West Lake Improvement Newsletter

Restorative Lake Sciences, LLC

Spring 2013

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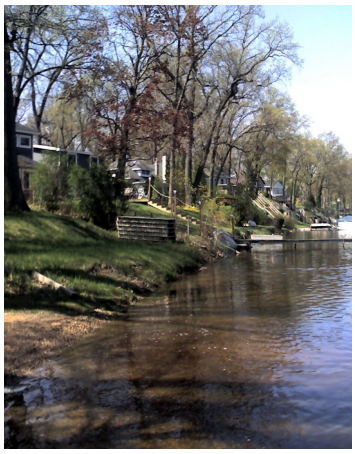
2013 Agenda For West Lake

Last year was a terrible year for weed growth but West Lake fared well due to rigorous treatments for small areas of milfoil and large areas of nuisance pondweed. The pondweeds can interfere with recreational activities and always grow well in West Lake. Water sampling will continue to be conducted in West Lake this season to make sure the overall health of the lake is improving.

Scientists from RLS will be out surveying the lake in May. Any areas of milfoil will be spot-treated with the systemic herbicide 2,4-D. Pondweeds will be treated with contact herbicides in late May or in June.

Scientists will make sure the balance is good between the native aquatic plants and the needs of the riparians.



RLS To Utilize Innovative Aquatic Plant Mapping Software

Beginning in 2013, RLS will be utilizing a highly innovative aquatic plant mapping software that allows us to determine the changes in aquatic plant bed characteristics after aquatic herbicide treatments are applied. The technology combines a highly sensitive side-scan sonar GPS device with innovative software from Contour Innovations, who RLS has partnered with to provide the most accurate and detailed data on every lake project. This technology will allow us to make more sound management decisions that are based on both numerical data and spatial data.

The technology was used last year by RLS on Paradise Lake in Emmet County, MI and was able to document the relative biovolume of all aquatic plants in the West Basin. Data will be collected at the same time this year to make comparisons before and after treatment.

All data are stored in a database and can be used for future comparisons.

This technology will allow us to monitor the success of new herbicide applications.

New Mapping GPS System

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EURASIAN WATERMILFOIL CAN BE USED AS A FISHERY MANAGEMENT TOOL

"Some of its effects can be detrimental to fisheries. When dense, the plant obstructs swimming space of fishes, shelters too many juvenile fishes, and disrupts foraging movements of predatory fish"

Eurasian watermilfoil (*Myriophyllum spicatum* L.) poses new challenges to fishery managers as it continues to spread and multiply in North American waters. Some of its effects can be detrimental to fisheries. When dense, the plant obstructs swimming space of fish, shelters too many juvenile fishes, and disrupts foraging movements of predatory fish. In replacing native plants that harbor a diverse array of invertebrates, watermilfoil creates food shortages for fishes. By blocking sunlight penetration and water movements, it depletes dissolved oxygen that can cause fish kills when shoots decay in autumn. Surface temperatures in Eurasian watermilfoil beds have been significantly elevated, while bottom temperatures were significantly depressed each year. Studies also found that dissolved oxygen concentrations in surface layers of the bed were elevated, while DO in the bottom layers was depressed more than 50% of the time. Dissolved oxygen and temperature appeared to be most severely impacted at shallow, densely vegetated sites close to shore and can adversely affect the fishery.

With increasing amounts of Eurasian watermilfoil, there are significantly fewer bluegill and significantly fewer isopod, midge, caddisfly and mayfly larvae. These differences were most visible in late summer when Eurasian watermilfoil is normally at its highest growth point. Natural vegetation communities consisting of pondweed and water celery as the dominant vegetation have three to four times as many fish during daylight hours versus those dominated by Eurasian watermilfoil. In the sediment, beneath the native beds, five major groups of prey invertebrates were much more abundant

Eurasian Watermilfoil

The foliage of native pondweed plus water celery supported twice as many invertebrates per area in late summer than did Eurasian watermilfoil.

Abundant sunfish can actually assist in the growth of Eurasian watermilfoil by consuming some of the insect larvae that feed on Eurasian watermilfoil.

Therefore, lakes with healthy native plants should be left undisturbed and guarded against infestations of Eurasian watermilfoil. Where Eurasian watermilfoil is abundant, control methods should take place.

A Largemouth Bass

VEGETATIVE BUFFERS CAN PROTECT LAKE WATER QUALITY

Over the past few decades, pollution associated with lake development, residential, agricultural, and forestry activities have increasingly been recognized as a serious threat to the quality of surface and groundwater throughout North America. These practices can degrade surface and groundwater quality by increasing phosphorus and nitrogen loading, erosion, water temperatures, and bacterial populations. The growing concern about these pollution types have resulted in best management practices (BMP's) that minimize the impact of these activities. Some of these BMP's include using natural shoreline features as well as buffer strips.

Buffer strips are undisturbed vegetated zones around lakes and their tributaries that are a recognized and integral aspect of watershed management

Vegetative buffer strips are being widely promoted as an effective way to protect lakes, rivers and streams from the negative impacts of adjacent land uses. These strips can be very effective in protecting the quality of public lakes by removing sediment and associated pollutants, reducing bank erosion, and displacing activities from the water's edge that represent potential sources of nonpoint source pollutants. In addition, buffer strips may also reduce nutrients by uptake into growing plants.

One study reported retention rates of sediment, N, and P were as high as 97%, 85%, and 84%, respectively. Buffer strips have also been known to absorb harmful chemicals and heavy metals, especially in close proximity to lakes and streams.

Near agriculture, forested buffer strips that are sufficiently dense may also improve water quality by restricting the access of livestock to streams, thereby reducing inputs of nutrients and bacteria associated with livestock feces and reducing erosion resulting from stream-bank trampling. Furthermore, agricultural sites with wide riparian vegetative buffer strips had significantly more zooplankton than agricultural lakes with narrow buffer strips.

Residential areas can also benefit from these buffer strips around lakes to protect water quality. In addition, Canada goose problem areas can prohibit the use and defecation of their shoreline property by installing natural buffer strips. Vegetative buffer strips also add an additional dimension to the lake-shoreline interface by allowing larval fish and insects to use the habitat. The vegetation may also add protective cover for adult breeding fish species from predators. Vegetative buffers can also allow the landowner to view the natural beauty of the buffer strip by incorporating native wildflowers that produce colorful blooms in the growing season.

Even a narrow buffer strip is helpful. Three to five feet wide will minimize fertilizer use near shore and also discourage geese.

A Native and Natural Vegetation Buffer Around an Inland Waterbody.

"Vegetative buffer strips are being widely promoted as an effective technique to protect lakes, rivers and streams from the negative impacts of adjacent land uses including forestry and agriculture"

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How To Tell Native Milfoil Apart From Eurasian Milfoil...

There are a few ways to tell the difference (s) between the native milfoil plants and the exotic or EWM. This is important to do to monitor the progress of the lake treatment program. Sometimes, it requires the expertise of a botanist since hybridization can also occur.

Northern Milfoil – a native milfoil with green leaves densely scattered along the stem (also usually olive green)

In general, the exotic milfoil will have its leaves spaced further apart (see page photo) and also contains a pinkish or red stem. There is also usually more than 12 pairs of leaflets on an EWM leaf.

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