Mazina'igan

A Chronicle of the Lake Superior Ojibwe

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FALL 2023

New GLIFWC executive focuses on resource enhancement, treaty rights, Ojibwe cultural values

By Charlie Otto Rasmussen
Editor

GLIFWC's Board of Commissioners has selected Jason Schlender (Manidoo Noodin) to lead intertribal natural resources management in the three-state Ojibwe Ceded Territory.

A Lac Courte Oreilles tribal member, Schlender previously served as tribal administrator for the St. Croix Chippewa Indians of Wisconsin, vice chairman of the Lac Courte Oreilles Tribal Governing Board and chairman of GLIFWC's Voigt Intertribal Task Force.

"My family is deeply rooted in Ojibwe treaty rights, history, and culture," Schlender said. "I am honored to accept the executive administrator position and continue with my life's work assisting tribes in practicing treaty rights, understanding our collective past, and protecting the natural resources that sustain us all."

Schlender takes over for Michael J "Mic" Isham Jr. who resigned from GLIFWC in late January of this year. Longtime planning director James Thannum served as acting executive administrator until Schlender's arrival on June 8.

An all-season treaty rights practitioner, Schlender is familiar with hunting, fishing, and gathering areas across the Ceded Territory. In addition, he is passionate about the preservation of the Ojibwe language, culture, ceremonies, proud owner of the Green Bay Packers, an enthusiastic golfer, and family man. James H Schlender Sr. (Zaagajiwe), Jason's father, led GLIFWC in the executive administrator position from 1986 until 2005 when he unexpectedly walked on.

At University of Minnesota-Duluth, Schlender earned a master's degree in Tribal Administration and Governance. He is currently pursuing a First Nations Education doctorate degree through University of Wisconsin-Green Bay.

Schlender had a busy summer meeting with top officials from tribes, states, and the federal government. He spent much of his first day with Wisconsin Department of Natural Resources Secretary Adam Payne and went onto spend time with a host of administrators including Jaime Pinkham, Assistant Secretary of the Army for Civil Works. Prior to his federal appointment, Pinkham served as executive director of a GLIFWC sister agency, Columbia River Inter-Tribal Fish Commission.

A resource management agency created in 1984, GLIFWC is comprised of 11 Ojibwe bands in Michigan, Wisconsin, and Minnesota. The tribes reserved off-reservation harvest rights to wildlife, fish, and wild plants on land transferred to the United States through treaties negotiated in 1836, 1837, 1842, and 1854. Collectively, the lands and waters included in the treaties are known as the Ceded Territory.

Manoomin surveys yielding optomistic outlook on some waters

By Brandon Byrne, GLIFWC Wetland Ecologist & Kathleen Smith, GLIFWC Ganawandang Manoomin

As wild ricing season nears, GLIFWC's manoomin team embarks upon another year of travelling by way of air, land, and water to compile a forecast for Ceded Territory harvesters. Long days on the water and sometimes turbulent survey flights has its challenges, but we are humbled to be able to continue this long-running work in a good way.

Manoomin ground surveys began mid-July and continued through the first week of August. Information gathered from ground surveys supplements aerial surveys, which collect imagery from the air to garner a much broader outlook for each year's manoomin abundance across the ceded territories.

Aerial photo of Island Lake. (B. Byrne photo)

Our initial visits took us to northwestern Wisconsin, where manoomin tends to mature earlier than the rest of the state. Clam Lake by Siren has by far the largest and densest beds we have seen this year. Rice is particularly abundant and densest throughout the southeastern bay; the western bed had sizable abundance as well, though some patches were damaged by wind. To the north, manoomin beds at Briggs Lake covered much of the water. Although the rice was sparser at Briggs near the boat landing, it increased in density throughout the rest of the lake—certainly worth a trip! The rice at Minong Flowage was earlier in growth than at Clam Lake, but rice was still generally abundant in moderate density.

Abundance on the popular manoomin waters of Pacwawong appears lower than last year, and the waterfowl herbivory is higher in sparser stands near the boat landing compared to the northwestern part of the lake. Much of the

(see Manoomin surveys, page 19)

2023 hunting season

waawaashkeshi, mizise & many more

COR

September 1 opener
Michigan 1842 (KBIC)

September 5 opener
Michigan 1836 (BMIC)
Michigan 1842 (LVD)
Minnesota 1837
Minnesota 1854 (FdL)
Wisconsin 1837 & 1842

See your local registration station for more on the 2023 hunting season.

