

TLA Quarterly

JANUARY 2013

President's Letter

Greetings to all,

As we come to the end of 2012 and the beginning of 2013, it is appropriate to take a moment to look back at what we have done and how far we have come, as well as to look ahead at what we have yet to do and how far we have yet to go. Doing one without the other skews our vision and disrupts our balance.

It also would not do to overlook the good friends of TLA to whom we have had to say goodbye in this past year. In March we lost Bob Hildorf, and in November we lost Larry Tomlinson. Bob Hildorf (1919-2012), served as TLA's Treasurer from 1987 through 1995. Among Bob's many acts of generosity, we remember with gratitude his full underwriting of the costs of publication of TLA's "First Thirty Years" history, and his naming of TLA as a recipient for memorial donations made in his honor. Larry Tomlinson(1935-2012), was a long-time member of the TLA Board, and close personal friend of the Norris family. Larry served as Chair of TLA's Legal Committee for the greater part of the 1990s. There are no words adequate to express either the profound affection many of us bear for both Bob and Larry, or the depth of the loss we experience in their passing. So, let us say, "Farewell, dear friends, we will never forget you!"

A year ago, at this time, we were welcoming Leslie Meyers as our new Executive Director. During this past year, Leslie has become deeply integrated into the mission and ongoing activities of the Three Lakes Association. She has brought a high level of optimism and enthusiasm to our organization, guiding three high school interns through our summer 2012 Water Science Sampler project; bringing TLA's scientific display to the Antrim County Fair, where our interns had the opportunity to interact with Governor Snyder on the topic of Eurasian Water Milfoil; and staffing TLA's first ever participation in Bellaire's Harvest Festival – just to name a few of the events and activities that she has participated in and championed on our behalf.

During 2012, the Fish Shelters project, a collaborative effort of the lake associations serving five lakes (in alphabetical order: Bellaire, Clam, Elk, Intermediate, Skegemog, and Torch), got off to a great start. By year's end, there were 21 fish shelter sites installed. Each site has three different types of shelters emplaced, to accommodate different types and sizes of fish (A map showing the locations and GPS coordinates of each set of fish shelters can be downloaded from our Website: <http://3lakes.com/fish-shelters-overview>.) The planned five-year total number of sites is 80, so our joint effort has taken us just over a quarter of the way there already! This is very good news, and it represents a fine example of regional collaborative effort by a virtual "army" of volunteers. Well done, colleagues!

Eurasian Water Milfoil has raised its ugly head in our precious waters again. We are working in collaboration with others to craft a plan for battling this pest (see the article on EWM in this newsletter). No matter what we do to eradicate this undesirable invasive aquatic plant, the long-term strategy includes committed and persistent vigilance – monitoring our waters for any regrowth of this nuisance. Volunteers? Contact us and let us know of your willingness to help.

There is not room enough, here, to talk about all our plans for 2013. But, let me leave you with this note: on the 30th of January 2013, at Camp Hayo-Went-Ha, TLA, in collaboration with several other organizations (known collectively as the Elk River Chain of Lakes-Watershed Plan Implementation Team – or ERCOL-WPIT), will participate in the second annual informational forum to update members of our local government entities on the state of our watershed, the challenges it faces, and the opportunities ahead for all of us to help keep this place beautiful and healthy.

Best,
Tina

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The Mission of the Three Lakes Association is to provide leadership to preserve, protect, and improve the environmental quality of the Elk River Chain of Lakes, especially Torch Lake, Clam Lake, and Lake Bellaire, for all generations



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Short's to Short's 2013 kayak paddle event: TLA volunteers needed

By Todd Gyulveszi, Short's Brewing Company, Manager of Festivals and Events

Short's Brewing Company is hard at work planning the 5th Short's to Short's Paddle event, which is scheduled to take place on May 18, 2013. Last year's event fielded over 250 kayakers and we are gearing up for an even larger flotilla in 2013!

