

## Spruce Pond - Questions from Third Party Reviewer - Beta

Beta provided several questions for us to answer. The text in black shows the questions that were asked.

The text in blue is Solitude Lake Management's Response to those questions.

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A1. MassDEP has issued DEP File No. 159-1267 for the Site and provided the following technical comment "Higher value wildlife habitat is achieved when there is less than 100% open water surface and at least 30% coverage of native aquatic plant species. MassDEP recommends that treatment be limited to areas where invasive non-native species are dominant."

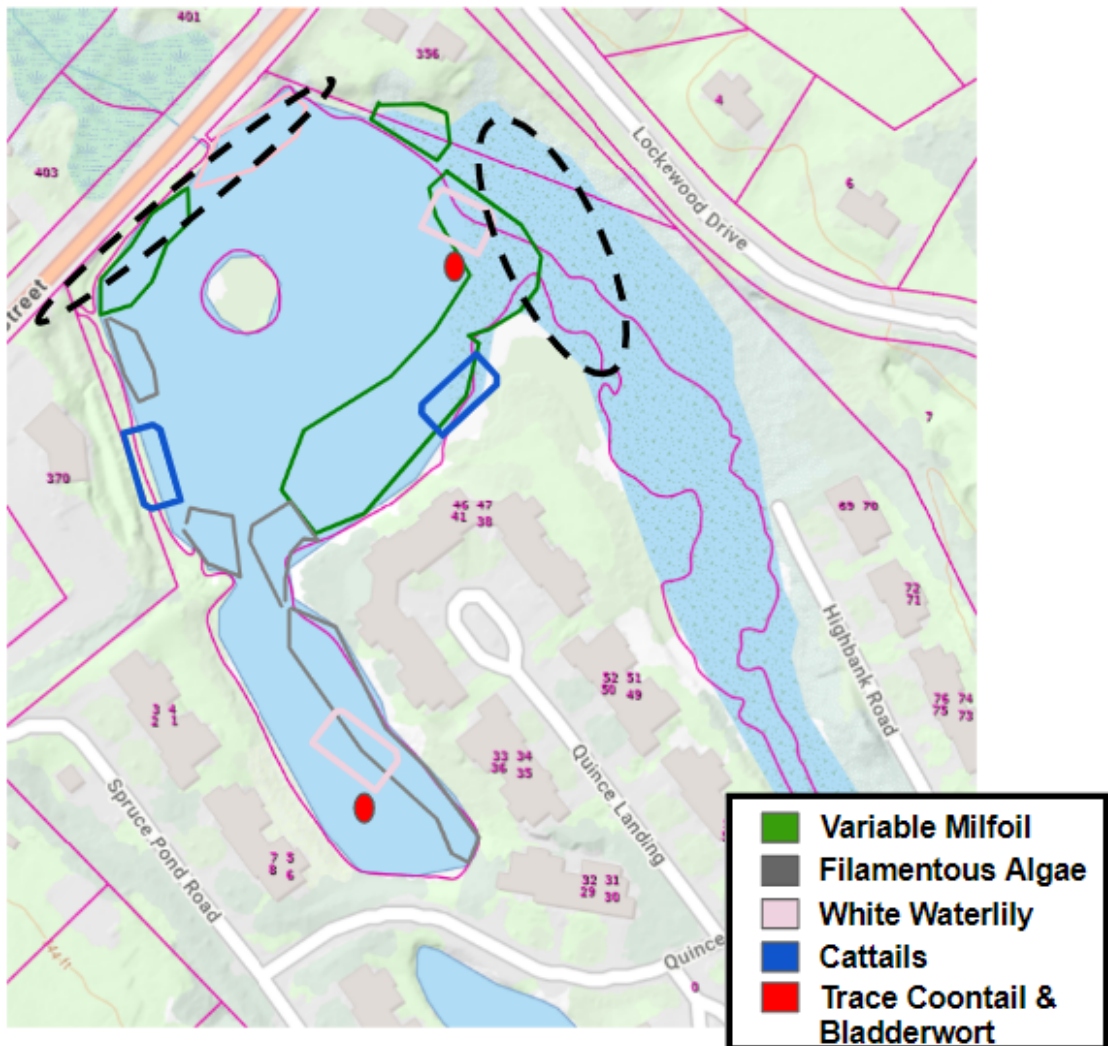
- We will strive to meet the goal of 30% coverage of native aquatic plant species. A healthy pond needs to have some plants. We never want to remove everything.
- For the other 70%, our goal is to eliminate the invasive species and the aggressive nuisance species in order to allow native species to return.

