Freshwater rivers & lakes provide for Ojibweg across Territory

By Charlie Otto Rasmussen
Editor

It’s around midnight in mid-April. Just past the roiling froth below Upper Michigan’s Escanaba River dam, Bay Mills members spear ogaaw from a maze of rocks and broken concrete cobble. Between freight trains sounding off to the northwest and intermittent traffic overhead, clunking across the US Highway 2/41 bridge, it’s a unique setting, unlike the typical Northwoods walleye lake—silent save the calls of new loon arrivals.

Here on the river, walleye harvesters swap out motor boats for rubber chest waders, stepping carefully across slippery rocks as the current pulls downriver to Lake Michigan. Headlights powered by AA batteries replace the heavier miner-style helmets often used on inland Ceded Territory lakes. But the reflective eyes shine all the same, marking ogaawag in pools that include white suckers and other fish.

“I’ve been coming here for about seven years now. It’s a really nice spot to get some fish,” says Lynn Carrick of Bay Mills Indian Community. Carrick, a Bay Mills member living near Sault Ste. Marie, fished with Adrian Hatfield, a Bay Mills member near Sault Ste. Marie.

Upon the steep riverbank, GLIFWC Officer Gale Smith monitors the treaty harvest. Other fishermen are also drawn (See Freshwater, page 17)

Chronicles of Mille Lacs:
The walleye, the zebra mussel, & the waterflea

By GLIFWC Inland Fisheries Section

Very quickly, the adult walleye population declined (see “A closer look at Mille Lacs management” on page 7 for more info). Tribal and state biologists reduced harvest levels to preserve what was left, but death rates of young unharvestable walleye remained high. Around the same time, two food chain rearranging invasive species, the zebra mussel and the spiny waterflea crashed into the lake ecosystem. Were these the culprits in the walleye decline?

Very quickly, the adult walleye population declined (see “A closer look at Mille Lacs management” on page 7 for more info). Tribal and state biologists reduced harvest levels to preserve what was left, but death rates of young unharvestable walleye remained high. Around the same time, two food chain rearranging invasive species, the zebra mussel and the spiny waterflea crashed into the lake ecosystem. Were these the culprits in the walleye decline?

The zebra mussel is a filter-feeding animal about the size of a quarter with alternating stripes on its shell. This little strainer is native to eastern Europe and western Russia. It was first found in the Midwest in the Great Lakes in 1988 after hitchhiking in the ballast water of large vessels. Since its discovery in the Great Lakes, it has caught a ride with unsuspecting boaters to several inland waters, including the 132,500 acre Mille Lacs Lake. Zebra mussels are extremely prolific, females can produce up to 500,000 eggs, and eventually, the young will attach to any hard surface available.

Zebra mussel densities on the Mille Lacs Lake floor skyrocketed from 0.00016 per square foot in 2005 to a high of 1,269 per square foot in 2012 (Figure 1). Zebra mussels consume the tiny microscopic plant-like organisms called phytoplankton that form the base of the Mille Lacs food chain. What this might mean is less zooplankton (microscopic animal-like organisms which feed on phytoplankton) for baby fish.

The walleye, the zebra mussel, & the waterflea

Spiny waterflea. (Gary Montz, 144, Bugwood.org)

Lynn Carrick emerges from the Escanaba River in Upper Michigan with a pair of walleyes last April. (CO Rasmussen photo)

The walleye, the zebra mussel, & the waterflea

Spiny waterflea. (Gary Montz, 144, Bugwood.org)

Lynn Carrick emerges from the Escanaba River in Upper Michigan with a pair of walleyes last April. (CO Rasmussen photo)
High honor for GLIFWC environmental biologist

The Environmental Protection Agency (EPA) presented the Taimi Lynne Hoag Award for Environmental Stewardship to GLIFWC’s John Coleman at a ceremony April 6th in Chicago. The EPA Region 5 Tribal Operations Committee selected Coleman for the prestigious award for his work on a wide range of environmental protection projects throughout the Ceded Territories.

Each year the award recognizes significant contributions in environmental management and/or environmental stewardship in Indian country. Nominations are solicited from all tribes in Region 5 annually. Nominees are considered and selected by the RSTOC Tribal Caucus.

The EPA established the award in March 2003 to recognize the environmental protection accomplishments and contributions of Taimi Hoag, the former Environmental Director for the Little Traverse Bay Band of Odawa Indians. Hoag was a community, regional, and national leader for environmental protection in Indian country.

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Counting every fish

Harvest monitoring on Mille Lacs Lake

The 2017 spring tribal harvest season in the Mille Lacs Lake area is all wrapped up. Through long nights and cold weather, GLIFWC and tribal creel clerks, wardens, and biologists worked together to ensure that the process ran smoothly.

But what went into tracking all of this harvest? It turns out that a lot of work is involved with recording catch information and managing the fishery within the quota.

Every day, tribal officials provided GLIFWC personnel with a list of Mille Lacs Lake boat landings where band members wished to spear or gill-net. Creel teams, wardens from some individual tribes, plus GLIFWC wardens and biologists, were then notified and sent to those “named landings” to issue spearin or netting permits, which hold information such as the name of the harvester, walleye bag limit, and type of fishing gear being used. The creel team, biologist, and/or warden remained at the landing while spearin or netting activity was occurring.

After band members were finished with spearin or netting, they brought their catch back to the landing where the crew team counted and weighed each and every fish for all species; additional information such as length, sex, and age data was collected from a sub-sample of the total harvest and recorded on a catch report form.

After all the fish were creelled at a landing, a warden or biologist entered the catch data into an online database that automatically updated quota balances.

Based off this information, tribal officials, wardens, and biologists could determine bag limits and the number of netting or spearin permits that could be issued to band members the following night.

This entire system of recording and tracking tribal harvest has enabled GLIFWC and tribal staff to closely monitor quota balances, successfully keeping the walleye harvest well within quotas on Mille Lacs Lake every year.

Chi-emijeweh to all GLIFWC and tribal staff, including creel clerks, wardens, and biologists who were involved in this process!

---Ben Michaels

Spearfishing stories in Waaswaagoning

By: Dylan Jennings, Staff Writer & Melanie Montano, GLIFWC TEK Outreach Specialist

The warm and cleansing smell of sage filled the room as community members flooded into the Waaswaagoning (Lac du Flambeau) multipurpose building. It was that time of the year again and tribal members were excited to share about it.

Spearfishing has been a traditional subsistence practice for many Ojibwe Bands for centuries. Spearfishing is both a selective and effective means of harvesting the much needed giigoonh (fish). Tribal members can spearfish year round, which even includes spearfishing through the ice. The Waaswaagoning community has a deeply rooted relationship with the giigoonh as its name clearly indicates. Lac du Flambeau or Lake of the Torches refers back to European contact. The French fur traders would see Anishinaabeg fishing out of canoes guided by torchlight. Today, this tradition continues.

A ceremonial pipe traveled around the room and a prayer was spoken on behalf of the people and for the food. Shortly after, food was served and the stories began. Tom Maulson, former Lac du Flambeau Chair and walleye warrior started the gathering by recalling the struggle that Anishinaabeg had to endure. Children listened intently as the elder spoke the truth. “We had rocks thrown at us. Some of us wondered if we would even make it home on some of those nights.”

Vice Chairman John “Goober” Johnson recalls both the resiliency and generosity shown by Anishinaabeg: “When I harvest, sometimes we get a hundred fish. But everyone knows those fish don’t go to my freezer—they always end up feeding our elders, our single mothers, and at ceremonies. We are giving people and I see this tradition carried forward even today.”

Many of the harvesters nod in agreement. Harvesting not only translates into feeding your immediate family, but it extends to the community.

Shortly after the LCO (Lac du Flambeau) Decision in 1983, all hell broke loose in Northern Wisconsin. Boat landings were filled in the evenings with hostile protestors, angered by the reaffirmation of treaty reserved rights. It was the memories and stories of these times that inspired Tom Maulson’s idea of this event. When approaching some Waaswaagoning elders about the event, a few felt they wouldn’t have much to share. Yet it was those ones who had some of the strongest voices that evening that were heard by the younger generation.

“I think about what I need to do as a person living the days that I have on this here earth. The best ideas that came, to share it with our young people because they’re the generation that’s going to be around for a while,” said Tom Maulson.

On the cover

Wildlife Biologist Peter David photographed this ayaabe near Sandy Lake, Minnesota in late July last nighbn. ZIlgwiiw designatum: Melanie Montano and Hannah Pance co-authored the article “Resources like waaboozog, snow sheds light on climate trends” with Kim Stone on page 11.
Ceded Territory news briefs

Moose survey incomplete after snow melt

Marquette, Mich.—Mild winter weather with limited snowfall prevented the Michigan Department of Natural Resources (DNR) from completing a moose population analysis in the Upper Peninsula. A dramatic thaw in January melted much of the snow cover that researchers rely on to spot moose from the air.

Using three airplanes that fly over a sprawling grid of study plots, the DNR conducts moose population surveys every other year. Following the January 2015 assessment, biologists estimated moose numbers at 323 animals, a 28% drop from 2013. Despite the abbreviated survey this past winter, the DNR maintains the same official population estimate since the moose population has held steady in recent years.

“After analyzing the survey data, the DNR’s biologists concluded that, because of challenges experienced during the survey, the results should not be used,” said Chris Swartz, Keweenaw Bay Indian Community Chairman, who encourages the public to stand up for natural resources across the region.

“Clean air, clean water, are both really important to us at Keweenaw Bay Indian Community and to everyone around the Great Lakes,” Swartz said. The MIEC advocates for improvements in Native American education across the state. The conference draws a broad range of participants including students, teachers, policy makers, and Title VI Indian education program administrators. For more see www.miec.org.

—CO Rasmussen

Critical Issues for Michigan Natives

Marquette, Mich.—Drum songs and good words led off Michigan Indian Education Council’s (MIEC) Native American Critical Issues Conference March 24 at Northern Michigan University. During opening remarks, Chris Swartz, Keweenaw Bay Indian Community Chairman, encouraged attendees to stand up for natural resources across the region.

“Clean air, clean water, are both really important to us at Keweenaw Bay Indian Community and to everyone around the Great Lakes,” Swartz said. The MIEC advocates for improvements in Native American education across the state. The conference draws a broad range of participants including students, teachers, policy makers, and Title VI Indian education program administrators. For more see www.miec.org.

—CO Rasmussen

Birch Grove Campground closure on Chequamegon-Nicolet NF

Over the last couple of years the Chequamegon-Nicolet National Forest (CNNF) recreation program has been facing significant challenges related to increased operational costs and a decrease in the amount of funding available to cover these costs. This led to closures and reduced services at various recreational locations including campgrounds, day-use sites, and trails.

According to the CNNF: “Once again, the Forest will be focusing its efforts on the recreation areas open to the public in 2017. As a continuation from the last two years, a small portion of the Forest’s recreation areas will have reduced service and/or be closed again this season. Many of these areas are a carryover from the last two years with a few minor adjustments passed on the feedback we received. These changes are once again necessary given our current recreation budget.”

Upon review of the campground listings, the only significant change campers can expect from last year is the closure of the Birch Grove Campground on the Washburn Ranger District. This campground is closed due to the storm damage that was sustained in 2016.

