AQUATIC PLANT MANAGEMENT
LAKE BOON
STOW/HUDSON, MASSACHUSETTS
PLANT CONTROL STUDY DRAFT REPORT
May 2007

Introduction

As part of Lycott's continued aquatic plant management services to the LBC, we have initiated an experimental plant management study in Lake Boon. The study consists of five (5) tasks. Briefly, the tasks include: 1) Biological Survey of the Lake Boon study area, 2) Removal of the non-native plants Fanwort and Variable-leaf Milfoil from selected study sites, 3) Planting of native plants from within Lake Boon to the newly cleared sites, 4) Monitoring the re-vegetated areas for native plant establishment and replanting where necessary, and 5) Aid LBC in the permitting process.

The following is a report on tasks 3 & 4.

Methods

Three sites were chosen for study (Figure 1). Sites 1 and 2 were treatment areas and Site 3 was a control. Sites 1 and 2 had all plants removed within the 50'x 50' area by use of benthic barrier panels. Panels were installed in June 2006 and removed in September 2006. After barrier removal at Site 1 plant species were allowed to recolonize without further intervention in an attempt to monitor the effect of removal without replacement. Because of the problems with visibility (vis=0) at this site all usable cells here were assigned a replanting density of Zero (i.e., removal without replacement). After barrier removal at Site 2 nearly 200 *P. robbinsii* plants were transplanted within the grid system in an attempt to monitor the effect of plant removal (primarily *C. carolinia*) and replacement with a local (Lake Boon) native species. Each cell of the Site 2 grid was randomly assigned a density of Zero, Low (n=10), or High (n=25). This method was used in hopes that any density dependent factors regarding our transplanting study would be apparent. That is to say, our hope was that if transplanting was successful we could determine an optimal density of native plants to use so as to be more efficient with any larger-scale transplanting study/project within Lake Boon. After the initial transplanting, follow up surveys at Site 2 in the fall of 2006 found *P. robbinsii* still in place.

A submerged rope grid was installed at each site in September 2006 after barrier removal, but before transplanting in order to map the replanting, re-growth and/or reinvasion of any plant species. Study grids had the overall dimensions of 50'x 50' with 16 cells of 12.5'x 12.5' in each (Figure 5). All plant species originally present within the study areas

were mapped in June 2006 (Figures 2-4). June 2006 maps thus represent our baseline data.

A survey on 2 May 2007 was conducted at each site and any plant species present within the study areas were documented and a general observation of aquatic plant growth was made of the surrounding areas adjacent to the study sites.

Results & Conclusions

Over the course of the winter the rope grids were largely removed from our study areas. This was not simply a result of the freeze-thaw cycle as in most cases the ropes were pulled from the lake and placed in a pile well up on the shore. Thus, individual cells within the grid systems could not be identified. As a result accurate maps could not be produced, cell-specific data could not be gathered and no formal statistical test could be performed. Thus no detailed post-study site maps are presented herein. However, the study sites were well marked and a general observation could still be made of the original 50'x 50' areas.

Moreover, the results from this study were clear enough that statistics would have been unnecessary. By May 2, 2007 very few plant species had begun to grow. The water was very clear in all areas of the lake surveyed so visibility was not a limiting factor as it was too early and cold for significant algal production. Only two species of aquatic vascular plants were seen actively growing; *C. carolnia* (Fanwort) and *Nuphar sp*. (Pond Lily) and these had only just begun to grow. The bright green growing tips of Cabomba made it very easy to locate.

Results and interpretations are based upon the distribution of *C. carolinia* since this is the problem species in Lake Boon and it was one of only two species visibly growing at the time of the survey.

Even though most of the rope grid system was removed, it was clear that *C. carolinia* was present in all areas of each study site as well as common to abundant is areas outside of the study sites (i.e., generally very well established both inside and outside of the study sites). There was no apparent difference in the abundance or distribution of *C. carolinia* between the three sites or between the sites and other areas of the lake outside of the study despite the fact that each of the sites used a different management approach (i.e., Site 1=plant removal only, Site 2= plant removal and replacement with native plants, Site 3=no management). Based upon these results in this small-scale study, the only conclusion that can be reached is that physical removal alone or physical removal followed by transplanting native plants is no more effective than doing nothing at all in terms of limiting the growth or spread of *C. carolinia*.