A2. BETA defers to the Commission on the plan requirements presented in Section 7.18 of the Bylaw and if a variance should be requested.

- Section 7.18 says submitted plans must include several things, including details on existing vegetation, detailed maps and more.
- Our original application included basic maps such as a site locus and proposed treatment areas.
- We conducted the requested species survey. And are sharing an additional map and descriptions on what we found. Based on that. Our treatment will be reduced to avoid the areas shown in the black dotted line areas shown in figure 1

OUR SURVEY FOUND THE FOLLOWING SPECIES IN THE POND AREA AND ADJACENT BANKS. The map below (Figure 1) shows locations.

Figure 1



**In water:** Painted turtle, fish (likely smallmouth bass), Bullfrogs, Canada Geese  
**In swamp area west of pond:** Cardinals, Catbirds, Mourning doves, Red-winged blackbirds

#### Plants/Alga

- Filamentous algae spp. (excessive amounts)
- Variable watermilfoil (moderate amounts)
- White waterlily
- Coontail
- Water smartweed
- Bladderwort spp.
- Duckweed (moderate amounts)
- Thin-leaf pondweed spp.
- Cattails
- Watershield

#### Animals

- Bullfrogs
- Canada geese

- Painted turtle
- Cardinals
- Catbirds
- Mourning doves
- Red-winged blackbirds
- Small-mouth bass (Presumed, but not captured to confirm)

#### Avoiding Specific areas

- The black dotted lines show the areas we will avoid when we conduct treatment. We will not treat along King street, and we will not treat where the pond starts to become a swampy area, to the west

A3. The WPA Form 3 notes 228,690 sf of impacts to LUW, but the Resource Area Impact Summary Form notes 1,306,800 sf of impacts. The Applicant should clarify which impact number is accurate.

228,90 is correct.

A4. The Notice of Intent provides general information regarding the use of the proposed chemicals but does not provide information such as anticipated Site access, staging areas, application rates, or other information specific to this Site. The Applicant should describe any staging areas and anticipated Site access and show these areas on the Project plans .

We will launch from a parking area where Quince Island Road comes near the water. (Figure 2) We will place a jon boat in the water there and carry all treatment chemicals to the boat. No damage to the shore or bank should occur. We have launched there previously with no damage or complications.

Figure 2



A5. Beyond the statement that application of the proposed chemicals will be completed by Certified Applicators, information typically presented in the Material Safety Data Sheet(MSDS) regarding the safe use and handling of the proposed chemicals has not been provided. The MSDS or equivalent should be provided for each of the chemicals discussed in the NOI for use at the Site.

I have gathered these MSDS sheets. We are emailing the sheets to the conservation commission along with this file.

MSDS sheets usually refer to a concentrated chemical product and these sheets usually are meant as a reference sheet for those who may come in contact with the concentrated product as it is being shipped or stored.

The product is diluted when applied in the field. For use in the field, a better safety data measure is the **product label**. These labels can be multiple pages in length and set rules for how the chemical is carried in the field, how it is applied, safety measures and more.

I've also included the product labels in separate files.

Per a question about glyphosate that came up during the last meeting - AquaPro is a glyphosate product that is formulated for use in water. It is registered with the EPA for this use.

A6. The Applicant should provide a narrative discussing factors contributing to the development of nuisance aquatic vegetation at the Site, as well as additional factors that

should be considered for long-term management (i.e. nutrient control), instead of repeated use of short term management methods.