All updates and closures can be found at: https://data.glifwc.org/camping/
or www.fs.usda.gov/recmain/cnf/recreation.

Be sure to visit your registration clerk to receive your camping permit and directions on how to submit the fee envelope at the campgrounds. —Alex Wrobel
A closer look at Lake Mille Lacs management

By GLIFWC Inland Fisheries Section

Mille Lacs (a shallow, well-mixed lake, with moderate amounts of dissolved nutrients (“mesotrophic”)) is a famous walleye (ogaa) fishery in Minnesota harvested by both tribes and state anglers. Walleye are harvested by the Mille Lacs, Fond du Lac, Bad River, Mole Lake, St. Croix, Red Cliff, Lac du Flambeau, and Lac Courte Oreilles tribes located in the 1837 Ceded Territory.

Tribal members traditionally harvest walleye during the spring spawning period with gill nets and spears, with minimal harvest occurring with rod and reel throughout the year. Mille Lacs Lake is also a prominent walleye fishery among recreational anglers, who target walleyes with hook and line year-round, except during early spring. As a result, tourism associated with the walleye fishery supports the local economy. Overall, walleye have been the centerpiece for both subsistence and recreational fishing in Mille Lacs Lake.

Cooperative walleye research

The Minnesota Department of Natural Resources (MNDNR) with support from the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and Mille Lacs Band of Ojibwe conduct gill net surveys throughout the lake each fall. These surveys allow biologists to estimate the number of mature adult walleye in the lake. These yearly estimates of adult walleye abundance are supported by a more laborious mark-recapture population estimate, approximately every five years. In 1999, Mille Lacs Lake had over 2 million pounds of adult walleye but declined to approximately 1.5 million pounds in 2005, a low adult walleye biomass for this lake but within the range of natural variation. Unfortunately, adult walleye stocks continued to decline, reaching an all-time low of approximately 0.7 million pounds in 2013. Luckily, a relatively large year-class (i.e., lots of young walleye) was produced in 2013, and most survived to become adults, resulting in a moderate increase to 0.89 million pounds of adult fish in 2017. Even with this moderate increase, the pounds of adult walleye are still well below historical levels (Figure 1). The production of more large year-classes (i.e., lots of babies) and subsequent survival to adulthood is required to recover walleye stocks to near historical levels.

Mortality estimates include fish that die after being released by anglers.

Monitoring the harvest

MNDNR, GLIFWC, Mille Lacs, and Fond du Lac are responsible for monitoring harvest of walleye from Mille Lacs Lake throughout the year. Creel surveys conducted by the MNDNR collect information from individual anglers about species, fish size, bait type, number of hours fished, number of fish caught, number of boats, and number of ice shanties. From this information, MNDNR estimates the number of walleye harvested by anglers every year, including the number of fish that die after being released. GLIFWC counts and weighs every fish captured by netting or spearing, thus providing an exact number of walleye that tribal members harvest by these methods every year. Combined, these numbers equal the total walleye fishing mortality every year. In 1999, total fishing mortality was approximately 625,000 lbs but was reduced by more than half in 2005 (~275,000 lbs) because of a lower adult population size. Total fishing mortality decreased again to 160,000 lbs in 2013 when pounds of adult fish was at its lowest (~0.7 million pounds). Corrective management actions were taken by the State of Minnesota and Ojibwe Bands to limit harvest to relatively low levels so that adult walleye stocks would not continue to decline, with a low total fishing mortality of approximately 46,000 lbs in 2016 (Figure 1, Figure 3).

The invasive species wildcard

A potential complicating factor in understanding the decline of walleye in Mille Lacs Lake was the introduction of invasive species. In 2005, zebra mussels were found in Mille Lacs Lake, which were most likely introduced by hitchhiking on boats and trailers or in bilge water. Similarly, spiny waterflea was introduced in 2009 and again, these organisms were most likely transported by unknowing boaters (see invasive species article this issue for more info and this website [http://stopaquaticchichikers.org]). These invasive species can compete with and consume native zooplankton (microscopic organisms that age-0 fish eat), which can negatively affect their population size. In fact, by 2012, the native zooplankton population decreased from ~60/liter to less than 20/liter, directly correlating with the increasing number of spiny waterfleas and zebra mussels in the lake. The effect these exotic species have on top predators (walleye, northern pike) remains unclear, but research efforts are underway that will attempt to understand how productivity and food web connections (who is eating whom) might have changed since these invasions. Although more research is needed to understand recent changes in the walleye fishery, it is clear that continued implementation of a conservative management strategy will help promote recovery. The good news is that the State of Minnesota and Ojibwe Bands have agreed to a small increase in the total fishing mortality to 64,000 lbs in 2017. This approach will result in a moderate increase in the mature adult population in 2017, an outcome that should assist with the recovery of this fishery. GLIFWC and MNDNR will need to monitor this fishery closely over the coming years to ensure management strategies (e.g., habitat protection, harvest limits) are achieving mutually agreed upon recovery goals.

Please contact Dr. Aaron Shultz, Mark Luering, Ben Michaels, Carl Klimah, Dr. Adam Ray, or Joe Dan Rose for more information.

Changes in the Ecosystem

Figure 1. Total Fishing Mortality

Figure 2. Adult walleye biomass (pounds of adult fish) in Mille Lacs Lake from 1998 to 2016. Solid line represents a best fit curve.

Figure 3. Walleye fishing mortality in Mille Lacs Lake from 1998 to 2016. Mortality estimates include fish that die after being released by anglers.

Zebra Mussels. (National Oceanic and Atmospheric Administration, Great Lakes Environmental Research Laboratory photo)
Making sense of good years, bad years on manoomin waters

By Peter David, GLIFWC Wildlife Biologist

Ask a simple question; get a complicated answer. This is the way nature often works.
I have frequently been asked: “does manoomin abundance cycle?” The question certainly seems straightforward. Rice harvesters of course are familiar with the great variability rice can depict between years, but they often wonder if there is a pattern underlying that variability. Are the year-to-year changes they witness in the field more or less random, or is there some pattern—even a rough one—governing these changes over time?

Over the years, I have certainly read references suggesting that rice “cycles.” But does it really?
Probably the best support for cycling comes from a paper published in 1989 that looked at wild rice production in Ontario, Manitoba and Saskatchewan between 1970 and 1987. That data suggested cycling of abundance might be occurring on the province level in Ontario and Manitoba—but not Saskatchewan—on roughly a 4-year period. Pretty interesting data at first blush, but that paper also exemplifies the challenges inherent in trying to answer this question.
First of all, it turns out the question—does wild rice abundance cycle?—is really too vague to easily answer. For one thing, it’s not clear at what scale the question is being asked. An individual lake? A region, state or province? The answer could be different at different scales. For example, individual lakes could be cycling, but unless they are in synchrony with each other, that cycling would be lost when measured at a regional scale.

It’s also important to note that the Canadian data was tracking commercially harvested wild rice. In Canada, much of that harvest is coming from “semi-domesticated” wild rice. While this rice is generally grown on natural lakes, it is often subject to a much higher level of management than true wild-growing manoomin.
For example, water levels may be tightly regulated and bed density is often manipulated through thinning. In addition, commercial harvest levels can be influenced by market prices and other factors. In fact, it is likely that the lack of cycling in Saskatchewan may have been due to a marked increase in production during the study period. These factors and others suggest that data based on commercial harvest may not accurately reflect what is happening on more natural stands.

(See Making sense of good years, page 23)

Manoomin restoration brings together tribal, federal, state stakeholders

By Paula Maday
Staff Writer

Odanah, WI—Survival. Ecosystem. Grandmother. Priority. To start the Lake Superior Manoomin Restoration Workshop on April 11-12, participants introduced themselves and shared one word to describe what manoomin means to them.

The words ranged from cultural to economic to biological in nature, accurately reflecting the complex interests on the table for the gathering between tribal, federal, and state agencies.

The purpose of the workshop—organized by the National Oceanic and Atmospheric Administration (NOAA) with a planning team of representatives from the Bureau of Indian Affairs, Fond du Lac Band, Bad River Band, Keweenaw Bay Indian Community, and GLIFWC—was to provide a meaningful opportunity for tribal communities to share knowledge and exchange perspectives on wild rice management and restoration.

Specific objectives included: identifying the best areas and approaches for wild rice restoration efforts in the Lake Superior region, understanding opportunities and challenges for the restoration of wild rice, and identifying priority needs for restoration success—including tangible outcomes for potential funding from the Great Lakes Restoration Initiative (GLRI).

Culturally relevant viewpoints punctuated opening presentations by Roger LaBine, Lac Vieux Desert Band, who talked about wild rice as an important part of his cultural identity, and Edith Leoso, Bad River Band, who shared the history of manoomin as told in Ojibwe prophecies.

“The history of wild rice grounds us to this place that we were guided to for our survival, for our livelihood,” Leeso said. “We were guided to follow the path to the place where food grows on water. We are to take care of that good seed so that the good seed takes care of us,” she said.

So how is the “good seed” being taken care of? Workshop participants first shared their knowledge of manoomin, developing an understanding of historical wild rice coverage, old and new monitoring techniques, and commonly used management and harvesting practices.

Darren Vogt, Environmental Director for the 1854 Treaty Authority presented to the group on the biology of wild rice, wild rice presence in Minnesota and how the Authority is monitoring wild rice abundance in the 1854 Ceded Territory.

According to Vogt, the Authority has had a wild rice monitoring program in place since 1998 and has consistently observed a suite of ten lakes since 2002. Activities include tracking water depth and temperature on each lake after ice out until late fall. Field measurements and lab analysis of water samples are also conducted to garner information on water quality. Finally, biologists estimate wild rice density on each lake when rice is standing and mature.

More information on these efforts can be found in the report “Wild Rice Monitoring and Abundance in the 1854 Ceded Territory (1998-2016)” at www.1854treatyauthority.org. Additional tribal and government representatives indicated they conducted similar monitoring programs within their areas.

Under Stress

Day two began with a panel discussion on the stressors affecting wild rice and the impacts on harvesting. Identified stressors include hydrology, climate change, recreation, and some plant communities. All panelists agreed however, (See Manoomin, page 15)

What does manoomin mean to you? Participants in the Lake Superior Manoomin Restoration Workshop on April 11-12 each chose one word to describe what manoomin means to them. The collage of words shows the complexity of interests involved in manoomin restoration efforts. (PM)

What a difference a year makes: manoomin abundance in back-to-back years on Pacawawong Lake. (Peter David photos)
Sugar Island research to expand Bay Mills harvest options

Mainland sugar bush a family affair

By Charlie Otto Rasmussen, Editor

Sault Ste Marie, Mich.—With an eye to expanding harvest opportunities for tribal members, Bay Mills Indian Community’s Inland Fish & Wildlife Program is investigating the wilds of Sugar Island situated in the far-east of the Upper Peninsula. Much of the island’s 606 acres of reservation holdings on the island are uninhabited and heavily wooded.

“We’re determining what’s available there, from wildlife to plant species,” said Emily Martin, Bay Mills biologist and project leader. “The main reservation occupies a small area, and these surveys should help expand on-reservation options for members.”

