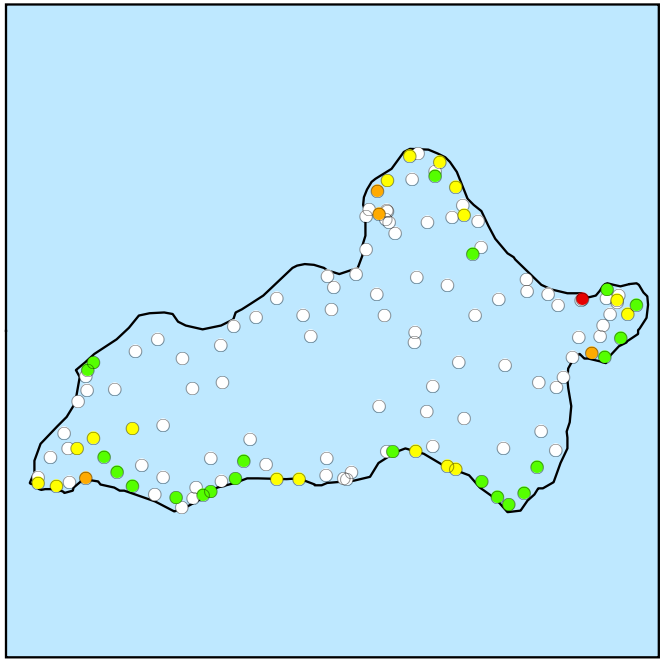
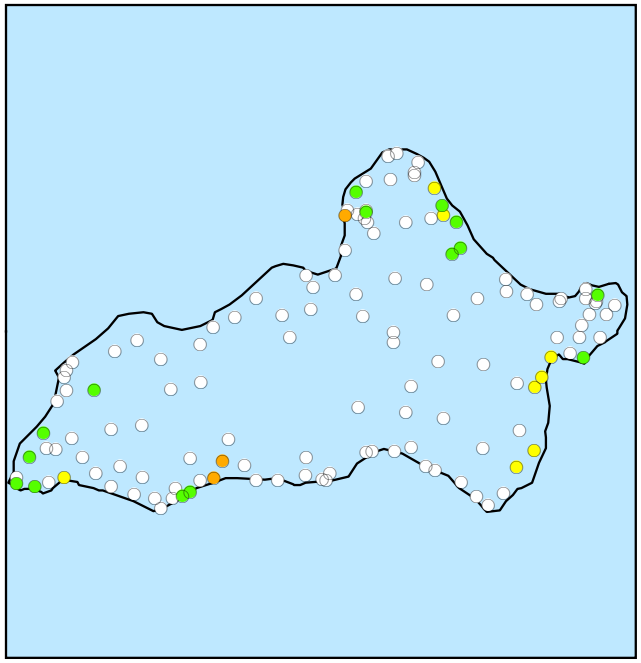
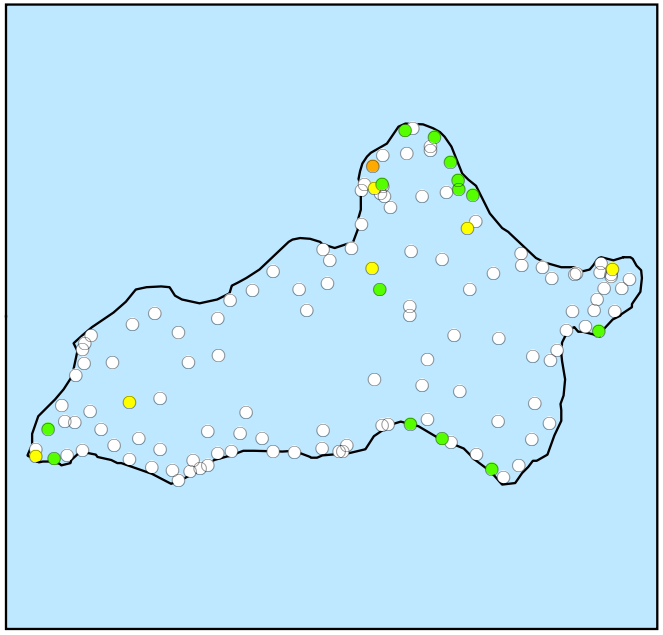
Figure 3 - A: Relative Abundance of Aquatic Vegetation Species