The types of aquatic vegetation found in Spruce Pond is typical for many ponds in Massachusetts. The invasive plants such as milfoil can arrive in many ways, including washing in from other water bodies, or by clinging to waterfowl or boats. It can be very challenging to keep these plants from entering a water body. But they can be controlled once they are there.

Algae tends to form when a waterbody has high phosphorus levels, often created by rotting vegetation, fertilizer runoff, and animal waste, including aquatic animals.

Limiting nutrients that enter a waterway is a viable way to reduce phosphorus, and in turn plant and algae growth is. The long-term efficacy of nutrient management strategies is determined by the origin of the nutrient load to the system (internal vs. external).

The condo association should be encouraged to continue limiting the amount of fertilizer used in the area. Pet owners should be encouraged to pick up animal waste.

But a nutrient load can come from multiple external sources within the larger town watershed. Full control of run-off likely needs to be part of a larger set of watershed rules for the town.

A7. Monitoring of the Site before, during, and after chemical application should also include monitoring of water quality such as temperature and pH to provide a comparative benchmark. The Application should provide a more robust monitoring plan that is inclusive of water quality testing in addition to visual observations.

We agree to test for PH, temperature and O2 and visibility. Are their specific tests the town would like to request?

A8. "Figure 2: Vegetation Assemblage" appears to depict treatment within the Kings Street Right of Way. The Applicant should provide documentation showing the Town's approval for work on their property.

We have dropped this treatment area from our request. The black dotted outline in Figure 1 shows the area that we will avoid.

The Project is adjacent to Bordering Vegetated Wetlands (BVW) and inland Bank but no discussion of these Resource Areas at the Site or how the work may or may not impact these Resource Areas has been provided.

We do not plan to enter the BVW area. The inland bank area is addressed in our answers in section W3 below.

## Methods of chemical application

Methods of chemical application specific to Site have not been discussed, and detailed information for the proposed chemicals such as Material Safety Data Sheets have not been provided. Therefore, additional information is required to describe the work and the effects of the work on the interests of the Act and the Bylaws.

### Tribune:

During the application, approximately 62% of the pond ( 5.25 acres) will be treated with Tribune. A Jon boat will be utilized for the treatment, outfitted with onboard containment - where the diquat herbicide will be diluted with lake water before application (as per the requirements of the product label). A calibrated pump system will be used to apply the chemical mixture subsurface through a weighted hose system while the vessel is guided by GPS to ensure even application throughout the treatment areas.

### Glyphosate:

Stands of purple loosestrife within the designated treatment area of the pond will be treated with AquaPro (Glyphosate). The herbicide will be diluted with pond water and applied directly to the foliage of the plant via a low-pressure backpack sprayer or hand-wicker from a small jon boat and by walking around the perimeter of the ponds.

### Copper-based algaecides

There areas where filamentous algae is present will be targeted with copper-based algaecides. We most often use Captain XTR, SeClear, and GreenClean PRO. These also will be distributed from a jon boat using a pump system, over the areas where algae is found.

We will provide the data sheets for all chem.

W1 - No comment from Beta

[No new action required on our part.]

Although work is proposed to generally occur within Spruce Pond, the surrounding Resource Areas including BVW and inland Bank were not identified or specifically discussed. BETA defers to the Commission on whether they will require the identification of these Resource Areas through field delineation, or if they will accept approximation through orthoimagery.

We will not enter any adjacent wetlands. All work will take place in the area we outlined in our map and description. The only part of the bank we will interact with is where (and if) some purple loosestrife may grow on the bank.

## MITIGATION COMMENTS

W3. The NOI requests the use of an algaecide should nuisance algae conditions develop in the pond but provides no analysis supporting that use of algaecide is preferred over other methods of algae control. As suggested in Guidance for Aquatic Plant Management in Lakes and Ponds: As it Relates to the Wetlands Protection Act "Control of nutrients is used to achieve control of algae and associated water quality problems (e.g., oxygen depletion, taste

and odor), but as algae tend to be the symptom and nutrients constitute the real problem, the focus is on nutrient control". The Alternatives Analysis within the NOI should be revised to discuss alternatives to the use of algaecide including nutrient control methods .