Just east of Sault Ste Marie, the St. Mary’s River wraps around the island, which forms the international boundary with Canada. Bay Mills’ primary land base is located to the west on Lake Superior at Washkewa Bay.

The study kicked off this past winter focusing on the island’s namesake resource: the sugar bush. Following a short ferry ride, Bay Mills natural resources staff strapped on snowshoes, trekking through dense woods to a mixed stand of maples in late February. They tapped both red (soft) and sugar (hard) maples, installing a five gallon bucket below each spile. The large sap receptacles allowed researchers to wait a week or two between visits to check the 24 tapped trees.

While sugar maples are the signature species for syrup production, scientists expect red maples to fair better in the future as the region continues to warm under climate change. Depending on variables like site conditions, it typically requires more red maple sap than from sugar maples to make a gallon of syrup. The reds have a slightly lower sugar content.

Trees in the Bay Mills study yielded sugar percentages between 1.8 to 4.4 with an average around 2.5%, Martin said. Since the trees were selected after the fall leaf-drop, Martin and her crew plan to return to Sugar Island this summer to pair up individual trees—red or sugar—with the corresponding sugar content results.

Martin said that while the island holds potential for a resurgence in maple production, another culturally important tree species is fading fast from an exotic invasive insect.

“There a lot of dead ash out there,” she said. “Every tree we checked had EAB holes in them.” EAB, or emerald ash borer, first arrived near Detroit in shipping containers from China around 15 years ago.

Since then, the ash-killling insect has made its way to isolated locations in a handful of Ceded Territory forests—from Michigan to Wisconsin and Minnesota. For black ash basket crafters from Bay Mills and other regional native communities, EAB means a lot of uncertainty about the future of the ash resource and makes locating healthy trees increasingly difficult.

(See Sugarbush, page 22)

Remote cameras keep a close watch on the seasons

By GLIFWC Biological Services Staff

The second field season of the GLIFWC phenology project is well underway. GLIFWC’s climate change scientist Hannah Panci and wildlife biologist Travis Bartnick have been visiting the two study sites since March, making observations and recording the phenological status of each plant that has been tagged for monitoring.

Prior to the start of the growing season, Hannah Panci and Travis Bartnick visited the locations of the time-lapse cameras that have been placed at strategic locations to record images of the forest canopy (Figure 1). During their site visits, they cleaned the time-lapse camera lenses, checked for any new obstructions in the photo frame, and replaced the rechargeable batteries and memory cards in preparation for the 2017 growing season.

Remote cameras have been gaining popularity for many uses, including hunting, birding, and science-based monitoring. One of the ways scientists have been using remote cameras is to monitor the phenology (the study of the timing of biological events over time) of vegetation on the landscape with digital repeat photography. The cameras used for this purpose can come in many forms, including remote trail cameras, cameras designed specifically for time-lapse photography, and even security cameras near parks and college campuses. When used to monitor phenology, these cameras are collectively known as “phenocams.” Phenocams are typically programmed to capture digital photos at regular intervals from a fixed position throughout the growing season. When the photos are sorted, processed, and played back in a movie format, we can observe the transition of the seasons at a rapid pace. Since most of the phenocams have a date and time stamp associated with every photo, we can use the photos to determine the date that the tree canopy greens up in ziigwan (spring), and the date when the leaves begin to change color in dagwaagin (autumn).

Scientists at Harvard University, the University of New Hampshire, and other partners have taken this idea a step further by developing a phenocam image processor graphical user interface (GUI). Digital photos are made up of pixels, and the color within each pixel typically contains a mix of red, green, and blue (RGB) values. The phenocam image processor allows the user to calculate the proportion of green values from the raw RGB values, resulting in a greenness chromatic coordinate (Gcc) value for each image. The GUI also allows the user to define and analyze a specific region of interest in the photo frame (Figure 2).

(See GLIFWC phenology project, page 19)
**Habitat central to sharp-tailed grouse success**

**USFS leads project with Red Cliff, WI & MN DNRs**

By Charlie Otto Rasmussen, Editor

Ino, Wis.—As the habitat diminished in the Moquah Barrens, so did the aagaskoog. Unlike their relations—the ruffed grouse, which thrive in deep aspen forests—sharptails are a bird of pine barrens and prairie. It’s the kind of country Great Lakes Indians historically set aside to rejuvenate the plant community, create small patches of bush habitat for all manner of small birds to large four-legged mammals. But fire suppression and tree growth transformed the landscape into a dense woodland through the 20th Century. “By 2014 we were down to one known lek with only two known dancing males,” said US Forest Service (USFS) Wildlife Biologist Brian Heeringa.

Over the past eight years the USFS has implemented a plan to restore a large portion of the Moquah Barrens—high, rolling sand country near the Gichigami South Shore—back to a functioning pine savannah and pine barrens ecosystem. Loggers cut vast swaths of jack and red pine, and fire specialists conducted prescribed burns, refreshing understory plants. Through a broad inter-agency effort, wildlife managers are also infusing the ecosystem with sharp-tailed grouse, known as aagaskoog in the Ojibwe language.

**Mating season round-up**

A half-dozen Red Cliff tribal natural resources staff joined Heeringa and others in northwest Minnesota this past spring to trap, tag, and box up wild sharp-tailed grouse. The project team spent several weeks in Minnesota—split between Karlstad and Baudette areas—to capture 67 grouse for the Moquah Barrens. That number is the result of trapping efforts in the Baudette and Ino, Wis. areas, where sharply-tailed grouse congregated during the breeding season, said US Forest Service (USFS) Wildlife Biologist Brian Heeringa.

The translocation of the captured elk is part of an agreement between the WDNR and the United States Forest Service to help restore a native species, “The intent of translocating the elk from Kentucky is to boost the elk herd and to provide additional genetic diversity in Wisconsin. One of the ways GLIFWC and WDNR have been involved in the translocation efforts is through the purchase of feed for the elk during the quarantine period in Kentucky and during the time they are in the holding pen near Winter. Beyond assistance from GLIFWC and WDNR, general tribal gaming contributions to the elk reintroduction program total $1,748,100 since the State of Wisconsin’s 2001-2002 fiscal year.

**Turning them loose**

It took a number of trips to get all the captured birds from Minnesota to Wisconsin. The last transfer took place May 5 when Greg Kessler, Wisconsin Department of Natural Resources wildlife biologist, received 10 grouse in four wooden boxes. Kessler arranged the boxes—fitted with sliding doors—around a large livestock trailer.

“After tying off individual nylon cords to each door, Kessler extended the ends under the blind. He positioned a small speaker box—the kind predator hunters use to call in coyotes—out into the middle of the lek, then went into hiding. On a hand-held remote control, he hit play. Instead of pitched yowling, the box broadcast soft cooing and other soothing sounds made by sharptails. Kessler whispered in the late afternoon. “We want the birds to come out and take in their surroundings rather than bursting out, randomly flying off.”

After tying off individual nylon cords to each door, Kessler extended the ends under the blind. He positioned a small speaker box—the kind predator hunters used to call in coyotes—out into the middle of the lek, then went into hiding. On a hand-held remote control, he hit play. Instead of pitched yowling, the box broadcast soft cooing and other soothing sounds made by sharptails.

Fifteen minutes later, he pulled the doors open one by one. A few birds took off wildly, but most of them took time to walk around and inspect the lek. Like a gifting party, local male birds began showing up, dancing and weaving around atop pounding legs. After a time, all the birds walked off in pairs and threes into the rolling hills of bare trees, low grass, and sweet fern.

Biologists hope to repeat the trap-and-transfer effort one more time in 2018.
Public engagement, education key to phragmites control

By Jennifer Ballinger, GLIFWC Outreach Specialist

Duluth, Minn.—According to the Lake Superior Lakewide Action and Management Plan (LAMP), aquatic invasive species (AIS) are a high threat to the lake and surrounding basin due to their tendency to outcompete native species and the changes they make to the local ecosystem.

Recently, a nonnative variety of phragmites has been found in the wetlands and shorelines of the Lake Superior basin. Infestations in the basin are not yet well established and removal efforts, such as the one in the St. Louis River estuary, are underway to prevent further spread.

An open house sponsored by the St. Louis River Alliance April 20 featured informational booths about in-basin AIS prevention and promoted awareness of the environmental impacts of phragmites. Landowners learned how to prevent the spread of phragmites and the removal process if the invasive plants are on their property.

The event provided an opportunity for stakeholders to interact with invasive species experts during a panel discussion followed by a question and answer session. The panel featured Wildlife Section Leader Miles Falck who shared his experiences of removing phragmites in the Ceded Territories as well as efforts by other agencies working on LAMP objectives and the Great Lakes Restoration Initiative (GLRI).

Don’t forget to check these spots for hitchhikers.

Phragmites. (Leslie J. Mehrhoff, University of Connecticut, Bugwood.org)

Ganawendan Ginibiiminaan (Protect Our Waters)

Aquatic invasive species (AIS) can have negative impacts to treaty resources including spawning and fish habitats. Remember when out on the waters to take the precautions to prevent their spread. Watch for invasives hitching rides on plant fragments, mud or debris!

Stop Aquatic Invasives

- REMOVE any mud or debris, plants and animals from your boat, trailer and equipment
- DRAIN all water from boat, fishing boxes and equipment ensuring it does not drain back into the waterbody.
- CLEAN or DRY boat, trailer and all equipment that came into contact with water including nets, buoys, anchors, ropes and lines, etc.

Equipment

- Lines & Anchor
- Nets and Net Roller
- Boat or Motor
- Ropes
- Buoys
- Ladder

Don’t forget to check these spots for hitchhikers.

No news is good news

Last fall’s emerald ash borer (EAB) update (“Turtle Island’s forests at risk,” Winter 2016-2017 Mazina’igan) mentioned new county quarantines for EAB in central Upper Michigan, northern Wisconsin and around Duluth, Minnesota. Since then something notable has happened: No new Ceded Territory counties have been quarantined! While no one can say for sure whether or not more northwoods infestations will be found this summer, it appears as though the EAB is spreading into the region more slowly than expected. So chi-miigwech to everyone who has taken the “don’t move firewood” message to heart!

We still have a modest number of 12 x 18 inch aluminum “Don’t Move Firewood” signs available. Tribal wardens, natural resource people and others are encouraged to put them up along main roads into reservations, at tribal campgrounds, at powwows, and anywhere else where they may remind people of what’s at risk. We also have flyers about EAB and other forest invasives. We can send you copies, or you can download your own from www.glifwc.org/Forest_Pests/Education.html.

Protect Great Lakes forests

DON’T MOVE FIREWOOD!

Help stop the spread of pests and diseases in the Great Lakes region

Buy your local firewood at or near your destination.
Boardman River project aims to block lamprey, support fishery

Underway in Michigan 1836 Ceded Territory

Traverse City, Mich.—A consortium of fishery management and research institutions has selected Lower Michigan’s Boardman River as the site for a first-of-its-kind project to develop and evaluate the effectiveness of technologies to pass desirable fish around river barriers while simultaneously blocking harmful species, most notably the destructive sea lamprey.

The ten-year project, led by the bi-national Great Lakes Fishery Commission, will take place at the Boardman River’s Union Street Dam. The initiative has gained widespread attention, as lessons learned may be applied to other rivers and optimized to create selective bi-directional fish passage at new sites. The Traverse City Commission unanimously endorsed the technology demonstration and evaluation project during a meeting last fall.

