



Tamarack Lake

~ Lake Management Letter ~

A Publication of the Tamarack Lake Lake Improvement Board

Success! The 2011 Aquatic Weed Management Program Dealing with the Monster Milfoil

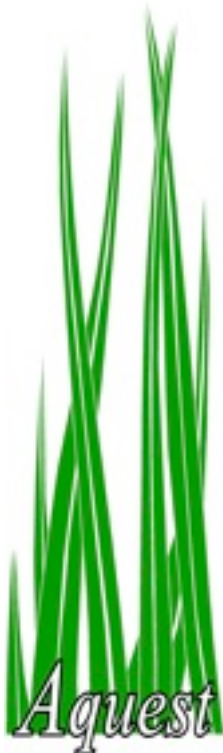
Dr. G. Douglas Pullman
Aquatic Ecologist
Aquest Corporation

Winter has a way of erasing our memories of summers past. That's one of the reasons why the Tamarack Lake Improvement Board publishes a spring newsletter. However, some of us are not able to forget the summer of 2009 when a highly herbicide tolerant strain of milfoil refused to die after repeated treatment. Recreation was ruined and so too was the integrity of the Tamarack Lake ecosystem. The offending milfoil was the not Eurasian watermilfoil that inhabited the lake in the 1990's but was a hybrid milfoil that is known to be much more difficult to manage than milfoil genotypes that we've successfully managed in the past. Eurasian watermilfoil, which was a serious problem in Tamarack Lake in the 1990's was relatively easy to manage. It is very sensitive to many different aquatic herbicides, and this allowed us to suppress the Eurasian watermilfoil and still protect many of the desirable aquatic plant species that normally inhabit lakes in Michigan. However, the same aquatic herbicides have been used to manage nuisance aquatic plants in Michigan for more than 40 years. Consequently, it is no surprise that nuisance aquatic plants would develop mechanisms to help them to tolerate or survive the application of these management agents. This is biology, after all and we see the same things happen in crop pest management and the development of antibiotic resistant bacteria in human and veterinary medicine. The milfoil that currently dominates Tamarack Lake has seemingly developed a close relationship with microbes that like to "eat herbicides for lunch". The microbes create a protective layer on the plant surfaces and prevent herbicides from penetrating into the weeds where they can do what they need to do.

After, six years of study with collaborators at the University of Michigan - Flint, and the treatment of countless test plots, our understanding of the problem has increased and we finally discovered a treatment strategy that provides reliable control of herbicide tolerant milfoil communities. It still needs some fine tuning to provide the level of selective control that we seek; however, we are relieved to know that we do have a way to suppress this emerging problem. The 2010 treatment was a resounding success and we expect to see similar results in 2011.

The Tamarack Lake Improvement Board was very aware of some of the concerns of residents of the lake and some of the options and management strategies that are being considered and discussed by lake residents and lake user groups. We were aware that there were many individuals who wanted to "return" to the "good old days" when the application of fluridone (Sonar) did such a great job of eliminating the

"Hybrid milfoil, Eurasian watermilfoil, curly leaf pondweed, weedy sago pondweed, pithophora and starry stonewort are invasive species continue to threaten the stability of Tamarack Lake. Progress is being made to suppress these problem species, but we seem to face a constantly moving target. That's biology."



Key Metrics Used to Evaluate the Condition of Tamarack Lake, 2010?

Total Plant Species Present (Species Richness)



Generally, the greater number of species present in a lake, the better the lake. Most lakes range from 10 to 20 species. Tamarack Lake has never support that many speices, but there has been a measurable increase in species in recent years. Starry stonewort could cause this trend to reverse in the coming yeras.

Mean Coefficient of Conservatism "C" Value



The "C" value is an index value that is used to describe the "quality" of the plants that are found in a lake. Weedy species are assigned lower "C" values while more desirable species are assigned higher values. A lakwide "C" value of 5 is considered to be good for Michigan inland Lakes.