As always our priority is to host a safe event. In order to make the event safer than ever, we will need an army of volunteers on land and on the lakes. Three Lakes Association (TLA) and Elk-Skegemog Lakes Association (ESLA) have agreed to partner with Short's to help recruit additional safety boats, observers, and checkpoint-volunteers to be stationed along the route. Interested boat captains, first mates, and checkpoint volunteers should contact Todd Gyulveszi at Short's Brewing Company to become an official member of the safety team by sending an email to Todd at todd@shortsbrewing.com or by calling (231) 498-2300 ext 105.

To upgrade the safety aspects of the event, Short's is pursuing approximately 50 safety-spotter boats and check points to be strategically placed throughout the near 30-mile journey along the Chain of Lakes route from the launch site in Bellaire behind Fischer Insurance to the landing point in Elk Rapids at the public kayak launch near the Elk Rapids Chamber of Commerce. A post-paddle reception will take place at Short's Elk Rapids Production facility. Volunteers will be rewarded with a bounty for helping out with this year's event.

Short's has created a Mission Statement for this event that describes what the event means to them now and what it will remain to be for years to come:

The Short's to Short's Paddle is an annual point-to-point paddle event that spans Antrim County's entire lower chain of lakes. The event is open to all who possess the skills and perseverance to attempt it. Taking place near the day of Short's Brewing Company's annual anniversary, the event began as an informal meeting of co-workers to celebrate another year of making beer in pristine Northern Michigan. Today, the manta Per Unda Por Zythum (By Water for Beer) remains as strong as ever, yet the mission has expanded to include raising awareness and funds to protect the waters and resources of our region and those who work to protect them.

TLA's goal is to help Short's host the largest single day paddling event in Michigan, Short's style, that is not only safe and fun but also to highlight the beauty of this area.

Shorts will start registering kayakers on-line starting mid-January 2013. A special Website will be accessible at www.shortsbrewing.com If you have any questions, please contact Todd Gyulveszi. Stay tuned for further updates!



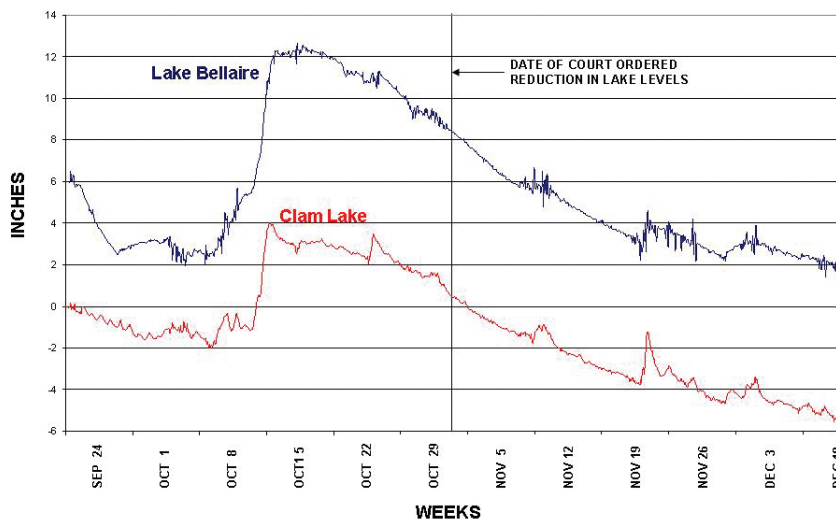
Can the accumulation of sediment in Grass River be reduced?

By Dean Branson, Fred Sittel, Gary Knapp, Anthony Kendall, and Frank Dituri

Editor's Note: This article is part of a series of articles to be published in TLA's Newsletters that will focus on the accumulation of sediment in Grass River. The slow moving river behaves like a long sand trap that is gradually causing the river to become shallower and wider. The information in this article was based on some very preliminary findings from the stream experts who are involved in a co-sponsored study of sedimentation in Grass and Rapid Rivers. The experts include Anthony Kendall, Principal Investigator from Michigan State University; Frank Dituri, Grand Traverse Band of the Ottawa & Chippewa Indians; Kevin Cronk, Tip of the Mitt; and Professor Paul Richards, Brockport College in New York