The Great Lakes Basin contains hundreds of thousands of barriers, some dating to the beginning of European settlement in the region. Although the basin’s dams often serve industrial, recreational, aesthetic, and ecological purposes, they also block fish access to streams. Many Great Lakes fish move up streams at some point in their life to live, feed, and reproduce. Barriers segment and disrupt natural stream ecological functions, which affect aquatic species and inhibit fish movement while undermining sound fishery management. However, barriers also play an essential role in protecting fish from harmful invasive species and fish disease. Sea lampreys, a noxious, destructive pest, for instance, are denied access to tens of thousands of miles of prime spawning habitat by effective barriers. In fact, without barriers to block sea lampreys, the $7 billion Great Lakes fishery would not exist as we know it today.

The Great Lakes are not alone in coping with the legacy of barriers, as managers globally struggle with rehabilitating fisheries in disconnected river ecosystems while managing around invasive species.

“One of the major fishery management challenges of our time is to find ways to allow desirable fish to pass barriers while denying passage to harmful species like sea lamprey,” said Commission Chair David Ullrich. “This project will bring together the best minds, the best fishery managers, and the best engineers to identify promising technologies, test those technologies in a real-world setting, and optimize to create selective bi-directional fish passage at new sites. The Traverse City Commission unanimously endorsed the technology demonstration and evaluation project during a meeting last fall.

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The project itself will involve a steering committee of fishery experts and engineers who will identify potential technologies and then modify Traverse City’s Union Street Dam to demonstrate whether the technologies successfully pass desirable fish while also blocking undesirable species.

The intent is to construct one or more channels in association with the existing dam site so that a suite of tools and technologies can be integrated for fish passage and invasive species control. For instance, natural alarm cues or pheromones could be used to guide fish toward passage devices or to guide sea lampreys into traps. Computer recognition of fish species could be used to automatically sort different species, passing those that should be passed and blocking those that should not. Tools already under development in the Great Lakes region could be used, though the steering committee will also scour the globe for other potential technologies.

“Traverse City’s Union Street Dam, near the mouth of the Boardman River, was selected as this project’s site for a variety of reasons, not the least of which is because the project aligns with existing restoration objectives,” said Gary Whelan, Michigan Department of Natural Resources (MDNR)–Fisheries Division Program Manager. “Several dams have already been removed on the Boardman River, and further connectivity to Lake Michigan is a major goal.” Scott Heintzelman, Central Lake Michigan Unit Manager, MDNR added: “The Boardman River is an excellent habitat for many of our prized species such as brook trout, lake sturgeon, and walleye, just to name a few. It is also prime sea lamprey habitat. The Union Street Dam does block sea lampreys effectively, though its fish ladder is poor in passing desirable fish.”

Frank Dituri, Ecologist for the Grand Traverse Band and Chairman of the Boardman River Dams Implementation Team, added: “The Grand Traverse Band of Ottawa and Chippewa Indians has been a proud partner in the process of restoring the Boardman River. It is exciting to think that this river, which is tremendously important to the Tribe, could usher in a new era in fishery management.”

Lieutenant Colonel Dennis Sugrue, Commander, Detroit District of the Army Corps of Engineers, said: “This project is a model of how federal, state, tribal, and local leadership can combine resources and work to a shared goal of habitat and wildlife protection and restoration. This project has a regional benefit, as its outcomes may be applied across the Great Lakes on various other restoration projects.”

Ullrich warned that while success is not guaranteed, the potential benefits warrant the effort. “We are blazing new ground here, and we are growing confidence that things might not go as planned. We might learn that sorting a variety of fish species control. For instance, natural alarm cues or pheromones could be used to guide fish toward passage devices or to guide sea lampreys into traps. Computer recognition of fish species could be used to automatically sort different species, passing those that should be passed and blocking those that should not. Tools already under development in the Great Lakes region could be used, though the steering committee will also scour the globe for other potential technologies.

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An uncertain future for Lac Vieux Desert’s walleye fishery

By GLIFWC Inland Fisheries Section

Watersmeet, Mich.—Straddling the borders of Michigan and Wisconsin in the 1842 Ceded Territory, Lake Lac Vieux Desert (LVD) has been a productive walleye fishery for both tribes and state anglers. Tribal members from Mole Lake and Lac Vieux Desert Bands have harvested walleye in this lake, and state anglers from Michigan and Wisconsin have long enjoyed catching walleye with hook and line. Unfortunately, both catch and harvest has declined considerably in recent years, with many anglers and tribal members suggesting that the walleye population has crashed in the lake. This notion prompted the Lac Vieux Desert Tribe to eliminate harvest of walleye by its members in 2010-2011 and every year since 2013.

To understand the walleye downward population trend in LVD, biologists from GLIFWC worked in spring 2016 to estimate the lake’s walleye numbers, referred to as “abundance.” The effort involved capturing adult walleye by electrofishing along the spawning grounds. The captured fish were marked by fin-clipping and then released into the lake. Shortly after that, fish were recaptured by electrofishing around the entire shoreline. The proportion of recaptured fish relative to the number that were fin-clipped was used by biologists to estimate the abundance of walleye. The estimates revealed that in 2016, the abundance of adult walleye hit a 26-year low of just over 2,000 fish. By comparison, walleye abundance was at a high of 13,000 fish in 1990 (See Figure 1).

Continuing the search for clues in the LVD walleye decline, biologists from GLIFWC and Wisconsin Department of Natural Resources teamed up last fall, this time focusing on the abundance of LVD’s age-0 walleye (i.e., fish that have not reached their first birthday). Crews sought to collect age-0 walleye by electrofishing the entire shoreline of LVD. Biologists were interested in comparing the abundance of walleye captured in 2016 to previous years by counting the number of walleye captured per mile of shoreline.

The research first depicts largemouth bass and walleye abundance under present-day environmental conditions and then projects how abundance might change in the next 40 to 60 years. For LVD, largemouth bass currently comprise a small portion of the fish community. By 2085, however, largemouth bass likely become abundant in the lake. On the other hand, walleye abundance will likely remain at present-day levels over the next 60 years. This means that as the climate changes, largemouth bass (and possibly other sunfishes, e.g., smallmouth bass, crappie) might become a major component of the fish community.

Climate change has the potential to influence the abundance of cool- and warm-water fishes. Recent research has quantified the probability that largemouth bass and walleye will be abundant in lake ecosystems under future climate scenarios. The research first depicts largemouth bass and walleye abundance under present-day environmental conditions and then projects how abundance might change in the next 40 to 60 years. For LVD, largemouth bass currently comprise a small portion of the fish community. By 2085, however, largemouth bass likely become abundant in the lake. On the other hand, walleye abundance will likely remain at present-day levels over the next 60 years. This means that as the climate changes, largemouth bass (and possibly other sunfishes, e.g., smallmouth bass, crappie) might become a major component of the fish community.

Clearly, management actions need to be taken to conserve dwindling walleye stocks and restore walleye natural reproduction in LVD. A rehabilitation plan has been developed by management agencies with input from the public. Of the 3,319 votes cast during DNR’s Spring Hearings, a majority (2,302) voted in favor of changing harvest regulations for anglers from 15” length limit, bag of 3 fish to 18” length limit, bag of 3 fish. Similarly, Mole Lake and Lac Vieux Desert tribal members supported a no spearing or netting policy. In the short-term (3-5 years), these actions should protect the vast majority of adult walleye, giving them the opportunity to re-establish natural reproduction in Lac Vieux Desert Lake. Over the long-term, managers should also consider actions that will mitigate the impacts of climate change on the fish community.

Contact the authors for more information: Dr. Aaron Shultz, Mark Luehring, Dr. Adam Ray, Kim Stone, or Joe Dan Rose at 715.682.6619.
Ashland, Wis.—Northland College hosted the 2017 Lake Superior Youth Symposium the weekend of April 28th on the NC campus. Students from all around the region gathered for a weekend of environmental experiences and ecological knowledge. GLIFWC conservation wardens Holly Berkstresser and Christina Dzwonkowski led two morning sessions on trapping and the harvesting of furbearers.

“What does ethics mean to you?” Berkstresser asked the crowd. “Ethics is about doing the right thing, even when nobody is watching.” Much like biologists, hunters and trappers also have a strict commitment to the resources they work with. Caring for the resource and protecting them is a huge part of being an ethical steward of the land.

Next, the officers highlighted the driving factors in fur prices and the fur trade industry. Anishinaabe history and perspective were incorporated throughout the presentation. The fur trade was a big part of Anishinaabe history and economy prior to currency. Furs were also a very reliable way to clothe a family and keep a lodge warm throughout the year. Officer Dzwonkowski gave an Ojibwemowin lesson for the audience to better understand that each animal has an Ojibwe name and relevant translation.

Participants also jumped out of their seats to test some of the foot-hold traps and even the more intimidating conibear traps. Some of the youth came from families with rich trapping history and were able to contribute great questions and answers. Some youth traveled from Michigan, and others from Minnesota. Every State has different equipment requirements and season regulations. For instance, in Wisconsin an individual that wants to trap on state lands is required to take a trapper education course.

“These courses are great so that we teach trappers to remain ethical and understand the rules and regulations that protect the resource,” said Officer Berkstresser, stressing the importance of these classes for first time trappers.

Anishinaabe teachings always relay the significance of the seventh generation. Thinking to the future and carefully examining our metaphorical footprints on aki (earth) are lessons that need to be ingrained into the minds of our future generations. Examining the crowd of intent young listeners was enough to reassure even the most doubtful minds. The 2017 Lake Superior Youth Symposium sent students on an unforgettable adventure. These young people will return to their communities and share what they have learned in hopes of protecting the very places that are dear to them.

Peter David, GLIFWC wildlife biologist also presented at the conference.

GLIFWC law enforcement officers introduced young people to fur trapping at the 2017 Lake Superior Youth Symposium held at Northland College. Officer Christina Dzwonkowski (left) is pictured with a bobcat pelt. Students (right) examine a finished beaver hide. (DJ photos)

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For the Earth, Water: Water Walk 2017

Water Walkers were greeted by the sound of the drum as they carried nibi from Mooningwane'naaning-minis (Madeline Island) to Mashkiiziibing (Bad River) on April 25. This leg of the journey was only part of a walk that extended from Duluth, Minnesota to Matane, Quebec. Water walks are regarded as an Anishinaabe ceremony to honor all nibi and to speak to water spirits so that there will be healthy rivers, lakes, and oceans for generations to come. Melvina Flamand took the first stretch on Bad River soil, carrying the water in a copper vessel while Mike Clark walked next to her with the Eagle Feather Staff. Special thanks to GLIFWC Officer Dan North for transporting the Water Walkers across Gichigami. For more information on the walk, please visit motherearthwaterwalk.com. (Paula Maday photo)
Spring spearing with Bad River, Red Cliff youth

Next gen Ojibwe harvesters exercise treaty rights at Lake Namekagon

By Paula Maday, Staff Writer

Learning to use asema

What are they doing? My son asked me, intently watching those boys who stood at the edge of the water, holding their hands out and speaking. He had been run-
ning around since we arrived at the lake, weaving in-
between trees and splashing at the edge of the water like energetic 5-year-old. I saw suddenly he stood still and focused, completely fascinated by what these older kids were doing.

