

Mazina'igan

A Chronicle of the Lake Superior Ojibwe

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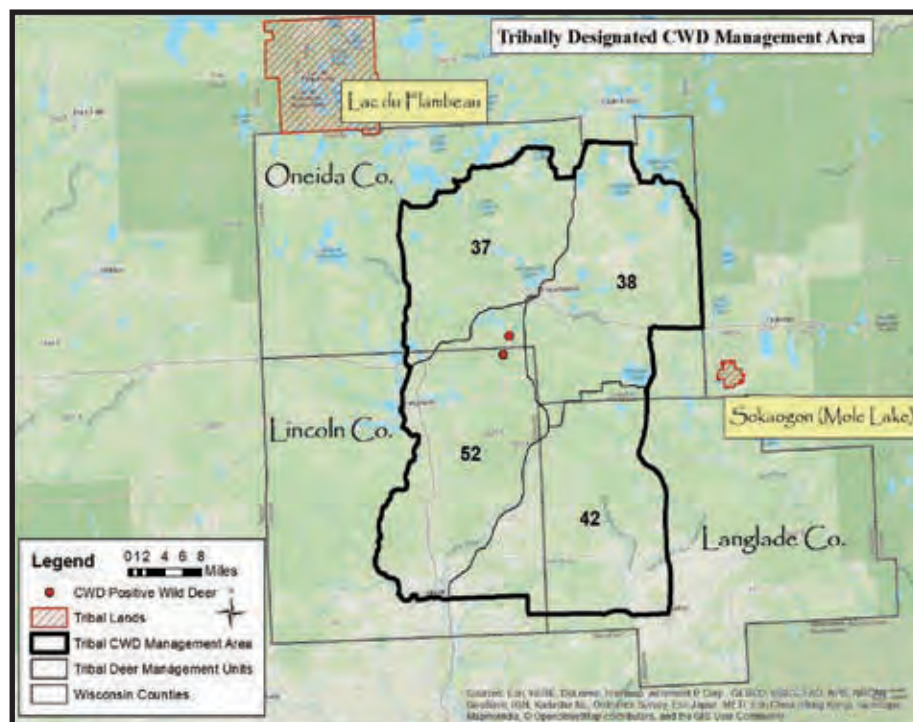
Wildlife managers expand chronic wasting disease management

Tribal CWD Management Area approved

By Travis Bartnick
GLIFWC Wildlife Biologist

The Voigt Intertribal Task Force (VITF) passed a motion September 6 supporting recommendations from the Intertribal CWD Working Group designed to limit the spread of the fatal deer ailment. The Intertribal CWD Working Group was established by the VITF in 2016 and consists of Task Force representatives and wildlife biologists from tribal natural resources departments in Minnesota, Wisconsin, and Michigan. The recommendations approved by the VITF include the establishment of a tribal CWD Management Area (see map) and regulations concerning the transport, disposal, and registration of deer harvested within the tribal CWD Management Area.

The Tribal CWD Management Area is an area in which the potential for a tribal member to kill a deer carrying chronic wasting disease is increased. Restrictions on the transportation of deer carcasses killed within these areas, and additional (see CWD, page 19)



The Tribal Chronic Wasting Disease (CWD) Management Area is an area where the potential for a tribal member to kill a deer carrying chronic wasting disease is increased.

Tribal hatcheries support fisheries across north country



Lac du Flambeau's extended growth walleyes averaged 6.9 inches each. The fish were released into both on and off-reservation lakes. (submitted photo)

By Charlie Otto Rasmussen, Editor

Environmental degradation, invasive species, and rising water temperatures all take a toll on the walleye resource in the Ojibwe Ceded Territory. For many GLIFWC member bands, struggling walleye populations on some waters hits close to home.

Fish is a primary food source, both culturally important to the Ojibwe, and a living icon of modern-day treaty rights when ogaawag occupied center stage during the "Walleye Wars" of the late 1980s.

"Walleyes in northern lakes are experiencing more forms of stress than ever," said longtime Lac du Flambeau Natural Resources Director Larry Wawronowicz. "Self-reproducing fish populations are always the best way to go. There's nothing else like it. But when that fails, hatcheries can provide a significant boost."

With little fanfare, Lac du Flambeau's William J. Poupart Sr. Fish Hatchery has provided that boost, turning out hundreds-of-millions of fish into regional waters for more than 80 years.

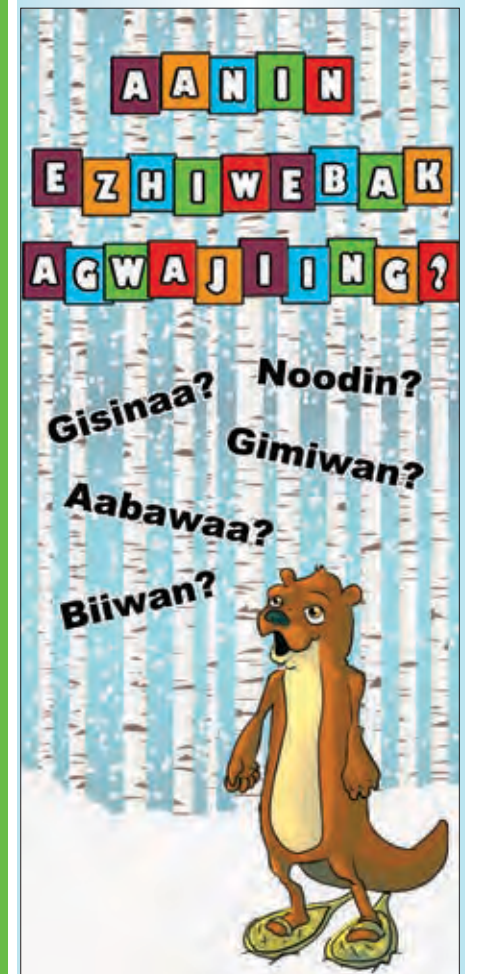
An additional half-dozen GLIFWC tribes also propagate and release millions of fish annually, providing for state anglers and native fishers alike.

"Walleyes and other species are stocked both within reservation waters and in the surrounding lakes," Wawronowicz said.

Across Ojibwe Country, tribal hatcheries provide a shared resource even inside reservation borders. On Lac du Flambeau (see Lac du Flambeau, Sokaogon, page 22)

Biboon is a great time to learn Ojibwemowin

Let's talk about the weather!



Aanin Ezhiwebak Agwajiing? (How Is It Outside?)

Aabawaa (warm)

Biiwan (blizzard)

Gimiwan (raining)

Gisinaa (cold)

Noodin (windy)

Check out GLIFWC's language website: glifwc-inwe.com/about.html

(see more Ojibwemowin, page 16)



Hunts rooted in community, ceremony yield five bull elk in Wisconsin

By Charlie Otto Rasmussen, Editor

Clam Lake, Wis.—For tribal nations in the Ojibwe Ceded Territory, the return of a native species is an occasion for ceremony and celebration. From coaster brook trout to the American marten, GLIFWC member tribes and their interagency partners have invested decades into restoring fish and wildlife to the fractured ecosystems of the upper Great Lakes region. In a new milestone, elk stewardship in northern Wisconsin has helped usher in the first omashkooz hunting season of the modern era.

“It’s been a real source of pride to see the herd grow and develop into a healthy population. We’ve come a long way since the early 1990s when we mapped out the road to elk restoration,” said Michael J. Isham, GLIFWC executive administrator. “The recent hunt fulfills an Anishinaabe teaching that native people must make use of our natural resources, these gifts from the Creator, or risk losing them.”

The Ojibwe elk hunt got underway in late September, while Department of Natural Resources (DNR) officials set the state opener for October 13. Treaty and state-licensed hunters evenly split 10 bulls-only harvest tags valid for the Clam Lake elk management zone, a vast expanse of largely public land centered in the Chequamegon-Nicolet National Forest.

Following a September 22 gathering at Chippewa Lake that included a review of regulations by GLIFWC wardens and a series of traditional ceremonies, intertribal groups drew up hunting plans for five bull elk in the Clam Lake zone. Hunters from GLIFWC treaty bands took turns in the wilds of the mixed pine-hardwood forest, scouting elk habitat and looking for harvest opportunities. On September 23 a Sokaogon Mole Lake member made the first kill, connecting with a beautiful omashooz bull. The harvest kicked off a new era for many native hunters experienced in pursuing white-tailed deer, but now after a whole new animal.

The right spot

Patrick Hmielewski’s hunting partners weren’t sure what to make of his new elk calls. The cow call sounded like some sort of screaming bird and the other one—meant to mimic a bull elk’s mating bugle—seemed to defy description.

“By the time the weekend is up, I’ll have these things down,” he assured fellow Bad River Band members Elijah Weber, Steven Nelis, and Jerome Powless. It was Thursday afternoon, September 27.

Weeks earlier the foursome was selected at random from a pool of qualified hunters to participate in the historic hunt that placed a premium on community patronage and a traditional hunting ethic that inspires collaboration above individual achievement. Over the following days, the crew would coordinate hunting forays with other tribal members and share responsibilities both at camp and in the field.

Most treaty hunters made camp in the meadows east of the manoomin-rich Chippewa Lake—the same site that hosted the GLIFWC-led elk orientation and a number of ceremonies. The Commission provided portable toilets and a dumpster for hunters and their families lodging in personal wall tents and campers. A central firepit offered a place to cook meals and share stories.



Mole Lake youth waadookaaged (helpers) pack out an omashkooz quarter on a length of pole wood near Clam Lake, Wisconsin. A Sokaogon hunting party harvested the first elk of the season on September 23. (T. Bartnick photo)

On the cover

A pair of waaboozoog (snowshoe hares) feed on the dry twigs of an alder. Hares have been a traditional food source for Woodland Indians for centuries. The small mammal with powerful legs has been in decline, however, and native residents of the Northwoods report seeing fewer and fewer of them. Reductions in the depth of the snowpack is decreasing their access to the upper branches of alders, a primary food source. Read about climate change and waaboozoog on page 18. (Michael Quinton, photo)



A hunting group comprised of Bad River Band members found success in the Chequamegon-Nicolet National Forest on September 29. From left: Patrick Hmielewski, Elijah Weber, Steven Nelis, and Jerome Powless. (K. Hmielewski photo)

Elk return to Wisconsin

Today’s Clam Lake elk herd is rooted in a reintroduction project that included University of Wisconsin-Stevens Point, Department of Natural Resources, U.S. Forest Service, Ojibwe Tribes, GLIFWC and Rocky Mountain Elk Foundation. GLIFWC researchers mapped out suitable elk habitat in the region and Lac Courte Oreilles Spiritual Leader Gene Begay presided over a welcoming ceremony in 1995 when the founding herd of 25 elk was translocated from Lower Michigan to the Wisconsin Ceded Territory.

After a gloomy Friday that didn’t produce elk sightings for tribal hunters, Saturday morning delivered sunshine and a woodland aglow in autumn reds, oranges and yellow. A few hours after sunup, the four hunters from the Bad River Band stood in a staggered line some 40 yards apart in a wide forest opening bound by trees and, on the back end, a lowland marsh.

“We’d seen a lot elk sign there,” Hmielewski said. “Now, this is all new to us, hunting elk. But the spot seemed right.”

Before the crew began a slow, stop-and-go walk into the forest meadow—a technique known as still hunting—Hmielewski produced his bugling tube, making a series of calls that imitated a challenge to bull elk. During the September breeding period known as the rut, bulls will face-off, sparring with their antlers in a show of dominance to establish the right to mate with area cows. A few minutes after the last bugle, three bulls appeared. He had struck the right tone.

(see Elk hunt, page 19)

Early season deer registrations down, bear registrations up from 2017

The early dagwaagin (fall) hunting season harvest numbers are below average for waawaashkeshi (deer) hunters and up for makwa (bear) hunters in the 1842 and 1837 Ceded Territories compared to the same period last year.

Early season weather started off hot, humid, and buggy, and then cold, windy, rainy weather persisted through much of late September and into early November. From the start of the season (the day after Labor Day) through October 22, Ojibwe hunters registered 201 deer and 36 black bears. At the same time last year, tribal members had registered 477 deer and 27 black bears.

This is the second year tribal hunters have had the option of registering their deer remotely, via phone. Of the 201 deer that were registered in the first few weeks of the season, 153 (76%) were registered using the new phone registration system. The peak of the off-reservation tribal deer harvest typically falls over the second, third, and fourth weeks of November.

—T. Bartnick



Ceded Territory news briefs

PolyMet mine permits approved by Minnesota DNR

On November 1, the Minnesota Department of Natural Resources issued permits to PolyMet Mining Corporation to move forward with a proposed copper-nickel mine near the Iron Range in northeastern Minnesota.

The permits—including a permit to mine, six water appropriation permits, two dam safety permits, a public waters work permit and an endangered species takings permit—support development of a 6,000-acre open-pit mine, tailings basin and processing plant at the former LTV taconite site near Hoyt Lakes. In August, tribal and GLIFWC staff met with the Minnesota Department of Natural Resources to try to have tribal concerns addressed in the proposed permits.

Though the project still needs water and air quality permits from the Minnesota Pollution Control Agency, a wetlands permit from the U.S. Army Corps of Engineers, and some local permits and approvals, the DNR's backing increases the likelihood that the project will move forward after 14 years of environmental review.

The PolyMet mining project has generated much concern and conflict in Minnesota and the surrounding areas, due to the risk that hard rock mining can pose to local lakes and rivers.

Waste rock can produce acid that leaches heavy metals from the ground, threatening local water bodies with toxins. Additionally, environmental groups say the 1950s-era tailings basin that will be used for the project is a risk for catastrophic failure. GLIFWC will review the permits to see if they address tribal concerns raised in August and will continue to monitor the project as it develops. —P. Maday

First wolves arrive on Isle Royale in pack reboot

Grand Portage, Minn.—The National Park Service wrapped up the first phase of its ma'iingan translocation program to Isle Royale in mid-October. In collaboration with the Grand Portage Band, four wolves were captured on the mainland and moved to Isle Royale by boat and aircraft with assistance from the US Fish & Wildlife Service.

Since the wolf population collapse on the large Lake Superior island in recent years, moose numbers have soared, stressing tree and plant communities. Wolf inbreeding over the past decade on the island—located 18 miles from the mainland—created an unhealthy population with physical abnormalities that made the animals ineffective hunters.

In a move designed to give the new pack a healthy start on their island home, the Park Service killed six moose near ma'iingan release sites to feed the animals after the short-term captivity and likely stressful translocation. —CO Rasmussen

Oneida County voters reject Lynne mine development

Rhineland, Wis.—A proposed metallic mineral sulfide mine situated just south of the Lac du Flambeau Reservation was rejected in a public referendum on November 6. The advisory referendum asked whether Oneida County should lease county-owned land for mining; the voters said no. Located on county forestland, the mine site is comprised of wetlands connected to waterways including the Willow River.

"It's a clear indication of what local residents think, but this is one step in a process," said Lac du Flambeau Natural Resources Director Larry Wawronowicz. While residents rejected the mine by a 62% margin, the ultimate decision on whether to move forward with mining lies with the Oneida County Board.

Developers are interested in mining a deposit that contains lead, zinc and copper. The minerals are bonded with sulfides which, when exposed to air and water, transform into acid that can leach into the environment. —CO Rasmussen

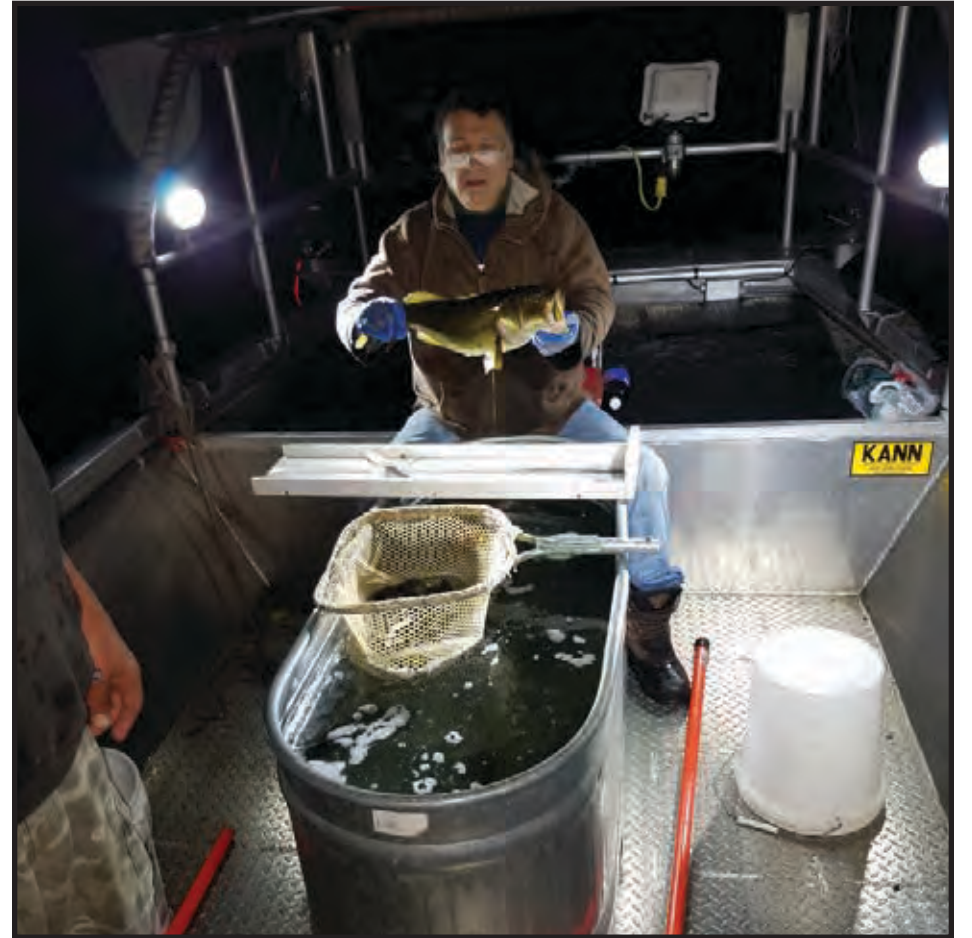
A plan for ma'iingan

Natural resources officials kicked off a community comment period October 23 for an updated wolf plan on the Bad River Ojibwe reservation in far northern Wisconsin. During the gathering in New Odanah, Bad River elders, Wolf Clan members, and others from the community stressed that the traditional Ojibwe-Ma'iingan brotherhood should continue to be a major consideration in tribal management policies.