One of TLA's recent goals is to address the accumulation of sediment in Grass River that is making the river more difficult to navigate without stirring up sediments on the bottom of the river channel. The diagram below shows how the difference between the level of Lake Bellaire and Clam Lake changes over time. The difference in lake levels determines how fast the current flows in Grass River and its ability to carry sediment down stream. This diagram is based on data from two lake-level recorders that we installed in spring of 2012. These devices record the lake levels every two hours, and data can be downloaded and plotted whenever the data is needed. The diagram shows the values from September 25th to December 15, 2012. The reasons lake levels change over time include the amount of precipitation in the watershed and the adjustments intentionally made to the overflow of the dams on the Intermediate River and the river in Elk Rapids. Hopefully, stream experts can utilize this and other data collected to suggest ways to improve the capacity of Grass River to slowly and naturally reduce the amount of accumulated sediment.

LAKE LEVEL CHANGES RELATIVE TO LEVEL OF CLAM LAKE ON SEPTEMBER 24, 2012
DATA ASSUMES + 6 INCH INITIAL OFFSET TO LEVEL OF LAKE BELLAIRE
September 24 through December 13, 2012



Our Grass River sedimentation project in 2012 was a co-sponsored study with Elk-Skegemog Lakes Association to calibrate the Soil-Water Assessment Tool (SWAT) models that were developed in 2011, for use in Grass and Rapid Rivers. The purpose of this 2012 project was to pinpoint and prioritize opportunities for reducing the accumulation of sediment in these rivers. Some of the data generated by the stream experts using some very sophisticated instruments including an

Please see SEDIMENT on page 5

Samantha Fox and Derek Walton – 7 years later

In the summer of 2005, Sam and Derek participated in the Three Lakes Association summer internship program. Sam examined the potential effects of phosphate pollution in the lakes, and the lakes' ability to sequester phosphates introduced to the system. Derek's primary responsibility was modeling the flux of phosphate through the Three Lakes ecosystem.

Sam had always cared about the environment, and the TLA internship was one of her first hands-on introductions to environmental science. After graduation from Elk Rapids High School in 2006, Sam went to Boston to study at Massachusetts Institute of Technology (MIT). While there, she continued her environmental education through studying Environmental Engineering, with a minor in Environmental Policy. She participated in several classes and internships that gave her more opportunities for hands-on practice, including lab work and field studies. In 2010, she graduated from MIT and continued her education at Stanford University, where she earned her Master's in Environmental Engineering and Science.

Derek attended Kalamazoo College for his undergraduate education and completed a Bachelor's degree in Chemistry. The Chemistry department at Kalamazoo places a strong emphasis on "Green Chemistry," a focus on minimizing reagent usage and waste generation through micro scale reactions. During the summer of 2009,

Derek returned to Northern Michigan to assist Acme and Antrim counties in conducting a thorough *Phragmites australis* survey along their Lake Michigan shorelines as well in Petobego Pond, and presenting this information in his undergraduate dissertation.

Currently, Sam is working as an environmental specialist for AATA International, Inc. in Denver, Colorado. This company conducts Environmental Impact Assessments for development projects, including mining, oil and gas, and other resource development projects. The company conducts studies to determine the present state of the environment, potential impacts from the project, and mitigation measures to reduce these impacts. Water quality and ecosystem health continue to be her primary interests.

Derek is currently employed as a quality control chemist by Hospira Boulder, Inc., a pharmaceutical development and manufacturing facility in Boulder, Colorado. Like the Chemistry department at Kalamazoo College, Hospira promotes environmental health by closely monitoring waste generation and discharge, and striving to mitigate these outputs by reducing, using and recycling materials in every facet of business. Derek and the entire quality control department work closely with Environmental Health and Safety representatives to ensure these goals are met on a day-to-day basis.