“They’re talking to the spirits,” I replied, “saying thank you and asking for safety before they go out on the water. In their hands, that’s tobacco, or asena.”

And when they have that in their hand, the spirits can hear them,” he asked.

“Yes, I want to do it!” he exclaimed.

He skipped to the pavilion, where we scooped some asena into his little hand, and then walked back down to the water. Standing at his side, I guided him in saying his name, saying thank you to the water and thank you to the fish, and asking to keep everyone safe on the boats.

Then he gently broke his tobacco into the water. I noticed that elders, volunteers, parents, youth workers and community members filled in the spaces between youth, forging connections where there had been none before, and creating one cohesive group. Two bands were present, but members filled in the spaces between youth, forging connections where there had been none before, and creating one cohesive group. Two bands were present, but

As a cooperative effort between GLIFWC and other tribal programs, and people from both bands who wished to usher the time-honored Ojibwe tradition of spearfishing to the next generation.

Around 3:30 p.m., the caravans arrived and people started gathering inside the pavilion. I noticed that elders, volunteers, parents, youth workers and community members filled in the spaces between youth, forging connections where there had been none before, and creating one cohesive group. Two bands were present, but this was one nation, gathering together to exercise their inherent rights.

In that moment, I felt so much gratitude for the opportunity that this youth spearing night offered. Because even if my little one was too little to spear, he still learned the first and most important part of any harvest: using asena and giving thanks.

Two bands, one gathering

Atta-Woowang Sunjeew’s ( Gathering the Practice of Spearfishing on April 14 saw 19 youth from Red Cliff and 13 youth from Bad River. The event was an important part of the Bad River and Red Cliff, together, we practiced our future.”

It was a small gathering of teachers, parents, and our communities are still teaching as they did back then. If you teach our youth to love the earth, they will defend it.

As daylight faded away and asena made its way to the spirits, youth presented their tribal Ids to erect tram workers and received their fishing permits. It was twi-

light, and everyone headed to the water.

Stars below nibi

Lake Namekagon is an exceptionally clear lake, known for its dark root beer colored water. Many will say that if you can learn to spear in dark water, you can learn to spear anywhere. And on the evening of April 14, this seemed especially true.

Clouds had moved in to cover the sky after sunset, and complete darkness sur-
rounded those out on the boats.

In a nearby boat, a Red Cliff youth pulled up another beautiful ogaa at nearly the same time. A shimmer of headlamps shone all around the lake, signifying that Anishinaabeg were blessed in many ways. Our Ojibwe youth people becoming providers for themselves, for their families, and for their communities.

Ogaa stories

Ethan Gordon, 12, was one of those boys. Gordon went out twice, but only got to spear one of those times because it started raining and the boat had to return to shore for safety. Even so, Gordon caught two ogaa in his freshman endeavor, which he chalked up to the strategy he used: “I decided not to go first when trying,” he said. “I went second so I could watch how it was done and listen to the directions. Dayton Milligan, 13, was another first time spearer. He said that his dad goes out spearing and that he’s always wanted to go but had to wait until he got a little older. “I actually felt pretty confident about myself,” he said about being on the water.

“Yeah, I was so excited that I was pretty good too because I got the first fish I went for!” I asked a few fish within the first five minutes!”

An exciting yet anxious feeling loomed over many of the first timers. Talk-

ing about spear fishing is one thing, and actually spearing is another. As the boats approached the shallow waters where ogaa (walleye) swim, youth were instructed to stand up at the front of the boat and arm themselves with a 12-foot spear-equipped pole. Instructors were waiting nearby, closely attending to each kid and helping to spot the notorious set of eyes that glow through pure darkness, like stars shining beneath the water.

On Lake Namekagon, the walleyes’ eyes glow a few yards ahead of the boat. Judging by the speed of those eyes, one can get a better handle on how to prepare. Many spearmen will start with their spears in the water and establish their footing for optional harvesting capacity.

Once the eyes are spotted, it’s up to the spearer and the boat driver to effectively communicate direction and speed. Much like harvesting wild rice, your partner and this relationship are crucial. The spearer will also watch for rocks and other hazards that the driver cannot see. With the spear in the water to help counter refraction, the harvester will aim for the eyes or just behind the eyes. In one quick jab, a fish is on the other end and is brought up and placed in a harvest tub. The process continues until the fishermen have filled their permits, or until conditions permit.

After a couple missed fish and a few spears collided with rocks, one Bad River youth pulled up his first ogaa in a boat manned by Red Cliff tribal members and experienced fishermen Russ Denomie and Dayton Jennings.

Chi-Migwech

Many people and programs helped make intertribal youth spearfishing night a success in 2017. A heartfelt miigwech goes out to all Bad River and Red Cliff tribal programs and staff, all the harvesters that devoted their time and teaching, Mike Tribble for his willingness to continue sharing his story, and GLIFWC staff for their assistance.
Information technology internship wrapping up

Tino Redhouse is finishing up a four-month GLIFWC internship centered on managing network systems. An Information Technology student at Wisconsin Indianhead Technical College-Ashland, Redhouse has worked alongside GLIFWC Computer Network Administrator, Lee Cloud since January.

“I’ve learned a lot about troubleshooting, especially with the unique needs of GLIFWC’s law enforcement division,” Redhouse said. “This internship has offered a little of everything. I like the idea of creating networks and implementing them.”

Upon completion of a network administrator associate degree, Redhouse plans to continue on at WITC to earn a network specialist degree. He said the two areas of study will provide a solid foundation to build and manage networks.

Redhouse grew up on the Bad River reservation and graduated high school in 2001 at Flandreau Indian School in eastern South Dakota. On the western end of the state, Redhouse served in the Air Force at Ellsworth Air Force Base near Rapid City. He said his duties in air traffic control and experience in writing code of the state, Redhouse served in the Air Force at Ellsworth Air Force Base near Rapid City. He said his duties in air traffic control and experience in writing code

(Continued from page 9)

(cies automatically is simply beyond our technological capabilities or that tools and methods are only applicable to certain rivers. A sea lamprey treatment might be necessary on the Boardman River if sea lampreys pass along with desirable fish. But the project’s potential payoff is tremendous. If we are successful, we will generate new science and technology that we will use in the Great Lakes and export globally. We will have new tools at our disposal to manage fisheries and stop invasive species. And we will achieve real fishery restoration results that will improve the resource for generations to come. My colleagues and I cannot be more excited about the possibilities.”

Ullrich concluded: “The project is a true partnership among many agencies, thus leveraging resources and aligning fishery management objectives.” In addition to the Great Lakes Fishery Commission and the city of Traverse City, partners include the Michigan Department of Natural Resources, the Grand Traverse Band of Ottawa and Chippewa Indians, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, Fisheries and Oceans Canada, Michigan State University, the University of Guelph, the Ontario Ministry of Natural Resources and Forestry, and the State of New York. Editor’s note: article adapted from a Great Lakes Fishery Commission press release.

Sea lamprey

The 2017 Healing Circle Run/Walk is a prayer for healing. It is an opportunity for people to come together to pray for healing for themselves, their families, their communities, their nation, aki, and all our relatives. During the 2001 Healing Journey Run, participants were told of a teaching on healing—“for a nation to heal, it must begin with the individual. As a person heals, then that person can help heal his/her family. As a family begins to heal, they can help heal their community. As communities heal, they can help heal the nation. As individuals, families, communities, and nations heal, they can help Aki (the earth) and our plant and animal relatives to heal.”

The 2017 Healing Circle Run/Walk will occur from July 8–14, 2017. The run/walk will connect eight Ojibwe reservations in northern Wisconsin, Michigan, and Minnesota (see below map) starting at the Lac Courte Oreilles Reservation and ending at Lac du Flambeau on July 8 (Day 1), ending at Mole Lake on July 9 (Day 2), at Lac Vieux Desert on July 10 (Day 3), at Bad River/Red Cliff on July 11 (Day 4), at Fond du Lac/Black Bear Casino on July 12 (Day 5), at St. Croix on July 13 (Day 6), and at Lac Courte Oreilles on July 14 (Day 7).

For more information or if you are interested in participating as a core runner, or having a group of runners from your reservation participate, please contact Jenny Krueger-Bear, Sue Lemieux, or Dylan Jennings at GLIFWC at (715) 682-6619. All participants must assume personal liability, as well as responsibility for their own transportation and expenses.
Waadookodaading hosts inaugural Language Immersion Conference in Lac Courte Oreilles

By Paula Maday, Staff Writer

The Waadookodaading Ojibwe Language Institute hosted the inaugural Gaa-Onwaa’iinjg Language Immersion Conference in Lac Courte Oreilles on May 4-6. The conference was designed to address four areas vital to the planning and maintenance of language revitalization efforts: K-12 indigenous immersion, community language revitalization, adult indigenous language immersion, and policy and administration.

Pre-conference classroom visits kicked off the event, with guests invited to observe 4K-5th grade classrooms at Waadookodaading. Visits gave participants an opportunity to observe activities and methods used to maintain an Ojibwe environment within the classroom. Students at Waadookodaading spend 60-100% of their day immersed in the Ojibwe language.

Down the road at Lac Courte Oreilles Ojibwa Community College, participants were treated to keynote speeches from Bawdwaywidun Eddie Benton-Banai, Waabi-bizhiikikwe Patricia Ninegwance, and Waawaakeyaash Keller Paap over the course of the weekend.

Benton-Banai is well-known as a strong advocate for culture-based education and as presiding Grand Chief of the Three Fires Midewiwin Lodge. Ninegwance is known for her 30 years of experience in language teaching, and for authoring language books Survival Ojibwe and Ankishinabemodaak: Becoming a Successful Ojibwe Eavesdropper. Paap, one of the founding members of Waadookodaading, is widely regarded as “the Godfather of Ojibwe Immersion” by many of his colleagues and contemporaries.

Tucked in between the motivating words from each of these language leaders were sixteen different breakout sessions covering topics such as using the language to heal, child language acquisition, and building language capacity.

Close to 200 people traveled from all over Ojibwe country to take part in the conference and make connections with one another. Manidoo Noodin Jason Schlender, Chairman of the Waadookodaading Board of Directors said to participants in his opening letter that he hoped the “interaction with colleagues from many different communities and personal fields leads to a creative exchange of ideas.”

Close to 200 people attended Gaa-Onwaa’iinjg Language Immersion Conference on May 4-6 in Lac Courte Oreilles. The conference was organized on behalf of The Chippewa Federation by the Waadookodaading Ojibwe Language Institute with support from the St. Croix Band of Chippewa.

Waadookodaading, the place where we help each other, was founded in the early 2000s by a group of elders, language activists, and community members who shared a concern about the loss of Ojibwemowin at Lac Courte Oreilles. Their language revitalization efforts have been featured in the Midwest Regional Emmy Award winning documentary First Speakers: Restoring the Ojibwe Language. Watch it now at www.ipt.org/first-speakers-restoring-the-ojibwe-language.

Manoomin under stress

(Continued from page 5)

that the biggest challenges currently facing manoomin are socio-political, not ecological, and there is a great need to share the importance of manoomin with legislators, youth, and others.