Healing Circle Run photo gallery, pgs. 12-13

JVS

A victory for tribal sovereignty

US Army Corps rescinds wetland fill permit for NorthMet mine

By GLIFWC Staff

Open pit mining has had dramatic impacts on the Minnesota landscape as well as the quality of surface and groundwater. (CO Rasmussen photo)

For the last 18 years, staff from the Fond du Lac Band, GLIFWC, the 1854 Treaty Authority, Grand Portage Band and Bois Forte Band have been engaged in the environmental review for the NorthMet project. NorthMet is a proposed copper-nickel mine located on the eastern end of the Mesabi Iron Range in Minnesota.

The project has been evaluated in two different Environmental Impact Statement (EIS) processes led by the Minnesota Department of Natural Resources and Army Corps of Engineers (the first of these EIS processes was found deficient by the US Environmental Protection Agency). These processes included many pre-draft, draft, and two final EIS documents and their supporting technical documents. Through these efforts, it became clear that this proposed mine would not be able to comply with water quality standards set by Fond du Lac Band authorities.

A flawed project

Tribal reviewers identified a number of significant flaws in the environmental setting and design of the NorthMet proposal. The proposal depends on re-using an old tailings basin that could perpetuate existing contamination in rivers and lakes downstream of the site. The open pit design would permanently destroy over 900 acres of wetlands in the "100 Mile Swamp." This extensive wetland is located at the headwaters of Lake Superior, the St. Louis River, and the Fond du Lac Reservation.

The impacts of this mine, when put in the context of all the other mines located in this area would likely result in cumulative effects to surface and groundwater by dewatering and contaminating headwater streams, fragmenting wildlife habitat, and impacting to cultural resources of native people.

Fond du Lac water quality standards

The Fond du Lac Band established water quality standards under the Clean Water Act (CWA) in 2001 to protect nibi, ogaa, manoomin, and other beings that tribal members depend upon. This is an important element of tribal sovereignty, the ability of tribes to determine, based on western science and indigenous knowledge, what levels of protection they need for their continued survival. An important component of the CWA is that any proposed discharge regulated under the Act must comply with the standards set by downstream states or tribes.

Fond du Lac is downstream of the NorthMet project. For many years, state and federal agencies failed to acknowledge that the tribe's standards could be violated, and so in 2019 the Band sued the EPA in federal court and won. This decision required the EPA and Army Corps to ensure that the proposed mine would comply with Fond du Lac's standards. In June of 2021, after further analysis, the EPA formally notified the Band that the NorthMet project "may affect" the quality of waters under the tribe's jurisdiction.

Better late than never

The Fond du Lac Band, with assistance from a legal and technical team that included GLIFWC staff, analyzed available data and determined that the NorthMet project would violate the tribe's water quality standards. This "will affect" determination was carefully reviewed by EPA and in May of 2022 the EPA agreed with the Tribe's technical assessment and recommended that the Corps not reissue the 404-wetland fill permit. The Corps held a three-day public hearing where the mining company, Fond du Lac, and GLIFWC staff defended their data and technical positions before Colonel Karl Jansen and his permitting staff. Finally, in June of 2023, after a full and fair administrative process, the Army Corps agreed with the tribe that there were no permit conditions available for the project to ensure compliance with the Band's water quality standards. The permits to destroy wetlands at the proposed mine site were withdrawn.

Minnesota Supreme Court weighs in

In a separate but related matter, on August 2, 2023, the Minnesota Supreme Court ruled that the Minnesota Pollution Control Agency's (MPCA) decision to issue a water discharge permit for the NorthMet project was "arbitrary and capricious" and sent the permit back to the MPCA.

A concurring opinion in which five Justices joined emphasized the failure of both the MPCA and the EPA to treat Fond du Lac's water quality standards appropriately. With regard to MPCA, the opinion stated that "[b]y failing to make a record of how the agencies resolved the inadequacies that the EPA identified in the draft permit, the MPCA continued this country's centuries-long history of threatening tribal resources with political disregard of tribal rights."

It is difficult to predict what comes next for this proposed mine. The mining company, PolyMet, merged with Teck Resources that holds the mineral rights to another deposit in the area, to form a new company called NewRange Copper Nickel. We expect the economic pressures that are encouraging mining in the Ceded Territories to continue. But, at least for now, this highly destructive project is on hold.

—Esteban Chiriboga, Environmental Spec.
John Coleman, Environmental Section Ldr.
& Ann McCammon Soltis, Policy Analyst

Wilmer books retirement date after 38 years

Since joining GLIFWC in 1986, the job titles assigned to Rose Wilmer conceal the extraordinary breadth of her contributions to the agency, its staff, and eleven Ojibwe member tribes. While the Bad River Band citizen and mother of two retained her original post as executive secretary throughout, five interim stints in the deputy administrator chair (GLIFWC's #2 staff position), and unmatched skills in everything from organizational prowess to the nuances of navigating the intertribal realm sets her apart.