Waterfowl Botulism Update 2012: The What and Why

By Mark Breederland, Educator, Michigan Sea Grant Extension

A significant waterfowl botulism kill was experienced along the northern Lake Michigan lakeshore during Fall, 2012. A variety of waterfowl species, the largest number being common loons (*Gavia immer*), were impacted by type e botulism and found geographically in a general area from Manistique, Michigan down to about Frankfort, Michigan (Schoolcraft, Mackinac, Emmet, Charlevoix, Antrim, Leelanau and Benzie Counties). Perhaps you read of the banded loon, nicknamed The Patriarch, which was found dead along the shore near Northport, Michigan in late September 2012 and confirmed positive for type e botulism. The Patriarch, hatched in 1991, lived the majority of his life near the Intermediate River in Lake Bellaire and was the oldest banded loon in northern Michigan reaching age 21. The Patriarch certainly had a productive life (and may now have 16 living offspring) but for loon researchers and interested citizens, his demise from botulism was quite discouraging.

The bacterium *Clostridium botulinum* which produces the botulinum toxicant under certain circumstances is native to the Great Lakes. There are documented years in the 1960s, 1970s and early 1980s (pre-zebra/quagga mussel, pre-round goby fish) where there were notable botulism impacts to loons and other species. Today, the weight of evidence points to increased frequency of avian botulism in the post-invasives food web now existing in Lake Michigan. This article will describe some details from the recent impacts in 2012, the Lake Michigan food web, as well as some of the understanding related to the mechanisms which enable the botulism toxicant to be available in the food supply of these waterfowl.

Species and numbers of waterfowl killed during Fall, 2012

As mentioned earlier, the waterfowl species most impacted in terms of carcasses found was the common loon. The other most common species killed were also fish-eating ducks including red-necked grebes, horned grebes, long-tailed ducks, white-winged scoters, double-crested cormorants, herring and ring-billed gulls and smaller numbers of merganser species. The majority of the loons and other waterfowl impacted are typically Canadian birds which are on their annual migration cycle and stop over on the Lake Michigan shore for feeding before continuing on to the Chesapeake Bay area or Gulf of Mexico.

Actual kill numbers are only best estimates, but dedicated volunteers – beach rangers – have been very helpful making these estimates in many areas including in Antrim and Charlevoix Counties. The Sleeping Bear Dunes National Lakeshore had 19 volunteers donate 930 hours monitoring and walking beach segments over the summer and fall (D. Ray, National Park Service). In the Sleeping Bear Dunes two county shoreline, 580 common loon kills were documented in Fall 2012, the largest number of loons since annual counts began in 2006 within the Lakeshore. I can verify from reports and personal observations of at least 100 other loons in other parts of Leelanau County, mostly near Leland. Loon researchers from Commoncoast.org reported 247 loons east of Manistique, Michigan and volunteer reports were submitted of up to 20 loons in Antrim and Charlevoix Counties. The Emmet County shoreline also had good numbers of loon losses (no good count estimate available yet) and that would put a conservative total estimate to be at least 1000 loons were lost this fall, both juvenile and adult birds. Mid-October to mid-November was the highest die-off time period, probably corresponding to bird migration cycles. As well, for other species, a conservative kill estimate might be around 500 for grebes, 500 for long-tailed ducks, 500 for double-crested cormorants, and perhaps 250 for white-winged scoters and 250 for gull species.

The Lake Michigan Food Web

While the food-web of Lake Michigan has undergone many changes in the 1900s (i.e. sea lamprey, alewife, introduction of pacific salmon),



it is unquestionable that the food web has changed radically since the late 1980s and early 1990s when the invasive zebra and quagga mussels, and the round-goby fish, took hold. Water clarity in Lake Michigan has at least doubled since then due to the massive filtering of the quagga mussels, now estimated in the 950 trillion range in Lake Michigan, and light penetrates deeply, allowing native algae to thrive and grow at deeper depths than ever before. The post-invasive food web is thought to account for the increased frequency of avian botulism in the past 10 years. Let me briefly describe the most-probable pathway for avian botulism.