Lacey Hill-Kastern, Bad River Tribe wildlife biologist, said four wolf packs totaling up to 20 or more animals maintain home ranges that include the heavily wooded, 124,000-acre reservation. With a high juvenile mortality rate, the population can dip down to around a dozen wolves, Hill-Kastern said. Tribal wildlife staff plan to wrap up the comment period by early December.

Contact Hill-Kastern at 715-682-7123 to submit comments. See the most recent wolf management plan at http://www.badrivernsn.gov/images/stories/image/WildlifeProgram/2013WMP_Final.pdf —CO Rasmussen

GLIFWC crews evaluate fisheries in all weather



GLIFWC Fisheries Aide Jerome Cross with a largemouth bass that was captured and released September 17 during a survey of Oneida County's Tomahawk Lake. (E. White photo)

In a busy field season that wrapped up October 18, GLIFWC inland fisheries specialists conducted electrofishing surveys for juvenile walleyes on 91 lakes in Minnesota, Wisconsin and Michigan. While young-of-the-year walleyes are the primary targets, staff also collected other data from species including bass and perch. Like many years, crews experienced a wide range of weather this past autumn during the evening assessments.

"We started out in shorts and t-shirts and by the end we were wearing winter clothes and Mustang suits," said Crew Leader Ed White. Mustangs are survival suits used in dangerous on-the-water conditions. They provide both warmth and buoyancy.

Fall surveys help biologists evaluate the success of walleye spawning that took place earlier in the year. —CO Rasmussen

2018 Manoomin Season: A Mixed Bag

While the term "a mixed bag" might be welcomed by a duck hunter, it is less of a positive when applied to a rice season—but it seems apt to describe this past fall. Rice abundance throughout the Ceded Territory was highly mixed; while below average over-all, a few areas produced wonderful stands. Early season storms appeared to cause problems at many sites, but none worse than at the Radigan Flowage in Douglas County. There a jewel of a rice bed disappeared in a flash when the dike blew out after the "Father's Day Storm" dumped over a foot of rain in parts of northwest Wisconsin. (GLIFWC is in contact with Dairyland Township officials and other partners to see if reconstruction can be accomplished.)

It was also a year where nature seemed to play favorites. Early ripening beds were hit the hardest; they seemed to produce little manoomin, and even less human harvest, as storms swept through as they were ripening. However, some late ripening beds came into maturation in a window with better weather, and it appears that many ricers were able to bring home some seed by concentrating on those sites.

Manoominike feedback

If you picked up either a state or tribal off-reservation ricing permit this year, there is a good chance a harvest survey from GLIFWC has already showed up in your mail box. If so, please know we really appreciate your cooperation by completing and returning the survey—even if you didn't get out to rice. The rich harvest data base we have built with the cooperation of ricers like you really helps us steward this precious gift from the Creator. —P. David



Binding—an older method of manoomin harvesting

By Peter David, GLIFWC Wildlife Biologist

Imagine an acre of manoomin not as a sea of swaying stalks, but as orderly rows of shocked heads, tied into neat bundles a yard in diameter at their base, with an open canoe channel between them. Imagine the labor of producing such a scene, or harvesting the rice not with the cedar ricing sticks, but simply by returning at a later date, paddling down the channel, leaning the shocks over the canoe and untying the heads.

This other, older, and apparently less common method of harvesting manoomin was once practiced by the Ojibwe, but the practice faded out perhaps a century or more ago. Much of Traditional Ecological Knowledge (TEK) associated binding seems to be fading away as well. “Binding” or “tying” rice reflected a high application of TEK: binding too early would interfere with pollination; binding too tightly would presumably crush the stems and prevent the seeds from filling out. But when done properly, binding allowed the seeds to reach full maturity (and thus likely finished with a higher yield) while protecting the plants from losses due to wind, rain, hail and birds.

Binding also differed from “knocking” rice in at least two other important ways: 1) it likely made it possible to harvest a much higher portion of the seed produced than the 10-15% that is harvested by even intensive application of the ricing sticks, and 2) binding rice implied ownership: if I bind this manoomin, I have an expectation that it is mine to harvest once the rice has matured. Both of these matters likely had important implications.

The high yield that was possible through binding likely offered both positives and negatives. It allowed a high harvest from a relatively small area, and thus the



Woman in boat tying wild rice stalks with basswood fiber. (Frances Theresa Densmore photo ©Minnesota Historical Society)



Wild rice tied for harvest on Minnesota's Lake Onamia. Done properly, binding allowed the seeds to reach full maturity while protecting the plants from losses due to wind, rain, hail and birds. Binding is not currently legal under state or tribal off-reservation codes (©Minnesota Historical Society, circa 1909)

practice seemed to be more commonly done by elders, or individuals without a ricing partner.

The implied ownership also meant that binding was really effective only when that ownership was respected by other harvesters. There is little reason to go through the labor of binding if “my” rice is taken by another. It also means that binding was likely practiced close to tribal communities, where control was greatest.

It seems likely that the ownership issue is one of the reasons that the practice was lost. As more non-tribal people became ricers, it was likely impossible to maintain the level of regulatory control of the rice beds that existed when ricing was strictly a tribal activity. However, while that consideration would seem to apply to off-reservation beds, it is less clear why the tribal members stopped binding within reservation boundaries.

Although binding is not currently legal under state or tribal off-reservation codes, there is interest in re-learning the TEK associated with this practice, and determining if there is a place for it today. Perhaps someday, you will not have to imagine the scene of bound rice, but will see it yourself.

If you have knowledge, stories or experiences with binding you may be willing to share with GLIFWC staff, please contact Peter David at 715-682-6619, ext. 2123, or pdavid@glifwc.org. Miigwech!

Manoominikewin in Milwaukee

By Bizhikiins Jennings, Staff Writer

Milwaukee, Wis.—Hunting, fishing, and harvesting aren't necessarily the first things that come to mind when driving through Milwaukee, but one resilient community is looking to make these traditions commonly understood and engrained in their youth. Staff at Indian Community School (ICS) of Milwaukee work around the clock to bring Milwaukee native students many opportunities to flourish in their identity. The school prides itself in its seasonally oriented calendar, superb programming and unique curriculum.

Manoomin was in the air, literally, as youth took to each manoominikewin station. While manoomin dried on a tarp, students gathered around to learn about the harvesting process and the biological and phenological cycles of the delicate food staple.

Audra Williams, Our Ways Coordinator at ICS, assisted in organizing this year's manoomin camp. “As we are rolling out our new culture calendar this year, we thought it would make more sense to tie into what is going on back home on our tribal lands and what our people are doing seasonally. We are a large school of 377 students and to get students up north to experience the harvesting is a challenge.”

Youth learned and assisted with each step of the labor-intensive process. Parching, dancing and winnowing were all enjoyed by hundreds of youth throughout the two-day workshop. In addition, students also assisted staff in constructing rice knockers from cedar logs harvested right on the school property.

Williams explains that the manoomin camp is just one piece of the bigger picture. “Our Ways Culture department organized this event to be able to give the students, staff and community the opportunity to start learning about harvesting and why we do it, and how important it is to our survival as our ancestors did this for generations.”

In addition to the basic processing steps, modern techniques and equipment were employed for processing at the camp. Students learned both traditional and contemporary processing, which allowed for a great conversation about the bal-



Indian Community School (ICS) staff and volunteers both learn and demonstrate the process of manoominikewin for intertribal youth at the school. Community member Mark Denning and ICS staff Mark Powless teach youth how to scorch the manoomin in large kettles. (B. Jennings photo)

ance between old practices and mechanized techniques. Students and staff engaged in discussions of rice processing machines and how the design and engineering pertain directly to related STEM fields. The school was challenged to develop and (see Manoomin, page 5)



Mining waste, food webs, and climate intersect in Gichigami surveys

By Charlie Otto Rasmussen, Editor

Century-old mining waste known as stamp sand is beginning to smother one of the most valuable spawning reefs in Lake Superior. Buffalo Reef, located along the southeastern shore of the Keweenaw Peninsula, produces an estimated 33% of the entire tribal commercial catch of lake trout and whitefish in Gichigami's Michigan waters. Factor in rising water temperatures that are reaching historic highs, and a growing level of uncertainty surrounds the region's fish community and ecological health.

"We're continuing our research on trout and whitefish, and also gathering baseline data on the zooplankton community," said GLIFWC Fisheries Biologist Ben Michaels aboard the research vessel Mizhakwad. "The fishery is facing some potentially serious hurdles"

The mid-autumn work meshes traditional GLIFWC gillnet surveys of mature fish spawning at Buffalo Reef with a new assessment tool, a plankton net or trawl. Michaels said GLIFWC crews are using the trawls to document abundance of zooplankton such as opossum shrimp, which are tiny organisms that play an important role in the food web. Researchers conduct trawl surveys in nearshore areas overrun with stamp stands as well as locations with a natural lakebed.

While present research is designed to identify longer term trends, GLIFWC, Keweenaw Bay Indian Community, Michigan Department of Natural Resources and other partners are looking to tackle the stamp sands problem in shorter order.

As the winds and currents along the shoreline push the sands—a byproduct of historic copper mining—into key fish habitat, the problem grows worse each year.

The Army Corps of Engineers and US Environmental Protection Agency have allocated funding to dredge the coarse, dark sands from the shoreline and deposit it at an inland site. Cooperating agencies in association with experts from Michigan Technological University are developing plans to begin work on stamp sand removal and habitat revitalization along approximately five miles of shoreline.



A dune of coarse, dark-colored mining waste called stamp sands rises from Lake Superior shoreline on the southeastern shore of the Keweenaw Peninsula. Currents along the shoreline are pushing the sands over important fish habitat including a foremost spawning ground, Buffalo Reef. (B. Michaels photo)



GLIFWC Fisheries Biologist Ben Michaels prepares a plankton trawl, or net, to search for microorganisms near whitefish and lake trout spawning grounds on Lake Superior. (L. Cloud photo)

Vulnerability of namegos to climate change

Namegos (Lake Trout)

Salvelinus namaycush



Figure 5. Range map of namegos.

Less – Extremely Vulnerable
(Confidence Level: Moderate)

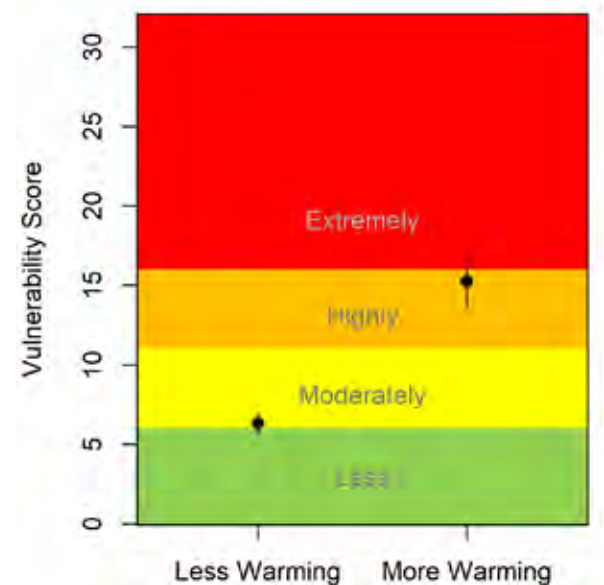


Figure 6. Climate change vulnerability scores for namegos on a scale of 0 (lowest vulnerability) to 32 (highest vulnerability). Dots indicate average score; lines indicate possible range of scores for each warming scenario.

General Description:

Namegos is known as a culturally significant being/species to the Ojibwe people. The fish clan is part of the Ojibwe clan system and those who are part of it are known to be sky watchers that hold knowledge of all that is in the sky, such as the sun, stars, and moon, connecting the earth to the sky.

Namegos is found in Lake Superior and some deep inland lakes throughout the Ceded Territories, often preferring clear, cold, infertile waterbodies (Figure 5). It is harvested by Anishinaabe people and is considered a highly prized sportfish among recreational anglers. Namegos spawns in the fall (mid-October to December; 46-51.9°F) at water depths of inches to 90 feet over low-sediment rocky bars. Young namegosag feed primarily on opossum shrimp (mysis), but also consume insects and small fish. As namegos grows larger, fish (e.g., ciscos and smelt) become an important part of its diet.

The namegos population collapsed in the early to mid-1900s and was effectively extirpated from the Great Lakes except for Lake Superior. Predation by non-native sea lamprey further reduced populations in the mid-1900s. Stocking programs as well as sea lamprey control have aided recovery of most spawning populations of namegos in Lake Superior, but some populations have declined. For example, in management unit WI-2 (North of Ashland, WI), relative abundance nearly doubled from 0.69 adult fish per kilometer of net in 1980 to 1.16 fish per kilometer of net in 2015. Conversely, in management unit MI-2 (Northeast of the Michigan/Wisconsin border), relative abundance has declined from approximately 1.83 fish per kilometer of net in 1980 to 0.64 fish per kilometer of net in 2015. Namegos rarely occurs in inland waterbodies, but the two well-known inland namegos lakes, Black Oak and Trout Lake, have experienced declines or no recruitment in recent (see Namegos, page 11)

Manoomin

(see Manoomin, page 4)

build a more efficient threshing machine before next manoomin season.

As the sun began to lower in the sky, students sat in a circle behind the school, overlooking acres of forested and wetland habitat. One student held a finished piece of manoomin up to the sky to get a better look at it. With one swift movement, the child devoured the "good seed," just as their ancestors had done for hundreds of years. Manoomin may be scarce or no longer existent in these areas, but the identities of our young people will continue to flourish, thanks to communities like ICS.



Red Cliff, partners remove non-native phragmites beds from Chequamegon Bay region

By Gabrielle VanBergen
For Mazina'igan

From spring to early fall the Red Cliff Band of Lake Superior Chippewa's Treaty Natural Resources Division led a project to eliminate three large seed

sources of non-native phragmites (common reed) in Bayfield County with partners Strand Associates, the Greater Bayfield area, and the City of Washburn.

GLIFWC and Red Cliff staff began finding small populations of non-native phragmites in 2013, primarily within one mile of each of the three Bayfield Peninsula wastewater treatment plants (see WWTPs on map). An additional outbreak of the invasive plant was found across Chequamegon Bay near the Kakagon Sloughs in 2016, which was treated by Bad River and GLIFWC staff. At the time, these WWTPs were utilizing non-native phragmites reed beds (see photo below) to dewater biosolids as part of the wastewater treatment process.

A 2016 genetic study led by Red Cliff confirmed the external populations originated from seed and showed some genetic similar-

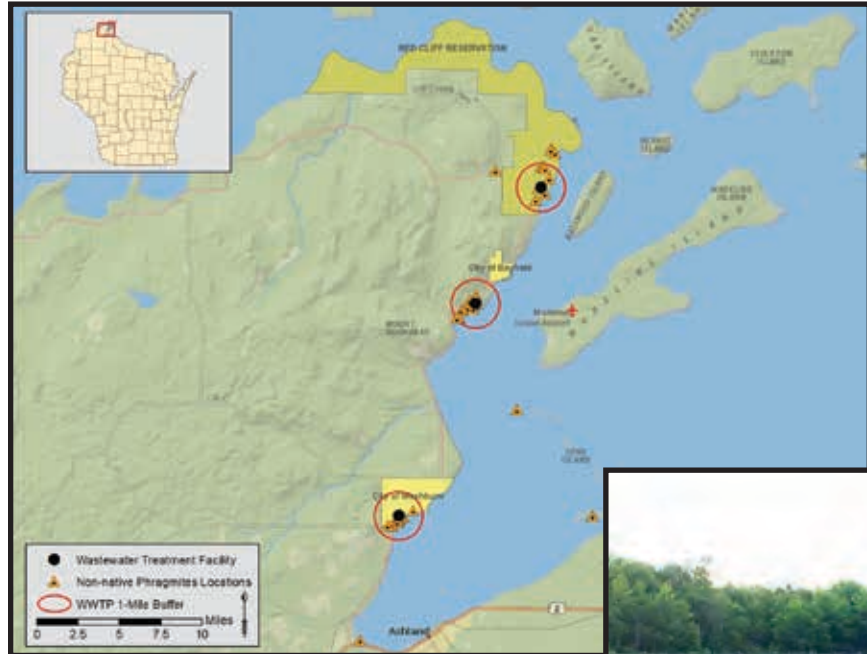
ity to WWTP reed bed phragmites. When these reed bed installations occurred during the late 1990's and early 2000's, there was a widespread belief that non-native phragmites would only spread by rhizomes (roots) and not by seed. The plants were expected to stay contained within the concrete walls of the reed beds.

Efforts in 2018 included removal of non-native phragmites plants and all other material (biosolids, soil & bed liners) from the reed beds at the three WWTPs. To prevent any further spread of the invasive plant, all material that was removed from the reed beds was land-filled. In addition, every truck and piece of equipment that operated onsite was washed and inspected through each phase of the project. The existing reed bed infrastructure will continue to be utilized, now with the non-invasive, native phragmites subspecies. The new plants were sourced from within Bayfield County and genetic testing confirmed that they are indeed the native subspecies of Phragmites.

GLIFWC and Red Cliff staff will continue to monitor throughout the region for non-native phragmites and treat new populations as necessary. Red Cliff staff will also work closely with the WWTP operators to monitor newly established reed beds and around each facility to ensure long term project success.

By removing the previous reed bed populations, the only known Chequamegon Bay local seed source of non-native phragmites has been eradicated, and 14,000+ acres of coastal wetlands among countless inland wetlands have been protected from this highly invasive plant.

—VanBergen is Project Coordinator, Red Cliff Treaty Natural Resources Division



Non-native phragmites locations were primarily within one mile of each of the three Bayfield Peninsula wastewater treatment plants. INSET: Wastewater treatment plants in the Bayfield Peninsula of Wisconsin utilized non-native phragmites reed beds to dewater biosolids as part of the wastewater treatment process. These beds were replaced by non-invasive native phragmites subspecies. (submitted photo)



GLIFWC & NIACS Tribal Adaptation Menu A tool focused on stewardship through an indigenous lens

By Rob Croll, Hannah Panci & Melonee Montano
GLIFWC Staff

In May 2017 GLIFWC became a formal partner with the Northern Institute of Applied Climate Science (NIACS). NIACS is a regional collaborative effort between the Forest Service and several public and private partners, including GLIFWC.