This past summer, Rose wrapped up a distinguished career during her favorite worktime of the year; the last full week of July when GLIFWC staff, tribal representatives, and friends from around the region come together in east-central Minnesota for Mikwendaagoziwag Ceremonies, bookended by a pair of Ojibwe intertribal meetings. It's a special time of remembrance and companionship and has long been a valued opportunity for Wilmer to plan and execute a feast for a multi-generational gathering that now numbers in the 400s.

Just days before her July 31 retirement, an intertribal group sat at the GLIFWC drum and played her an honor song. The GLIFWC Board of Commissioners followed with a resolution of appreciation and gifted her a star quilt.

"Rose's organizational skills, her thoughtful approaches, and her institutional knowledge have enhanced the mission of the Commission and the implementation of the treaty-reserved rights of its member tribes," the Commissioners said in the resolution. **—COR**

Miigwech from all of us at GLIFWC, Rose!

Ceded Territory news briefs

Tamarack area mine EAW under review

Talon Metals submitted an Environmental Assessment Worksheet (EAW) to the Minnesota Department of Natural Resources (MNDNR) in mid-June for a proposed nickel mine near Tamarack, Minnesota. The EAW is the first step in the development of a state Environmental Impact Statement (EIS) and is primarily a description of the proposed mine and an initial description of the types of analyses needed for the EIS.

GLIFWC staff continue to review the EAW and are developing comments to be submitted to the MNDNR. Talon is proposing an underground mine in eastern Minnesota near Mille Lacs Band Ojibwe reservation lands.

According to Talon, cemented backfill would be used to close the underground workings after mining. Mined ore would be shipped to a facility in North Dakota, pushing ore processing and mine tailings disposal outside the Ceded Territories.

The project proposal includes construction of a 1.5-mile rail spur from the mine site to an area north of Tamarack where the spur would meet an existing rail line. GLIFWC staff will continue to assess potential impacts of this proposal as it moves forward. The EAW and associated documents can be found here: *dnr.state.mn.us/input/environmentalreview/tamarack-nickel-project.html*

—E. Chiriboga

Interagency ogaa & ginoozhe roundup provides snapshot of Mille Lacs fishery

This past spring, while ice still covered most of Mille Lacs Lake, Minnesota Department of Natural Resources staff and GLIFWC Fisheries Technician Ed White, with Fisheries Aides Dane Lagrew and Douglass Keiser, began capturing and "marking" ginoozhe (northern pike) and ogaa (walleye). Over the following weeks, specialists from the Mille Lacs and Fond du Lac Bands—plus US Fish & Wildlife Service—joined in to mark over 3,000 northerns and 13,500 ogaawag with yellow tags, completing the first phase of the fishery assessment.

Starting in mid-May, crews used gill nets set for a short amount of time in effort to recapture these tagged fish. During this time, almost 4,000 ogaa (119 with tags) and almost 400 ginoozhe (18 with tags) were captured and released back into the lake. This data will be analyzed over the next few months to provide an estimate of the population size for both these beings. These estimates will provide managers and biologists with a glimpse of the health of the population and help direct management and harvest goals for the next few years until a new survey is conducted.

—A. Ray

Creating a shared vision with tribes

In an effort to increase cross-agency coordination on objectives related to aquatic species management and conservation, resource officials gathered at the National Conservation Training Center in Shepherdstown, West Virginia February 22-24, 2023.

GLIFWC's Bill Mattes, Great Lakes section leader, presented during the tribal trust responsibilities session on day two of the summit, providing an overview of the court cases leading up to the formation of GLIFWC and the reaffirmation of Ojibwe tribe's rights to hunt, gather, and fish in the Ceded Territories of Michigan, Wisconsin, and Minnesota. The summit is one step in developing and outlining a shared inter-agency vision for aquatic species management and conservation.

—GLIFWC Staff

On land and water, GLIFWC inventories wild beings on Line 5 reroute

While state and federal agencies consider permit applications from Alberta, Canada-based Enbridge Inc. to begin new Line 5 pipeline construction around the Bad River Ojibwe reservation, GLIFWC environmental specialists continue to catalogue the rich diversity of aquatic and terrestrial wildlife living in the path of the proposed oil pipeline.

During this second off-reservation survey season along the 42-mile reroute through Ashland and Iron Counties, GLIFWC teams have conducted fish and aquatic invertebrate assessments, and are documenting rare and culturally important plants.

