

BEAR LAKE IMPROVEMENT BOARD (BLIB) NEWSLETTER

Spring 2015

2015 AGENDA FOR BEAR LAKE

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The Bear Lake aquatic plant management program has been a great success with substantial and continuous reductions in the invasive Eurasian Watermilfoil over the past several years. The scientists from Restorative Lake Sciences (RLS) will be on the lake soon to again survey the entire lake for all aquatic vegetation and

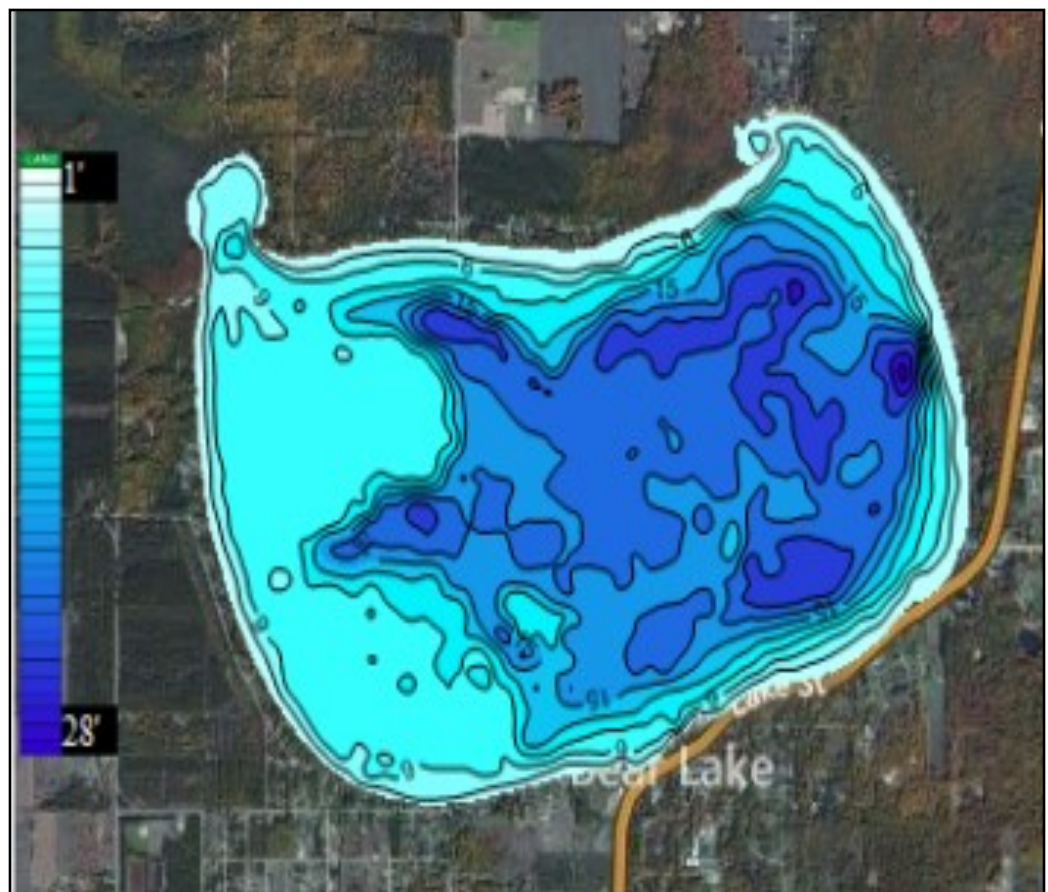
create detailed treatment maps for the aquatic herbicide applicator, Professional Lake and Land Management to use. RLS will then be present to oversee the lake treatment(s) by PLM and will conduct the necessary post-treatment surveys. RLS will also be conducting water quality sampling of the lake water and compiling an annual Bear Lake progress

report that will be available on the website reference on page 3 and also at each of the 3 municipalities. The report is compiled each late fall after all data is carefully analyzed and recommendations are made for the following year based on the date collected in 2015. We look forward to another successful year!

BEAR LAKE DEPTH CONTOUR MAP

Bear Lake Improvement Board Members:

- Gerald Stick, Pleasanton Twp. Rep.
- Don Brisbin, Chair, Riparian Rep.
- Bob Yates, Secretary, Bear Lake Twp Rep.
- Carver Edwards, Bear Lake Village Rep.
- Ken Hilliard, Manistee County Board of Commissioners/Treasurer
- Tom Smith, Manistee County Drain Commissioner



WHAT REALLY HAPPENS WHEN A LAKE IS INUNDATED AFTER SNOWMELT?