NIACS assists natural resource managers and landowners in climate assessment and adaptation, focusing on the land manager's values, judgement and knowledge of their land to help set goals and priorities for adaptation. As part of the partnership with GLIFWC, changes to the NIACS charter were made to reflect tribal sovereignty and GLIFWC member tribes' unique status as co-managers of the natural resources in the Ceded Territories.

One significant project resulting from the partnership is the Tribal Adaptation Menu. GLIFWC and NIACS staff have been working with partners from the

Intertribal Council of Michigan, 1854 Treaty Authority, College of Menominee Nation Sustainable Development Institute, Lac du Flambeau Band, Red Cliff Band, Keweenaw Bay Indian Community and Michigan Technological University to create the Menu.

The project began in March 2017 after NIACS's "Adapting Forested Watersheds to Climate Change" workshop. A sample exercise at the workshop utilized a wild rice revitalization project from Lac du Flambeau. Group members working on the exercise felt NIACS's Adaptation Menu and approaches didn't adequately recognize or incorporate cultural considerations important for tribal climate adaptation projects. From this experience came the idea to create a tribally-oriented product specifically for tribes, and nontribal partners, to use in climate change planning efforts.

The Tribal Adaptation Menu is designed to be used in conjunction with the NIACS Adaptation Workbook, a collection of resources designed to help natural resource managers incorporate climate change into management decisions and

devise adaptation tactics. The Tribal Adaptation Menu includes considerations such as traditional knowledge of tribal elders and harvesters, culturally-based management techniques, community engagement and consensus decision-making, consideration of cultural and historical sites, indigenous languages, and other appropriate cultural values and priorities. While the initial Menu was created from an Ojibwe & Menominee perspective, the Tribal Adaptation Menu is intentionally designed to be a living and adaptable document transferable to other indigenous communities through the incorporation of their language, history and culture.

An initial field test of the Tribal Adaptation Menu occurred at the BIA Partners in Action Conference in July 2018 in Milwaukee. A small group of tribal natural resource and climate change professionals used the Menu to evaluate real world climate adaptation scenarios. According to workshop participant Allissa Stutte, Environmental Justice Specialist with the Red Cliff Band, "One of the aspects that resonated the most was the focus on community input, involvement, and engagement, (see Stewardship, page 20)



Using the Tribal Adaptation Menu as a reference, land managers can make decisions—like what trees to cut at a timber sale—that both support cultural practices, such as making maple syrup, and advance climate change adaptation efforts. (CO Rasmussen photos)



Gichigami—the big topic at 2nd annual conference

By Bizhikiins Jennings, Staff Writer

Houghton, Mich.—Gichigami (Lake Superior) was the focus at a major conference held in Houghton, Michigan during the second week of October. Michigan Technological University hosted the 2018 State of Lake Superior Conference which was organized by the International Association for Great Lakes Research.

The gathering, still in its infancy, was designed to be an annual event which attempts to bring together research, management, education/outreach, policy development all focused on the big lake. GLIFWC presenters included Ben Michaels, John Coleman, and Jen Vanator.

Sessions that focused on protection were big hits at the conference. Currently, an ongoing issue identified among the group pertains to providing added protection for the water body and wildlife it maintains. Also funding issues for providing protection were addressed.

“Watching the scientists and researchers come together and have deep discussions with the managers was really key to figuring out how the science can help better management of the lake and the life it holds,” said GLIFWC Intergovernmental Affairs Director Ann McCammon-Soltis. The discussions even led to identifying the need for developing metrics to get protection activities better funded.



GLIFWC Fisheries Biologist Ben Michaels presents at the State of Lake conference. (J. Vanator photo)

Recognizing that the great lake and its fish and wildlife inhabitants know no borders or boundaries, participants came from Canada and every state in the region. The Ontario Ministry of Natural Resources, Environmental Protection Agency, Tribes, U.S. Geological Survey, U.S Fish & Wildlife, and many Universities were just a few entities that presented on various topics.

GLIFWC Fisheries Biologist Ben Michaels collected commercial harvest data on Lake Superior over the past 20 years and laid out the geographic distribution of the harvest in a presentation about whitefish, lake trout, and cisco. Michaels explained some of the trends by species and compared these to local timelines, which oftentimes correlate with local regulations, law and the economy. For instance, Cisco harvest in Wisconsin waters reached a spike in 2011 from fishing pressure all around. The spike was attributed to rapidly increasing roe prices.

Another trend that Michaels and other fisheries biologists have noted over time is decreased catch per effort for lake whitefish lake wide. More research would have to be conducted but Michaels hypothesizes that, “Fish could be moving around or moving to deeper water due to changing water temperatures.” Whatever the reasons, Michaels stresses the importance of outreach and scientific dialogue. “A lot of topics and issues were being put in the spotlight at the conference. It’s great for people to (see Gichigami, page 20)

A long-term water monitoring program for protection of Lake Superior tributary health

During the 2011 “Year of Intensive Monitoring” (also known as CSMI), the GLIFWC Environmental Section began a project to monitor aspects of the health of streams and rivers in the Chippewa Ceded Territories of the Lake Superior basin.

The CSMI program focuses resources on monitoring of the Great Lakes. The monitoring project targeted nibi (water) that might be impacted by future hard rock mining development.

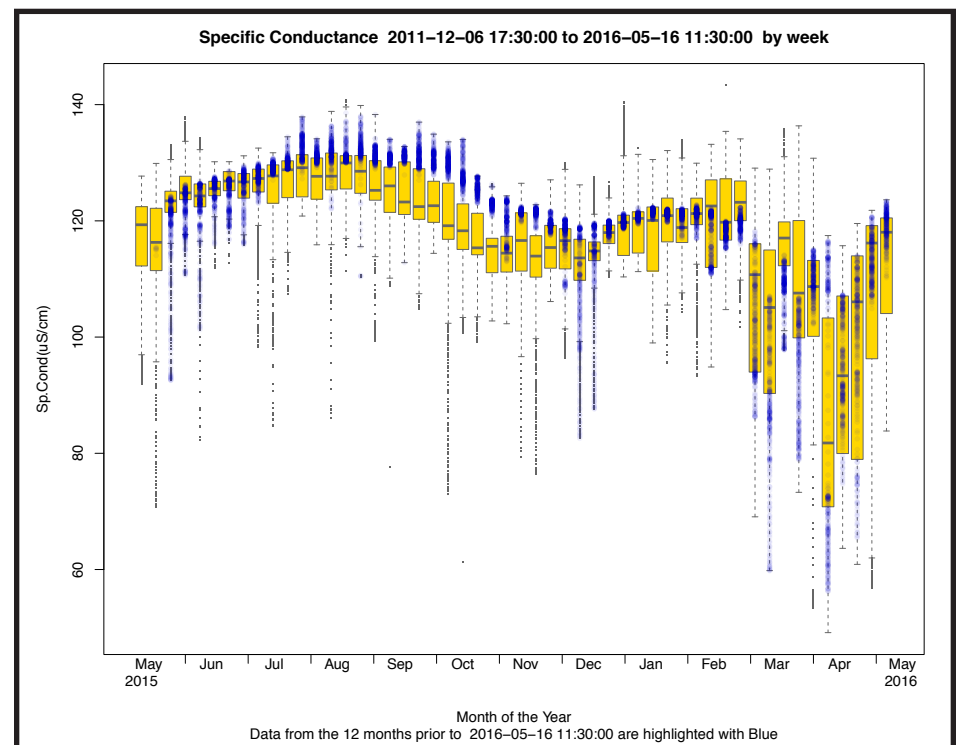
We identified three watersheds that had been unimpacted by recent mineral development but where there was interest in mineral extraction. The project focused on providing baseline data to help protect the health of these tributaries to Lake Superior.

Using a combination of water quality sampling, flow measurement, and near-continuous monitoring of water temperature and conductivity we have been able to develop strong baseline datasets in unimpacted tributaries to Lake Superior.

Over the past seven years, GLIFWC has located additional funds to continue and expand the collection of water quality and quantity data in those watersheds as well as to expand to additional watersheds. GLIFWC now cooperates with four tribes and two federal agencies to monitor water quality in six watersheds in the Ceded Territories.



GLIFWC Mining Specialist Dawn White records data at a water monitoring site. (J. Coleman photo)



Conductance chart: Five years of water quality data by week of the year. Specific conductance of water samples at a monitoring site, collected every 30 minutes, is plotted by week as a box-plot showing the range of values in each week (yellow bars show range and black dashes showing outliers). Over top of the box-plots is one year’s worth of data plotted in blue. The overlay of one year of data shows how that data deviates from the general trend which is shown by the box-plots.

Not only has the project developed a baseline of water quality and flow in generally unimpacted watersheds, but it has also identified cases of increased pollution due to human activities.

In one case, our monitoring contributed to an enforcement action that improved water quality in the Salmon Trout River. In another case, identification of unusual pollutant levels in a stream downstream of the White Pine Mine has triggered discussion with state regulatory agencies and the property owner.

In recent years, our monitoring program includes not only undisturbed watersheds but those that are experiencing mineral development and pollutant discharges. The 2011 CSMI provided the resources and focus to start this program of long-term data collection that is contributing to understanding changes and potential changes in the health of nibi in at-risk tributaries to the Great Lakes.

—John Coleman, Esteban Chiriboga & Dawn White, GLIFWC Environmental Section



Ojibwe trapper ed course debuts in the northwoods

By Paula Maday, Staff Writer

Ashland, Wis.—About a year ago, Bad River Natural Resources Department held a meeting for public comment on revisions to the Bad River trapping code. Two of the comments received at the meeting indicated that not many tribal members were trapping anymore, and that there hadn't been a trapper's education course held in awhile. Post-meeting, Bad River Wildlife Specialist Lacey Hill-Kastern, along with Bad River Education Director Stephanie Julian, set out to change that.

Developing partnerships with GLIFWC, Red Cliff, Wisconsin Department of Natural Resources, Association of Fish and Wildlife Agencies, Wisconsin Trappers Association and numerous local trappers and volunteers, Bad River developed a four-day course aimed at providing instruction in trapping culture and traditional and modern trapping methods, as well as Ojibwe treaty rights, traditional lifeways and cultural practices. This unique course was open to both tribal and non-tribal members, part of an effort to share tribal perspectives with a broader community audience.

On October 10 the course debuted with a waiting list, as participants gathered at the DNR Service Center in Ashland to begin their learning and prepare for their certification test at the end of the course. The first day's agenda introduced students to the tools of the trade, trap identification, equipment preparation, Ojibwe treaty rights, history of trapping, and information on the Madeline Island fur trade, presented by Keldi Merton from the Madeline Island Museum.

Two days later, on October 12, the group came back together for trap setting demonstrations and actual trap setting. They also covered furbearer identifica-



Participants of the 2018 Trapper Education Course included youth, adults, tribal and non-tribal members from around the Ceded Territory. In total, 16 students were certified through the course, which incorporated Ojibwe cultural perspectives, treaty information, and tribal trapping regulations into the course curriculum. (P. Maday photo)

tion, habits, and habitats; trapping communication; skull preparation; and rules, regulations, and incidental catch—a cooperative presentation by Lynna Martin of the Wisconsin DNR and Christina Dzwonkowski-Burns of GLIFWC. Rules and regulations covered on-reservation, off-reservation, and Ceded Territory areas.

Saturday, October 14 focused on cubbies and body grip sets, as well as cable restraints. This instruction was followed by fur handling demonstrations, wherein students were able to learn and try their hand at open skinning (beaver), case skinning (fox, raccoon, mink), beaver fleshing, fox, raccoon, and mink fleshing, and muskrat handling, start-to-finish.

After lunch, students settled in for some time with Jon Gilbert, GLIFWC Director of Biological Services, to learn about Trapping Best Management Practices (BMPs), ethics, and treaty rights. Following Gilbert, Bad River Tribal Historic Preservation Officer Edith Leoso shared information on the Ojibwe cultural significance of wildlife via stories and cultural items. Students finished out the day with their practical trap setting and test.

Sunday—though an optional day—was attended by 14 out of 16 students. Topics for the day included extended safety discussions, such as ice safety, disease, and conibear safety. Students were also able to bank more hands-on time practicing trap setting and skinning, fleshing, and tanning various furbearers.

Hill-Kastern says there is enough interest and demonstrated need for the course that they have begun planning for next year. Cooperative efforts helped to make the course a success in its initial run. These efforts included: a donation from an anonymous donor that covered the registration fee for all students, transportation provided by Bad River for youth that needed it to attend the course; financial and equipment support received from the Association of Fish and Wildlife Agencies and the Wisconsin Cooperative Trapper Education Program; donation of traps so that each student could take one home; and credits offered from Ashland High School for students that participated in the course. All in all, the course was a unique, interdisciplinary learning experience for trappers and a true exercise in cooperative education and management by our natural resource stewards.

From 1790-1830, the value for food, goods, and services was often expressed in beaver skins. Here is what you could expect to pay or receive in beaver skins for the following items during that time period:

1 25-ft. canoe	20
Guiding traders to another post	11
100 whitefish	7
15 pounds of bear grease	4
1 sack of wild rice	2-5
1 trap	5
1 package of white beads	4
1 pound of gun powder	1

For comparison, during the 2018 North American Fur Auction, the average price for beaver from the Eastern section, which includes Wisconsin, was \$10.46 per pelt.

Sources: Research files at the Madeline Island Museum; www.nafa.ca/wp-content/uploads/2018/03/Wildfur-Feb-2018-reports-prices.pdf



Retired DNR Furbearer Specialist John Olson demonstrates how to use cable restraints for trapping. (P. Maday photo)



Ethan Rossing prepares to skin amik (beaver). (P. Maday photo)

Ojibwe trapping words

- wanii'igan: a trap
- wanii'ige-mazina'igan: a trapping license
- naajiwani'ige: s/he goes to get the traps, goes to check the traps
- giitaabikin: remove from a trap



Meet the warden

By Paula Maday, Staff Writer

For the last seven years, Matt Kniskern has served as an Eastern District Warden for GLIFWC, covering the Lac Vieux Desert area. Recently, I caught up with Officer Kniskern to learn more about his interests on and off patrol.

How did you know you wanted to be a conservation warden?

I always liked the outdoors. Hunting and fishing was a big part of my life growing up, so finding a job that would keep me in the outdoors was important. I also wanted a job that allowed me to give back, especially to kids. In college, I took natural resource classes and minored in Native American studies. That put me on the right track to get the job I wanted. It wasn't easy!

What's your favorite book?

"Flags of our Fathers" by James Bradley. It's a book about World War 2. I read it before I joined the military and it was very influential, one of the reasons I joined.



Officer Matt Kniskern and 6-year old Chloe Baumgartner pose for a photo at C.O.P.S (Concerns of Police Survivors) Kids camp. The camp is for kids who have lost a loved one that served in law enforcement. Kniskern has participated in the camp for four years. (submitted photo)

Where and how long did you serve in the military?

I joined the Marine Corps out of high school, left for boot camp in 2001. I completed two years of training before being stationed at Camp Lejeune, North Carolina. From there, I deployed to Iraq from 2004-2005. When I got out of the Marines in 2006, I went to college at Northern Michigan University.

What's one of the most interesting things you've learned from your job?

One of the things that fascinates me is how much I learn from young kids. This summer, we traveled around the Ceded Territory with a handful of kids and I was amazed at what they taught me every day. From birch bark harvesting to other cultural crafts, kids have an ability to turn every day into a lesson. That's what I like about working with kids, they're a wealth of knowledge and they don't even know it.

How do you build your relationship with local youth and the community through your position?

One of the biggest requests we get from communities in Michigan is for safety programs, so we offer a lot of classes throughout the year: hunter's ed, snowmobile safety, boater safety, Canoomin. We've developed a good safety program. And we go above and beyond in those classes. We get them out shooting and riding snowmobiles. We partner with a lot of agencies to make that happen.

I also try to involve myself in every youth camp that I'm available for: GLIFWC's Camp Onji-Akiing in the summer, various winter camps held throughout the Ceded Territory, and the Young Leaders camp that travels to different reservations.

What are some of your hobbies or things you like to do in your free time?

I like hunting, fishing, hiking, anything outdoors. I enjoy working out and running. If I'm home, I like cooking. I love cooking wild game!

When you get time off from work, what's your ideal vacation?

It doesn't matter where I go, as long as the vacation is based all around food. I will try anything and everything! I've eaten road kill, porcupine, snapping turtle eggs, organ meats. Wild rice has been a game-changer for me. That's one of the things I've learned at the different camps is how to prepare it in different ways and from different family recipes. I've learned how to puff the rice, how to make it into granola, and how to make it into a burger patty. That was really good. There's only one food I've ever tried and can't stand: olives!

Since you're such a foodie, what snacks do you keep in your truck when you're on patrol?

Jack Link's Beef Jerky, pepper flavor. It mixes well with black coffee. And pink lady apples.

Critter of the Month program welcomes portable petting zoo

GLIFWC Enforcement Division's Critter of the Month program organized a special "Back to School" petting zoo September 27 for children at Our Lady of the Lake School and Bad River Head Start. In addition to regular discussions about wildlife, the recent gathering included domestic animals and pets.

Every month I meet with approximately 130 kids and teach them about a featured critter, including reading a book, and giving each student a GLIFWC Anishinaabe coloring book.

On this special day, the kids got to explore a huge table with an extensive fur collection with Lacey Hill-Kastern, a wildlife specialist from Bad River Natural Resources Department, standing by to answer questions.

Children were able to see and touch a collection of live snakes, lizards and turtles with Lexi Williams of Snakes of the Northlakes. Outside, the children were able to see goats, a duck, a baby rabbit, several chickens, and a guinea pig with its two babies brought by Tawnya Spriggs.

The petting zoo was a huge success and we're looking forward to planning a bigger and better event next year.

For more information about the Critter of the Month program email me at cdzwonkowski@glifwc.org.

—C. Dzwonkowski-Burns



Children at Ashland's Our Lady of the Lake school explore an extensive fur collection. INSET: In addition to regular discussions about wildlife, the recent gathering included domestic animals and pets. GLIFWC Warden Christina Dzwonkowski-Burns shows a goat at the Back to School petting zoo. (submitted photos)



Traditional foods research continues, community roundtables on deck

GLIFWC, member tribes developing uniform food codes

By Owen Holly Maroney
GLIFWC Community Dietician

Another year moves to a close on the calendar but for the “GLIFWC Chippewa Ceded Territory Traditional Food Regulatory System Project” year two is just beginning. From eastern Minnesota, through Wisconsin and across Upper Michigan, GLIFWC traditional food specialists are making plans to visit Ojibwe reservations in 2019 to discuss development of tribal food codes.