Because this was a small scale study with only three sites and no replication (i.e., only one site of each type; control and two different treatments) conclusions based upon these results are necessarily limited. An attempt was made at replicating areas within each site

with use of a grid, but that was no longer available once the grid was removed by unknown persons apparently unaware of the study.

However, we feel we can conclude that so long as a source population of Cabomba exists within Lake Boon, small-scale removal methods would at best have only short-term effect. Thus, a large scale (lake-wide or at the very least basin-wide) and short term (single season) methods (either physical or chemical) should be employed. Small scale methods are not likely to be an effective control technique for Cabomba within Lake Boon because these techniques leave a source population nearby which can quickly invade any newly cleared areas. This seems to be true whether or not a transplanting approach is adopted.

Figure 1. Study site locations.

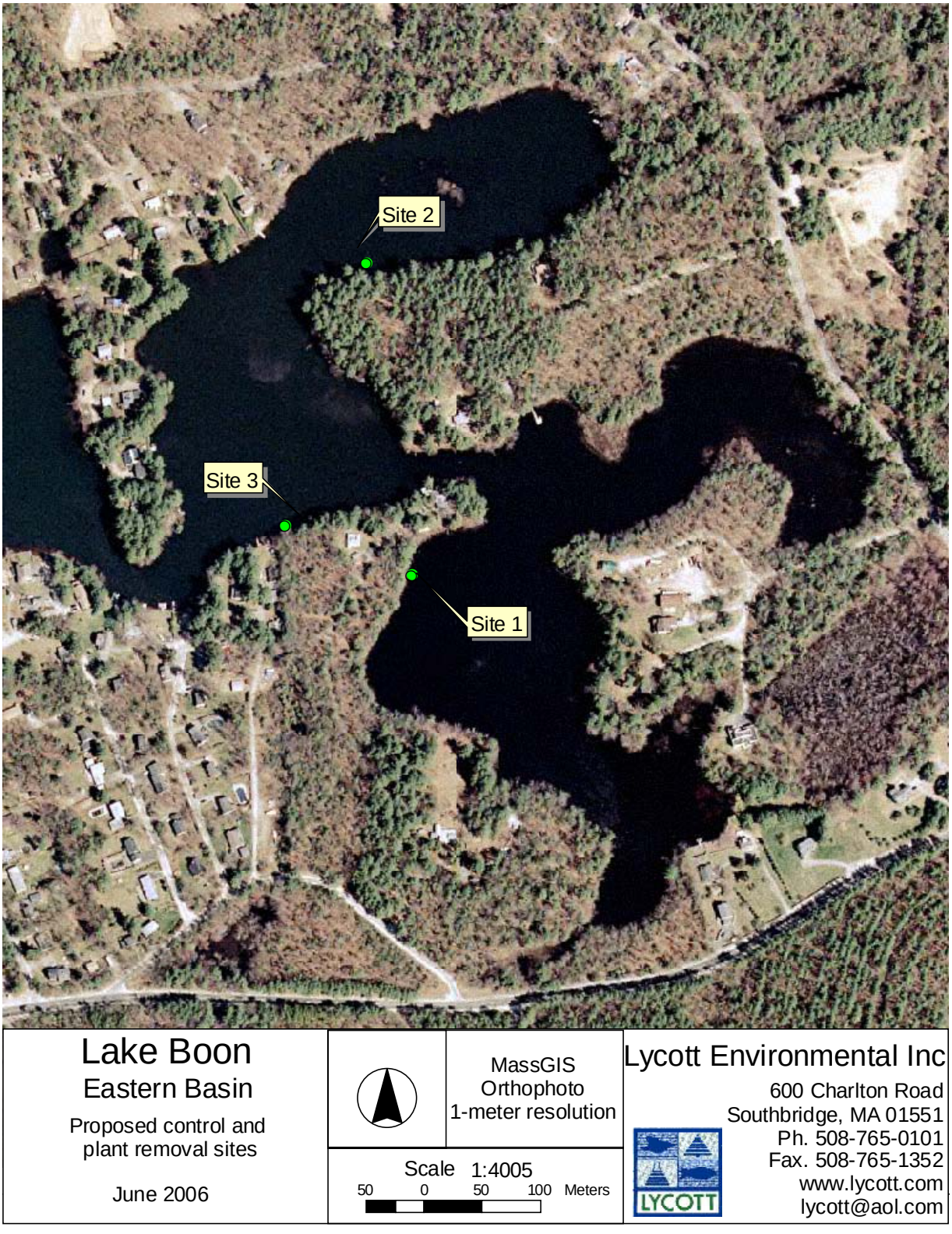

Figure 2. 2006 Map of plant distribution in proposed treatment site 1 in Lake Boon.

