**Revised 4/9/2003**

# STAR LAKE
# EURASIAN MILFOIL MANAGEMENT PROGRAM
# BELMONT, VERMONT

Star Lake is 62.2 acres in size with an average depth of five feet and a maximum depth of seven feet. The lake discharges into Otter Creek and Lake Champlain. There is a concrete earthen dam and spillway with flashboards.

In 1998 a State study found a substantial growth of Eurasian Milfoil (*Myriophyllum spicatum*) scattered around the lake. In addition to the Eurasian Milfoil, the following aquatic plant growth is present in Star Lake: Coontail (*Ceratophyllum demersum*); Naiad (*Najas flexilis*); Yellow Lilies (*Nuphar variegata*); White Lilies (*Nymphaea odorata*); Bigleaf Pondweed (*Potamogeton amplifolius*); Ribbonleaf Pondweed (*Potamogeton epihydrus*); Leafy Pondweed (*Potamogeton foliosus*); Slender Pondweed (*Potamogeton pusillus*); Arrowhead (*Sagittaria*); Burreeds (*Sparganium americanum*) and Cattails (*Typha latifolia*).

In 1999 the Department of Environmental Conservation indicated that the Milfoil growth had increased two-fold. A cursory survey conducted by Lycott on August 7, 2002 revealed that the lake was totally inundated with Milfoil to the point where a monoculture had developed. At the time of the survey the Milfoil had surfaced and was in the process of auto fragmentation. The excessive aquatic plant growth in Star Lake is prohibiting recreational activities such as swimming, fishing and boating.

During the 2000 and 2001 winters, fish kills have occurred at Star Lake. This is attributed to the heavy snow cover that precluded the sunlight from penetrating the lake. This situation was exacerbated by the degradation of the Milfoil plants.

The presence of the aquatic weevils (*Euhrychiopsis lecontei*) and hand pulling operations have not precluded the Milfoil infestation in the lake. It is the desire of the Friends of Star Lake Committee (FOSL) to restore the lake by instituting an aquatic management program with the use of the US EPA registered and state approved herbicide Sonar A.S.® (active ingredient fluridone) during 2003 with the option to spot treat any re-growth of Milfoil in subsequent years with the herbicide Renovate (active ingredient triclopyr) as needed.

The management plan involves an initial treatment in the Spring of 2003 with the herbicide Sonar A.S. at a concentration of 8 ppb. Booster treatments will be undertaken to maintain the fluridone concentration at 6 – 8 ppb for forty-five days. We plan to utilize 3.4 ounces of Sonar per surface acre (211.48 ounces or 1.6 gallons) for the initial treatment.

Samples will be collected from three locations (two in-lake and one along the outlet stream) 2 – 3 days after the treatment and weekly thereafter for eight weeks. The samples will be submitted to SePRO Corporation (manufacturer of Sonar) for FasTEST analysis to determine the fluridone concentration. If the concentration falls below 6 ppb any time during the ensuing 45-day period, a booster treatment will be conducted. We plan to utilize .85 ounces of Sonar per surface acre (53 ounces or .4 gallons) for each of the booster treatments. Depending on the absorption, breakdown, and dilution of the herbicide one to four booster treatments may be required to maintain the fluridone concentration at 6 –8 ppb for forty-five days.

The initial treatment should be undertaken during May/June 2003 when the plants are actively growing. It will take 6 – 8 weeks for the Milfoil plants to show signs of management--turn pink/white, disintegrate, and drop to the bottom. In addition to Milfoil, the Coontail and some Lilies will be temporarily affected by the Sonar treatment(s).

The only water-use restriction on the Sonar AS label is for irrigation. There is a seven day restriction for established tree crops, fourteen day restriction for established row crops turf/plants, and an Assay is required for newly seeded crops, seedbeds or areas to be planted included overseeded golf course greens (per label pg 3 – attached). In accordance with the label, "These time frames and assay recommendations are suggestions which should be followed to reduce the potential for injury to vegetation irrigated with water treated with Sonar AS. Greater potential for crop injury occurs where Sonar AS treated water is applied to crops grown on low organic and sandy soils."