Year one’s capstone was the completion of a Traditional Food Safety Contaminant Report, which discusses known risks impacting the safe consumption of identified traditional foods. Examples of known risks include mercury in fish and salmonella bacteria in birds. Identifying risks means steps can be identified to reduce risk, for example, choosing smaller fish or cooking fowl and poultry to proper temperatures. Steps like these can help keep foods safe and healthy for consumers.

For risks that lacked enough scientific evidence, a companion scientific-unknown report was created. This report will guide the sampling that scientific



Mizise (wild turkey). (Robert Engberg/Flickr/CC by 2.0)

testing staff are undertaking this year. For example, exposure to lead in deer meat from animals harvested with lead ammunition is well-studied, however, little is known about lead in wild turkeys. Information from the two reports, and the results of testing, will create the scientific foundation in which a customizable model food code will be developed.

While science and food safety staff were busy with the reports, policy staff performed an in-depth legal review and summary report. Staff worked with a legal firm to develop a report identifying regulations on federal, tribal, state, and local levels which impact small scale food production.

Now that year two is underway, project staff are working with member-tribe communities to collect samples for analysis and testing. Starting in 2019, project staff will visit each community to host a roundtable discussion related to model food codes, as well as meeting with natural resource staff and food processing facilities. This will provide an opportunity for tribal members to learn about the project and provide input. Community input will drive the development of the model codes.

By the end of year, the results of the scientific testing will be made available along with a food processing capacity report. Project staff will conclude year two by developing trainings to be taught in the third and final year of the project.

If you are interested in attending the roundtable discussion in your tribal community keep an eye on the GLIFWC Facebook page for the dates and location.

Tribes explore food policy options

By Philomena Kebec
GLIFWC Policy Analyst

In this era of tribal nation-building, tribes are expanding their sovereignty by enacting laws addressing environmental protection, public safety and criminal conduct, and food (among other areas). When tribes legislate, they are able to create indigenous responses to problems, and governmental systems that better address the needs and circumstances of their communities.

In the area of food law, tribes like the Navajo Nation are using food policy to create system-level changes. The Navajo Junk Food Tax applies to the marketing and sales of unhealthy foods within the reservation. Its goal is to interrupt easy access that food corporations have to Navajo consumers, encouraging retail establishments to use marketing tools like food placement to promote healthy indigenous foods.

A Native-led think-tank, the Indigenous Food and Agriculture Institute (IFAI) of the University of Arkansas Law School, is providing tribes with technical assistance on the development of indigenized food systems. IFAI Director, Janie Hipp, J.D., LL.M. (Chickasaw) is leading initiatives on tribal engagement for the 2018 Farm Bill and developing a tribal model food code. Once completed, the IFAI Model Food Code will be a template addressing many aspects of food law for tribes to modify and adopt according to their needs and enforcement capacities.

GLIFWC is also working to provide its member tribes with assistance in this area. With support from the Administration for Native Americans, GLIFWC has recently completed year one of its three-year Chippewa Ceded Territory Traditional Food Regulatory System Project. In the next two years, Commission staff will be working with tribal representatives and community members to develop a model food code for traditional Ojibwe foods, producing scientific reports on food safety for these foods and providing food safety trainings on handling and processing traditional Ojibwe foods.

Food law is a highly specialized area of the law, involving the areas of agriculture, international trade, consumer protection, liability and logistics. Most of the actors in this arena are big, multinational corporations, producing and manufacturing the majority of foods that end up on our tables. Until very recently, tribal participation in commercially-available food has been virtually non-existent.

However, many tribes, concerned about how processed food diets are impacting community members, are becoming engaged in food policy development and actual food production. Reducing dependence on foreign, processed foods and increasing access to local, indigenous foods, are goals of the tribal food sovereignty movement. Food law plays an important role in realizing these goals and revitalizing indigenous food networks. In today’s globalized world, standards are required to ensure that all human food is safe and that consumers have access to accurate information about their food.

Food law is complex and multi-jurisdictional, meaning that many different governmental agencies play a role. Eggs, for example, are regulated by multiple agencies. Chicken farmers who produce eggs on a large scale are required to comply



Wild-harvested meats are a part of many tribes’ traditional diets and constitute a healthy alternative to farmed meat products, which generally have a higher fat content.

with local, state and federal regulations regarding waste management, animal feeding and humane treatment of their egg-producing chickens.

Once the eggs are laid United States Division of Agricultural (USDA) and Food and Drug Administration (FDA) regulation (and inspection requirements) apply to the storage of eggs. Transportation of eggs is regulated by the Department of Commerce; the USDA regulates liquefied eggs and egg package labeling; the FDA regulates freeze-dried eggs, egg substitutes and imitation egg products. If eggs are used for a commercial product in a restaurant—a cake, for instance—that cake must be produced in accordance with the applicable food code.

Food codes regulate restaurants and other places where ready-to-eat food is made and sold on-site, including federally-funded feeding sites (school lunch programs, etc.). The FDA blesses a model food code, which is updated every four years and becomes the basis of state law (and the law of several tribes). Food codes would require that workers making the cake are not sick with a communicable disease, that the cake is sold within a certain time after it is baked, and it is produced in a commercial kitchen (among other requirements).

The major federal laws that apply to food production include the Federal Meat Inspection Act (FMIA), originally adopted in 1906, and the Food, Drug and Cosmetic Act (FDCA), originally adopted in 1938. These laws have been amended over the years, with the most significant amendments to the FDCA coming in 2011, with the adoption of the Food Safety and Modernization Act (FMSA). The FMIA regulates “meat” (meat from cattle, sheep, swine or goats), requiring that meat sold for human consumption within the United States comes from animals that are inspected before and after slaughter, certified by a veterinarian as disease-free, and are killed within a slaughterhouse.

Meat from wild game animals is regulated by the FDA, and is not considered to be “from an approved source” due to the lack of veterinarian inspection. The food codes of most states require that all meat originates from an approved source, prohibiting the sale or provision of wild-harvested game. Tribes have been actively working to change this policy.

Wild-harvested meats are a part of many tribes’ traditional diets and constitute a healthy alternative to farmed meat products, which generally have a higher fat content. Native communities in Alaska have been leaders in this area, working with the State of Alaska to develop food safety standards in order to serve wild game and other traditional foods in schools, hospitals and other federally-regulated feeding sites. The 2013 Farm Bill also included a provision allowing federally-funded feeding programs primarily serving Native Americans to accept donations of traditional Native American foods, including wild game, to serve as part of regular programming.

The Chippewa Ceded Territory Traditional Food Regulatory System Project is about assisting tribes in navigating through the complex maze of food regulation, and developing templates specific to Ojibwe traditional foods, in order to increase tribal participation in food systems and promote access to healthy, traditional foods. (see Food policy, page 22)



Treaty youth ricing on a pair of popular lakes

By Paula Maday, Staff Writer

On a humid September day, 4th graders from Lac Courte Oreilles Ojibwe School set out on Totagatic Lake near Cable to harvest some of the good seed—manoomin.

Two-by-two, they loaded into the canoes and paddled out onto the water, disappearing amidst high stalks of the aquatic grass. To me, the crop looked pretty good, but it was my first experience ricing on that lake.

In talking with GLIFWC Wildlife Biologist Peter David, I learned that manoomin growth on Totagatic Lake has been a mixed bag over the years. Aerial photos from 2016 show rice growth on the lake as virtually non-existent. The crop was better in 2017, and 2018—though he says was “a little below average”—was still okay.

Nutrient cycling can account for some changes on wild rice waters from year to year, but one of the biggest factors that contribute to variances on Totagatic is water level. The lake is susceptible to high water levels that can affect wild rice growth. Historically, beaver activity at the lake has affected water levels even further. GLIFWC now partners with Animal and Plant Health Inspection Service (APHIS) to manage beaver activity on that lake.

This year though, students were able to take advantage of a decent crop, bending and knocking Ojibwe spirit food into their canoes. It is a tradition that has become part of the school’s regular curriculum, and over the course of the week, the entire school made it out to harvest, part of its philosophy to incorporate the wisdom and beauty of Ojibwe heritage along with the knowledge and skills to succeed in a more technological society.

Four days later, at the close of the season, Bad River youth from Ashland High School headed to nearby Pacwawong Lake, to rice. For this group, it was the second year of a new tradition they hope takes root for future classes. For many of the students, last year was their first experience ricing. This year, it was apparent that the students had grown in comfort and confidence in this traditional Anishinaabe harvesting activity, gathering close to 60 lbs. of manoomin in a day.

At Ashland’s Fall Fest a few weeks later, that comfort and confidence was on full display as the same group demonstrated activities associated with ricing, including making ricing sticks, parching, dancing, winnowing, and hand cleaning the rice. As fellow students explored the demonstrations, high schoolers took the initiative in explaining the different activities and inviting them to join in. It was heartwarming to see traditions being carried forward by youth who just two years ago knew very little about harvesting wild rice.

Pacwawong, always a very popular lake for ricing, had a similar few years to Totagatic. In 2016, the crop was poor, though not as bad as Totagatic. 2017 and 2018 yielded a good crop, especially 2018. According to Peter David, Pacwawong tends to be a little more consistent than Totagatic, “likely because of the greater water flow through the system, which delivers more nutrients every year.” Either way, youth treaty ricing on this pair of Cable-area lakes was successful yet another year.



Students and staff of Lac Courte Oreilles Ojibwe School paddled around Totagatic Lake on September 4th to harvest manoomin—the good seed. Totagatic lake is susceptible to high water levels that can affect wild rice growth. 2017 and 2018 harvest has been a little below average. (P. Maday photo)



Gunnar Crowe (Bad River) helps an Ashland student parch wild rice at Lake Superior Elementary School’s Fall Fest September 27th. (P. Maday photo)

Namegos continued

(continued from page 5)

years. This has spurred management agencies to initiate stocking in both of these lakes. Overall, most namegos populations appear to be stable or increasing in Lake Superior, but declining in inland Ceded Territory lakes.

Namegos was not as frequently mentioned as other beings/species in TEK interviews. However, some mentioned the existence of specific places related to namegos, likely because of a story relating to that area or the presence of namegos. Gaa-namegosikaang (Chicagon Lake), east of Watersmeet, Michigan, is known as the place of namegos.

Summary of climate threats:

Namegos was in the 56th percentile relative to other fish in the vulnerability assessment. Relative to other beings/species in the vulnerability assessment, namegos was in the 84th percentile. The following factors increased its vulnerability to climate change: natural and anthropogenic barriers (e.g., low oxygen zones, effluent), thermal niche (loss of coolwater habitat), hydrological niche (less precipitation), disturbance regime (wind and waves can damage eggs), restriction to uncommon landscapes (spawns on shallow, rocky bars), sensitivity to natural enemies (susceptible to sea lamprey attacks), competition (smallmouth bass might outcompete namegos for food), and a loss of genetic variation (Figure 6).

Factors that increase namegos’s vulnerability to climate change:

- N/SI** Natural barriers: Low dissolved oxygen concentrations may limit dispersal/vertical movements in inland waterbodies, but might not be barrier to dispersal in Lake Superior.
- N/SI** Anthropogenic barriers: Changes in the watershed (e.g., effluent from septic systems) can result in eutrophication and low-oxygen zones. These zones might act as barriers to dispersal.
- SI** Physiological thermal niche: Lean and siscowet namegos are consider coldwater fish with a preferred temperature of 50°F and 39.2°F, respectively. As water temperature increases, both types of namegos are expected to seek deeper, cooler habitats. Most recent analyses indicate lean namegosag have experienced an increase in preferred thermal habitat of 6 days, while siscowet namegosag have experienced a loss in preferred thermal habitat of 3 days.
- SI** Historical hydrological niche: The area that namegos occupies has experienced slightly lower than average variation in precipitation in the past 50 years.
- SI** Disturbance regime: The intensity and frequency of severe weather is predicted to increase in the future. Wind and wave action associated with severe weather might damage or displace eggs on relatively shallow reefs.
- SI** Uncommon landscape features: Namegos is restricted to spawning on shallow rocky bars that have little silt. Loss of these spawning reefs could negatively affect reproduction and recruitment.
- I** Pathogens or natural enemies: The introduction of sea lamprey into the Great Lakes resulted in a decrease in namegos populations. White sucker mortality rates increase when sea lamprey feed on them at elevated temperatures. Similarly, namegosag that are hosts to sea lamprey might experience higher mortality rates as water temperature increases in the future.
- SI** Competition: Pacific salmon, steelhead, and smallmouth bass compete for food resources with namegos. Smallmouth bass, a warmwater being/species, is predicted to be favored under future environmental conditions.
- SI** Genetic variation: A substantial loss of genetic diversity occurred when many populations of namegos were extirpated or severely depressed in the mid-1900s.

Legend	GI	Greatly Increase This factor greatly increases vulnerability	I/GI	Increase/Greatly Increase This factor may increase or greatly increase vulnerability	I	Increase This factor increases vulnerability
	SI/I	Somewhat Increase/Increase This factor may somewhat increase or increase vulnerability	SI	Somewhat Increase This factor somewhat increases vulnerability	N/SI	Neutral/Somewhat Increase This factor may not increase or may somewhat increase vulnerability

Tribes, Forest Service reflect on challenges, accomplishments after 20 years

Memorandum of Understanding (MOU) established guide for harvest, collaboration

LVD traditional roundhouse, a powerful symbol of cooperation

By Charlie Otto Rasmussen, Editor

Old Indian Village, Mich.—At the annual Tribal/Forest Service Memorandum of Understanding (MOU) meeting, all parties agreed that protecting natural resources and honoring reserved Ojibwe treaty rights were positive results from two decades of rewarding and sometimes difficult interagency work.

GLIFWC member bands and the US Forest Service reflected on the historic, twenty-year-old agreement that includes 11 Ojibwe tribes, four National Forests (Chequamegon-Nicolet, Hiawatha, Ottawa, and Huron-Manistee), federal Law Enforcement & Investigation, and the Northern Research Station.

“We have learned to search for the common ground, identify shared goals and desired outcomes,” said Paul Strong, Forest Supervisor of Chequamegon-Nicolet National Forest and one of the original architects of the MOU. “Trust and respect are the foundation for successfully working together.”

The MOU signatories, in fact, were meeting in a building that embodied one very tangible result of that cooperative spirit—the Lac Vieux Desert traditional roundhouse. LVD tribal representatives first requested logs in 2002 to construct the roundhouse under an MOU provision that pledged 40,000 board feet of timber to tribes per year from cooperating National Forests. But the deal hit a snag. Clear legal authority to release the logs blocked regional Forest Service officials from moving forward.

While the proposal went dormant for a few years, officials explored other options. Assembling the eight-sided structure would require 150 twenty-five-foot logs, 12 to 16 inches in diameter. Even larger logs measuring 20-24” around were needed to for the roof. Then in 2004, the Forest Service identified a means to see the project through by collaborating with the tribe on a Stewardship Contract; Lac Vieux Desert completed a watershed restoration project in exchange for the logs. The roundhouse became a reality.



Located at Old Indian Village on the north shore of Vieux Desert Lake, the Lac Vieux Desert traditional roundhouse is built from pine logs acquired through collaborative work with the US Forest Service. The eight-sided structure is made up of approximately 150 twenty-five foot logs, plus eight large, 20-25 inch diameter logs utilized for roof trusses. The federal and native signatories to the Tribal/Forest Service Memorandum of Understanding held their 20th annual meeting at the roundhouse October 3. (P. Strong photo)

Over the following years, GLIFWC, the tribes, and Forest Service worked on the timber issue and ultimately came up with the first major amendment to the MOU, the “Tribal Timber Harvest Framework Agreement,” which lays out a step-by-step process for tribes to acquire live standing timber.

“Whether it’s in discussions with county or state governments, I always point them to the Forest Service MOU as a model agreement with tribes,” said Michael J. Isham, GLIFWC executive administrator. “When you have an agreement, have it all spelled out, it cuts through the misunderstandings and really helps all parties work together.”

Gathering marks MOU milestone

By Bizhikiins Jennings, Staff Writer

Twenty years have passed since the US Forest Service and tribes first sat down together and began a chronicle of crucial dialogue. On October 3 GLIFWC member tribes, staff, and Forest Service staff gathered in the community of gete-gitagaaning (Lac Vieux Desert) to acknowledge the relationship that has formed as a result of the MOU signing in 1998.

Laughter and appreciation filled the air as gifts were exchanged between the leadership at the LVD community roundhouse. Former GLIFWC Deputy Administrator and Task Force Rep Wayne Labine recalls the work that has gone into the MOU. “It’s more than just meeting, it’s about a relationship. The Forest Service’s relationship with the tribe’s is a great example for how all Federal and State agencies should work together with tribal communities. Together we can accomplish so much.”

Labine also referenced the great partnership every year with camp Onji-Akiing (From the Earth), held at Camp Nesbit, in the heart of the Ottawa National Forest in Sidnaw, Michigan. The camp is jointly hosted by GLIFWC and the Forest Service and was developed to give tribal youth the opportunity to learn about their culture, identity, and future careers, all in a safe and fun camp environment.

Afterwards, the group attended a banquet at the Lac Vieux Desert Casino Convention Center and shared an evening of trivia and storytelling. GLIFWC Executive Administrator Mic Isham and Forest Service Forest Supervisor (Chequamegon-Nicolet National Forest) Paul Strong spoke about the trials and tribulations of the MOU. Strong and Isham both related that the protection of the resource has always been at the forefront of decision making.

Participants took the opportunity to play an interactive trivia game with questions pertaining to the history of the MOU. The questions created great dialogue, which sparked individuals to speak about their favorite memories.

As the drum closed out the meeting, the vibrations felt from the round house, rippled through everyone in attendance. The large trees that held the building together could be heard as GLIFWC and Forest Service sat at the table once more to talk about preservation of a way of life.



Tribal representatives and GLIFWC staff share a moment before the MOU celebration dinner in Watersmeet, Michigan. (CO Rasmussen photo)

Get your firewood in biboon

Tribal members can gather firewood on National Forests located in the 1836, 1837 and the 1842 Ceded Territories as well as Wisconsin State Properties located within the 1837 and 1842 Ceded Territories.