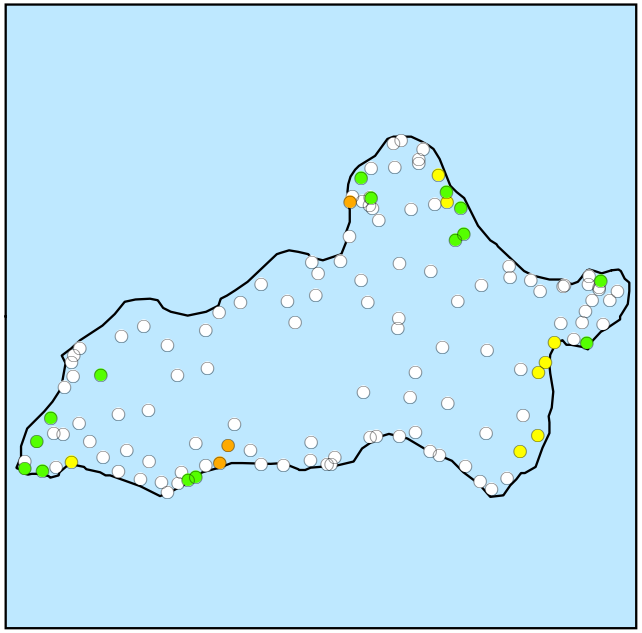
American Tapegrass (*Vallisneria americana*)



Common Waternymph (*Najas guadalupensis*)



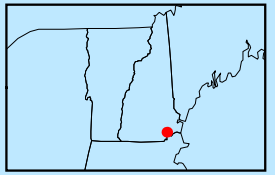
Water Marigold (*Megalodonta beckii*)



Quillwort (*Isoëtes* sp.)

Wash Pond
Hampstead
New Hampshire

Total Area: 168 acres



N

August 2012

1:18,500

0 1,000 2,000 3,000 4,000

Feet

Data Source(s)

USGS NAIP Orthoimagery

Legend

Relative Abundance

- Zero
- Trace
- Sparse
- Moderate
- Dense

Note: Individual occurrences of Water Bulrush (*Scirpus subterminalis*), Coontail (*Ceratophyllum demersum*), and Ribbon-Leaf Pondweed (*Potamogeton epihydrus*) were observed in the easternmost cove at Wash Pond.