Plant Community LakeScan Biodiversity Index



It is good to have a long list of species present in any lake. However, it is far more important that those species are spread throughout the lake and not just confined to a small area. Biodiversity is an index that refers to the spread of species throughout a lake. The greater the spread of the grater number of species is considered to be good and stabilizing. Because there are so few species in Tamarack Lake at the present time, the biodiversity index value for the lake is much lower than most lakes. It is expected that these value may increase with the consistent application of good management practices.

milfoil problem in the lake. Aquest cautioned your Lake Board to avoid this management strategy because the State limits fluridone concentrations to a level that will not be effective when challenged by herbicide tolerant plant communities. A nearby lake failed to heed these warnings and applied fluridone in 2010. That lake witnessed the predicted failure and expectations were not met. The Tamarack Lake Improvement Board should be commended for heeding the warning and for taking time to understand the mechanisms that preclude the use of fluridone or other low-dose herbicide application strategies at this time.

So where do we go from here? We were extremely pleased with the outcome of the 2010 milfoil treatment. As a bonus, the treatment also suppressed the production of two other nuisance species, curly leaf pondweed and nuisance sago pondweed. We were also able to avoid and protect several stands of beneficial pondweeds that are beginning to spread near the islands. We will continue to seek ways to make this approach more selective, but in the meantime, plan to repeat the milfoil treatment that was used in 2010.

Another exotic species has found it's way into Tamarack Lake and is having a profound impact on the ecosystem. Starry stonewort was first identified by Aquest in 2006 and was positively identified in Tamarack Lake in 2007. Starry stonewort is the most invasive and aggressive plant that has ever invaded Michigan inland lakes. It can outcompete every other plant, including milfoil. Starry stonewort and a particularly aggressive form of Chara covered a significant part of the bottom of Tamarack Lake in 2010. By late in the season, these two species appear to have eliminated much of the "competition" and there was a profound loss of plant biodiversity. Generally, the higher the biodiversity, the more stable the ecosystem. This is a matter of great concern and will be watched closely in the coming years. One positive outcome of the starry stonewort invasion is that the water in lake lake has

become markedly clearer, which is a common lake wide response to starry stonewort invasions. Starry stonewort is not particularly difficult to control; however, it is an algae and will grow to unexpected levels at unexpected times during the course of the growing season. It is not possible to predict when it may become a nuisance and time a treatment accordingly. Furthermore, it can be treated effectively, but regrow to nuisance levels in the matter of a couple of weeks. It is algae, after-all. Like filamentous algae blooms, it will be important for lake residents to keep close watch on emerging starry stonewort problems so that corrective action can be taken. Sentinels should check the lake on a weekly basis or even more often because this pant is so unpredictable and capable of such rapid growth.

Good scientific reasoning and keen observation has helped us to meet the management challenges in Tamarack Lake. We will continue to apply these principals in formulating management strategies that will insure that the lake will meet the expectations of property owners and lake user groups. We will continue to employ the latest technologies to insure management program success, but will not take unnecessary or unreasonable risks that would leave the lake in a compromised condition for most of the summer. That kind of testing can be done in smaller systems and by others in the State. We look forward to another great year on Tamarack Lake.

~ TAMARACK LAKE TREATMENT NOTICE ~

PLEASE TAKE THE TIME TO READ THIS NOTICE: IT IS FOR YOUR INFORMATION!!

RESIDENTS IN THIS AREA ARE PLANNING TO HAVE THE WATERS IN THIS AREA TREATED FOR CONTROL OF LAKE WEEDS AND/OR ALGAE. This notice is being circulated at least 7 days and not more than 45 days in advance of the treatment in accordance with MDNRE procedures. A permit for the treatment has either been secured or will be secured from the MDNRE before the treatments are to begin. You are receiving this notice if you are within 100 ft of the treatment area.

-Our company does two types of treatments: Algae control and Weed Control.

If we are treating for weeds (including lake dye) then there are restrictions on the use of the water and we will post the shoreline with 8.5 x 11 inch signs before these chemicals are applied to the lake. In some cases we treat for both algae and weeds. In those cases we may be treating with the copper products while the signs are being posted. We do not treat with the weed chemicals without posting first.