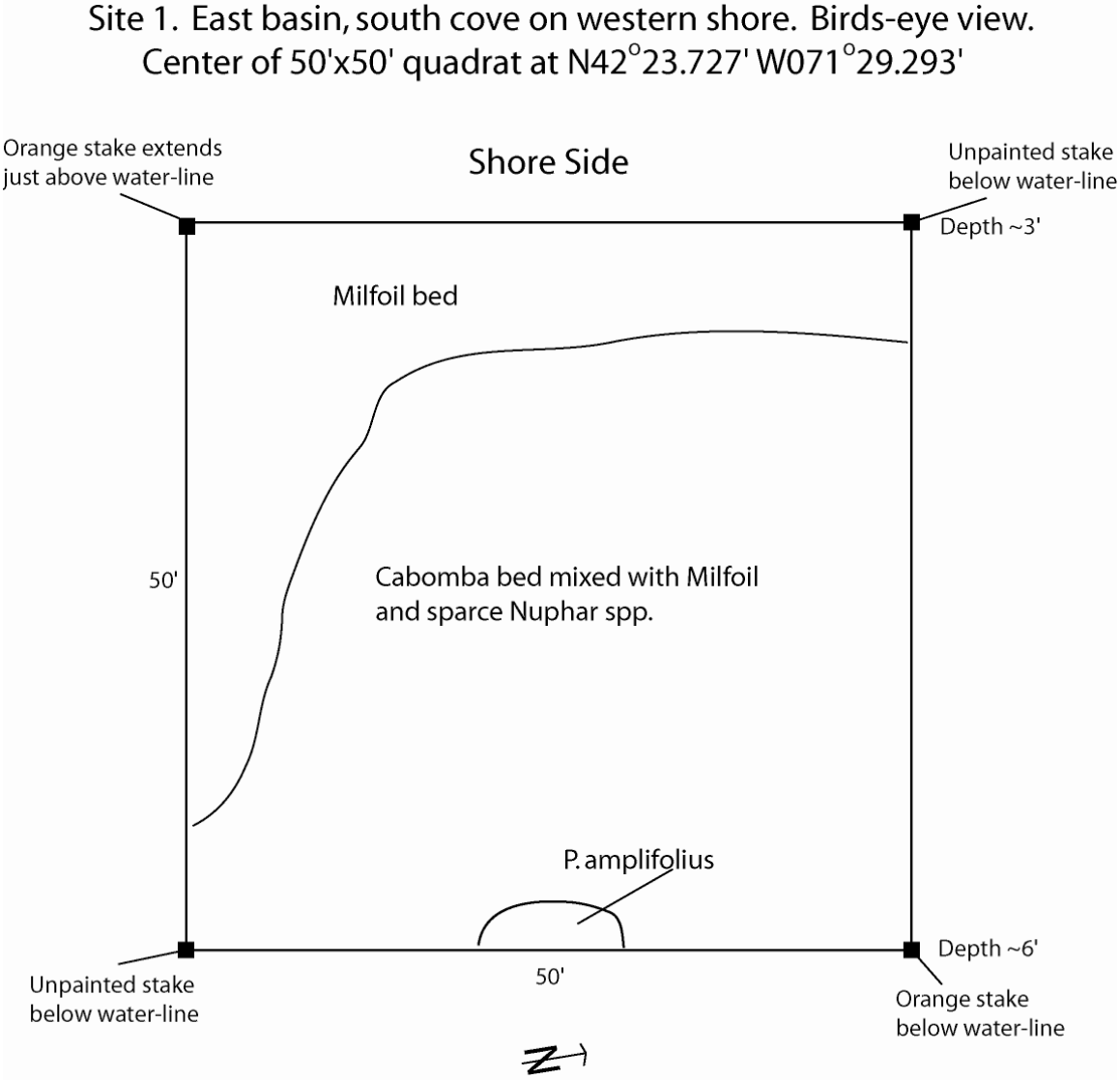

Figure 3. 2006 Map of plant distribution in proposed treatment site 2 in Lake Boon.