In order to gather tribal members must:

- o Have a valid tribal I.D.
- o Obtain a GLIFWC firewood gathering permit available at tribal conservation departments.

Gathering Regulations:

- o Firewood permits obtained from a tribal conservation department are valid for up to Ten (10) cords of firewood.
- o You may only gather dead-and-down trees for firewood use, *however*, there are a few exceptions:
 - You may not cut any standing dead tree on National Forests EXCEPT those standing dead trees within 100 feet of any road or designated use area
 - You may not gather any dead tree or portion of dead tree where any portion of the dead tree is located below the ordinary high water mark on select State of Wisconsin properties.
 - You may not cut down standing dead trees on the National Forest within 200 feet of a pond, lake, stream or river.
 - Anything beyond the 10-cord limit or harvesting any live-standing trees require a special permit which is negotiated between the Tribe, GLIFWC and the Property Manager where you wish to gather. —A. Wrobel



Mille Lac Band Representative Kelly Applegate accepts a quilt from Regional Forester Kathleen Atkinson during a gift exchange. (CO Rasmussen photo)



Wesley Ballinger, Mille Lacs Band artist, created this image to capture the spirit of the MOU, and the importance of National Forests to tribes.

Waabizheshi study combats Wisconsin cold, snow with culverts

By Abi Fergus, For Mazina'igan

Six GLIFWC employees and a graduate student lug culvert pieces off of a dirt road and into the forest. The group stakes down the insulated tubes in a grid and then repeats the process in additional hemlock and hardwood stands. The 150 culvert pieces are key elements to a study that builds on more than 30 years of waabizheshi (*Martes americana*, or American marten) research by GLIFWC.

"This research is a piece of the puzzle," said Tanya Aldred, GLIFWC furbearer and climate change biologist. The culvert towers will house live traps for small mammals this winter during a study on waabizheshi prey density. "Not much small mammal trapping has been done in the winter, because it's hard to keep animals warm," said Aldred. To overcome this issue and Wisconsin snow, the researchers are using culverts, insulation foam, and hand warmers as a buffer between the traps and the winter cold, according to Aldred.

Winter track surveys are used to study waabizheshi, according to Aldred. Summer density studies have been used to study small mammal density, so the seasonality of the data doesn't align with marten research. To better understand the density and quality of waabizheshi's prey, the researchers are exploring winter and summer small mammal densities for the first time, according to Aldred.

Waabizheshi became extinct in Wisconsin during the 1930s, because of unregulated trapping, timber harvest, and forest fires, according to a 2016-17 progress report by GLIFWC. Between 1975 and 1990, the Chequamegon-Nicolet National Forest reintroduced 172 martens into the Eagle River district and 139 martens into the Great Divide district. Between 2008 and 2010, 90 more martens were stocked in the Great Divide district. The Great Divide district is surrounded by the Bad River, Red Cliff, Lac Courte Oreilles, and Lac du Flambeau reservations. Despite these efforts, marten populations in Wisconsin have not grown the way they were expected to. This causes concern for biological and cultural reasons.

"The clan system is important to our governance," said Dylan Jennings, member of waabizheshi clan, or doodem. "The clan system used to be a lot stronger prior to European contact and the signing of treaties. It helped us stay organized and function as a society. In marten clan, we are strategists and warriors. The clan system is still very relevant today. Nowadays we engage in protection of our way of life—protecting culture and language. Martens are very tough and evasive creatures—that's how our warriors are."

Allison Scott, a graduate student in the Wildlife Ecology program and Jonathan Pauli's Lab at the University of Wisconsin-Madison said that while animals



GLIFWC Wildlife Biologist Tanya Aldred (second from right) issues instructions to a GLIFWC crew that installed Sherman small mammal traps within sections of culverts across a grid in the Chequamegon-Nicolet National Forest (A.Fergus photo)

are surviving, marten recovery in northern Wisconsin has been slow. Scott is conducting the small mammal density study, which depends on the success of the culvert warmers. During two 10-day trials in January, she will check the traps and identify small mammals found within them. The findings may help the researchers understand why waabizheshi recovery has not happened at the anticipated rate based on prey availability.

"Red-backed voles are the marten's highest quality food," said Scott. "[They've been found] eating shrews, mice and deer carcasses—not the highest quality food."

Studying prey density will help Scott and other collaborators understand whether waabizheshi's diet is affecting its re-population rate. A lack of preferred prey, in this case the red-backed vole, could limit waabizheshi numbers, according to Scott. Another aspect of Scott's research project is comparing prey density before and after a timber harvest. Findings from this facet of the study could help illuminate how human activity is affecting waabizheshi restoration.

"Martens are important to ecosystem stability," Scott said. "Small mammals are at the bottom of the food chain, not just for the marten. They also are important to seed dispersal and studying climate change. We're at the southern extent of the red-backed vole's range, so they might be pushed north due to climate change."

Scott hopes to give forest managers information, based on this study, on how to preserve habitat for waabizheshi and its prey.

Jon Gilbert, GLIFWC biological services director, developed the research project utilizing culverts in collaboration with Jonathan Pauli of the Pauli Lab. The culverts were tested by GLIFWC employees, with success, over the past two years, according to Gilbert. Trail camera rigs showed various small mammal entering holes at the bottom of the towers to eat sunflower seeds that were placed inside.

"The long-term goal is understanding of waabizheshi," said Gilbert. "It's the only mammal listed as endangered in Wisconsin. Michigan and Minnesota have plenty of martens, so much so that they have a trapping season."

Gilbert placed the Michigan and Minnesota populations in the 1000s. Waabizheshi's population size in Wisconsin is not fully understood, but Gilbert said it's estimated that there are less than 100 in the Great Divide District. The Eagle River district population may be about 200, and is connected to Michigan's marten range.

"[The marten's historical range in Wisconsin] may have went as far south as Wausau," said Gilbert. "Today there's suitable habitat that they're not using."

Hemlock stands have been found to be favorable to martens, according to Gilbert. This study on prey availability may help to answer why waabizheshi is not occupying more of this forest type in Wisconsin. Another factor that may be suppressing marten populations is competition with ojiiig (*Pekania pennanti*, or fishers).

"We're at the southern end of the marten's range," said Gilbert. "Any little change can force them north and would have negative consequences. Fishers kill martens. They don't like to eat them, but they're competition."

While martens and fishers coexist elsewhere in North America, they don't seem to segregate their habitat so they can do the same in Wisconsin, according to Gilbert. This may be related to climate change.

"Martens have fur on their feet that act like snowshoes, so they can navigate deep fluffy snow" said Gilbert. "Fishers are much bigger and don't have fur on their feet, so they can't navigate deep fluffy snow. As it gets warmer, we get crusty snow that makes fishers able to go anywhere."

(see Waabizheshi, page 18)



Allison Scott (right), University of Wisconsin graduate student and GLIFWC's Ron Parisian prepare a small mammal trap in a hemlock forest near Clam Lake, Wisconsin. (A. Fergus photo)



Red-backed vole. (©Alex Lamoreaux, some rights reserved (CC BY-NC))



Snapshot Wisconsin:



Discovering the wildlife in your own backyard

By Sara Moses

GLIFWC Environmental Biologist

Have you ever wondered what left those interesting tracks you saw in the woods behind your house? Or maybe pondered what animal was making those sounds you hear in your forest? Snapshot Wisconsin is a fun way to learn about the wildlife in your own backyard while helping the state gather information to monitor and protect these species.

Snapshot Wisconsin is a year-round, statewide, citizen science effort by the Wisconsin Department of Natural Resources, University of Wisconsin (UW), and UW-Extension to monitor wildlife populations using trail cameras.

Selected volunteers are trained to deploy and monitor trail cameras on their land. The wildlife photographs captured are categorized by the project participants and by the public using a crowd-sourcing website. The pictures are used to monitor wildlife in the state more thoroughly than is currently possible.

Snapshot Wisconsin is on track to become the largest citizen science project in Wisconsin. All types



Waawaashkeshi taken with the author's trail camera provided by Snapshot Wisconsin.

of wildlife are being captured with trail cameras including deer, elk, bears, fox, bobcats, whooping cranes, and more. The photos offer a unique opportunity to view wildlife going about their normal routines out in the wild.

Volunteers must have access to at least 10 acres of contiguous land, which can be private or public land.

They agree to maintain a trail camera on that land for at least one year, checking it at least every three months. Training and supplies are provided free of cost, and no prior experience with trail cameras is necessary. Basic computer and internet skills are helpful.

I have personally been enrolled in the program as a volunteer for two months now and captured all sorts of critters on my camera, large and small. I've seen turkeys and grouse, raccoons and skunks, and even a tiny vole. The most exciting for me was catching a glimpse of the coyotes that I've heard howling around my house at night for so many years, but had never seen. And of course, I have seen a lot of deer, including a beautiful seven-point buck.

To apply to become a Snapshot Wisconsin volunteer, visit www.dnr.wi.gov, search for the key words "Snapshot Wisconsin" and then click the "Trail Camera Application" link on the page.

If you are unable to host a trail camera on your land but still want to be involved in the project, you can help identify species that have been captured by other cameras around the state at the crowd-sourcing site Zooniverse (www.zooniverse.org/projects/zooniverse/snapshot-wisconsin).

Ambe sanoo ganawaabandamok maajiyeg! Please watch what you eat!

Gaa-anishinaabemod: Lee Obizaan Staples

Gaa-anishinaabewibii'ang: Chato Ombishkebines Gonzalez

Ishke a'aw Anishinaabe ishkweyaang ogii-tazhindaanaawaa, aanind a'aw Anishinaabe, "Gii-kabe-bimaadizi", ogii-izhi-wiindaanaawaa. Mii iw ingodwaak naa niizhtana endaso-biboonagiziniin awashime gaa-izhi-wiinaawaajin inow Anishinaaben gaa-kabe-bimaadiziniin. Mii-go gaye gaa-izhi-ashkibaginaand-edengwewaad gaa-izhi-gichi-aya'aawiwaad. "Gii-aasaakamigoomagadini odengwayaawaan", ogii-izhi-wiindaanaawaa.

Back in the day Anishinaabe talked about how some of the Anishinaabe lived a full life, they called it, *Gii-kabe-bimaadizi*. The Anishinaabe that were called, *gii-kabe-bimaadizi*, were those that lived to be 120 years old or more. They were so old they had green faces. They were called, "Gii-aasaakamigoomagadini odengwayaawaan."

Ishke dash gaawiin geyaabi ginoondanziimin da-gabe-bimaadizid a'aw Anishinaabe noongom. Mii imaa wenjikaamagak noongom enanjiged a'aw Anishinaabe. Ishke mewinzha a'aw Anishinaabe gaa-ayaad mii eta gaa-miijid i'iw-sa iniw Manidoon gaa-izhi-miinigod da-inanjiged. Gii-miinigonaanig ingiw Manidoog inow giigoonyan, manoomin, awesiinyan, miinawaa bagwaj mayajjiing iw akeyaa da-inanjigeyang.

Nowadays we no longer hear of Anishinaabe living to be that old. This is a result of Anishinaabe's diet. Long ago the Anishinaabe ate only those foods that were given to them by the Manidoog to eat. The Manidoog gave us certain foods to eat such as the fish, wild rice, wild animals and all that grows in the wild.



Wild rice salad with herbed turkey breast is a healthy recipe developed by GLIFWC staff for the Mino Wiisinidaa! Let's Eat Good! cookbook. This cookbook is available for purchase on GLIFWC's website at: www.glifwc.org/publications/#Cookbook.

Ishke dash a'aw wayaabishkiiwed gaa-izhichiged, aana-wii-mamaanjigonaad inow Anishinaaben, mii iwapii gii-miinaad inow ishkoniiganan da-ni-bibizhaagiinid eta-go. Mii dash gii-makamind a'aw Anishinaabe iko nebowa gii-ayaangiban i'iw aki ge-giiwosaadang. Mii dash i'iwapii a'aw chi-mookamaan gii-miinaad inow Anishinaaben ge-inanjigenid. Mii dash i'iw wiisiniwin geyaabi enigaa'igod a'aw Anishinaabe miijid. Mii dash imaa wenjikaad zaasakokwaani-bakwezhigan. Gaawiin ingiw Manidoog gii-miinigosiinaanig i'iw akeyaa da-inanjigeyang.

At that time in order for the white man to have control over the Anishinaabe they gave them the reservations to live on. As a result of the creation of reservations the Anishinaabe were robbed of a lot of the land that they once hunted on. At that time the white man gave Anishinaabe rations/commodities to eat. That is still the food that is harming the Anishinaabe. That is where fry-bread originated. Manidoog did not give those foods to eat.

Mii dash omaa noongom wenda-onzaamiikawaad inow zaasakokwaani-bakwezhiganan a'aw Anishinaabe. Mii inow waaninoshkaagojin, gwezigwanishkaagojin, biinish gaye wenjikaamagadinig ishpiming izhaamagadinig omiskwiim miinawaa ziinzibaakwadaapined a'aw Anishinaabe. Mii a'aw bibine-bakwezhigan gaa-miinigooyang ani-dagonigaazod imaa jiibaakweyang, mii-go dibishkoo enikaagoyang. Wawaaj igo ani-napodiniked a'aw Anishinaabe, mii gaye enidoodaagod. Ishke a'aw Anishinaabe wenda-onzaamiikawaad inow napodinensan mii-go dibishkoo enigaa'igod. Aniish naa mii imaa wenjikaawaad gaye ingiw napodinensag imaa bayezhigonijin bibine-bakwezhiganan.

These days Anishinaabe overindulge in fry-bread. That is what is causing Anishinaabe to be obese, overweight, to have high blood pressure, and diabetes. When we add the flour to our cooking it has the same effect on us. Even the dumplings we make and add to our soup is causing us these same problems. Even though the Anishinaabe enjoys eating macaroni it too is causing the same problems.

Ishke gaye ekidong bezhig inow bakwezhiganan amwaad a'aw bemaadizid, mii imaa dibishkoo ingodwemikwaanens i'iw ziinzibaakwad nigaapoonod. Mii gaye inow opiniin wenda-minwenimaad a'aw Anishinaabe, mii inow gaye genaniizaanenimaapanen.

It is said that if a person eats one slice of bread it is the equivalent as eating one teaspoon of sugar. Anishinaabe really loves their potatoes, they should be wary of them also.

Mii iw bezhigo-biboonagak ingoji-go apii gaa-maajii-booni'agwaa a'aw bakwezhigan, napodinensag, miinawaa opiniig. Ishke mii iw gaa-onji-izhichigeyaan i'iw akeyaa nigii-wenda-aabiinji'igon ziinzibaakwadaapineyaan iwapii. Ishke endaso-giizhik mii inow bebiikwaminagakin gaa-mamoooyaan ani-miigaajigaadeg iw ziinzibaakwadaapineyaan. Ishke dash gaawiin geyaabi memwech inda-mamooosiinan inow mashkikiinsan, weweni inganawaabandaan i'iw akeyaa enanjigeyaan. Gaawiin-go anooj nimijisiin gegoo. Gaawiin gaye geyaabi indizhi-gozigwanisiin gaa-izhi-onzaami-gozigwanishaambaan iko. Agana-go indizhi-bikwanagizhii noon-gom gaye. Gaawiin igo wenipanasinon. Ishke nebowa gaa-wenda-minwendamaan gaawiin geyaabi nimijisiin. Gaawiin anooj a'aw bakwezhigan waashkobizid indamwaasiin, biinish gaye i'iw dekaag gii-poonitooyaan. Gaawiin igaye ziinzibaakwadoons indaa-mijisiin.

(see *Ambe sanoo ganawaabandamok*, 20)



Ojibwemotaadiwag Anishinaabewakiing. They speak Ojibwe to each other in Indian Country.

Booshke giin. Anishinaabemog/Ojibwemog! Akawe, daga ikidon, "Aaniin!" gemaa "Boozhoo!" Aaniin ezhi-ayaayan? Nimino-ayaa. Giin dash? Mii dash gagwejimad: Aaniin ezhinikaazoyan? _____ indizhinikaaz. Indoojibwem bangii. Ninitaa-ojibwem. Gigikinoo'amawaa abinoojiinh giishpin netaa-ojibwemoyan. Biboon noongom. Gisinaa. Minwendaagwad. Boodawen! Minwaajimon! Aadizooken! Minawaanikwad. Gakina awiya daga izhaadaa agwajiing noongom!

(It is your decision. You all speak the Anishinaabe/Ojibwe language! First, please say, "Hello!" or "Hi!" How are you? I am well. And you? And then you ask him or her: What is your name? _____ is my name. I speak Ojibwe a little bit. I'm skillful at speaking Ojibwe. Teach a child if you are a really skilled Ojibwe speaker. It is winter now. It is cold. It is fun. Build a fire! Tell a good story! Tell a sacred story! It is exciting. Everyone please let's all go outside now!