In the Great Lakes, botulism spores (the resting stage of the bacteria) are naturally abundant in various habitats, such as soils and aquatic sediments, and persist over many years in this inert spore stage. The problem begins when the correct environmental factors are present for the spores to germinate and begin toxin production. When algae, such as *Cladophora*, wash ashore and decompose, there can be a loss of oxygen in the substrate area and the *Clostridium botulinum* spores can germinate, allowing one of nature's most potent toxins to become bio-available in the environment. The toxin causes a neuromuscular paralysis in fish, birds and mammals, but does not impact invertebrates and quagga mussels. Fish, like the abundant and invasive round goby, eat the mussels and invertebrates and can become paralyzed, losing equilibrium in the water. The loons and other waterfowl consume these easy-to-catch toxin rich fish and then themselves become paralyzed. The botulism disease in waterfowl is often called limberneck because the birds often lose the ability to hold their neck upright and may actually drown. Carcasses tend to wash ashore during storm events, and are most abundant after those storm events pass through.

Conclusion

In Northern Lake Michigan, there was a vastly significant waterfowl kill due to botulism in the fall of 2012. However, there was almost a non-existent botulism kill in the falls of both 2011 and 2010, with very small numbers in 2009 and 2008 after significant kills in 2006 and 2007. There are many factors yet to still be fully understood but the recent cycle is undoubtedly related to the post-invasive food web which has taken hold of the Great Lakes. Avian botulism kills do not occur along inland-lakes, nor can humans get botulism from swimming in the Great Lakes but efforts to keep additional invasives out of the Great Lakes and inland lakes are important.

For more information see or contact: <http://www.miseagrant.umich.edu/explore/coastal-communities/avian-botulism/>, Mark Breederland-breederl@msu.edu, 231.922.4628.

TLA to attack Eurasian watermilfoil in 2013...again

By Dean Branson, Trish Narwold, and Becky Norris

Eurasian watermilfoil (*E. milfoil*) is an exotic invasive aquatic weed that continues to be a major threat to Torch Lake and the entire Elk River Chain of Lakes. TLA has addressed *E. milfoil* infestation in Alden Harbor and Butch's Marina on several occasions since the late 1990s.

In the fall of 2010, for the first time so far as we know, several pioneering colonies of *E. milfoil* were found in the cove between Stony and Lone Tree Points directly south of Clam River; re-growth of *E. milfoil* in Butch's Marina and Alden Harbor was also discovered. This photo shows one of the *E. milfoil* plants, root ball and four to five foot long shoots dug up from the cove by a scuba diver.

A couple of the more insidious characteristics of *E. milfoil* are 1) its shoots are very fragile, which are easily broken into floating fragments that grow new roots, and then start new colonies, and 2) its roots are viable sources of new plants when some remain after removal of plants by hand digging or exposure to herbicides. As has been learned in other lakes in this area, the consequences of failing to adequately monitor and manage *E. milfoil* is that it responds by spreading, increasing its nuisance effect and raising the ultimate cost of control.

In 2011 we engaged the services of a firm experienced in the diver-assisted removal of *E. milfoil* to clear the colonies in the cove and in Alden Harbor at a cost of \$7000, with the co-sponsorship and financial contribution to the project by Torch Lake Protection Alliance and Helena Township. Although the firm estimated that 80 – 90% of the *E. milfoil* was removed, a significant amount of re-growth was observed that fall.

In 2012 TLA conducted an aquatic plant survey of Lake Bellaire, Clam Lake, and Torch Lake. *E. milfoil* was again found at Butch's Marina, the cove between Stony and Lone Tree Points in Torch Lake, and in Alden Harbor. Thankfully, no new sites of colonization were found although fragments were found washed up on the beaches at the south end of Torch Lake, raising the specter of possible new colonies emerging in the near future. Cross-fertilization between native milfoils and *E. milfoil* is known to be occurring, producing hybrid offspring that are hardier, more aggressive, and less susceptible to herbicides than the parent species, and one hybrid plant, detected by DNA analysis, has been found at Butch's Marina. The presence of hybrid milfoil in our watershed provides yet more incentive for us to develop an aggressive plan of attack for 2013.