A decade after it's Line 5 easement with the Bad River Band expired, Enbridge continues to pump crude oil and natural gas liquids through the reservation in far northern Wisconsin.

US District Judge William Conley ruled that Enbridge is operating in trespass on Bad River reservation but declined to order the 70-year-old pipeline shutdown. While Enbridge has offered construction of the horseshoe-shaped reroute as a fix, Bad River Tribe and other Ojibwe bands continue to call for the complete removal of Line 5 from the watershed. Three hundred forty miles to the east, Bay Mills Indian Community is equally invested in seeing Line 5 decommissioned citing its unacceptable threat the Great Lakes.

Enbridge pipelines have a well-documented track record of ruptures in sensitive habitats across the region. The company is connected to the two largest inland oil spills in US history: the 2010 Kalamazoo River watershed disaster in Michigan and the even larger Line 3 spill at Minnesota's Prairie River in 1991.

—CO Rasmussen

GLIFWC among tribal governance "All Stars"

GLIFWC's Ann McCammon Soltis and Jonathan Gilbert proudly accept the award from Harvard's Honoring Nations on behalf of the Commission. (COR photo)

Harvard University's Honoring Nations program recognized GLIFWC as one of nine indigenous All Stars for its work over the last quarter century in developing and implementing treaty harvesting on National Forests in the Ojibwe Ceded Territory.

In collaboration with USDA Forest Service, GLIFWC staff created the "Memorandum of Understanding Regarding Tribal-USDA-Forest Service Relations on National Forest Lands Within the Territories Ceded in Treaties of 1836, 1837, and 1842." Established through government-to-government consultations, the Memorandum of Understanding provides a framework for tribal gathering as well as collaborative interagency research and law enforcement efforts.

"Honoring Nations recognizes innovative programs and initiatives operating throughout Indian Country and provides a unique opportunity for local governments around the world to learn about and replicate lessons from these outstanding tribal governance success stories in their own communities," said Megan Minoka Hill (Oneida), program director for Honoring Nations.

—CO Rasmussen

Register your harvest

Off-reservation hunters are reminded that harvest registration is required by tribal conservation codes for many species. Hunters have multiple registration options for deer, bear, turkey, and cranes: in-person, at a tribal registration stations (see *data.glifwc.org/registration* for a map of locations), online (*glifwc.nagfa.net/online*), or by phone (844-234-5439). Swans must be registered in-person.

The benefits of harvest registration are substantial, extending well beyond an exercise in indigenous sovereignty and self-regulation. As co-stewards, tribes work with state and federal counterparts to determine population abundance and coordinate management for a variety of fish and wildlife species. This requires an accounting of both tribal and non-tribal harvest. Having an accurate measure of off-reservation tribal harvest also helps to identify and prioritize important places for protection.

For hunters seeking chronic wasting disease (CWD) testing for their whitetail harvest, in-person registration is the first choice. Clerks will register the deer and take possession of the head—lymph nodes are typically removed to complete a CWD test.

Good luck to hunters of all ages. It's a great year to take a kid hunting and pass on your knowledge.

2023-2024 Season

NAGFA ID #: 6366 **Tribe:** BRV
Name: JON DOE
Address: 777 Traditional Way Odanah, WI 54861
Phone: 715-685-2125 **Hunter Safety #:**12345657
Remote Registration (deer, bear, turkey, crane): 1-844-234-5439 or glifwc.nagfa.net/online/
Remote Registration Instructions: glifwc.org/Regulations/remote.registration.pdf

SMALL GAME	CAMPING	CAMPING
Turkey Spring - MI/WI	National Forest Camping	Apostle Islands Camping
Stamp# 223394	Stamp# 223744	Stamp# 223745

Sample license with NAGFA ID highlighted.

Anishinaabe insights
Mawinanaawag ma'iinganag (War on Wolves)

By Michael Waasegiizhig Price, GLIFWC TEK Specialist

As guaranteed by the Treaties of 1837, 1842 and 1854, Ojibwe tribes in Wisconsin and Minnesota have usufructuary rights, or reserved rights, on territories ceded to the federal government. Ojibwe treaty rights include hunting, fishing, and gathering, but also guarantee the right to manage and protect those resources as they see fit. Ma'iinganag (wolves) are part of the landscape and ecosystem; they are considered relatives by many Anishinaabe people in this region who want to see their populations restored and healthy. But ongoing efforts at play in Washington DC seek to diminish tribal prerogatives to shape wolf recovery in the upper Great Lakes region.