We treat each lake according to a schedule or season plan worked out with the persons in charge of your lake treatment program. However, due to the differences in season plans and the uncertainty of weather please watch your shoreline for the posting of the 8.5 x 11 inch signs, particularly in **April, to late August. YOUR LAKE MAY BE TREATED MORE THAN ONCE EACH SEASON. CHECK THIS WITH YOUR ASSOCIATION.** The signs will indicate the date of the treatment, the chemicals used, and the restrictions as to the use of the water for swimming, irrigation and the consumption of fish taken from these waters. We use **NEW SIGNS** for each application.

Only chemicals, which have been registered by the State of Michigan and the Federal Government, are to be used. These chemicals are applied in amounts approved by the MDNRE.

Method of Application: Chemicals are applied as either liquid or granular formulation, liquids are either surface sprayed or sub-surface injected, granular formulations are applied with broadcast spreaders.

Another requirement of our permit is that we locate all wells (**when using granular 2,4-D or granular Endothal products Aquathol-K and Hydrothol 191 only**) and maintain a distance of 75 ft from all wells and 250 ft from any well that is less than 30 ft in depth. **IF YOU ARE AWARE OF SUCH A WELL, PLEASE NOTIFY OUR OFFICE.**

We anticipate using one or more of the chemicals listed below. Please be aware of the restrictions on each. We will post signs as necessary. If we have not posted it means we are using products that require no posting. If the MDNRE changes any restrictions they will be noted on the signs we post. **PLEASE READ THE SIGNS WE POST!**

CHEMICAL/RESTRICTIONS

Reward (Diquat Dibromide): Do not use the treated water for swimming for 24 hours. Do not use the treated water for watering lawns or gardens, animal watering (farm stock--not incidental drinking by a domestic pet), or drinking for 5 days after treatment. There is **NO** restriction on fish consumption.

2,4-D(Dichlorophenoxyacetic Acid,Butoxyethyl Ester): Do not use the treated water for swimming for 1 day. Do not use the treated water for irrigation, agricultural sprays, watering dairy animals, or domestic water supplies. "Irrigation" includes water gardens--however, it does **NOT** include watering lawns. 2,4-D is often used by lawn spray companies to kill weeds in lawns--watering lawns when only 2,4-D has been applied will not hurt your lawn (but see restrictions on the other products). "**Domestic use**" means using lake water inside your house. Fish and wildlife are not effected. There is no restriction on fish consumption.

Renovate (Triclopyr)

Do not use the treated water for swimming for 24 hours. Do not use the treated water for irrigation for **120 days** following application. As an alternative to waiting 120 days, treated water may be used for irrigation once the Triclopyr level has reached a non-detectable level. This can be done by laboratory analysis (immunoassay). **There are no restrictions on the use of water from the treated area to irrigate established grasses.**

Aquathol-K,Aquathol(Dipotassium Endothal), & Hydrothol 191 (Mono(N,N-Dimethylalkylamine) salt of Endothal):

Do not use the treated water for swimming for 24 hours. Do not use the treated waters for household uses, irrigation (lawn or gardens), animal watering (farm stock), or similar uses for 14 days.

SONAR/AVAST(Fluridone): Do not use the treated water for swimming for 1 day. And do not use water for irrigation (turf-non food crops for 30 days).There is no restriction on fish consumption. When using Fluridone there may be more than one treatment bumping the concentrations back up.

Rodeo,Eagre(Glyphosate): Rodeo is used primarily for lily and cattail control. There is a 1-day no swimming restriction. There is no restriction on watering or fishing.

Copper Sulfate(Pentahydrate), Cutrine-Plus(Cutrine Alkanolamine Complex) NO RESTRICTIONS.

Nautique(Copper Carbonate): 24 hours No swimming.

If you have any questions, please contact the homeowners Association or Board who is in charge of the treatment. If they cannot answer your questions we can be reached at the number below. Norm Zion, Matt McCall or Corey Powers are the applicators.

AQUATIC NUISANCE CONTROL, INC. P.O. BOX 316 REMUS, MI. 49340-0316, (989) 967-3600 FAX (989) 967-3447

Tamarack Lake Improvement Board
c/o Montcalm County Drain Commission
211 W. Main Street
P.O. Box 368
Stanton, MI 48888