TLA's recommended approach in 2013, subject to approval by the involved property owners, is as follows:

Retain the services of a licensed applicator to treat Alden Harbor and Butch's Marina with Renovate OTF (granular formulation of triclopyr herbicide) as soon as *E. milfoil* growth occurs in the spring, between June 15th and July 1st. The total cost, which may be shared with TLA by other stakeholders, will be in the vicinity of \$1500.

Place benthic barriers (light-blocking cloth on the lake bottom) around the boat slips at Butch's Marina and, possibly, Alden Harbor after the herbicide treatment has been taken up by the plants. Benthic barriers have an excellent track record of killing vegetation by light deprivation for 6 – 8 weeks. Cost estimates for materials and installation are being developed. The barriers can be re-located and re-used as needed to cover areas to be treated.

Hand dig and remove the remaining *E. milfoil* plants from the cove.

The latter two activities will require the help of volunteer scuba and snorkel divers.

There are advantages of using Renovate OTF, the granulated form



EWM found in Torch Lake, 2012

of triclopyr over the liquid form. With the liquid, the entire water column has the same concentration of the active ingredient and the target concentration lasts for about one day. With the granules, which dissolve slowly, the active ingredient is concentrated in the vicinity of the growing plants and the target concentration is preserved for about two days, increasing the likelihood of lethal uptake by the plants. Since the granular form of the herbicide settles to the bottom of the harbor, some of the active ingredient may also be absorbed by the roots directly through the soil.

The health and environmental safety of using triclopyr for *E. milfoil* control has been evaluated by EPA and by M-DEQ experts and confirmed in carefully monitored field studies. The desirable native plants growing in the harbors are not expected to be affected by this herbicide, especially when it is applied in late June before the native plants emerge from their winter dormancy. Although we do not like the idea of putting chemicals in the lakes, applying a carefully limited amount of material that is known to kill the *E. milfoil* and is rapidly degraded in the environment appears to be an appropriate initial step in controlling the infestation we are confronting. Once the bulk of the colonies has been reduced, successful further control may be achieved using non-toxic means such as benthic barriers.

For further information or to volunteer with the diving activities, contact Becky Norris by phone (231-599-2894) or email (norrisrebe@torchlake.com).

Sediment *continued*

Acoustical Doppler Coupled Device that measured stream flows and channel morphologies of Grass River and its three tributaries, Shanty, Cold, and Finch Creeks. They also used surveyor's instruments to measure the elevations above sea level at specific Global Position System locations. The findings from this project will be the subject of future articles about Grass River sedimentation that will present some ideas for reducing the accumulation of sediment. These may include measures such as reducing the stormwater runoff from roads and other impervious surfaces into the tributaries and increasing the movement of sediment from accumulation areas by installing structures made of natural materials to increase the river flow at strategic locations.

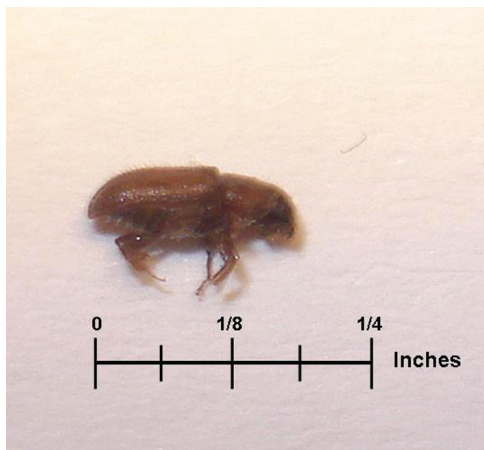
Tamarack beetle; changing the appearance of our wetland areas

By Fred Sittel

In Antrim County and around the chain of lakes a native insect is waging war on a prevalent species of tree and the evidence can be seen all over. The eastern larch beetle, (*Dendroctonus simplex*), has been steadily transforming healthy stands of dark green larch or tamarack, (*Larix laricina*), into pockets of grey ghost forest along shorelines, in wetland areas and in people's backyards. *Dendroctonus* means "tree killers" and the genus includes many species of pine and spruce beetles each with its specific host trees. Tamarack mortality on my five acre parcel in Forest Home township has been high with over fifteen trees lost during the last eight years. According to the U.S. Forest Service, larch beetles were first documented in this country before the turn of the twentieth century and numerous outbreaks have occurred since. In the late 1970's this beetle destroyed more than half the tamarack over millions of acres in central Alaska. More recently, notable infestations occurred during the 1980's in Michigan and Minnesota and in 2000 and 2001 in northern Minnesota.