We would like to add the following text to the Alternatives Analysis

Unbalanced growth of cyanobacteria or other algae species is in some way a function of an abundance of available nutrients. In freshwater systems the limiting nutrient necessary for plant and algae growth is phosphorus. Therefore managing/reducing phosphorus availability can indirectly limit the production of algae. The long-term efficacy of nutrient management strategies is determined by the origin of the nutrient load to the system (internal vs. external).

If the majority of the nutrient load is coming from external sources (watershed), control of the nutrient load is out of the hands of the Spruce Pond Village Association. Control likely needs to be part of a larger set of watershed rules for the town. Also, the benefits of in-lake nutrient management strategies are generally more short-lived. Under these circumstances more frequent lower-dose treatments with phosphorus binding compounds provide better prevention of elevated phosphorus conditions. As a result, additional investigation or nutrient budgeting should be performed in order to fully be able to evaluate long-term efficacy of efforts to limit nutrient loads.

W4. The Commission could consider requiring advanced notification for algaecide applications, with a requirement that the Applicant demonstrate establishment of algae onsite.

We always do pond surveys before planning treatment, and we always provide advanced notification. If we see algae, we can send photos to the town and highlight our treatment plans.

W5. The Applicant should provide a detailed alternative analysis for the proposed chemicals, outlining why certain herbicides and algaecides were selected, and which will be used in certain conditions.

### **Alternatives Analysis**

Alternatives to the proposed Aquatic Plant Management Plan were considered. SOLitude evaluated all available strategies for management of Spruce Pond. Findings and recommendations are based on direct experience and discussions found in the "Eutrophication and Aquatic Plant Management" in Massachusetts GEIR, EOEA 2004

### **Bottom Weed Barriers: Not Recommended**

Physical controls, such as the use of bottom weed barriers (i.e. Aquatic Weed Net or Palco) can be effective for small dense patches of nuisance vegetation, but are not cost effective or feasible for large areas. Weed barriers are expensive to install and maintain at -\$1.75/ft<sup>2</sup> (material & installation). Semi-annual maintenance to retrieve, clean and re-deploy the barriers would be expensive and time consuming. Additionally, covering expansive areas of the pond bottom may also have detrimental impacts on invertebrates or other types of wildlife.

**Harvesting: Not Recommended**

Harvesting of variable watermilfoil is not recommended because its ability to reproduce through vegetative fragmentation, leading to increased spread into previously un-infested areas or further intensifying growth rates. Additionally, harvesting would be costly and at best would only provide a season of relief from the native vegetation growth with no guarantee of success. The disruption and nontarget impacts would be more significant than with spot-treatments using aquatic herbicides.

**Biological: Not Recommended**

There are no proven biological controls available or approved by the State for the control of the invasive aquatic plant species present at McCain Pond.

**Sediment Excavation/Dredging: Not Recommended**

Dredging nutrient rich bottom sediment is sometimes used as a strategy to control excessive weed growth. Conventional (dry) or hydraulic dredging would require the expenditure of hundreds of thousands of dollars in design and permitting fees alone. Dredging may also have severe impacts to aquatic organisms (i.e. fish and macroinvertebrates) in the ponds with no guarantees of elimination of invasive vegetation.

**Hydro Raking: Not Recommended**

Hydro raking of weeds is not recommended for these types of weeds. It would not be a long-term solution. It would also be extremely challenging because of the location of McCain pond (in a wooded area) and because of the size of the infestation. Hydro raking would not be feasible or cost effective for this size area.