“We need to bring manoomin into the school systems. It should be in history. It should be in social studies. It should be in biology. Because as we’ve seen from up here, it has many meanings to many people,” said Evelyn Ravindran, Keweenaw Bay Indian Community.

To address identified worries, the group engaged in conversations about traditional restoration practices for wild rice, as well as any challenges or gaps in knowledge that prevent these practices from being successful. To finish out the workshop, participants broke into groups to discuss priority restoration and preservation needs, resources available, and opportunities for partnerships.

Among the various discussions, education and outreach was a consensus. The availability of long-term funding was another common need identified.

“I was reminded of how broad the interests are and how different the concerns are and how complex our restoration efforts will be,” Peter David, GLIFWC manoomin biologist and workshop participant said.

Red Cliff Conservation Warden Mark Duffy agreed: “What I’ve taken away from this gathering is the biodiversity of people that are getting into ricing,” he said.

Myron Burns, Sr., a Bad River tribal member who has been ricing for 60 years, reminded everyone that within new restoration and preservation efforts, there must be a place for traditional ecological knowledge.

“When we first started ricing, we used to rice in wooden canoes and make our own paddles. We knew that the best time for ricing was early in the morning and late in the evening. I don’t understand the 10 o’clock rule,” Burns said, referring to Wisconsin’s current off-reservation harvest regulations that allow ricing from 10:00 am until sunset.

With so many diverse interests expressed at the Manoomin Restoration Workshop, NOAA Administrator Heather Stitts acknowledged that ongoing conversations and organization would need to take place.

If you are interested in learning more about manoomin monitoring and restoration, please check out the resources listed below.

Manoomin Resources

GLIFWC Off-Reservation Harvest Regulations, Rice Abundance Information and Map of Manoomin Waters https://data.glifwc.org/manoomin.harvest.info
“Wild Rice & the Ojibway People” by Thomas Vennum, Jr.

GLIFWC manoomin biologist Peter David moderates a panel discussion on stressors affecting wild rice and the impacts on harvesting. Panel members included Evelyn Ravindran (Keweenaw Bay Indian Community), Barb Barton (Michigan Dept. of Transportation), Nancy Schudit (Fond du Lac Band), and Darren Vogt (1854 Treaty Authority). (Paula Maday photo)
Sucker phenology citizen science study

By Aaron Shultz, GLIFWC Inland Fisheries Biologist

All of life has its rhythms, with certain events tied to very specific environmental conditions. Phenology is the study of the timing of biological events, like the seasonal migration of animals, and how these natural phenomena relate to climate change.

For example, how do white and longnose suckers know when the time is right to migrate from the Great Lakes into the tributaries to spawn? Are they looking for cues from the water temperature, or is it how much water is flowing from the rivers? What happens if changes in climate shift the timing of sucker migrations? These are all questions being investigated in a new citizen science study launched last March, led by Shedd Aquarium’s research biologist Dr. Karen Murchie in collaboration with researchers at the University of Wisconsin-Madison and the Lake Superior National Estuarine Research Reserve.

Citizen scientists along the western shore of Lake Michigan and southern shore of Lake Superior are spending approximately 15 minutes each day monitoring a designated tributary to document when the suckers arrive for spawning. In addition to looking for the presence of suckers and how many there are, citizen scientists write down information on weather, water clarity, and water depth as well. This will allow the researchers to analyze whether fish are responding to water temperature, stream flow, or lunar cycles as cues to initiate their spawning migrations, and to document the rolling wave of migrations along a latitudinal gradient. The project will be an ongoing commitment to collect long-term data to determine whether the timing of sucker migrations is shifting with climatic change.

Though they receive little attention, suckers are important to Great Lakes ecosystems. When the suckers spawn in a tributary, they contribute nutrients from the eggs and waste they deposit. These nutrients are important in kick-starting the growth of insects and plants living in the streams where spawning occurs. Shifts in sucker spawning patterns can change the dynamics of nutrient inputs, affecting the stream ecosystem.

Thanks to the Bad River Natural Resources Department and GLIFWC, the Bad River is being monitored for the timing and of sucker migrations. As the project continues, researchers hope to engage more citizen scientists in the Ceded Territory in subsequent years! For more information on project findings see: www.sheddaquarium.org/Conservation--Research/.

February is known as “Namabins-giizh” (the Suckerfish Moon). It was at this time (long ago) that the Anishinaabe people would set their nets under the ice in order to catch the suckers. It is said that the Anishinaabe people were starving and on the brink of death when the suckerfish (namabin) took pity on the people, and decided to bless them by swimming into the nets, thus giving themselves to the Anishinaabe.

Mercury in the environment

Common questions tribal members ask

Why do different lakes near each other have walleye with different levels of mercury?

There are many factors that affect the level of mercury in a lake’s water. Local sources of mercury can increase the amount of mercury deposited in a given lake. The physical and geochemical properties of a lake can affect the amount of mercury that settles into lake sediments. Each lake also has its own unique biota, or makeup of organisms. A particular lake may have a higher activity of the bacteria that produce methylmercury due to the unique water chemistry of that lake. Lakes may also have different combinations of fish species present that would affect how high in the food chain omega there is in that lake.

Where does mercury come from?

Nationally, the largest source of mercury emissions is the burning of fossil fuels, especially coal-fired power plants. Within the Lake Superior basin, the pulp and metals processing industry is the largest source of mercury emissions. Installation of scrubbers in industrial smokestacks, removal of mercury from products such as thermometers and medical devices, and other pollution control measures have greatly reduced U.S. mercury emissions. Since U.S. emissions peaked in the 1970’s, the mercury levels in the air, water, and fish within the Ceded Territories have been generally declining.

Phragmites control

(Continued from page 8) prescribed burning. By educating homeowners how to identify and report invasive phragmites, agencies hope to avoid the challenges found in the southern Wisconsin area of the Lake Michigan basin where phragmites removal has not been successful.

Phragmites removal is an integral component of the remediation process for the St. Louis River estuary which is an Area of Concern, a geographic area that fails to meet general or specific Great Lakes Water Quality Agreement objectives.

A key objective of the Lake Superior LAMP is to restore the St. Louis River estuary to the condition where it meets the remediation standards to be delisted. GLIFWC will continue work on phragmites treatment this summer in the St. Louis River estuary. Removal of the phragmites will create a more favorable environment for the restoration of manoomin in the area and ensure that biodiversity of other native aquatic plants is protected.

The ups and downs of Lake Herring

By Ben Michaels

GLIFWC Fisheries Biologist

Kewis (cisco or lake herring) have long been an important fish species in Lake Superior; they serve as a food source for predators such as lake trout, and after lake herring spawn during the late fall, lake white fish won’t hesitate to feast upon their developing eggs.

Aside from their ecological significance, lake herring play an important role regarding human consumption, as it has had a history of being a commercially-targeted species, especially near the Apostle Islands region within Wisconsin waters of Lake Superior. The abundance of lake herring in the Apostle Island area has been on a roller coaster ride of ups and downs since the late 1800’s. Management agencies around Lake Superior are currently considering actions to limit harvests of lake herring to ensure both the viability of the commercial fishery and stability of the fish community.

How we got here

As fishing gear technology and boating equipment developed throughout the early 20th century, commercial yield of lake herring began to increase into the mid-1900’s.

From the 1930’s to the late 1950’s commercial gill net effort and harvest appeared to have been fairly stable until the early 1960’s when fishermen dramatically increased their fishing effort in an attempt to sustain profitable yields of lake herring. Ultimately the abundance of lake herring decreased to such low levels that commercial fisherman no longer found it economically viable to fish for them.

The reduction in fishing effort after the 1960s, coupled with several large year classes recruiting to the fishery in the 1990’s, allowed for some recovery of the lake herring population in Wisconsin waters where there has been a small but viable commercial fishery for over two decades. Since the early 1990’s, yield of lake herring had remained stable but at low levels.

However, the large year classes that were supporting the fishery began to disappear, and recruitment events were becoming more sporadic and less frequent into the 1990’s and 2000’s. By 2008, fish buyers began purchasing lake herring in-the-round in response to an increase demand for Roe in the European market. This meant that commercial fisherman did not have to spend time processing their catch. Unsurprisingly, more time was devoted to increasing fishing effort and catching more fish to meet market demands.

The increased demand on the lake herring population in conjunction with results from bottom trawl surveys conducted annually by the US Geological Survey, which show that recruitment of lake herring remains low and that strong year classes do not occur very often, is especially worrisome considering that both commercial fishermen and the fish community rely on lake herring.

This lack of recruitment is not exclusive to Wisconsin waters. In fact, a downward trend of forage fish production has been observed on a lakewide scale not just for lake herring, but for a multitude of species. While the exact reason for this decline remains unclear, predator/prey ratios, changes in thermal habitat due to warmer surface water and reduced winter ice cover could be contributing to poor lake herring production.
The vanishing “canoe birch”  
Insights into the big birch dilemma

By Steve Garske, GLIFWC Invasive Species Coordinator

Those of a certain age may remember paper birch (wiigwaasaatig or wiigwaasaatig-mitig) being common across the northwoods. Extensive clearcutting followed by intense fires in the early 1900s resulted in abundant regeneration of early-successional trees such as paper birch and aspen. Since then many areas of forest have matured, leaving less habitat for birch. Extensive aspen pulpwood harvests have decimated birch as well. While still a fairly common tree, paper birch have become fewer and farther in between. On poor, droughty sites, paper birch is relatively short-lived, and populations often begin to decline after 60-70 years. On richer, moister sites though, birch that reach the canopy often live significantly longer and get much larger. Surrounded by a forest of shade-tolerant trees such as hemlock, sugar maple and yellow birch, individual birch trees frequently live to be over 100 years old.

By burning away some of the leaf litter and allowing more light to reach the forest floor, fire can create ideal site conditions for the germination, growth and survival of paper birch seedlings. Natives across North America once made extensive use of fire for hunting, improving the growth and yield of berries and other vegetation, and regenerating browse for deer, elk, and other grazers. In eastern North America, fires set in areas with sandy soils (supporting pine forests and oak savanna) may have promoted birch regeneration as well. American Indians typically set fires that were relatively easy to control and designed to encourage new vegetation growth. But with European settlement, fire was pretty much taken off the table as a management tool.

In recent years Ojibwe elders and gatherers have noticed a significant decline in the abundance of paper birch across the Ceded Territories. Canoe makers are particularly concerned, as they need high-quality bark (wiigwaas) for large tended birch craft. That contemplation has been backed up by data gathered by researchers at GLIFWC and the US Forest Service. Their data shows that the number of birch trees across all size classes has been declining in recent decades, including large trees.

In order to get a better picture of what types of forest support large birch, I visited over 40 sites across northern Wisconsin and Upper Michigan last summer and fall. Many of these sites were approved for harvest by tribal elders from GLIFWC member tribes in 2001, as part of an Anishinabek Wild Plant Traditional Environmental Knowledge project. (While these sites were considered acceptable for wiigwas harvest, they didn’t necessarily have large trees with canoe-quality bark.) Several tribal elders suggested good areas to search, leading to several sites with large-diameter birch. Several more sites were found by simply watching the woods along the way. While seeing these large, old trees is both exciting and humbling, the purpose of this project was not to locate sites with big birch trees, but to learn more about what kinds of sites are likely to support large, healthy birch.

