CASE STUDY *of* LILY BROOK

Variable Leaf Water-Milfoil in a Slow-flowing Stream Connecting Two Waterbodies

By Joel Bloom, Lew Wetzel, Fred Cummings and Pixie Williams

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Waterbody: Lily Brook (also spelled Lilly Brook)

Association(s): Pleasant Lake and Parker Pond Association (PLPPA)

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Town Waterbody Located In: Casco **County Waterbody Located In**: Cumberland

Waterbody History: Lily Brook is a narrow stream that connects Pleasant Lake and Parker Pond. The water flows from Parker Pond north through Lilly Brook into Pleasant Lake. Both Pleasant Lake and Parker Pond are highly vulnerable to infestation. During prevailing northern winds, the water moves south into Parker Pond. These lakes are used for recreational purposes including motorized and non-motorized boats.

Invasive Species Distribution: Variable leaf water-milfoil (*Myriophyllum heterophyllum*) was documented in Lily Brook in August of 2000. A survey of Parker Pond and Pleasant Lake at that time did not find any variable leaf milfoil growth. In August 2001, a follow up survey of Lily Brook found that the variable milfoil population had doubled in size, and a colony of variable milfoil was also identified in the outlet dam area of Pleasant Lake.

Management Objectives: Aggressive management effort to eradicate invasive watermilfoil from Lily Brook and the outlet dam area of Pleasant Lake.

Management Timeline:

2001 - At the beginning of the IAP management effort, a ten-member committee was formed from within PLPPA. Maine DEP manually harvested variable-leaf milfoil in the outlet dam area of Pleasant Lake.

2002 - Initial surveys were conducted on Pleasant Lake, Parker Pond and Lily Brook to identify where the infestations of milfoil were occurring. Surveys have continued on all three waterbodies and are conducted twice a season. Maine DEP again manually harvested variable milfoil in the outlet dam area of Pleasant Lake. Several 10' x 12' benthic barriers were placed in the northern end of Lily Brook and held in place by sand bags. Sand bags proved difficult to handle, and did not adequately hold the barriers in place.

2002 – Screens to capture plant fragments were installed at both ends of Lily Brook, to prevent spread of the infestation to Pleasant Lake and Parker Pond. The screens are made of ¼" galvanized wire mesh 24" and 36" wide mounted on pipes driven into the bottom about 6' apart. The screens must have bottom

clearance of at least 12" to allow fish and wildlife to pass. All propeller driven watercraft are banned from Lily Brook, but canoes and kayaks can paddle through the channel. The screens protecting Pleasant Lake are staggered to allow the canoes and kayaks through. The inlet from Parker Pond does not lend itself to staggered screens so a passageway was cleared of milfoil approximately seven yards from the north end of Parker Pond, and a carry-on access was established in this area for canoes and kayaks.

2003 - An additional six waterbodies in the area are also surveyed for invasive aquatic plants (IAP). Volunteers manually harvested variable milfoil several times a season. Benthic mats were installed and left in place for 45-60 days and then moved to a new location. Manual harvesting was utilized around the barrier edges as they were removed. Underwater photographs were taken to track progress and help determine where additional harvesting was needed.

2004 – Benthic mats were installed and left in place for 45-60 days and then moved to a new location. Manual harvesting was utilized around the barrier edges as they were removed. Underwater photographs are used to show where remaining milfoil needs to be removed.

2005 – Additional benthic mats were installed and left in place for 45-60 days. Over four years, a total of eighty-two barriers were installed.

2006 – Same basic control strategy was continued.

Two docks were installed for non-motorized boaters, to facilitate the portage from Lily Brook to Parker Pond. Signs were installed to encourage use of the docks - "*Boater - When you portage using this new dock you are protecting Parker Pond.*"

Prevention Strategies: Courtesy Boat Inspectors (CBIs) are hired each season to staff three launch sites. Custom signs have been designed and installed at three launch sites to inform boaters about aquatic invasives, stickers and penalties.