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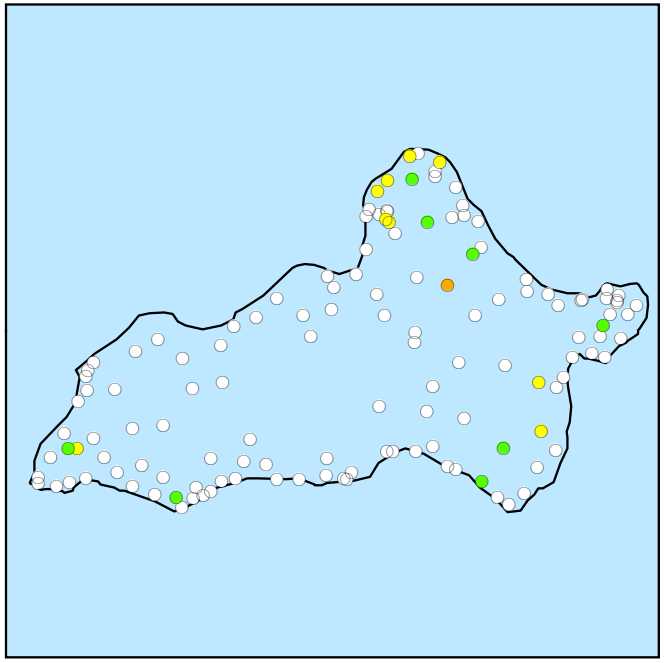
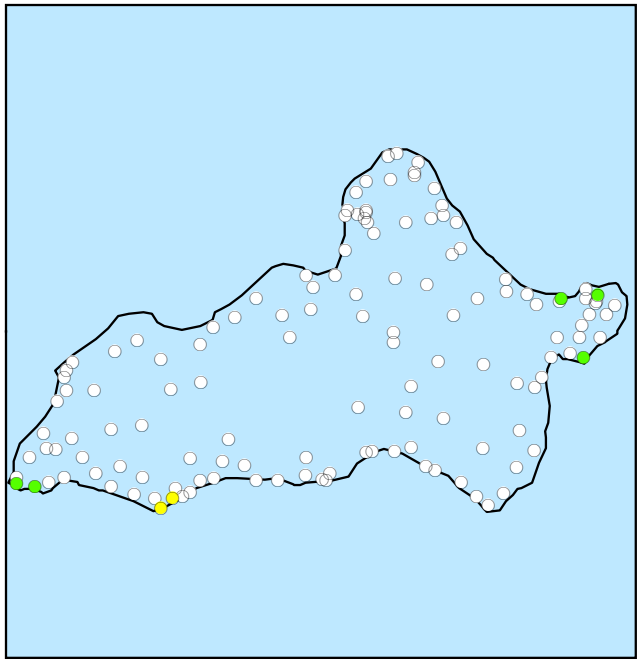
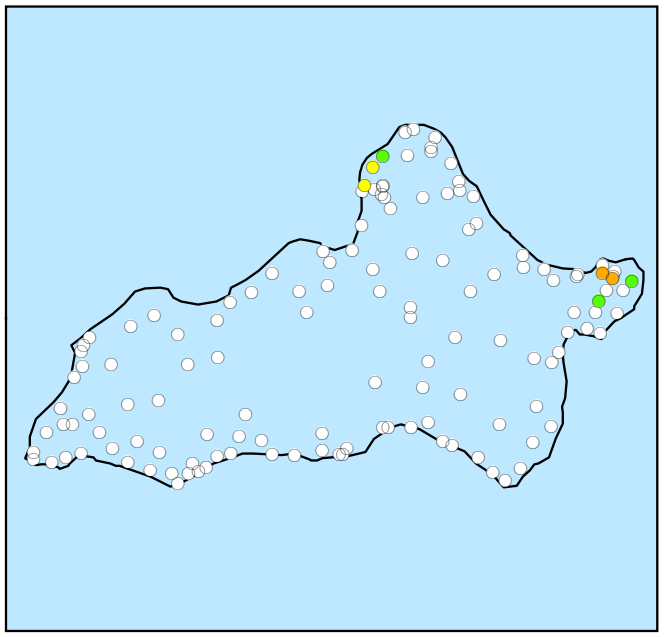
Figure 3 - B: Relative Abundance of Aquatic Vegetation Species



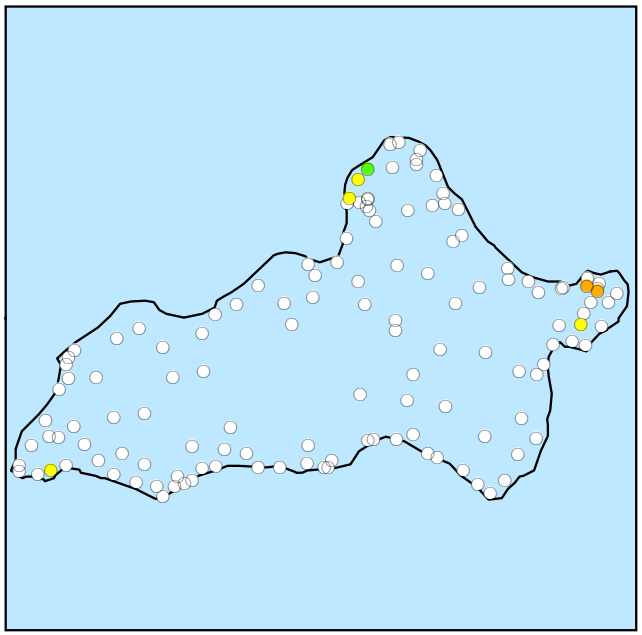
Fern-Leaf Pondweed (*Potamogeton robbinsii*)



Snailseed Pondweed (*Potamogeton bicupulatus*)