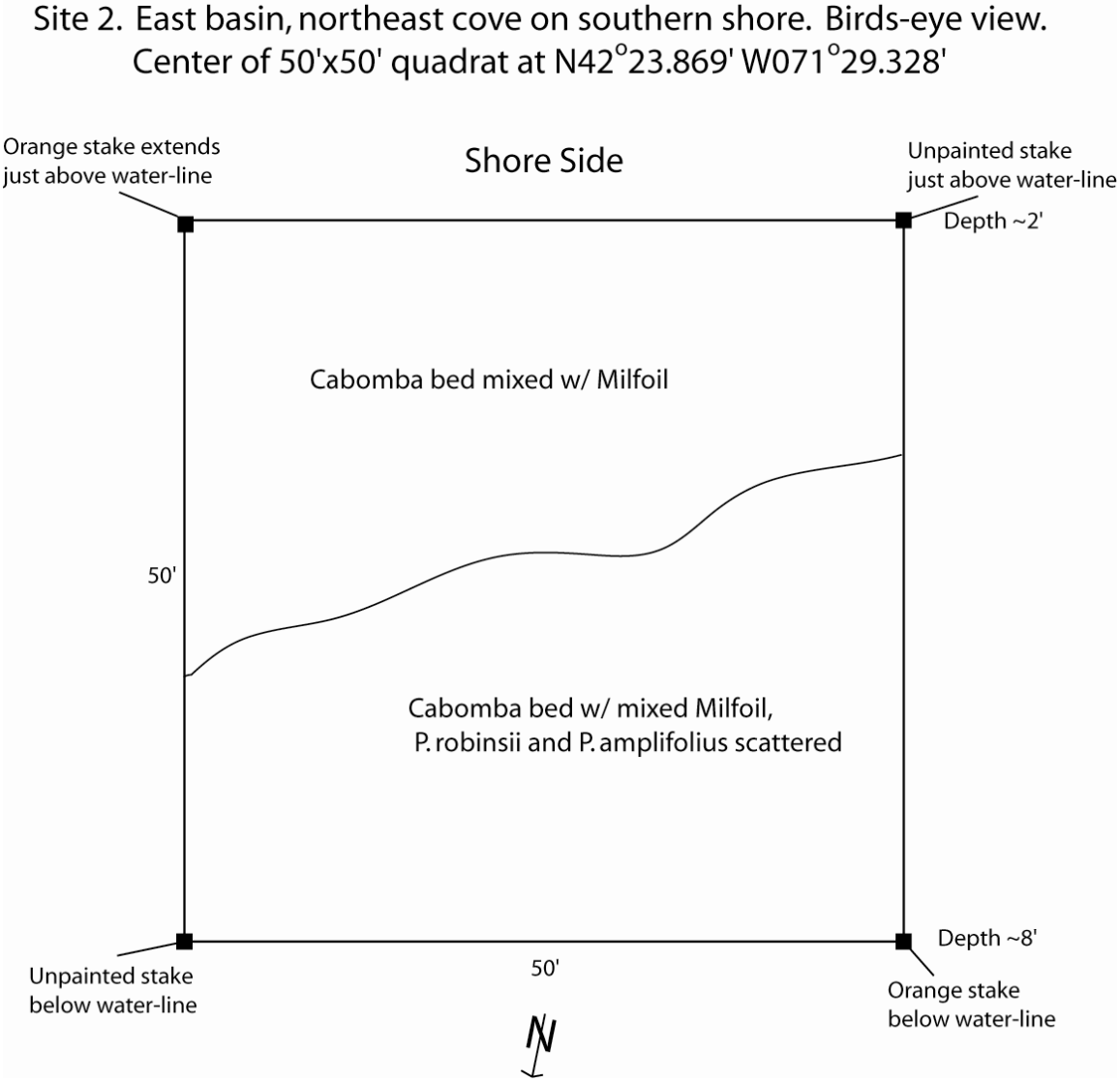

Figure 4. 2006 Map of plant distribution in proposed control site 3 in Lake Boon.