Project Successes:

Benthic barriers have been remarkably effective at controlling the invasive milfoil and allowing the native plants to re-grow. The reduction of plant growth is particularly noticeable at the northern end of Lily Brook where the project was started. After two successive years of laying down dozens of barriers, PLPPA has found the invasive milfoil in these areas, *including the roots*, has been *killed*.

Key association members have remained involved in the control project since the beginning.

A number of individuals have provided contributions and services.

The towns of Casco and Otisfield have become "invested" in the effort, contributing support for the boat inspections, the IAP surveys, and control projects.

In 2006, students from the Spurwink School were hired to help with important the end of season tasks. (The Spurwink School, located in Portland, is dedicated to helping students and their families cope with various mental, behavioral, emotional, and developmental challenges.) Sixty seven benthic barriers, recently removed from Lily Brook, needed to be cleaned, repaired, dried and rolled up for storage. Seven Spurwink students and their teacher participated. The work was overseen by an experienced PLPPA volunteer. The students thoroughly enjoyed the work--and the pay--and came away from the project with a sense of pride and accomplishment. All of students expressed an eagerness to help with the project again next year. PLPPA members came away from the experience feeling very encouraged by the

obvious “win-win” nature of the partnership. The group has received grant funding to expand this program in 2007.

Project Challenges:

Keeping association members actively involved in the multi-year, ongoing project.

Cleaning and repairing the barriers each time they are moved. This task often takes place in the fall, after the hired summer help is gone. In 2006, PLPPA found an innovative “win-win” way to address this challenge (See “Project Successes,” above)

Constant maintenance of the screens at both ends of Lily Brook.

Educating the canoe and kayak people to go around the screens rather then over them.

Project Costs:

Approximately $7,500 has been spent on hiring a scuba diver, materials and repairing screens. Benthic mats are reused from year to year. Volunteers have contributed approximately $2,000+ each year.

Funding Sources:

2003 – Pleasant Lake and Parker Pond Association contributed funds primarily for courtesy boat inspection (CBI) programs in Casco and Otisfield

2003 – Funds awarded the Towns of Casco and Otisfield, primarily for the CBI program

2003-2006 – Received DEP Cost Share Grant funds (administered by Lakes Environmental Association) for CBI program and IAP management

2006 – A Maine Community Foundation Grant was awarded, to help PLPPA expand upon its partnership with the Spurwink School and its students next season. Students will be trained to assist in all aspects of prevention and control.

Lesson Learned:

Galvanized fragment barrier screens held up better than those constructed with stainless steel.

Where the fragment barrier screens cannot be staggered, provide “weed-free” areas with facilities for canoes and kayaks to easily portage from one waterbody to another.

Work the management project *with* the flow of water so that any fragments created during the control activity will not flow to cleared areas.

Assess progress by taking underwater photographs at about 2 month intervals during the working season. If possible, pick a day with brilliant sunshine so flash is not needed.

When constructing benthic barriers, heat the edges of the material with a torch to bind all loose fibers.

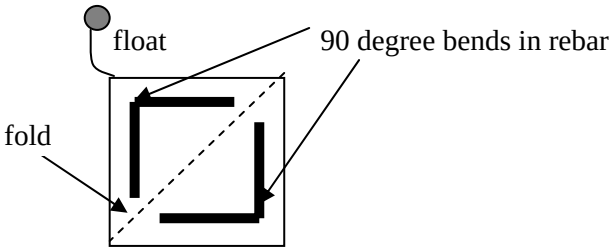
Try to time laying the barriers so that they can be removed before the onset of winter.

Small (5’ x 5’) diagonally folding benthic mats are easier to deploy and position by one person

Sand bags can be difficult to handle and do not work as well as rebar to hold benthic mats in place.

Innovations:

Small “Clamshell” Benthic Mat *- an innovative design by PLPPA member, Trevor Tidd of Casco:*



This small (5’ x 5’) benthic mat can fold diagonally for easier deployment and positioning by one person on uneven substrate. The rebar sections are not connected to each other at two of the corners, allowing the barrier to be folded. A float is attached at one corner to help locate the mat.