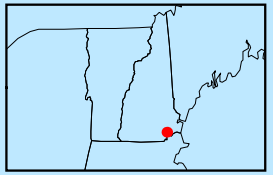
White Water Lily (*Nymphaea odorata*)



Yellow Water Lily (*Nuphar variegata*)

Wash Pond
Hampstead
New Hampshire

Total Area: 168 acres



N

August 2012

1:18,500

0 1,000 2,000 3,000 4,000

Feet

Data Source(s)

USGS NAIP Orthoimagery

Legend

Relative Abundance

- Zero
- Trace
- Sparse
- Moderate
- Dense

Note: Individual occurrences of Water Bulrush (*Scirpus subterminalis*), Coontail (*Ceratophyllum demersum*), and Ribbon-Leaf Pondweed (*Potamogeton epihydrus*) were observed in the easternmost cove at Wash Pond.

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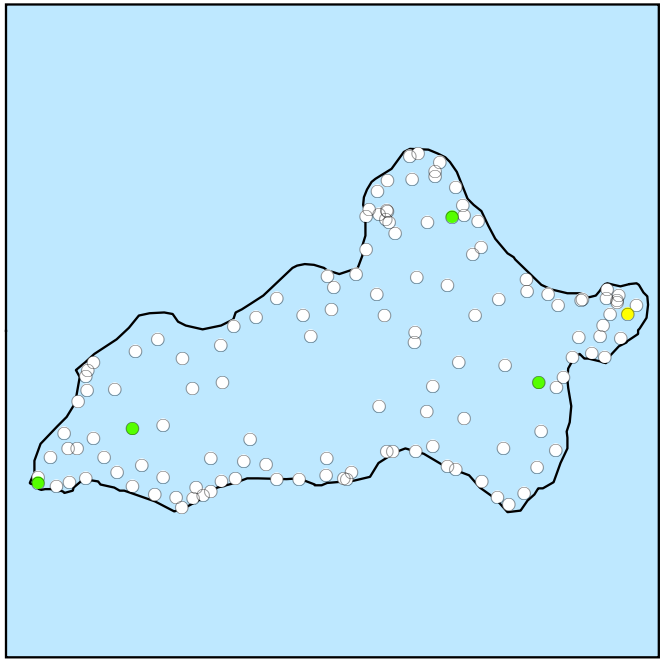
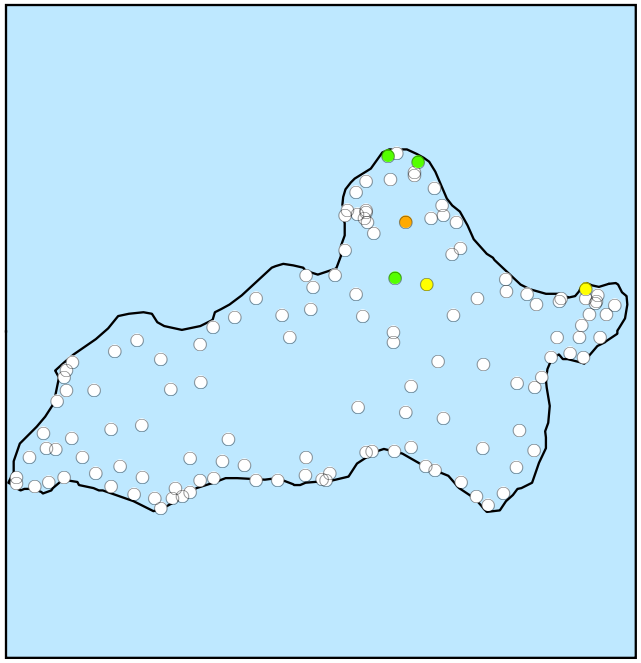
Figure 3 - C: Relative Abundance of Vegetation Species



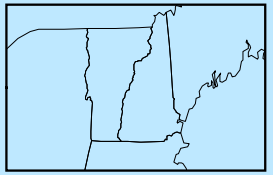
Common Bladderwort (*Utricularia* sp.)



American Waterweed (*Elodea canadensis*)

Wash Pond
Hampstead
New Hampshire

Total Area: 168 acres



N

August 2012

1:18,500

0 1,000 2,000 3,000 4,000

Feet

Data Source(s)

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