Spring snow melt can drastically affect water levels in a lake. **Since Bear Lake is in close proximity to many roads that are likely to be salted, runoff from the roads could result in spikes in conductivity from salt runoff.** Within road salt, the primary agent used is sodium chloride with other components in salt like ferrocyanide, which is used for anti-caking, and impurities like phosphorus and iron, can represent up to 5 percent of the total weight. These elements can make their way into lakes through the runoff from rain, melting snow and ice, as well as through splash and spray by vehicles and by wind. Chloride is toxic to aquatic life and impacts vegetation and wildlife. There is no natural process by which chlorides are broken down, metabolized, taken up, or removed from the environment. Contamination of sodium in drinking water is a concern for individuals restricted to low-sodium diets due to hypertension.

Wildlife is also prone to high sodium levels by ingesting salt or drinking water runoff from snow and ice melt. Increases in sodium and chloride have been shown to decrease the biodiversity in wetland areas, altering the development of amphibians, decreasing the number and types of fish available, and increasing mortality rates of organisms that rely on an aquatic system. **There are abundant wetlands around Bear Lake that may be sensitive to these inputs but can also absorb pollutants.** In Minnesota, a large study found that the lakes studied in the Minneapolis/St. Paul area showed a marked increase from 1984 to 2005, which if continued would double salinity in these lakes in about 50 years. Compare this with a near zero concentration in the 1950s, when road salt application began. The study also found that 70% of the road salt applied stayed in the local watersheds (University of Minnesota 2009).

Other nutrients from surrounding land-use practices can also wash into lakes from nearby fields, especially agricultural areas. Elevated phosphorus concentration is often the main driver of loss of biodiversity and ecosystem function. Increased nutrient concentrations can also affect water chemistry, allow for increased overall plant growth, and increase chances of potentially harmful algal blooms.

Scientists at RLS have been monitoring the water quality of Bear Lake over the past several years and have been closely watching the conductivity, dissolved oxygen, and nutrient levels. **Overall, the water quality of Bear Lake is very good and organizations such as the Bear Lake Watershed Alliance are doing even more to further protect the water quality of Bear Lake into the future.**

SEAWALLS –ARE THEY NEEDED ON BEAR LAKE?

Seawalls can affect the natural flow of water and nutrients in a lake, but also compounds wave action and increases it in a lake. A seawall is constructed to protect areas of human habitation, conservation and leisure activities from the action of waves, but unfortunately can impede the exchange of sediment between land and lake. Seawalls can be expensive to construct, cause nearby beaches to erode and wash away, be an eyesore to others especially when degradation begins, cause wave energy leading to scouring and erosion at their base, disrupt natural shoreline processes and destroy shoreline habitats such as wetlands, and alter sediment transport between the shoreline and the lake itself.

Vegetation abundance along undeveloped and developed shorelines of Minnesota lakes was compared to test the hypothesis that development has not altered the abundance of emergent and floating-leaf vegetation (Radomskia and Goemana 2001). Vegetative cover in littoral areas adjacent

to developed shores was less abundant than along undeveloped shorelines. On average, they found a 66% reduction in vegetation coverage with development. Fish populations have also been shown to be correlated with aquatic vegetation abundance. Significant correlations were detected between occurrence of emergent and floating-leaf plant species and relative biomass and mean size of northern pike, bluegill, and pumpkinseed.

Shoreline development can also have an effect on macroinvertebrates. Macroinvertebrates were studied in seven lakes exhibiting natural shorelines, retaining walls, ripraps and recreational beaches to examine impacts on the macroinvertebrate communities associated with the three types of shoreline development (Brauns et al. 2007). Interestingly, the study found that retaining walls and ripraps had no significant impact on the macroinvertebrate community.

Conversely, beaches had significantly lower species richness and abundance of mayfly and caddisfly larvae than natural shorelines. The majority of the additional macroinvertebrate major groups decreased with increasing proportion of shoreline development.

Since Bear Lake is a large, open-water body with a wide fetch (distance across the lake), the wave energy is often very high and scouring activity is likely to be high.

A more natural shoreline, such as native plants or ripraps, can decrease wave action and make the shoreline more capable of buffering large storms and wave action. Furthermore, using a natural shoreline can restore the shoreline to a more natural state while enhancing wildlife habitat and preventing erosion and runoff.

****Visit the Bear Lake Website!****

www.bearlakemichigan.org

Even more information on this beautiful lake is available here!

Also, Bear Lake Improvement Board Meets the 3rd Thursday of each month from April-October in the Bear Lake Fire Hall at 7:00 p.m. Plan to attend and share your thoughts...

RLS USING INNOVATIVE AQUATIC PLANT MAPPING SOFTWARE ON BEAR LAKE

Beginning in 2013, RLS has been 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 Bear Lake and was able to document the relative biovolume of all aquatic plants throughout the entire lake basin. Data will be collected around 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 all herbicide applications and make scientifically sound future recommendations for Bear Lake.



**New Mapping
GPS System**

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[www.restorative
lakesciences.com](http://www.restorative
lakesciences.com)