Tamarack is a unique conifer in that it loses all its foliage during the winter. It can be found throughout the Northeast United States, Canada and central Alaska. The Michigan - Ohio border represents the southern extent of its range. Tamarack usually grow in dense stands, are straight and tall with evenly spaced branches and can reach heights of over fifty feet and trunk diameters over twenty inches. Because they tend to grow in stands, an infestation that is allowed to progress can transform a nice

view into a ghostly scene. There are few viable management strategies for this insect. Spraying the trunks of trees with insecticide can be effective before an infestation occurs but is not effective after beetles tunnel beneath the bark where they spend most of their life cycle. Chemical injection by a trained arborist is expensive and is difficult due to the



Adult eastern larch beetle

tendency of conifers to produce sap at the injection site which restricts uptake. However, there are things property owners should be aware of that can decrease the rate of infestation and limit damage when trees are attacked. More about these in a moment, first it is important to be familiar with the characteristics of this insect and how to identify the early stages of infestation.

Adult beetles are dark or reddish brown around 3/16 in. long. Their life cycle is one year and young adults spend the winter beneath the bark of trees. They emerge between April and June and fly to new host trees where they bore holes through the bark and create vertical tunnels, moving upward in the phloem between the bark and sapwood to feed and lay eggs. The female produces an aggregation attractant which draws other male and female beetles to the host tree. More than one pairing use the same borehole to enter the tree and construct tunnels. The eggs hatch as white colored larvae which feed on the phloem and become pupae and then adults. It takes around eight weeks for a beetle to develop from egg to adult. Before the new generation is mature the adults may reemerge and colonize a second tree, particularly in the warmer regions of tamarack's range. This creates considerable



Beetle boreholes

overlap between broods and many of the young are able to leave their brood trees in late summer and find a new host in which to spend the winter. When beetles colonize a tree they enter the lower portions of the main trunk. They seek protection from predation under flakes of bark and bore 1/12 in. diameter round holes. The small size and hidden location of these holes makes the initial stages of infestation hard to detect. Often the only visible sign is a small amount of reddish boring dust beneath a flake of bark or a light accumulation where the root flare meets the ground.

When adults begin to reemerge they bore directly out from where they were feeding and the exit holes are clearly visible. When a new generation of beetles emerges, a tree that previously looked healthy can become peppered with hundreds of holes in just a few days. By the time this occurs beetles are already attacking nearby trees and the host tree has no chance of being saved. Between the initial attack and emergence of a new generation, a tree will begin to show subtle signs of its demise. Unusual amounts of sap may be seen running down from the upper half of the tree. From a distance, the first noticeable indication may

Please see TAMARACK BEETLE on page 7



Stripping bark reveals beetle larvae

Tamarack Beetle *continued*



Sanitizing a tree using a draw shave

be early yellowing of foliage. In the fall, when one tree's foliage turns yellow in advance of others in the same stand it is often an indication of beetle infestation. If the tree is left standing over the winter it may become partially debarked by feeding woodpeckers resulting in noticeable pieces of bark lying on top of the snow pack.

When infestation is suspected, locally removing small areas of bark with a tool such as a draw shave can confirm the presence of beetles. If the blade penetrates deeply revealing moist yellowish sapwood there are no beetles at that location. If bark strips easily and there is a damp layer of reddish dust beneath it, the tree is infested. Removing additional bark will reveal vertical tunnels and egg chambers which score the sapwood. Usually a mix of adults and larvae will be present. So what can property owners concerned about their trees do against such a formidable pest? Local eradication of the eastern larch beetle is not a possibility but there are a number of things property owners need to know.