<p>Bezbig—1</p> <p>OJIBWEMOWIN (Ojibwe Language)</p> <p>Double vowel system of writing Ojibwemowin. —Long vowels: AA, E, II, OO Waabooz—as in father Miigwech—as in jay Aaniin—as in seen Mooz—as in moon</p> <p>—Short Vowels: A, I, O Dash—as in about Ingjw—as in tin Niizho—as in only</p> <p>—A glottal stop is a voiceless nasal sound as in A'aw. —Respectfully enlist an elder for help in pronunciation and dialect differences.</p> <p style="text-align: center;">VAI's = Verbs, Animate, Intransitive. Root is S/he... Baapi.—S/he laughs. Mawi.—S/he cries.</p> <p style="text-align: center;">VII = Verbs, Inanimate, Intransitive. Root—It is... Noodin.—It is windy. Awan—It is foggy.</p> <p style="text-align: center;">VTI = Verbs, Transitive, Inanimate (Object) Root command—"to it" Miijin!—Eat it! Minikwen!—Drink it! Mikan!—Find it! Waabandan!—See it!</p> <p style="text-align: center;">VTA = Verbs, Transitive, Animate (Being) Root is "to Him/Her" Ojibwemotaw!—Speak Ojibwe to him/her! Waabam!—See h/h! Miizh!—Give it to h/h!</p>	<p>Niizh—2 <i>Circle the 10 underlined Ojibwe words in the letter maze. (Translations below)</i></p> <p>A. <u>Biboong</u> indizhaa zaaga'iganing. Indakwa'waa. (VAI) B. Biboong, nindagindaas <u>neniibowa</u> waakaa'iganing. (VAI) C. <u>Biboon</u>. <u>Gisinaa</u>. Gooniwan. Niiskaadad, geget! (VII) D. Niizho-giizhigad. <u>Aabitaa</u>-dibikad. (VII) E. Inga-<u>miijin</u> okosimaan ningo-diba'iganek. (VTI) F. Indayaan <u>onow</u> niizh okosimaan. (VTI) G. Ingii-waabamaa <u>nimaamaa</u>. (VTA) H. Gaawiin ningii-waabamaasiin <u>nindede</u>. (VTA)</p> <div style="text-align: center; border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 0 auto;"> <p>K O H M A N I A O B S I N G A I N B M E A K B W G I A Y I I O I A T B A M K N O A T W Z O M I O K N W J A N B O A I K I G M E E A J W N A J S E A N I N D E D E D I A N E N I I B O W A G N N I N D I Z H A A Z</p> </div>
<p>Niswi—3</p> <p>IKIDOWIN ODAMINOWIN (word play)</p> <p>Down:</p> <ol style="list-style-type: none"> 1. first 2. Let's all go! 3. or 5. Say it! 7. friend 9. It is foggy. <p>Across:</p> <ol style="list-style-type: none"> 4. Give it to him/her! 6. please 8. someone 10. more <div style="text-align: center; margin-top: 20px;"> </div> <p style="text-align: center; font-size: small;"> Online Resources ojibwe.lib.umn.edu ojibwe.net glifwc.org glifwc-inwe.com </p>	<p>Niiwin—4</p> <p>Ginwaa Ikidowinan—Long words Miini-baashkiminisigani-biitoosiji-gani-baadigwingwezhigani-bakwezhigan (ag)—Blueberry Pie (s) Blueberry cooked to sauce in pie-face covered bread. Mishiimini-baashkimininsigani-biitoosijigani-bakwezhigan—Apple Pie. Apple cooked to sauce in pie and bread. Future tenses: wii- will or want to, da- or ga- definite will. Past tense: gii- did And—dash or idash, ashi in counting Question markers as 2nd word—na, ina</p> <p style="text-align: right; vertical-align: top;"> gii— ga— —wii idash Ina </p> <ol style="list-style-type: none"> 1. Waabang megwayaak ni _____ - waabamaa waawaashkeshi. 2. In _____ -waabamaag niizh migiziwag zaaga'iganing. 3. Gigii-mikawaa _____ moozweshkan iwidi? (yes/no?) 4. Inashke iwidi! Waagosh waabooz _____ bimibatoowag. (and) 5. In _____ -andokawe'aa megwayaak noongom. Waaboozika iwidi. (will definitely)

Translations:
Niizh—2 A. When it is winter, I go to the lake. I spearfish through the ice. (VAI) B. When it is winter, I read a lot at the house. (VAI) C. It is winter. It is cold. It is snowy. It is bad weather, for sure! (VII) D. It is Tuesday. It is midnight. (VII) E. I shall eat a squash when it is one o'clock. (VTI) F. I have these two squashes. (VTI) G. I saw my mother (VTA). H. I did not see my Father. (VTA negation)
Niswi—3 **Down:** 1. Nitam 2. Izhaadaa 3. Gemaa 5. Ikidon 7. Niijii 9. Awan **Across:** 4. Miizh 6. Daga 8. Awiya 10. Nawaj
Niiwin-4 1. Tomorrow in the woods, I want to see a deer. (wii-) 2. I saw two eagles at the lake. (gii-) 3. Did you find the moose antlers over there? (ina) 4. Look over there! That fox and rabbit are running! (idash) 5. I will definitely look for his tracks in the woods today. There are a lot of rabbits over there. (ga-)

There are various Ojibwe dialects; check for correct usage in your area. The grammar patterns may help a beginner voice inanimate and animate nouns and verbs correctly, as well as create questions and negate statements. Note that the English translation will lose its natural flow as in any world language translation. This may be reproduced for classroom use only. All other uses by author's written permission. Some spellings and translations from The Concise Dictionary of Minnesota Ojibwe by John D. Nichols and Earl Nyholm. All inquiries can be made to **MAZINA'IGAN**, P.O. Box 9, Odanah, WI 54861 lynn@glifwc.org.



Color changing waabooz

A traditional teaching about the waabooz describes him telling Nenabozhoo (a main spirit in many Anishinaabe legends) how he would help the Anishinaabe when they arrived: “Here I have something too. I too have something to offer the Anishinaabe. The rabbit was looking at Nenabozhoo. ‘Who do you think you are? Look at you and how small you are. You don’t even have much meat on you. And the rabbit said: ‘Nope, don’t think of me that way. I will sense when the Anishinaabe is struggling to find food to eat. I will not go anywhere. Whenever I see a round snare, that is where I will put my head. That is how much I care about the Anishinaabe. There are a lot more, such as my white fur jacket. Anishinaabe will know how to use my gift, like sometimes, somewhere, when they get a skin rash, such as how children suffer with that. They will use my rabbit fur, my hide. I will not be far away. All they need to do is look around, and they will find my trail; this is where they can get me.’”



The snowshoe hare is brown in the summer. (©2008 Walter Siegmund, Wikimedia)

Waabooz (snowshoe hare) have fluffy coats, long ears and really large feet. Waabooz change their coat two times a year. In niibin (summer) the coat is thin and brown so it can blend into the woods. When biboon (winter) comes, it changes to a heavy snow-white, fluffy coat. The hare changes its fur to make it harder for predators to find it.



Waabooz changes to white in the winter to camouflage itself from predators. (©Gordon E. Robertson, Wikimedia)

The hare’s coat keeps them warm and is made of different layers. There is the silky soft fur for insulation, a medium layer of thicker hair, and then the long, coarse outer hair that sheds. Because their coat keeps them so warm they don’t have to hibernate or travel to warmer areas during the winter. Snowshoe hares live as far north as the Arctic ocean and all over the northern regions of Canada.

The hare’s large furry hind feet is where the name comes from. Long and wide, these feet work the way human snowshoes do, helping them to travel over snow. The fur on the bottom of the feet also helps keep them warm.

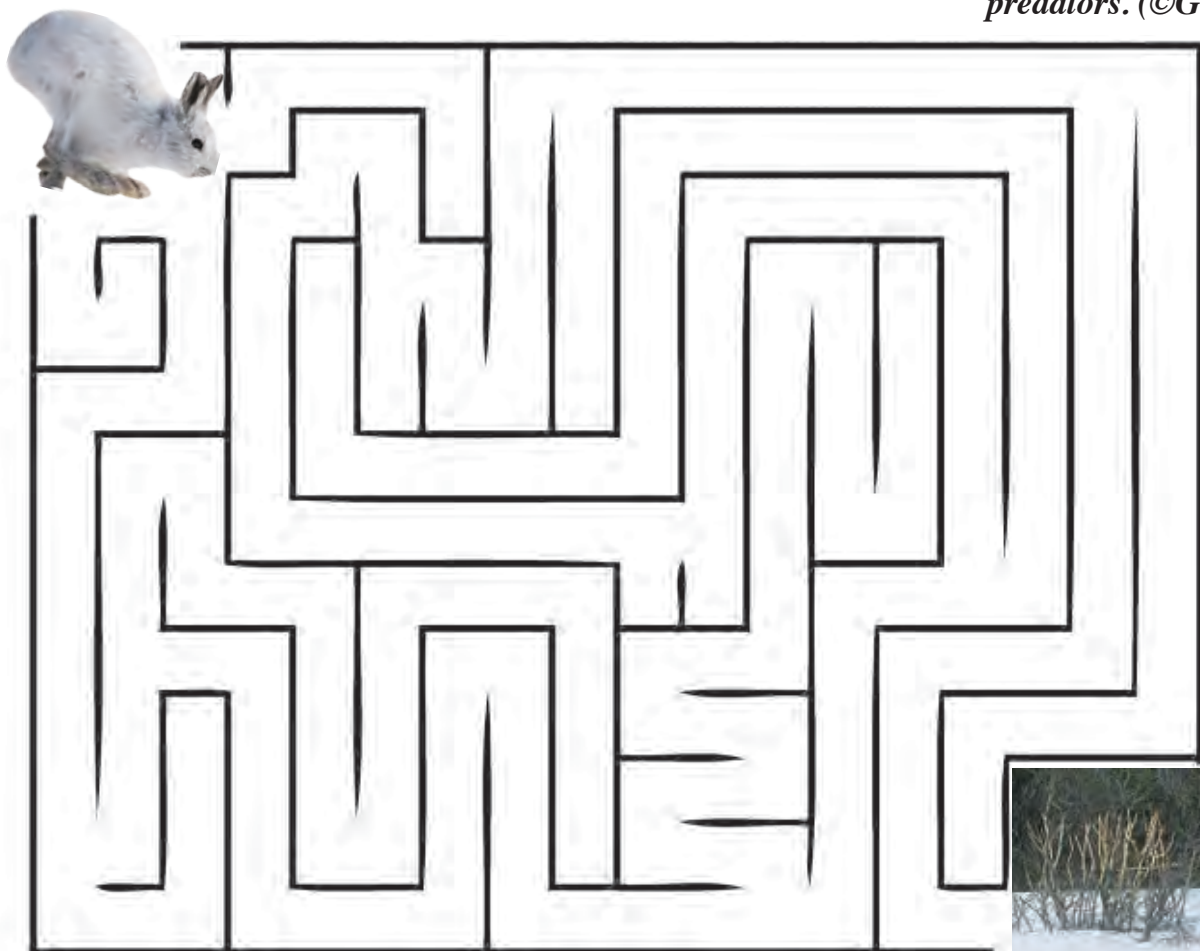
The hare has very strong back legs and can jump almost 10 feet at a time and can run as fast as 27 miles an hour. Hares are very strong swimmers and jump into ponds and streams to get food or escape a predator.

Snowshoe hares are herbivores (her-biv-ores) which mean that they eat plants and berries in the summertime. They have strong teeth, made for gnawing on tree bark, twigs and tree buds in the winter. They even eat needles from trees.

Hares are larger than rabbits. While rabbits live in underground dens, the hare likes to live under bushes or roots. Hares are born with a furry coat and their eyes are open. Just hours after being born, they are ready to start hopping.

(Waabooz information from Wisconsin DNR EEK! Critter Corner and www.cbc.ca/kidscbc2/explore/animals.)

(See page 18 for the effects climate change is having on waabooz.)



Help waabooz find food at the end of the maze.

What did you learn?

What is the Ojibwe word for winter?

Why does waabooz change color?

Where did the snowshoe hare get its name from?

What does waabooz offer to the Anishinaabe?

What does waabooz eat?



Walleye unplugged: acoustic telemetry study underway in Mille Lacs

In late September, biologists from Mille Lacs Band, Fond du Lac, and GLIFWC worked together to implant 86 acoustic transmitters into ogaa (walleye) in Mille Lacs Lake. This study aims to understand which habitats are most important for juvenile and adult ogaa and identify when and under what conditions juveniles and adults overlap.

Biologists surgically implanted transmitters into 51 adult ogaa (18-28 inches) and 35 juvenile ogaa (7-10 inches) this past autumn from locations throughout the lake (Image 1 below). In addition to the 19 adult ogaa implanted with transmitters in July, a total of 70 adult ogaa and 35 juvenile ogaa are currently transmitting their location, depth, and temperature to 61 stationary listening stations in a grid design covering most of the lake (see Fall *Mazina 'igan* page 6 for details).

Transmitters in adult ogaa will last for ~4 years, while the tags in juvenile ogaa will last for ~200 days due to the smaller battery in the transmitter. Biologists will tag another 35 juvenile ogaa next spring which will allow them to evaluate habitat use over the summer months.

Data from the stationary listening stations will be downloaded next spring shortly after ice-out and biologists will begin to analyze habitat use of both life stages over the winter.

Please contact Mille Lacs Band Biologist Carl Klimah (320-532-5690) or the Inland Fisheries Section at the GLIFWC (715-682-6619) for more information about this research, or if you catch an adult ogaa with a green external tag (Image 2).

—Dr. Aaron Shultz, Dr. Adam Ray, Mark Luehring, Ben Michaels, Joe Dan Rose, and Carl Klimah

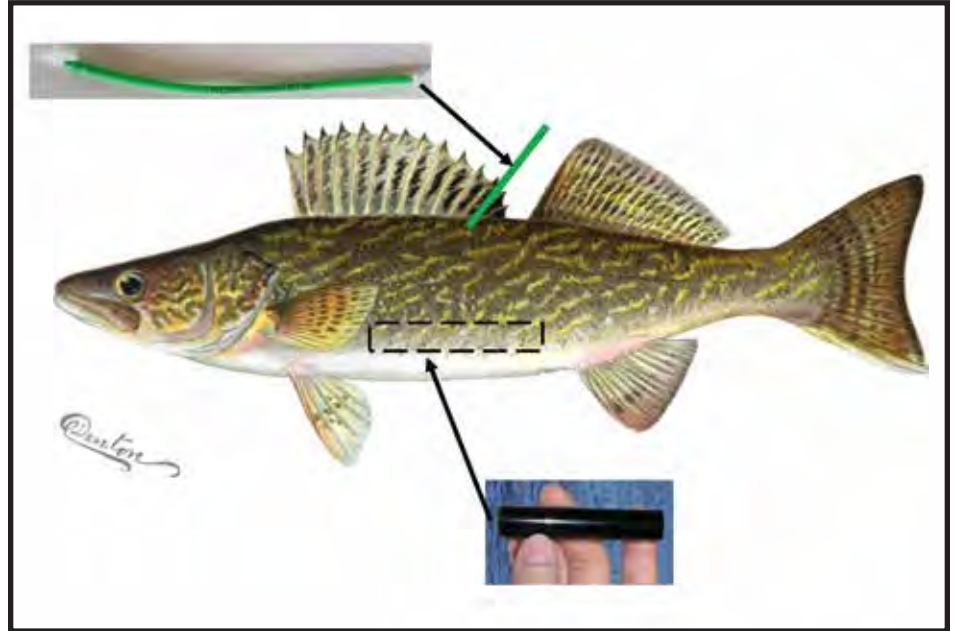


Image 2: Location of acoustic transmitter and external tag on adult ogaa in Mille Lacs Lake. Please report tag number and capture location to Carl. Klimah@millelacsband.com or 320-532-5690.

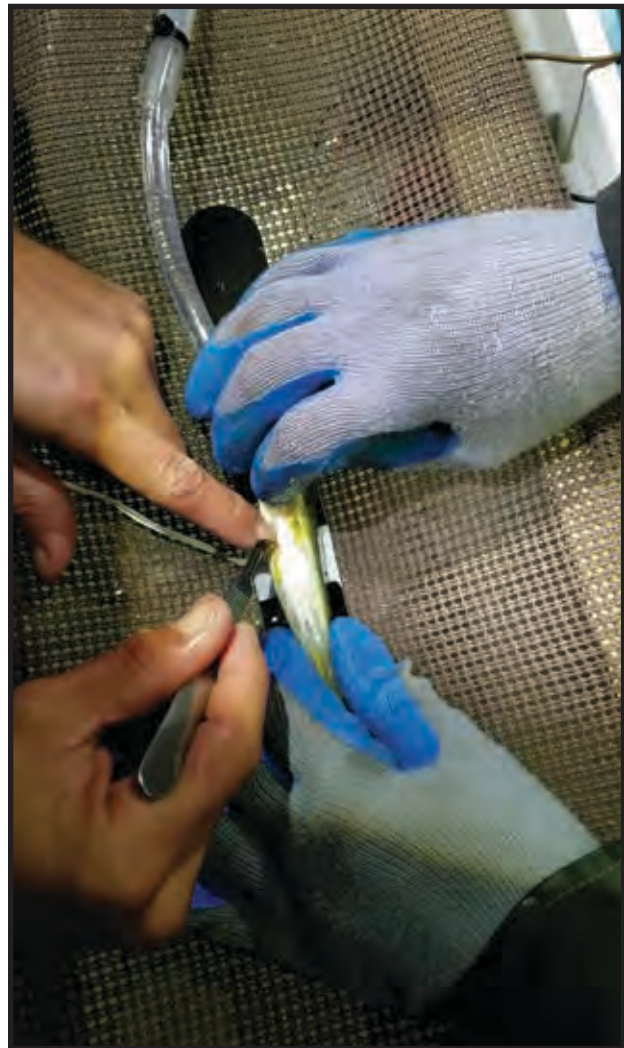


Image 1. Biologists perform surgery on a juvenile ogaa. (Brenda L. Chesshir photo)

Waabooz climate change vulnerability assessment

Editor's note: See page 17 for a traditional teaching about waabooz.



Waabooz (Snowshoe Hare)

Lepus americanus

Moderately - Extremely Vulnerable
(Confidence Level: High)



Figure 9. Range map of waabooz.

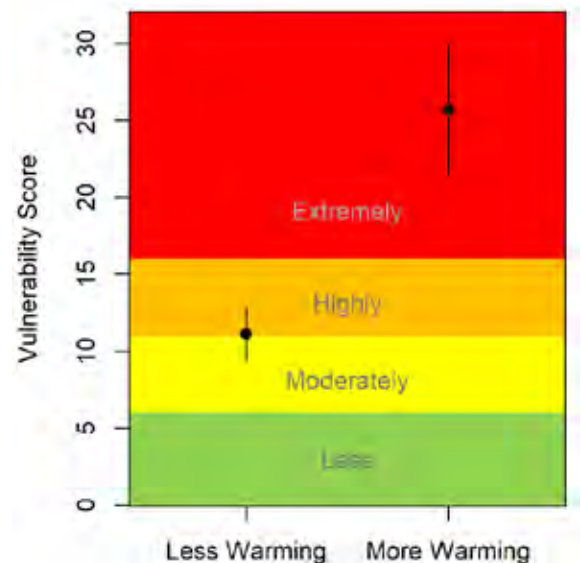


Figure 10. Climate change vulnerability scores for waabooz on a scale of 0 (lowest vulnerability) to 32 (highest vulnerability). Dots indicate average score; lines indicate possible range of scores for each warming scenario.