Large paper birch like these have become few and far in between in many parts of the Ceded Territories. (SCG photo)

Canoes from St. Croix after their maiden voyage across Big Sandy Lake in northeastern Minnesota in July 2013. (SCG photo)

While the information gathered wasn’t intended to allow a direct comparison between sites with large birch and sites with smaller birch, the sites with large birch did have some things in common. All but one site was on sandy loam to loamy sand soils. Sites were moist to well-drained, but not droughty. Mean soil pH (based on a limited number of samples from each site) was strongly acid, ranging from 4.07 to 5.31 (7.0 is neutral). Large, tall, healthy birch generally grow as scattered canopy trees in mature mixed forest of aspen, maple, northern red oak, basswood, hemlock, and other tree species. While certain birch have been lost from the landscape, Deciduous forests in the northwoods continue to provide ideal habitat for large, healthy birch.

Freshwater lakes provide for Ojibweg

(Continued from page 1)

to the river and Smith checks in with a pair of anglers who are casting plastic worms into the dark water for suckers—native fish that make a flavorful meal after a good brining and a half-day in the smoker.

While Carrick and Hatfield reached their permit quota that evening, spearling 10 walleyes apiece, other harvesters experienced mixed results over the season. Overall, the Mills family had a combined 116 ogaawg from the Little Bay de Noc tributaries: Escanaba and Rapid Rivers. Inland lake spearling was limited to one waterbody—Moc-no-ki Lake—where band members harvested just six walleyes. Rounding out the spring season on May 7, a Bay Mills member filled the band’s lone Black Lake sturgeon tag with a 47-pound spawned-out female measuring 60.5 inches. In western Upper Michigan, Lac Vieux Deserts bands focused harvest efforts on Lake Gogebic—a traditional hotspot where spearers took 3,552. In total, LVD spearers brought home 4,717 walleye from the Michigan 1842 Ceded Territory. The tribe continues to withhold walleye harvest permits for its home water, Lake Lac Vieux Desert, as researchers study the declining ogaa fishery (see page 10). LVD members, however, did spear three muskies from their home lake. The Mille Lacs Lake walleye harvest quota for Ojibwe bands edged up slightly over last year to 19,200 pounds. All eight 1837 Treaty tribes returned to the massive Minnesota lake in 2017 for a harvest dominated again by spearling. Perch, northern pike, and walleye were also taken by net. At press time with the spring season winding down, harvest totals measured in pounds stood at: 13,832.2 walleye; 2,817.7 northern pike; and 775.4 perch.

Tribal spearers visited a half-dozen smaller Minnesota 1837 lakes as well, harvesting a total of 958.4 pounds of walleye from those waters. Once unheard of, the Wisconsin ceded territ-
ory opener kicked off again at the end of March this year. The long season yielded a record harvest of 38,942 ogaa, surpassing another extended season from 2015 when spearers took 38,583 walleyes. The muskie harvest came in at 202 fish from a declaration of 1,577. All harvest numbers are preliminary as of May 10.
Walking on

Teacher, speaker, drum keeper, spiritual advisor Amik O’gaabawiban

By Wesley Ballinger
ANA Language Specialist

It is a difficult thing to do—saying goodbye to someone. In native communities our greatest resources are those elders (gichi-aya’aag), and speakers (netaa-oyibwemongi) who carry with them old knowledge of tradition, medicine, stories, and ceremonies—the foundation of a people.

When one of our speakers walks-on, we all feel a tremendous loss, not only for the family and community, but also a loss of our culture, our identity, and our future as Anishinaabe people. We only have a small minority of first-speakers left, and when one leaves us, we are that much poorer as a nation.

As a language instructor, Larry Amik Smallwood passed down the teachings of Ojibwemowin to those who were willing to learn. In those language lessons, the knowledge of our elders, and the spirit of our ancestors connect with younger generations.

It is only with the use of Ojibwemowin that we are able to conduct our ceremonies such as: naming, funerals, speaking for tobacco, or speaking for the drum. Being an active participant in our culture, or Anishinaabe ishtawinwin, means being Anishinaabe. It means standing up to the histories of enculturation, genocide, and systemic racism that infect our communities. All of these endeavors were very important to Amik O’gaabawiban, this is what led him to lend his knowledge to several language and community projects that promoted the use of culture and Ojibwemowin.

As a member of the G.A.A.G.I.G.E. (GLIFWC Advisory And Guidance Input Group of Elders) he lent his advice and knowledge to several language and community projects that promoted the use of culture and Ojibwemowin.

His work on “Inaadiziwin—the way of life,” “Gidaadizookaaninaan-Dibaajimowinan: Stories of Culture and Respect,” and our current language project “Nenda-likendamang Ningo-biboonagak—We Seek to Learn Throughout The Year,” will be a lasting testament to his commitment to language revitalization.

As the GLIFWC Language Specialist I had the greatest of honors to work with Amik over the past nine years. I will remember our conversations about Ojibwe names, the Old Lady who raised him, life in Aazhamoog, or that one time my uncle wanted to fight him in the 1970’s over the length of his hair.

Half the time we would just sit and talk about life in Ojibwe country; there was always a funny story to be shared by Amik. Humor was the medicine funny story to be shared by Amik. Humor was the medicine for chipmunk (you see, the Ojibwe word for chipmunk is agongos versus the word for young, he used to skin chipmunks (you see, the Ojibwe word for chipmunk is agongos versus the word for weasel, zhìngos)—when said quickly they can sound similar.

He would say: no matter how many times we look at our work, we will always find a mistake, and next thing you know, you’ll have me skinning chipmunks again. And then he would laugh. I will carry the memories and teachings with me, migwech for everything you have shared, Niijii.

Editor’s note: Larry Amik Smallwood, age 69, passed away on April 11 unexpectedly at Essentia-St. Mary’s Hospital in Duluth, Minnesota. Per the author: the suffix iban is used to denote someone who has made with a story he told; I tease me over an editing error I made with a story he told; I prescribe that effective remedy. He was always ready to tease me over an editing error I made with a story he told; I prescribed that effective remedy.

Amik (Larry Smallwood) (left) and the author in 2004. (COR photo)

Walking on

Treaty rights a priority under Rosen’s watch

Over a 34-year career, Diane Rosen worked up through the ranks at the Bureau of Indian Affairs, promoting tribal interests in everything from real estate services to natural resources. She was ultimately promoted to director of the BIA Midwest Regional Office in 2009, a position held until last September. Rosen, 58, walked on April 4 at her home in Burnsville, Minn.

“Diane was a staunch advocate of tribal sovereignty and tribal natural resource management programs,” said Michael J. Isham, GLIFWC Board of Commissioners Chairman. “Her commitment to the Commission and its member nations has helped protect ceded territory treaty rights for generations.”

A Red Cliff Band member, Rosen began her career in 1979 at the BIA Great Lakes Agency in Ashland. Fifteen years later she had earned the top spot at the Great Lakes Agency, becoming superintendent. Rosen—a frequent participant at the annual Partners in Fishing events—is also remembered for her good-humor and warm smile. She is the recipient of a number of academic and work performance honors.

—CO Rasmussen

Mii apii waa-tagoshinoomag manoominke-giiizis wayiiba onow oshki-mazina’iganan Ojibwemong, nandawaabandan onow!

Nenda-likendamang ningo-biboonagak

(At the time of the rising moon/August, these new Ojibwe language books will arrive, look for them!)
Mikwendaagoziwag ceremonies at Sandy Lake July 26

All are welcome to join GLIFWC for annual ceremonies, paddle and feast in commemoration of the 1850 Sandy Lake Tragedy. It is a time to remember the sacrifices made by the many tribal members who arrived at Sandy Lake, Minnesota, to receive annuity payments, but found only inadequate and spoiled rations, delayed payments and, for many, death.

It is a good time to remember those people, the struggles and determination, and to say chi mitwech!

A morning ceremony at the East Boat Landing is followed by a paddle in canoes or kayaks across Sandy Lake where ceremonies are held at the Mikwendaagoziwag Monument located at the Sandy Lake Recreation Site on Highway 65 north of McGregor, Minnesota. Anoon feast follows. For more information contact GLIFWC at 715.682.6619.

Check GLIFWC’s Facebook page for map, directions and other details.

Lake Superior Youth Symposium returns to its beginning

Ashland, Wis.—The 12th Biennial Lake Superior Youth Symposium attracted 94 participants, including teachers and students in grades 8-12 from around the basin April 27-28. The symposium—which began in 1995 at Northern Michigan University’s Sigurd Olson Environmental Institute—aims to enhance appreciation for the beauty and unique ecology of the largest Great Lake, inspiring youth to become environmental stewards. Breakout sessions featured GLIFWC staff to highlight key resources of Anishinaabe perspective in how and how treaty rights help protect the Lake Superior basin.

Wildlife Biologist Peter David was one of the featured natural resource management professionals to showcase what a career in ecology could look like. David’s talk stressed the importance that manoomin has beyond a simple food source. The Ojibwe migration story, and an overview of the traditional harvesting practices are highlighted how Anishinaabe perspectives guides his work in protection and restoration. For a more hands-on education, GLIFWC wardens Christina Dzwonkowski and Holly Berkstresser hauled out trapping tools and furs of mammals from the Lake Superior basin (for more see page 7).

Attendees also participated in this year’s tree planting at Whittlesley Creek National Wildlife Refuge in honor of Arbor Day in conjunction with US Fish & Wildlife Service. As the physical roots from their planted trees continue to grow, symposium goers are encouraged to cultivate and share the intangible knowledge they gained with their home communities and continue to make positive impacts around the Lake Superior basin.

Held every other year, communities in Wisconsin, Minnesota, Michigan and Ontario have hosted the youth symposium. For more see http://lakesuperioryouth.org.

GLIFWC phenology project in second year

(Continued from page 6)

This is particularly helpful in that the user can target groups of specific species of trees to look for differences in the timing between species throughout the growing season. Defining a region of interest also allows the user to avoid including portions of the sky or any other non-vegetative objects in the photo. When the Gcc is plotted over time, the result is a graphical representation of the spring green-up and fall senescence (Figure 2). When the Gcc is plotted over multiple years, we can look for variances in the timing of biological changes in the forest canopy, and determine if the variation is associated with changes in localized weather or climate variables, such as precipitation, temperature, relative humidity, and so forth. Eventually, this could allow us to look for additional relationships between phenology and environmental changes, and could provide us with a better picture of what changes we might expect to occur in the future.

This year, in addition to the phenocams overlooking the forest canopy at the phenology study sites, Panci and Bartnick are also experimenting with the use of a time-lapse camera at the ground-level. They have placed one phenocam at a site near a dense patch of wild leeks on the forest floor. Keep an eye out on the GLIFWC Facebook page for updates on the status of these phenocams. Expect to see new time-lapse videos of the spring green-up sometime in late summer.

To learn more about GLIFWC’s climate change program, including links to past phenocam footage, please visit: http://glifwc.org/ClimateChange.
Great Lakes Sea Lamprey

Great Lakes Sea Lamprey

Sometimes referred to as vampire fish, sea lampreys kill other fish by sucking their blood and other body fluids. They have been around since before the dinosaurs.