Eastern larch beetles readily attack storm damaged trees and breed successfully in logging slash, so it is important not to allow these materials to accumulate. Unaware of this insect, property owners often fail to remove infested trees before a new brood emerges or cut and stack infested wood on their property for outdoor fires allowing the beetle to complete its life cycle. Regular tree inspection followed by cutting down and sanitizing infested trees is the best defense against this insect. If the infestation is detected in the fall after nighttime temperatures drop below 40 F the tree can be cut down and sanitized over the winter.

Sanitizing is accomplished by stripping the bark using a draw shave. Beetles tend to accumulate around the base of the lower branches at the intersection to the main trunk so branches should be cut flush with a chain saw to make stripping bark easier. When bark is removed during the winter months it can be left on the ground and beetles and larvae will die of exposure. During warmer periods adult beetles may survive this procedure so the bark should be collected and submerged overnight in a water-filled covered container. The ground where the tree was debarked should be sprayed immediately with an insecticide intended for wood boring insects. The most effective products will contain the synthetic chemical *permethrin* which is similar to the natural insecticide *pyrethrum* that comes from the chrysanthemum plant.

If you want additional information or need help with something I discussed in this report you can contact me, Fred Sittel, at (231) 377-7818. Additional information about the eastern larch beetle is available from the U.S. Forest Service at www.na.fs.fed.us/spfo/pubs/fidls/elb/elb.htm

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Three Lakes Association is a 501(c)(3) corporation. Your dues and other contributions are tax deductible. Call for further information.

* * * * *

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THREE LAKES ASSOCIATION
P.O. Box 689
Bellaire, MI 49615

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P.O. Box 689
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231-350-7234
www.3lakes.com

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committee met for the first time on Dec. 11th to find alternate means of supporting our education program. Any grant that TLA may be awarded as a result will go toward funding unfulfilled grant requests. Donations earmarked for education are always welcome!

Bellaire Public Schools		
* Brain Bank Boxes	Karen Smolinski	1st/2nd grade
* Grass River Natural Area field trip	Sue Mills	4th grade
* Two Traveling Education Trunks	Keili Fischer	5th grade
* Apple TV for use with Smartboard		
Central Lake Public Schools		
* 5 science magazine subscriptions	Kari Groll	Kindergarten
* (whole class sets)		
* Mimio Teaching System	Lisa Hoogerhyde	4th grade
(portable hardware that converts		
a white board to a smartboard)	Michelle Perkins	5th grade
Kalkaska Public Schools		
* National Geographic Young Explorer	Randall Atwood	2nd/3rd grade
Magazine (whole class set)		
* Grass River Natural Area field trip		
* Watershed field kit		
* Watershed protection student activity		
booklets		
* Reflection activities	Anne Devol	4th/5th grade
* 3 Kindle Fires		
Mancelona Public Schools		
* 3 science tubs	Ann Grammer	K-4 science
* 2 sets owl pellet dissection kits	Nikki Willison	6th grade
* 70 squid for dissection		
* 2 TI Inspire graphing calculators	Larry Rager	Chemistry

Grants awarded by school district:

SEOP. This year, revenue from the outing was down. A grant search annual GRNA/TLA Golf Outing has been the major source of funding for the annual Inland Seas scholarship \$1600 of the total is earmarked for the annual Inland Seas scholarship \$4000 for grant requests. The an-



5th Graders in Bellaire using their new White Board

By the grant application deadline of Nov. 15th, eleven teachers had applied for grant requests totaling almost \$20,000. Board members Dean Branson, Norton Bretz, Nancy Hanson, Mark Knight, Ann McClelland and Patricia Roush met to review the applications and make selections in early December. TLA has had to cut back on funding for SEOP to \$5600, for the 2012-13 school year, making for a challenging grant selection process. \$1600 of the total is earmarked for the annual Inland Seas scholarship \$4000 for grant requests. The an-

TLA Education News
By Patricia Roush