General Description:

Waabooz utilizes primarily coniferous and mixed forest, as well as bogs, swamps, lowland shrub, and forest edges. Early successional forests often have a higher waabooz abundance. Waabooz also requires a dense understory for cover. Areas with greater than 60% forest cover and dense understories have the highest probability of having waabooz.

As forest was cleared for agriculture in the late 1800s, the waabooz range contracted northward. Currently, waabooz is at the southern end of its range in the Ceded Territories, and its range continues to shift northward (Figure 9). From 1980 to 2014, waabooz's range has shifted 18.4 miles north in Wisconsin, and 28 miles north over the last 20 years in Michigan. Waabooz populations undergo cyclical patterns in abundance, though at the southern end of its range these cycles are not as dramatic as in other regions.

Nearly all TEK interviewees have expressed concern about a decline in the waabooz population. The days of noticing tracks in the snow, seeing it in the backyard, and setting numerous snares to trap it are now mostly gone. When TEK interviewees were asked how long they had been noticing the population decline, the average response was 15 years. Most interviewees also noted a decrease in snowfall during that time frame, which some feel is contributing to the waabooz decline. There are concerns about the loss of traditional teachings and stories regarding the waabooz and waabooz trapping. Tribal members fear the traditional knowledge and stories about it will soon only be memories and younger generations will have never seen a waabooz in their backyard.

(see Waabooz, page 19)

Waabizheshi

(continued from page 14)

Changing snow in Wisconsin may be making it harder for martens to avoid fishers except for areas with deeper snow, according to Gilbert. The Penokee Range is an example of this valuable habitat to Waabizheshi.

Thirty years of waabizheshi research by GLIFWC has resulted in education opportunities for both Scott, currently in her Master's research, and Aldred, who also researched the marten in her graduate schooling.

Scott, Aldred, and Gilbert recommend getting involved in internships, volunteer work, and class projects to set oneself apart when applying to research opportunities.





CWD management

(continued from page 1)

precautions, are necessary to safeguard wildlife and human health. Tribal CWD Management Area boundaries are recommended on a case-by-case basis by the Intertribal CWD working group and approved by the Voigt Intertribal Task Force. The recently approved Tribal CWD Management Area is defined as the area encompassed by tribal wildlife management units 37, 42, 52, and portions of 38 within Oneida County in Wisconsin.

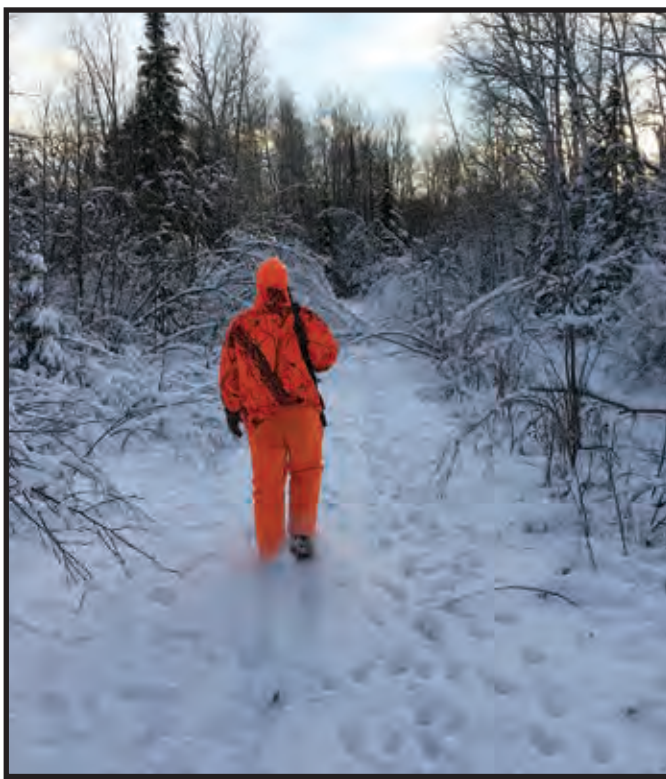
Tribal members planning on harvesting deer within the Tribal CWD Management Area are encouraged to review the Intertribal CWD Working Group's recommendations, which can be found at the GLIFWC CWD webpage: data.glifwc.org/cwd under the "Tribal CWD Management Areas" tab. The website also contains an interactive map that includes the boundary of the recently approved CWD Management Area.

Wisconsin passes portion of emergency rule, withdraws carcass transport restrictions

The Wisconsin legislature's Joint Committee for Review of Administrative Rules recently voted to suspend portions of an emergency rule that was designed to restrict the transport of deer carcasses in Wisconsin's CWD-affected counties. The carcass transport rule was supposed to go into effect as of October 1st. The Wisconsin Department of Natural Resources

notes that it is still illegal for state hunters to transport whole wild deer carcasses and certain parts of deer carcasses from CWD-affected counties to areas outside of CWD-affected counties. The exception is if the deer carcasses or parts of deer carcasses are being transported to an adjacent county, to a licensed taxidermist, or a licensed meat processor within 72 hours of the deer being harvested.

The Joint Committee upheld another portion of the emergency rule, which requires captive deer farms to add a second



Güyosewinini (hunter). (COR photo)

fence, an electric fence, or a solid perimeter fence for farms that have not tested positive for CWD within one year. Any farm that has tested positive for CWD would also be required to install a second fence or a solid barrier within a year. This emergency rule comes after five additional deer farms tested positive for CWD in 2018.

Chronic wasting disease is a fatal, contagious, neurodegenerative disease caused by a mutated protein known as a prion. Prion diseases such as CWD in deer and scrapie in sheep are known as transmissible spongiform encephalopathies (TSEs). These diseases can spread from one individual to another and cause damage to the brain and other neurological tissue.

The first case of a wild CWD-positive deer in Wisconsin was found in 2002. CWD has spread across a large portion of North America over the past several decades. Although there have been no reported cases of CWD infection in humans, the World Health Organization recommends against the consumption of any animal that could be infected with a prion disease.

CWD state updates

Minnesota—One wild deer has tested positive, and another is suspected of being positive for CWD in the southeastern portion of the state, well outside of the Ceded Territory.

Michigan—The state set a goal of testing 15,635 deer in 2018. As of mid-October, over 4,000 deer had been tested and nine deer tested positive for CWD in the state. This included the first deer to test positive for CWD in the upper peninsula, just outside of the 1842 Ceded Territory. The four year-old doe was harvested in Dickinson County, tagged with a deer damage shooting permit. The Department of Natural Resources is responding by providing additional opportunities for hunters to submit deer heads for testing and offering disease control permits to interested landowners, among other actions.

Wisconsin—State and tribal officials are continuing CWD surveillance efforts throughout the state. As of mid-October, over 1,400 samples had been submitted, with over 1,100 analyzed, and 57 deer testing positive for CWD. All of the deer that had tested positive by mid-October 2018 had been from the southern portion of the state and outside of the Ceded Territory.

Elk hunt

(continued from page 2)

"Two of the bulls ended up spotting us and took off across a road," Hmielewski said. "The third one, a 5X6, came in and we got him."

Health check

Some elk, including the Bad River bull, were loaded onto a trailer and hauled back to camp. Other animals harvested deeper in the woods were cut-up into quarters and carried out. In all cases, tribal members worked with GLIFWC wildlife biologists to collect blood and tissue for health testing.

"Hunters were really enthusiastic and engaged with the sampling process," GLIFWC Wildlife Biologist Travis Bartnick said. "Since collecting some of the samples was time-sensitive, their help was critical."

Ojibwe hunters carried a sampling kit afield that included storage tubes and a syringe for blood draws, plus collection bags for organ segments, including liver and lung samples. Biologists removed lymph nodes from the neck and the brain stem, or obex, to test for chronic wasting disease. Early test results for the first three bulls indicate the animals are in good condition, Bartnick said.

After a Lac du Flambeau member harvested a fifth and final bull elk October 18, GLIFWC biologists packaged the last of the samples in ice, transferring the material to the DNR for shipment off to the University of Wisconsin diagnostics laboratory in Madison. UW veterinarians analyze samples for a variety of ailments like bovine tuberculosis and the bluetongue virus. Meanwhile, tribal members are making plans for community feasts to recognize the return of revered native animal, omashkooz.



GLIFWC Wildlife Biologist Travis Bartnick collects a lymph node from an elk for testing. (COR photo)

Omashkooz for the Holidays

Bay Mills Indian Community hunters held onto their elk tags as warm weather lingered during the three early-season time periods from late August to early October. Hunters from Bay Mills were allotted a total of four omashkoozoog tags for the 2018-19 season, valid in Michigan's primary elk range in the Lower Peninsula. The harvest authorizations include three cow elk and one bull.

When the late elk season opens December 24, tribal hunting activity is expected to take off in the 1836 Treaty Ceded Territory, said Justin Carrick, Bay Mills Conservation Office. The Michigan elk herd is centered in the Pigeon River Country State Forest, numbering around 1,000 animals. Annual harvests are split between state hunters and members of five treaty tribes in Michigan.

—CO Rasmussen

Waabooz and climate threats

(continued from page 18)

One individual recalled walking from his house on Lake Superior in Red Cliff, Wisconsin, to Oak Island on the ice in order to snare waaboozoog: "It was tough going over in the winter time, got over there and had no shack over there. They had a halfway decent stove, one of those air tights, and you had to keep adding wood like you would never believe. Waaboozoog, we snared like ten waaboozoog the first night. The fishermen used to go by there. They would come in and trade waaboozoog for fish, which we did... We had to walk out there, then they would give us a ride home... I haven't seen a waabooz in 15 years and I shot hundreds and hundreds of them. I used to sell waaboozoog to go to the show and if you shot them you'd get 50 cents for them and if you snared them you'd get a dollar. My aunt used to ask what is the difference. When you shoot them you lose all the blood. If you snare them, we add that blood to the soup."

Summary of climate threats:

Waabooz was in the 94th percentile relative to other mammals in the vulnerability assessment. Relative to other beings/species in the vulnerability assessment, waabooz was in the 95th percentile. Waabooz is among the most vulnerable beings/species in our assessment. Its population is strongly linked to the duration of snow cover, which is likely to continue to decline, especially at the very southern end of its range. Many other factors contribute to waabooz's vulnerability, including natural and anthropogenic barriers, sensitivity to increasing temperatures, increased predation risk, and phenological mismatches. This being/species is the subject of much ongoing research, including models projecting waabooz's future range (Figure 10).

Factors that increase waabooz's vulnerability to climate change:

- SI** Natural barriers: Edge habitat in fragmented landscapes is a barrier to waabooz. Any increases in unsuitable non-forested habitats would likely increase mortality.
- SI/I** Anthropogenic barriers: Agriculture, roads and other urban development can all be barriers to waabooz.
- I/GI** Physiological thermal niche: Waabooz is a winter-adapted being/species restricted to cold environments that will continue warming, particularly in the winter. Models have linked local waabooz extinction in Michigan to an increase in maximum summer/fall temperature.
- SI** Historical hydrological niche: The area waabooz occupies has experienced slightly lower than average variation in precipitation in the past 50 years.

(see Waabooz, page 20)



Waabooz continued

(continued from page 19)

- GI** **Dependence on snow or ice:** Snow cover is a critical component of waabooz habitat and may be the primary factor in its vulnerability to climate change. Decreases in duration and depth, and increases in the density of the snowpack are expected to negatively impact waabooz. Reductions in the depth of the snowpack will decrease the availability of browse on upper branches. Waabooz is also dependent on snow cover for camouflage, and fewer days with snow on the ground has been linked to increases in predation. Decreasing duration of snow cover has been found to be the most important driving factor in the range shift of waabooz in Wisconsin.
- SI** **Pathogens or predators:** Waabooz is a major prey item for many carnivores that are less vulnerable to or may benefit from climate change in the Ceded Territories, including gidagaabizhiw (bobcat), wiisagazi ma'ingan (coyote), and ojiig (fisher).
- N/SI** **Interspecific interactions:** Population cycling in waabooz has been tied to specific predators (especially lynx) and beings/species with overlapping ranges (such as ruffed grouse). If those beings/species are also affected by climate change, waabooz population cycles may be dampened and abundance may be affected.
- N/SI** **Genetic variation:** Northern and eastern populations of waabooz in Canada and the eastern US are generally characterized by high genetic diversity, but at the southern end of its range in the Ceded Territories, genetic diversity is lower.
- I** **Phenological response:** Two Montana studies found waabooz did not vary the date or rate of fall molt (turning color from brown to white) with the timing of snowfall, indicating that fall molt is initiated by day length and not presence of snow. The spring molt did vary with longer or shorter snow seasons. The consistent timing of the waabooz fall color change will cause waabooz to stand out more to predators if snows come later in the year. However, the studies did find some variation in timing and rate of molt among regional populations of waabooz, and another study found waabooz in Pennsylvania had less white winter coats than in northern Canada. Both of these may indicate some ability in waabooz to adapt to changing winter conditions. However, models in Wisconsin and Michigan show waabooz is currently not able to keep pace with recent declines in snow cover. Continuing phenological mismatches will cause waabooz to lose its camouflage, particularly in the fall, and be subject to increased predation.
- SI/I** **Documented response to climate change:** Waabooz has already begun responding to climate change; waabooz range receded northward in the Ceded Territories at an average rate of 5.4 miles per decade from 1980 to 2014. This recession is primarily linked to duration in snow cover.
- SI** **Modeled future range:** Models show waabooz range continuing to move northward, though uncertainty about snowfall projections complicates the models, especially given snow cover is likely the primary driver of waabooz range.

Legend	GI Greatly Increase This factor greatly increases vulnerability	I/GI Increase/Greatly Increase This factor may increase or greatly increase vulnerability	I Increase This factor increases vulnerability
	SI/I Somewhat Increase/Increase This factor may somewhat increase or increase vulnerability	SI Somewhat Increase This factor somewhat increases vulnerability	N/SI Neutral/Somewhat Increase This factor may not increase or may somewhat increase vulnerability

Stewardship

(continued from page 6)

respect, and reciprocity—all of which are critical for successful climate adaptation. In general, this menu resonates in that it is rooted in indigenous ways of being, knowing and adapting.”

An overview of the Menu was presented at the September GLIFWC Board of Commissioners meeting in Bad River and at the October GLIFWC/Forest Service Annual MOU meeting in Lac Vieux Desert. In response to feedback received at these meetings, GLIFWC Climate Change staff have already started engaging with elders and Tribal Historic Preservation Officers (THPO) from GLIFWC member tribes so that the Tribal Adaptation Menu team may benefit from their knowledge and experience while the Menu is undergoing additional field testing. Publication of the final version is planned for 2019.

GLIFWC, NIACS and other partners are collaborating on additional projects that will benefit GLIFWC tribes and natural resources in the Ceded Territories in the future, including a new Wildlife Management Climate Adaptation Menu and a Climate Change Vulnerability Assessment for the Apostle Islands National Lakeshore.

For more information on the Tribal Adaptation Menu go to <https://data.glifwc.org/archive/bio/Tribal%20Menu%20Flyer%209-18.pdf>, for further information on other GLIFWC/NIACS projects or the GLIFWC Climate Change Program contact GLIFWC Climate Change Program Coordinator Rob Croll at rcroll@glifwc.org.

Gichigami

(continued from page 7)

learn about hydrology of the lake, contaminants and other important subjects that impact this amazing ecosystem.”

As the sun set on the shores of gichigami, conference participants returned to their respective communities. Great dialogue and next steps were affirmed at the closing of the 2018 event. Participants agreed that even though the conference is just once a year, the work to protect gichigami is an everyday practice. Anishinaabeg have always recognized the great lake as a source of protection and nourishment. It's time for all walks of life to stand up and reciprocate for the preservation of a powerful yet nurturing form of life.

Ambe sanoo ganawaabandamok maajiyeg!

(continued from page 15)

It has been about one year since I have gone without eating bread, macaroni, and potatoes. The reason I did this was, because my diabetes was getting the best of me. Everyday I had to take pills to try and control my diabetes. Today I no longer have to take diabetes medication, since I watch carefully what I eat. I do not always eat everything. I am also no longer as heavy as I once was. My belly also does not extend out as much as it once used to. It is not easy. I cannot eat of the foods that I used to love to eat. I do not eat cake or ice cream. I also cannot eat candy.

Nebowa niwaabamaa a'aw Anishinaabe gaa-kiishkigaadezhond maagizhaa gaye gaa-kiishkizidezhond. Mii dash i'iw weweni wenji-ganawenindizoyaan ziinzibaakwadaapineyaan gaye. Mii imaa ziinzibaakwadaapined wenjikaamagadanig ani-noogishkaajigaadenig weweni imaa da-izhijiwang omiskwiim awiya imaa okaading maagizhaa gaye ozidaang. Mii gaye ezhiwebizid ani-ginjiba'igod ziinzibaakwadaapined awiya. Mii-go gegapii gaawiin weweni anokiisiwan inow odoonikosiwan. Mii imaa ezhijiwang awiya omiskwiim odoonikosiwaning, mii dash iw eni-izhichigenid inow odoonikosiwan ani-mamaagod maanaadadinig imaa omiskwiiming ayaamagadinig. Ishkwaa-anokiinid inow odoonikosiwan mii iwidi booch aakoziwigamigong da-izhaad da-biitaabiiginind imaa ge-onjikaamagadinig da-biinichigaadenig omiskwiim nising endaso-giizis booch. Mii iw dialysis ezhiwiindang a'aw chi-mookomaan da-izhaad. Niizaanad geget ganawendanzig weweni ziinzibaakwadaapined awiya.

I see a lot of Anishinaabe that have amputated legs or amputated feet. That is another reason I take care of my diabetes also. The reason this happens is because the diabetes has stopped the circulation of blood maybe in his leg or his foot. That is what happens when someone loses control of his or her diabetes. Eventually their kidneys are not working properly. Their blood flows threw their kidneys, which filters the toxins from their blood. When their kidneys fail they have to go to the hospital to get hooked up to a machine that filters their blood for them three times a week. That is what the white man calls dialysis. It is dangerous for someone to not take good care of his or her diabetes.

Ishke gaye miinigooyaan a'aw opin gebozod imaa wiisiniwigamigong, mii eta-go aabita ezhi-amwag. Ishke gaye naajimijimeyaan, mii imaa ani-dibaabandamaan aaniin minik imaa ziinzibaakwad ani-dagonigaadeg waa-adaaweyaana.