**Do Nothing: Not Recommended**

If the invasive and nuisance plant and algae growth is allowed to continue unabated, eutrophication and filling-in at the pond will continue to occur at an accelerated rate due to the annual decomposition of excessive plant material. Anoxic conditions would degrade water quality and potentially impact fish and other aquatic organisms. Stagnant conditions will also increase water temperatures promoting both algae and bacterial growth as well as providing extensive mosquito breeding habitat. The pond's recreational and aesthetic value would be significantly degraded.

W6. A more detailed vegetation assessment than that provided on "Figure 2: Vegetation Assemblage" should be provided for the pond, noting areas of specific native and invasive aquatic vegetation, with the relative abundance. As an Ecological Restoration Limited Project, native aquatic vegetation should be preserved to the extent practicable, and the Applicant should demonstrate how they plan to preserve native vegetation. WPA PERFORMANCE STANDARDS COMMENTS

We conducted a detailed survey in mid-June and shared our map of the vegetation (figure1) on page 2 of this document. As detailed in our answer to A1, our goal is to eliminate the invasive and aggressive nuisance species in order to allow native species to return. This replacement growth can sometimes take a few months.



W7. The Project is an Ecological Restoration Limited Project proposed within LUW of Spruce Pond. The Applicant has provided Appendix A: Ecological Restoration Limited Project Checklists as part of the NOI submission as instructed on the WPA Form 3.

[Based on this, there is no new action required on our part.]

W8. The discussion of how the proposed Project will protect the interests of the Act should include more detailed information relating to the protection of fisheries, such as spawning periods of species present at the Site to avoid potential fish kills . BYLAW REGULATORY COMMENTS

We do hundreds of applications in MA and we always follow the dosing on the label. When this is followed there is minimal danger.

The following spawning seasons for in-water animals is noted as follows:

**Turtles:** Late April or early May. But there can be occasions when a lone female will decide to lay eggs at other times of the year.

**SmallMouth Bass:** Mid May through late June. This also applies to most other species of fish found in New England ponds.

**Bullfrogs:** Main spawning season is April. Some frogs may spawn into the summer, through August.

**Geese:** Mostly mid April to Mid may.

Most other **New England birds** will lay eggs from late March to late may. Second or third broods may happen, for some species, into August.

W9. The interests of the Act are generally discussed within the NOI, but this information is not specific enough to demonstrate that the proposed project will not negatively impact the functions and characteristics on onsite Resource Areas. A Function and Characteristics statement should be provided per Section 7.10 of the Bylaw that is specific to the Site.

This section states: *It is the applicant's burden of proof to demonstrate that their proposed project/activity will not result in any significant individual or cumulative adverse effect to the functions and characteristics of resource areas, and the functions and characteristics statement is the applicant's opportunity to do so.*

We believe the project will not have any adverse effects on the resource area. All chemicals we use are rigorously tested under supervision of federal and state governments. They are labelled as appropriate and safe for use in lakes, ponds, and other aquatic sites. We always apply them in a manner consistent with their labelling.

All pesticide applications made directly to the water or along the shoreline for the control of algae, aquatic weeds, or other aquatic pests will meet or exceed all of the Company's legal regulatory requirements as set forth by the EPA and related state agencies for National Pollutant Discharge Elimination System (NPDES) and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) We perform treatments that are consistent with their compliance standards. All staff are fully trained to perform applications in compliance with all federal, state, and local law.

W10. A sequence and schedule of the proposed chemical application should be provided pursuant to Section 7.15 of the Bylaw that is inclusive of the time of year, methods of application (i.e. via boat or on land), and application rate.

See Methods of chemical application section above. Final schedule cannot be set until the project is approved. We would like to treat by early to mid July. All three treatments can be delivered on the same day.

W11. The Bylaw Regulations state that no work is permitted within 25 feet of a Resource Area. A portion of the Project includes management of purple loosestrife populations within the Bylaw 25-foot buffer zone. The Applicant must submit a Variance Request that meets the provisions of Section 5 of the Bylaw Regulations.

We will remove our request for treatment along King Street. This was originally proposed in order to treat reed plants that were growing and blocking the outlet of the pond. This is less of an issue now, and we don't need to treat this area.