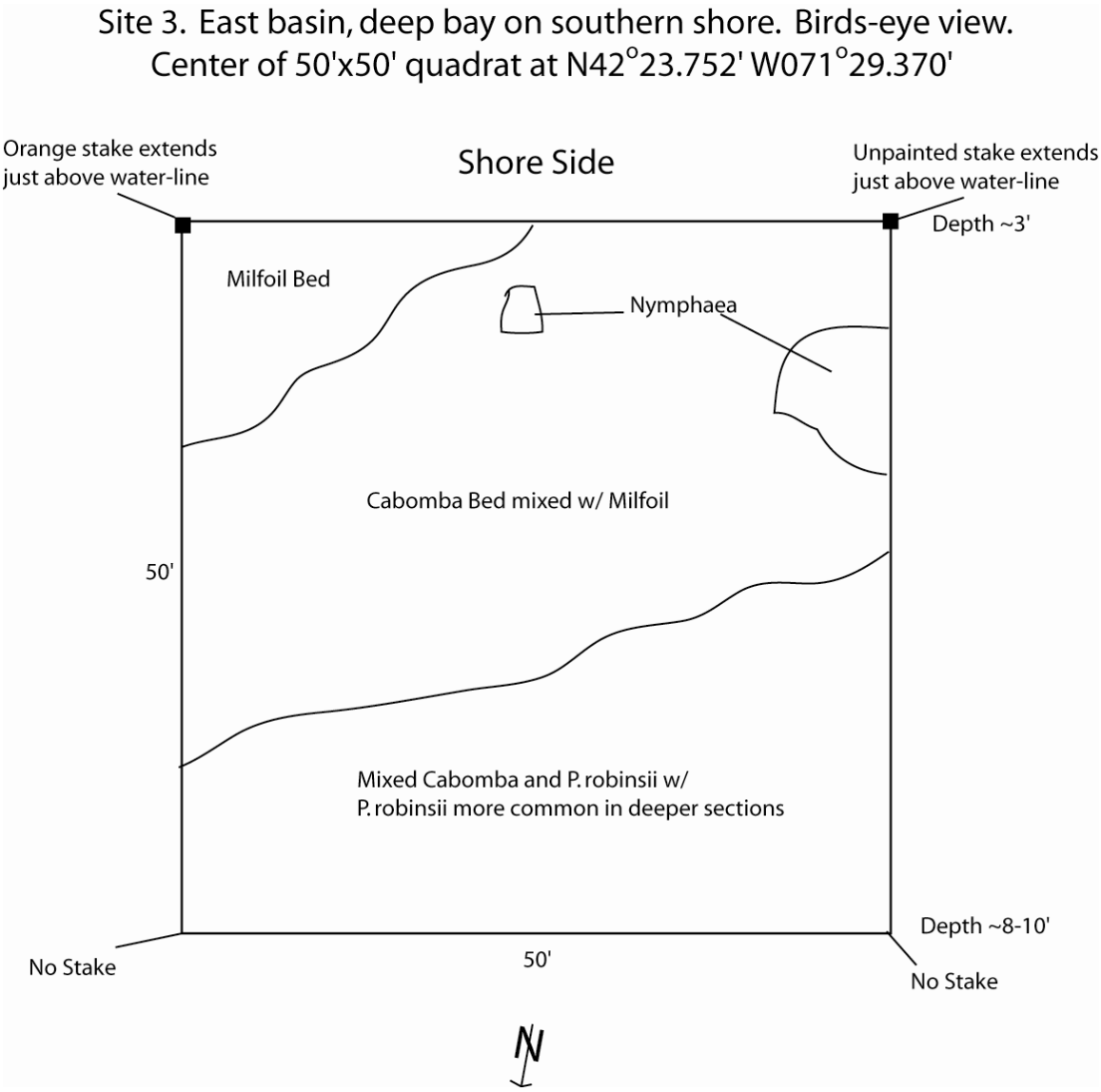

Figure 5. Grid overlay on Site 3, 2006 vegetation map.