Ishke mii iw gaa-onji-boonitooyaan i'iw bizhiki-doodooshaaboo nigii-waabandaan ozhibii'igaadeg nebowa imaa ziinzibaakwad dagonigaadeg. Mii iw noongom bagaane-doodooshaaboo menikweyaan waashkobanzinok. Mii gaye a'aw wiisagadesijigan gaa-izhi-minwenimag gaawiin geyaabi indamwaasiin onji a'aw bibine-bakwezhigan ayaabajichigaazod gii-ozhi'ind a'aw wiisagadesijigan. Niganawaabandaan gaye minik waasiniyaan. Mii iko gaa-izhichigeyaana baanima igo gii-wawiinge-debishkineyaan gii-poonitooyaan maajiyaan. Mii dash noongom mii eta-go da-debisewendamaan minik maajiyaan gegoo naa gaye weweni nidibaabishkoodoon nimiskwiim minik maa ziinzibaakwad eyaamagak. Niiwing maagizhaa gaye awashime dasing bimi-giizhigak.

When I go to restaurants and they give me a baked potato I only eat half of it. Also, when I am out shopping for food I have to check the labels to see how much sugar has been added to the food. I also quit drinking cow milk because I noticed how much sugar was in the milk. Now I drink unsweetened almond milk. As much as I love eating pizza I no longer eat that either, because of the flour used to make the crust. I also watch the amount that I eat. What I used to do was eat until I was plump full before I stopped eating. Now today I just eat enough so I am content and I also make sure I check my blood sugar. I may check it four times or more a day.

Ishke a'aw Anishinaabe gaawiin weweni ganawenindizosiin dibishkoo-go odapiitendanzin i'iw bimaadizid. Dibi wenjikaamagadinigwen i'iw izhichiged a'aw Anishinaabe, maagizhaa gaye mii imaa ani-debwetamang gii-aaniwenimigooyang anishinaabewiyang gii-goopidenimigooyang. Mii dash imaa biinjina bemiwidooyang o'ow weweni ganawenindizosiwang.

The Anishinaabe does not take good care of himself, as if he has no regard for his own life. I do not know where that comes from that Anishinaabe does that, it could be that we believe what we were told that we were inferior and not worthy. We carry that belief within us and is the reason we do not take good care of ourselves.

Bizindawishig weweni gidaa-ganawendaanaawaa bimaadiziyeg. Mii ingiw Manidoog gigii-miinigonaaing i'iw bimaadiziw. Gigii-ina'oonigonaaing ingiw Manidoog i'iw bimaadiziw. Gaawiin gidaa-wii-nishwanaajitoosiimin.

Listen to what I am saying and take good care of your life. The Manidoog were the ones who gave us our lives. Our life was a gift from the Manidoog, therefore we should not waste it away.



Tribal youth program collecting, archiving TEK

By Alena Prcela for Mazina'igan

The Tribal Youth Media program at Bad River is embarking on a project in conjunction with the National Park Service and two other local bands of the Lake Superior Ojibwe. The purpose of the project is to collect Traditional Ecological Knowledge (TEK) from elders and culture keepers about the Apostle Islands and other tribal lands. Tribal Youth Media participants and Bad River tribal members in middle and high school will be collecting much of that knowledge.

Since Tribal Youth Media moved to Bad River in 2011, students have cycled through the week-long summer class learning digital music composition, website design and video work. At the end of the week, students have their own personal websites, unique musical creations and professional quality video footage. Students have created everything from music videos featuring original sounds to publicly broadcasted news coverage of the 2016 floods in northern Wisconsin.

Now, during the summers of 2018 and 2019, students also have the opportunity to shoot oral history video interviews with elders and culture keepers as a part of the National Park Service collaborative research grant.

For the first few days of the class, students learn interviewing skills and the aesthetic and technical aspects of shooting quality video from Patty Loew (Bad River member and Northwestern University journalism professor), Fawn YoungBear-Tibbetts (White Earth member with over 20 years of media experience), and Tim Fish (Muscogee Creek member and University of Wisconsin-Madison graduate student).

After learning the basics from lectures and hands-on tutorials, students venture into the field and start shooting. Since the start of the program on July 9, students have interviewed elders and culture keepers at a gathering of Ojibwe rice chiefs, Lake Superior Days, Bad River Elderly Center, and even Madeline Island.

From those interviews, not only do students hone their video skills, but they also learn more about Ojibwe TEK. A video with Mic Isham, Lac Courte Oreilles tribal member and GLIFWC executive administrator, in which he discusses his experiences spearfishing stands out as a perfect example of TEK.

Isham recounts the time he headed out to spearfish on the first day the lake was 48 degrees, which is said to be the temperature male walleye swim to shallow water to spawn. When Isham grew frustrated that he was not seeing many fish, another tribal member explained that it was because the frogs weren't chirping yet.



In conjunction with the National Park Service and two other local bands, a Tribal Youth Media program at Bad River Reservation is embarking on a project to collect Traditional Ecological Knowledge (TEK) from elders and culture keepers about the Apostle Islands and other tribal lands. (COR photo)

It wasn't until seasons later when Isham was successfully spearing many walleye and heard the frogs chirping that he realized traditional knowledge goes hand and hand with the western scientific knowledge that told him to start spearing when water temperatures reached 48 degrees.

Stories like Isham's and many more, about everything from the deep history of Madeline Island to current fishing and hunting practices, will be available at the culmination of the two-year project on an open-source platform called Mukurtu, created specifically for indigenous communities to share and protect "digital heritage" items in ethical and culturally sensitive ways.

While some stories will be used to inform National Park Service management and shared with visitors to the Apostle Islands National Lakeshore, others that are deemed culturally sensitive by tribal historic preservation officers will be firewalled for the sole viewing and use of tribal members.

More training is scheduled to ensure all participating tribes have the tools to shoot oral history videos and manage their Mukurtu histories in ways they best see fit. While the project is still in its early stages, involved parties are looking forward to the end product—a vast archive of rich Ojibwe history available for hundreds of years to come.

—Prcela is a Tribal Youth Media assistant

Mikwendaagoziwag

GLIFWC Wildlife Section Leader Miles Falk steers the rear end of his canoe on Sandy Lake during the annual Mikwendaagoziwag (they are remembered) event and ceremony. Participants paddle across the lake and then gather for a feast and ceremony. (B. Jennings photo)

Laughter heard from the island



Treaty Day brought Anishinaabeg back to moningwanakaaning on September 30. This year a wide array of events were enjoyed throughout the island including the anticipated jingle dress dancer, which was unveiled on the island and danced into the circle with other jingle dress dancers from around Ojibwe Country.

The youth took to the fields to play multiple games of lacrosse. Ojibwe communities have been working hard at revitalizing the creator's game and the youth are picking it up with excitement. Winona LaDuke opened up the game with some encouraging words for the young group getting ready to engage in an intense match of strength, agility, and skill.

Everyone gathered in the center circle and shared a little about themselves and why they play the creator's game. The crew then raised the wooden staff-looking sticks to the sky as the ball was tossed up. Apparently, the old-style lacrosse sticks are making a big come back in this region.

"The youth here actually prefer to play with the old-style sticks rather than the modern contemporary lacrosse sticks," said former Bad River Youth Staff Joseph Gokee.

—B. Jennings



WINTER STORIES FOR CHILDREN

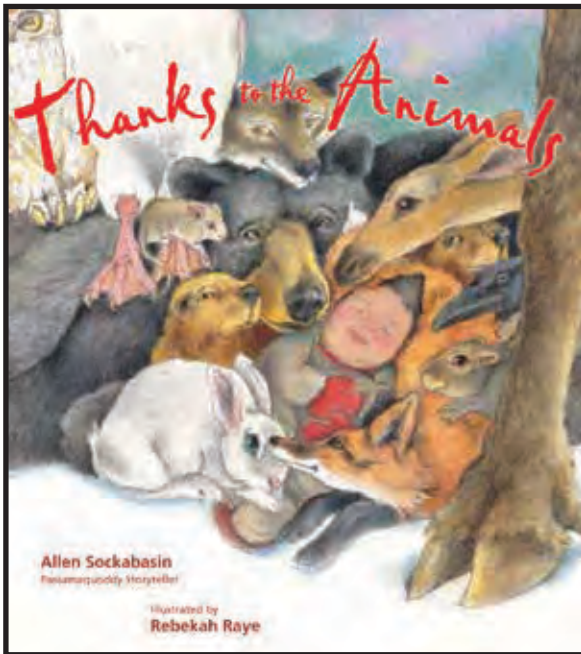
By Paula Maday, Staff Writer

Winter is a time for storytelling, dreaming, and quiet reflection. It is a time to share oral traditions and to let our imaginations savor the intricacies of the written word. As you prepare to hunker down from the cold this biboon, look for these books at your local tribal, public, or school library. They are heartwarming stories to share with children to honor this special season.

Thanks to the Animals

By Allen Sockabasin, Passamaquoddy Storyteller
Illustrated by Rebekah Raye

Thanks to the Animals follows the journey of a Passamaquoddy family as they move from their summer home on the coast of Maine to the deep woods for the winter of 1900. Traveling by bobsled pulled by horses, the littlest member of the family—Little Zoo Sap—falls off the sled unnoticed and gets left behind. When the forest animals hear his cries, they gather together, each finding a place to curl around the baby, keeping him safe, warm, and protected until his father returns.



Thanks to the Animals is the perfect winter story for children in preschool-grade 2. (Tilbury House Publishers image)

Though a Passamaquoddy story, this book characterizes the close relationship that many American Indian people—including the Ojibwe—share with the natural world. It is a beautiful depiction of the way in which animals take care of us, and the way in which we thank them. From the big bushy beavers that wrap their tails around the little boy to cradle him, to the tiny little muskrats that fill in the small crevices between the larger animals, every animal has a purpose and gift that it offers to us, both in the story and in the world.

I loved this book. Named one of the Top 10 Native American Books for Elementary Schools by American Indians in Children's Literature, this book should have a permanent place in your library. It is a timeless tale of love, interconnectedness, and appreciation.

Resources Inside the Book

Thanks to the Animals includes an author's note at the end of the book that shares information about the history and traditions of the Passamaquoddy people. It also includes two pages dedicated to Passamaquoddy names for the animals in the book, spelled phonetically to help English-speakers become familiar with the language as it's traditionally been spoken.

Food policy options

(continued from page 10)

Please keep an eye out for community roundtable discussions on the model food code and opportunities to participate in food safety trainings in the months ahead. If you have questions about this project, please feel free to contact me at ext. 2016 or pkebec@glifwc.org, or Owen Maroney at ext. 2147 or ohmaroney@glifwc.org.

Ingii-kikendaan da-Ojibwemoyaana noongom!
(I learned to speak Ojibwe today!)

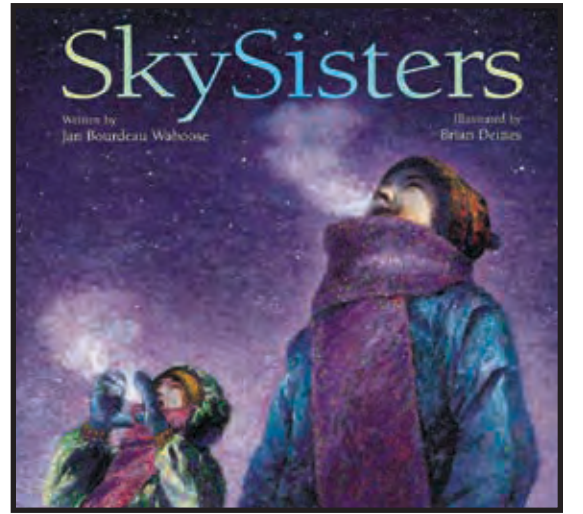
www.glifwc-inwe.com

Nenda-Gikendamang Ningo-Biboonagak

SkySisters

By Jan Bourdeau Waboose
Illustrated by Brian Deines

SkySisters follows Ojibwe sisters Alex and Allie as they set out into the cold winter night in search of the SkySpirits. Their walk across the snowy earth and up Coyote Hill is begun with a reminder from their mother that "Wisdom comes on silent wings."



SkySisters is appropriate for children in grades K-3. Both books in this review can be found on Amazon for purchase. (Kids Can Press image)

As the girls try to speak quietly and walk softly over the frozen ground, they observe their surroundings, encounter animals, and think about past generations that have made the same trek. The bond they form in this experience comes not from talking with one another, but rather from the shared experience of listening and responding to the world around them, in the same way they sing to the coyote and the coyote sings back to them.

When the girls reach the top of Coyote Hill, they dance and spin under falling snowflakes and an expansive northern sky. Eventually, as they lay in the snow, looking up at the stars, the SkySpirits (northern lights) appear in brilliant shades of green, blue, pink, and purple. The SkySpirits dance and spin in the sky, just as the girls had danced for them in their colorful parkas minutes before. In this story, many different worlds acknowledge and understand one another.

SkySisters is a gentle, introspective book with rich, impressionistic illustrations. In both the way the story is written and depicted, I felt like Alex's experience could have been my own, a quiet reflection during a still, but wonder-filled winter night.

Lac du Flambeau, Sokaogon tribes lead in extended growth walleyes

(continued from page 1)

Reservation's 260 lakes, non-natives account for 75% of fishing activity, according to the creel surveys.

Following a major hatchery renovation in 2015—including installation of six new rearing ponds—LdF's production capacity is greater than ever. While the tribe has reared a variety of species like lake sturgeon, trout, and white suckers in recent decades, walleye and muskellunge represent the core of hatchery output. Tiny hatchlings known as fry are traditionally released by LdF and other tribal hatcheries in vast numbers, but the trend toward "growing out" fish in ponds over a two-six-month period is increasing as resource managers bet on improved survival rates with larger fish. Wawronowicz said 2018 ogaawag totals include 43,989 extended growth fish, which averaged 6.9-inches each. One exceptional walleye topped out at nine-inches. Muskie production, by design, was kept in check at 200, eleven-inch fish.

"We stock our managed muskie waters at around one fish per ten acres," Wawronowicz said.

Joining Lac du Flambeau's recent enhancements, Sokaogon Mole Lake, Lac Courte Oreilles, and St Croix Bands are in the midst of refining their hatchery systems. Early results are impressive. A cooperative project between Lac Courte Oreilles and St. Croix generated 1.5 million walleye fry, 21,000 small fingerlings averaging 1.6-inches, and 12,299 robust

extended growth fingerlings measuring around 7.3-inches each.

"Our partnership with St. Croix was very beneficial," said Brian Bisonette, LCO Conservation Director. "We were able to utilize a St. Croix pond while new LCO ponds are still under development. A big chi-miigwech to staff from both tribes for this accomplishment."

From the Mole Lake tribal hatchery, Fisheries Manager Mike Preul reported strong 2018 oгаа numbers. In late June fisheries specialists distributed 29,512 small fingerlings into three northeast Wisconsin lakes. The big event came in October when the tribe turned loose 64,880 extended growth oгаа into 17 more lakes. Those fish averaged from 7.5 to 7.8 inches.

A better way

While Wawronowicz acknowledges there will always be a place for hatcheries—especially in waters that historically have little or no natural reproduction—he said there's a sense of unease that walleye and other traditional resources are near a tipping point.

"Somewhere along the line we're going to need to get a grip on clean air, clean water, and land use," he said. "Stresses like shoreline development, mining, and climate change are hurting walleye natural reproduction. A healthy human population needs that same clean water and air. We should all be concerned about this, Indian and non-Indian alike."



GLIFWC's 2018 poster

GLIFWC's 2018 poster, Mazinibaganjigan, is the art of making pictures or patterns on birch bark using careful bites of the teeth. The best bark for doing this is harvested in the spring and peeled apart into thin layers. One of the layers is folded—usually two or three, but sometimes up to 16 times—so that it can fit in the mouth. The artist then bites delicately to create a design that has been visualized in the mind.

The eyetooth is the primary tooth used to create imprints. This seems appropriate since the tooth has to “see” the image while it’s being created. Artists who have developed their skill can complete a birch bark biting in one sitting and without looking at their progress.

Some birch bark biters use different teeth to create different effects. One tooth might be used to make lines, while others are used for detailing. Varying the intensity of the bite is another way artists make their creations unique.

Birch bark biting is a pre-contact Ojibwe art form. In an oral history story shared by birchbark biter Awanigiizhik (Roderick) Bruce of the Turtle Mountain Ojibwe, he says he was told that birch bark biting was taught by the babies. “Small teething toys were made of paper birch and were filled with maple sugar. If the baby was sick, other medicines were added. When the babies would bite the toys, small indentations from their developing teeth were imparted onto the birch bark surface. The parents saw this and the art of birch bark biting was born.”



Bitings may have been used to create hunting and fishing maps, or to pass on cultural and ceremonial knowledge between generations. Bruce says that bitings were used as designs for quillwork, where the bitings were laid on top of birch bark or leather and then embroidered using quills. It may have been used similarly as patterns for beadwork.

As birch trees struggle with the onset of unfavorable environmental factors, the bark of our ancestors is still being bitten today. This ancient art form, a sheer glimmer of past generations, sending beauty forward.

Bruce was taught the practice and oral history of birch bark biting by Denise Lajimodiere, Turtle Mountain Ojibwe. The biting depicted on the poster was created in Lac Courte Oreilles on and took approximately 10 minutes to finish. The Ojibwe words on the bottom left translate to “I am eagle.”

For a free copy of the poster call GLIFWC at 715.682.6619 or email lynn@glifwc.org. Additional copies can be ordered through our website at: www.glifwc.org/publications/#Posters Limited quantities of older posters are also available.



Poster image photographed by Melissa Rasmussen, GLIFWC. ©August 2018

GLIFWC Enforcement youth outreach



GLIFWC's Conservation Enforcement Division offers a wide array of safety courses and outreach programs for youth and adults. From archery courses to hunter education, conservation officers located in communities throughout the Ceded Territory do their best to make sure everyone is safe while exercising treaty rights.

Recently, Western District Wardens Lauren Tuori and Brad Kaczak instructed a youth archery event at LCO School, where approximately 100 students learned the basics of safety and shooting techniques for archery and bow hunting (left).

Kaczak also joined Eastern District Warden Steven Amsler for Canoomin—a course that teaches canoe and water safety for manoomin (wild rice) harvesters (above).

For upcoming safety courses and events being offered, please like and follow the GLIFWC Facebook page for additional opportunities and announcements. (submitted photos)

