

North Lake Improvement Project

Q & A with C. Douglas Pullman, PH.D

Dr. Pullman is the owner of Aquest Corp. and V.P. of Michigan Aquatic Managers Association. He is retained by Washtenaw County to provide technical expertise for lake management issues for North Lake and other lakes. His Annual Reports for North Lake are posted at: <http://tinyurl.com/wclakemat>

Q. *Are the chemicals used safe?*

A. The chemicals are tested and registered by USEPA and residents will be notified when treatments occur and what is being applied. Use restrictions will also be posted. MDEQ has one day body contact restriction for the herbicides however it is not do due health concerns of swimmers but the optimizing the herbicides that are used. USEPA does not have body contact restrictions for the herbicides that we will be using. We are not planning to use restrictive use pesticides.

Q. *As we kill weeds by treatment, does the biomass decomposing on the take bottom affect the composition of the lake sedimentation?*

A. Weeds derive their "substance" from the lake sediments. If they are controlled early in the growing season they simply breakdown and settle back to the sediments. There are various estimates of the water content of most aquatic plants and these range from 90% to 95%. Whatever the water content, it should suffice to say that there is not much structural material in an aquatic plant that could add to or accrue in the sediments. Furthermore, aquatic plants do not need to make the structural materials that trees and terrestrial plants create because they essentially float in the water column by entrainment of gasses. This is another reason why weeds don't add much to the sediments. If plant growth is not controlled early in the growing season and the plants are allowed to persist throughout much of the summer, inorganic, calcium rich residues will accumulate on the outer surfaces of the plants and these can accumulate in the sediments. The quantity of these substances is very low relative to the contributions from terrestrial sources of input, but they do accumulate in the sediments. This is another good reason why weed species should be controlled - and controlled as soon as practical at the beginning of the summer.

Q. *Can you describe how North Lake's condition would likely differ if we defer weed control for, say, five years?*

A. North Lake has been infested for decades with plants that were brought to this continent from the old world. These plants are weedy, aggressive, and opportunistic. Another invasive species known as starry stonewort has recently been introduced to the lake and it can be even more invasive than the milfoil and curly leaf pondweed that arrived in North America decades ago. These weed species typically crowd out or extirpate many or most of our native and desirable plant species. Recently, certain hybrids of native Michigan plants known as pondweed seem to have "learned" how to compete with milfoil and the other foreign invaders. These hybrids demonstrate very unusual habits and can be equally as weedy as any milfoil population. If the growth of any of these species is not controlled they can overwhelm most of the desirable plant species that are normal inhabitants of Michigan Lakes. The total number and diversity of plant species in the lake will fall to very low levels and the ecosystem can become "unstable" or subject to sudden plant declines, algae blooms, and loss of the complex structure that helps to support a vibrant fishery. Recreation and property values would also be severely impacted by unmanaged weed growth. If a properly managed control program were to be suspended for 5 years, recreation would be severely constrained and the fishery would suffer from the absence of a diver's habitat and structural complexity. It could take years to recover positive ecosystem attributes.

Q. *What happens to the chemicals used to treat the weeds? Is the lake bottom contaminated? Do fish ingest the chemicals either directly or through vegetation? Are they safe to eat?*

A. One of the good things and bad things about aquatic herbicides is that they are quickly broken down or immobilized by chemical reactions. This is good because residual concentrations of significant chemicals are not found in the water very soon after treatment. Most of the control agents are degraded to water and carbon dioxide by a wide range of physical, chemical, and biological reactions. The rapid "break down" of aquatic herbicides can be bad because it can be difficult to reach the herbicide concentrations, for sufficient periods of time that are required to suppress or control weed growth. The aquatic herbicides and algaecides pass through fish either unmodified or in a form or condition that poses little or virtually no risk to anyone that might eat the fish. The only herbicide/algaecide that accumulates in the sediments is the copper that is used in some algaecides. These compounds are irreversibly deactivated by chemical reactions and are not considered to be biologically significant after these compounds are formed as a result of these interactions. Copper concentrations can be detected in sediments where copper containing algaecides are used; however, the copper can only be liberated for analysis after the extremely strong acids are applied to the samples. The amount of copper that is found in the water, and only briefly, is less than the amount of copper that is purposely included in some vitamins. Copper is an essential mineral/nutrient for humans and other mammals.

Q. *Is effective harvesting being done on any Michigan Lakes?*

A. Yes. Harvesting operations can be very effective for the control of some native and non- invasive aquatic plants. However, some plants are not as adversely impacted by harvesting as other species and may even benefit from harvesting. Harvesting can aid in the spread of some species from one area to other areas as harvesting releases large quantities of plant fragments to the surrounding waters. Some plants are simply more tolerant of cutting like grasses on the terrestrial landscape. Others don't do very well when they are harvested in much the same manner that a juniper bush would not be expected for fare well after an encounter with a lawn mower. Unfortunately, the most aggressive weed plant species, like milfoil and starry stonewort are the kinds of plants that not very sensitive to harvesting. Lakes that contain these species can rapidly become dominated by either of these weeds because harvesting provides a competitive advantage over more desirable plant species. In this case, harvesting remains a good weed control strategy – it has just not been applied appropriately. At this time, the plant community in North Lake includes a species composition that strongly contraindicates harvesting as a viable management strategy. It would only make conditions worse.

Q. *Is there any research being done on the effectiveness of weevils?*

A. Most of the work done by independent researchers on the effectiveness and use of milfoil weevils was done in the 1980's and 1990's. The US Army Engineers Aquatic Plant Research and Control Program funded or conducted most of the best work that was done in the development of these organisms. They were unable to elicit a consistent or satisfactory outcome when they attempted use the weevils for milfoil control. The reasons were many and the list is far too long to include in this missive; however, the overwhelming conclusion by independent researchers seems to be that the weevils certainly seem to have potential, but it was simply impossible to make them work reliably or in any way that might be considered to be superior to the outcomes that can be achieved with herbicides are used for selective milfoil control. Weevils are being marketed and there are claims that they can be effective. But these are not offered in the context of experimentally controlled studies and should only be considered with some skepticism. The threat of invasive species dominance of North Lake is so great that the application of unproven or "experimental" strategies would be unwise at this time.

Q. Are the e-coli bacteria found in Wild Celery a danger to swimmers in North Lake?

A. No. There are over 100 variants of E-coli bacteria. They range from the extremely toxic forms that have been known to contaminate food to a wide variety of innocuous forms that live in lakes. The E-coli on wild celery is a unique genotype that does not seem to present any problems for humans. It's too bad that they have not been given a different name. Dr. Jerry Sanders (UM-Flint) were the first to discover these E-coli nearly 15 years ago.

Q. What can residents do?

A. Home owners around the lake community have opportunities to protect the Washtenaw County the Huron River Watershed Council can provide best management tips for lake front living. The State of Michigan also has programs such as MiCorp which provide training and guidance on water quality monitoring. The Portage Baseline Whitewood Owners Association currently participate in MiCorp. We also would like feedback regarding the applications/harvesting activities to identify any areas that don't respond.

The above responses were reviewed by Lisa Huberty of the Aquatic Nuisance Control Program, Water Resources Division of the Michigan DNR. While the DNR will not provide written responses to the questions above (as a matter of policy), Ms. Huberty stated the above responses by Dr. Pullman are accurate in general, in her opinion.