"Where the use of Sonar AS treated water is desired for irrigating crops prior to the time frames established . . . FasTEST assay is recommended to measure the concentration in the treated water. Where FasTEST has determined that the concentrations are less than 10 ppb, there are no irrigation precautions for irrigating established tree crops, established row crops or turf. For tobacco, tomatoes, peppers or other plants within the Solanceae Family and newly seeded grasses such as overseeded golf course greens, do not use Sonar AS treated water if concentrations are greater than 5 ppb." Additionally, "when rotating crops, do not plant members of the Solanceae family in land that has been previously irrigated with fluridone concentrations in excess of 5 ppb. It is recommended that an aquatic specialist be consulted prior to commencing irrigation of these sites." * *(amended paragraph 4/9/2003).*

Since booster treatments are anticipated, the use of the water for irrigation will be prohibited until the FasTEST results indicate that the fluridone concentration is below 5 ppb. As indicated above, we anticipate maintaining a fluridone concentration of 6 – 8 ppb for forty-five days. As such, the water use restriction for irrigation will be at least forty-five days. Please realize, it is our understanding that the water in Star Lake and downstream is not used for irrigational purposes. * *(amended paragraph 4/7/2003)*

Lycott will utilize a custom-built airboat for the treatments. The airboat was specifically designed and built in Florida for herbicide and algaecide treatments. The boat has a fifty-gallon fiberglass tank, pumps and valves to dispense herbicides and algaecides in a safe, effective manner. The herbicides will be mixed with lake water and evenly injected below the surface of the lake.

The FOSL have instituted the hand pulling of Milfoil in the past in vain. While this technique is not recommended for the management of Milfoil because any fragmented plants will quickly become re-established, small, scattered Milfoil plants may be carefully removed with this method after the Sonar application.

After managing a number of lakes and ponds with the herbicide Sonar for Eurasian Milfoil over the last several years, we have found that water bodies that are highly eutrophic with organically-rich sediments are more likely to have a re-growth of Milfoil. As a result, we are proposing to utilize the US EPA registered herbicide Renovate (active ingredient triclopyr) to manage any regrowth of Milfoil in subsequent years. This herbicide is very effective on Milfoil at low concentrations.

According to Bo Burns of SePRO Corporation, "Eurasian Water Milfoil can be controlled with .75 – 2.5 ppm of Renovate. The rate is going to depend on the size and shape of the spot you want to treat. A lower rate can be used in large areas with little dilution while the higher rate is needed for small plots with a high chance of dilution. Most spot treatments should be applied at a rate of 1.5 to 2.5 ppm. The lower rate of .75 ppm can be used for large area treatments." * *(amended paragraph 4/7/03)*

"The size, location and shape of the spot needing treatment will determine the rate of Renovate to apply. If the lake has water leaving the lake the higher rate will be needed. If the plot is small and not in a protected area, the higher rate should be used. If you are treating spots under five acres in size, you should plan to use the higher rate. If the plots are under five acres or large, you can use the lower rate." " . . . the shape of the plot will also play a role in the rate that needs to be applied. A long narrow plot will need a higher rate than a rectangle plot. Strip treatments along shorelines have a high dilution rate and will take a higher rate." . . . the maximum rate allowed for each spot is 2.5 ppm for the growing season." * *(amended paragraph 4/7/03)*

We anticipate utilizing a concentration of 2.5 ppm for areas ¼-acre in size or less, and 1.5 ppm for areas greater than ¼-acre in size (or 11.3 gallons/surface acre to 6.8 gallons/surface acre). At the proposed application rate, Renovate will not affect non-target organisms. According to SePRO Corporation, manufacturer of Renovate, the only aquatic vegetation in Star Lake that will be affected by this product is Milfoil.

Renovate has a half-life 0.5 – 3.0 days in water. There are no restrictions on swimming, fishing or livestock consumption. There is no restriction for irrigation of established grasses, however, there is a 120-day irrigation restriction for irrigation of flowerbeds and vegetable gardens. Attached is a Material Safety Data Sheet, label and fact sheet for review.

A five-year integrated management plan is proposed combining the use of Sonar and Renovate. By reducing the majority of the Milfoil population in 2003 with the herbicide Sonar and the use of Renovate on any Milfoil re-growth during 2005, 2006 & 2007, Star Lake should remain in good condition. This past September, and for the past several years, the FOSL have conducted extensive hand-pulling operations. This method has not had any significant impact on the Milfoil growth around the beach area or in the lake. As part of the five-year management plan, annual pre-and post-treatment biological surveys will be conducted. The areas and extent of the aquatic plant growth will be depicted on a colored map and presented to the FOSL. Treatments will be set up using GPS equipment, and the surveys will duplicate the methodology used in the Vermont DEC surveys.

The FOSL would like a five-year management plan that will successfully manage the Milfoil growth while being environmentally sensitive and cost effective. We believe that the management of Star Lake with Sonar and follow-up treatments with Renovate as necessary will fulfill these objectives.

There are a number of plants in Star Lake that will not be affected by either herbicide proposed for use. These include: *Nitella flexilus*, Algae, *Potamogeton epihydrus*, *Potamogeton amplifolious*, *Sparganium*, *Sagittaria* and *Typha.* The following plants will show some effect, but will recover the following year: *Ceratophyllum*, *Nymphaea* and *Nuphar.*

Please realize, that if the Milfoil in Star Lake is not successfully managed, the lake will continue to be a source of Eurasian Milfoil to other water bodies via waterfowl or recreational watercraft.

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