Unfortunately, lampreys are invasive to the Great Lakes, and are a big problem! They entered the lakes through shipping canals built in the 1800s, allowing them to swim into Lake Ontario from the ocean. Sea lampreys were stuck in Lake Ontario because Niagara Falls blocked their path to Lake Erie. In 1919, the Welland Canal, which connects Lakes Ontario and Erie, was deepened, and sea lampreys used the route to swim into Lake Erie by 1912, then into Lakes Huron and Michigan by 1937, and finally Lake Superior by 1938.

Sea lampreys attach to most species of large Great Lakes fish. Each sea lamprey can kill up to 40 pounds of fish in its lifetime!

After invading the Great Lakes, sea lamprey quickly began to devastate sport and commercial fish species, particularly lake trout.

By the time it was obvious that sea lampreys were a problem, it was too late for some lakes. Native populations of lake trout were gone from Lake Huron and Lake Michigan. However, control methods began before sea lampreys completely depleted lake trout in Lake Superior. The native lake trout population in Lake Superior survived the sea lamprey invasion!

Life cycle word scramble

1. Unscramble each of the words below. (HINT: Words used are bolded in the story above.)

2. Copy the letters in the numbered boxes to the boxes at the bottom of the puzzle with the same number to reveal a hidden phrase.

Sea lamprey life cycle

12-18 MONTHS

Adult lamprey build horseshoe-shaped nests where they lay their eggs. Upon hatching, baby sea lampreys—called larvae—burrow into the stream bottom where they will live for 3 to 10+ years. Once they reach 5-6 inches in length, a metamorphosis occurs where the larvae develop a suction mouth, eyes, fins, and an appetite for fish blood. Now the sea lampreys are a parasite ready to eat! A migration into the lakes then occurs where parasitic sea lampreys feed for up to a year-and-a-half, afterward returning to streams for spawning.

Did you know?

Sea lampreys are a revered species for many nations situated on oceans, but lampreys that live in the Great Lakes are considered bad news. They kill large amounts of Great Lakes fish and are inedible because they contain a lot of contaminants like mercury.

Lampreys are a popular menu item in western Europe. And in the United States’ Pacific Northwest many tribes greatly admire lampreys, valuing the ancient fish as a food source and a relative, like a brother. Tribal members catch lamprey by hand in rivers where rapids and waterfalls form. Lamprey are eaten at feasts and play an important role in some ceremonies.

But lamprey populations in the Columbia River basin have plummeted since the 1900s and only a few places like Willamette Falls, Oregon still have harvestable numbers. Regional tribes including Nez Perce, Umatilla, Yakama and Warm Springs are leading an effort to restore Pacific lamprey back to their original home range.

—C. Rasmussen

Reprinted with permission from the Great Lakes Fishery Commission.
Aaniin ezhiewebak agwajing? What is happening outside?


(It is warming up and it is mild weather. Early in the morning, those birds are singing. When I wake up in the morning, I am happy. I think those birds are beautiful. As summer begins, we planted the gardens there. I knew how to take care of those gardens. It rained enough. It was warmed by the sunshine. It did not hail. We ate those potatoes. We ate those cucumbers/melons/squash. We always went into the woods to pick blueberries, my mother, my younger siblings and 1.)
The Mille Lacs walleye population has declined because the invaders redirected the energy in the food web, and to get things back to the way they were, we just need to get rid of the invaders. Unfortunately, it’s not that simple. First, while researchers are evaluating population control methods, there have been no effective lake-wide control programs for zebra mussels or spiny waterfleas. This means that for now, the invaders are here to stay. Secondly, while the walleye decline coincided with the increase of these two species, a causative link is difficult to establish. Even though the zooplankton community appears to have been affected by the invaders, walleye are surviving past the first summer of life when they depend on zooplankton for food. Survey catch rates of walleye in their first fall have not declined (2005-2008 catch rates averaged 86.2 per mile; while in 2009-2012 they averaged 103.9 per mile). Still, these fish are not surviving as well as they used to from ages 1-2. The 2005-2008 year-classes averaged 2.3 walleye per net lift at age 2 in fall assessment surveys, while the 2009-2012 year-classes averaged 0.41 walleye per net lift. A study by a blue ribbon panel of fisheries experts suggested that predation on these young walleye is higher than in the past. Has the invaders’ impact reduced the abundance of prey fish, causing large predator fish (e.g. adult walleye and northern pike) to eat more young walleye? Did the invaders reduce the total amount of walleye that can live in the lake? Researchers plan to explore these questions in the near future.

For now, the zebra mussel and the spiny waterflea will continue to affect the Mille Lacs food chain. Low fishing mortality will help the walleye population increase from its lowest level, but biologists are unsure if good survival of young walleye will return. In the meantime, prevention is the best way to control the spread of aquatic invasive species. Close attention to boats, trailers, and equipment when moving between waters is critical. While the best steps to prevent movement of each specific invasive are slightly different, washing, disinfecting, freezing and sun-drying can all be helpful ways to reduce the risk of new introductions. Biologists, anglers, and tribal members need to work together to prevent the spread of invasive species and the impact these organisms have on aquatic foodwebs.

Sugar bush
a family affair

(Continued from page 6)

“Will be mapping the extent of EAB on Sugar Island reservation land,” Martin said. “EAB can’t fly very far, so the best thing people can do is avoid moving firewood. That’s how new infestations typically start.” To date, Bay Mills’ black ash forest preserve near Brimley has remained free of EAB.

Sharing sap & knowhow

The Bay Mills assessment crew didn’t collect a lot of sap from Sugar Island—around 23 gallons—but they knew someone who would make immediate use of it: Paula Carrick and her extended family at the main reservation. In her 38th sugar bush season, Carrick said the recent run was a poor one and her family welcomed the extra sap.

“We thought it was a bad season,” Carrick said. “We put our taps out in March during a warm spell and there were a couple of really good days. Then it shut down for three weeks, ran a little bit more, but then that was about it.”

Carrick and her sister Wanda help oversee a mainland sugar bush that draws over four mussels / ft². In 2009, density increased to over fourteen mussels / ft². In 2010 to almost 14 mussels / ft². Error bars represent ± 1 standard error.

Figure 1. Mean density of zebra mussels sampled at nine sites in Mille Lacs Lake from 2005 to 2015. Zebra mussels were first observed in very low densities (<0.1 mussels / ft²) in 2005. Density was below two mussels / ft² from 2006-2008. In 2009, density increased to over four mussels / ft² and increased again in 2010 to almost 14 mussels / ft². Error bars represent ± 1 standard error.

Figure 2. Average spiny waterflea per liter during MNDNR May and June sampling in Mille Lacs Lake. Spiny waterfleas were first discovered there in 2005. Density was below two mussels / ft² from 2006-2008. In 2009, density increased to over four mussels / ft² and increased again in 2010 to almost 14 mussels / ft². Error bars represent ± 1 standard error.

Figure 3. Simplified hypothetical food web before and after zebra mussels and spiny waterfleas were introduced to Mille Lacs Lake. Size of the box indicates changes in biomass for each trophic level (e.g., base of the food web, apex predators). Number of solid arrows indicate the relative amount of energy moving up the food web (less arrows equals less energy). Dashed arrow indicates that young fish may consume spiny waterflea, but may be more difficult due to abdominal spine, potentially resulting in consumption of fewer food items.

Please contact Mark Luehring, Dr. Aaron Shultz, Dara Unglaube, Ben Michaels, Dr. Adam Ray, or Joe Dan Rose at GLIFWC for more information.
Sagkeeng First Nation hosts Elders Gathering on Hunting

The Assembly of Manitoba Chiefs organized an “Elders Gathering on Hunting,” on March 6. The intent was to solicit advice from Manitoba elders and knowledge carriers on the values, practices, and protocols on hunting.

Another big discussion item surrounded the safety and teachings pertaining to night hunting. Many elders, hunters, and Manitoba Provincial Representatives gathered at the Turtle Lodge at Sagkeeng First Nation, everyone eager to both listen and speak for their communities.

GLIFWC accepted an invitation to speak and Mole Lake Chairman Chris McGechick gave a presentation on night hunting within GLIFWC ceded territory. Many of the representatives and harvesters had questions related to night hunting regulations and course work. Overall, the gathering began on a positive note and ended with the calming sense of gratitude and strengthened relationships.

—Dylan Jennings

Making sense of good years, bad years on manoomin waters

(Continued from page 5)

Perhaps harvest data from natural waters would provide more clarity? Well, it turns out that, there are challenges with using that data as well. The best data of that kind available anywhere in manoomin’s range comes right from the annual Wisconsin harvest survey GLIFWC conducts each year in cooperation with the Wisconsin DNR. Does that data suggest a cycle? I would say (drumroll, please): no—at least on a state-wide scale (Figure 1). But there are some reasons why this data might not detect a cycle even if it were there.

First off, we are using harvest as an index to abundance, and while the two are certainly related, the match is far from a perfect one. While harvest cannot be (very) high when abundance is low, harvest can be low when rice is abundant. Poor, or ideal, weather during the harvest season may affect harvest levels as much as abundance.

In addition, human harvesting pressure can vary appreciably from year to year; good crops tend to increase state license sales, for example. Pressure may even drop after a particularly good year simply because some folks still have enough left in their pantry to get them through another year.

Figure 2 depicts estimates of rice abundance and harvest from Pacwawong Lake. While the relationship between harvest and abundance is pretty strong, some years don’t match up: in 2010 for example, rice plants were abundant, but an outbreak of brown-spot disease lead to a near complete failure in harvest. In contrast, the particularly high harvest seen in 2009 was likely as much a product of ideal weather during the harvest season as it was rice abundance.

And again there is the question of scale. While state-wide harvest estimates could hide cycling taking place on a local level, the Pacwawong figure is typical of our annual surveys of individual lakes in not suggesting a regular cycling in abundance either.

Of course, if manoomin were cycling, there would be the question of what is causing it. Dr. John Pastor at the University of Minnesota Duluth has explored how nutrient levels affect rice abundance. In particular, Dr. Pastor and his students have found evidence that nitrogen taken up by the plants and stored in the roots is not available to fuel growth of the next year’s crop due to insufficient over-winter decay. Under carefully controlled experimental conditions, it appears this nutrient cycling can lead to a cycling in manoomin abundance at the local level. And these observations seem consistent with the observations of many rivers that river beds of manoomin seem to vary less than lake beds—presumably because of the constant influx of nutrients that occurs on rivers.

Nevertheless, on real-world rice lakes, nutrient cycling is only one of several factors that affects rice abundance in any given year. Water levels, over-winter conditions, competing vegetation, storm events and disease outbreaks are just some of the myriad of factors that can influence whether a fall harvester finds a sea of grass or just a few scattered stalks on her favorite lake. In the end, the interplay of all these factors, and the variability of each of them, leave me to conclude that while wild beds of manoomin vary greatly from year to year, they likely do not cycle in a regular way.

Finally, if there is one message hidden in all of our monitoring, it may be this: When it is a really good year on a lake you favor, you may want to put your tobacco down and get out there, because there is a good chance next year will not be as good!
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