"Delisting Ma'iingan (wolf) via legislation is an affront to tribal sovereignty," said Jonathan Gilbert, Director of the Division of Biological Services at the Great Lakes Indian Fish and Wildlife Commission. "It also undermines the effectiveness of the ESA [Endangered Species Act]; anytime there is an issue with an endangered species, it will simply be legislated away." Legislative votes, rather than "best available science," may determine the fate and well-being of Ma'iingan.

There has been a war waged on wolves in the United States since prior to the founding of this country. The first official wolf bounty was administered by the Massachusetts Bay Colony in 1630. Throughout the 1700 and 1800s, as settlers forced their way westward in search of land and opportunities, deadly encounters with wolves increased. Wolves were perceived by newly arriving colonists as threats to livestock and livelihood. In 1906, President Theodore Roosevelt commissioned the U.S. Bureau of Biological Survey to systematically exterminate all wolves across the country. Wolves were eradicated from all lower 48 states except for northeast Minnesota and Isle Royale. The wolves retreated deep into the boreal forests of the Great Lakes where humans were unable to settle and cultivate.

Among Anishinaabe people, there is a teaching that says:

"Aaniin ezhiwebizid ma'iingan, mii ge-izhiwebizid Anishinaabe.
Aaniin ezhiwebizid Anishinaabe, mii ge-izhiwebizid ma'iingan."
"What happens to the wolf will happen to Anishinaabe.
What happens to the Anishinaabe will happen to the wolf."

This prophecy reflects the spiritual beliefs of many Anishinaabe people throughout the Great Lakes region. The plight of Ma'iingan was carefully monitored by Anishinaabe people from colonial times and recorded in oral traditions and stories. Those stories were preserved and passed down through generations. Throughout the colonial period, the persecution of Ma'iingan was parallel to the subjugation of Native peoples across the country. As Ma'iingan was pushed out of their territories, Native people were forced into treaties and land cessions relinquishing their homelands to settlement. It became clear that both Anishinaabe people and Ma'iingan shared intertwined fates during the colonial era.

The 20th century was a turning point for both Ma'iingan and Anishinaabe people. American citizens and conservation organizations became conscious of the near extermination of grey wolves. In 1973, after several legislative attempts to protect imperiled species, Congress passed the Endangered Species Act (ESA) which gave federal protection to many imperiled species including Ma'iingan. The ESA is a law designed to prevent the extinction of an imperiled species and promote its population recovery so that protections are no longer needed.

Since 1974, Ma'iingan has had 45 years of federal protection. At the same time, federally recognized tribes began empowering themselves through legal and legislative means. In the 1970s, several congressional acts that supported tribal sovereignty were passed which include: Indian Education Act (1972), American Indian Self-Determination Act (1975), American Indian Religious Freedom Act (1978), and the Tribally Controlled Community Colleges Assistance Act (1978). In the Ceded Territories of Wisconsin and Minnesota, the landmark court decision, *Lac Courte Oreilles Band of Chippewa Indians vs. Lester Voigt* (1983), reaffirmed the Ojibwe's treaty rights. As tribal nations began to flourish, wolf populations rebounded once again.

Today, the War on Wolves continues in the halls of Congress and the state legislatures. Bills, which lack proper science and procedures, are being introduced to delist Ma'iingan from the ESA. This war was made apparent in February 2021, when a court-ordered wolf season in Wisconsin was opened immediately after delisting. Officially, 218 wolves were slaughtered in just 36 hours, 86% beyond the state quota. The fervor unleashed on this hunt, after the failed re-election of Donald Trump, was fueled by anger, arrogance, and political interest. The killing of wolves was celebrated by sporting groups and trophy hunters across the country as a way of taking back America. Ma'iingan is back on the ESA for now but faces an uncertain future.

The Ma'iingan prophecy teaches us, as Anishinaabe people, to be forever vigilant over our relative, Ma'iingan, which, in turn, means vigilance for ourselves and our communities. What happens to one happens to the other.

MAZINA'IGAN STAFF:
(Pronounced Muh zin ah' igun)

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Although **MAZINA'IGAN** enjoys hearing from its readership, there is no "Letters to the Editor" section in the paper, and opinions to be published in the paper are not solicited. Queries as to potential articles relating to off-reservation treaty rights and/or resource management or Ojibwe cultural information can be directed to the editor at the address given above.

For more information see GLIFWC's website *glifwc.org* and our *Facebook* page.

On the cover

Like much of Ceded Territory since May, the Powell Marsh in northern Wisconsin witnessed the thick hazy skies generated by wildfires as shifting winds rolled smoke down into the region from Ontario and Manitoba. In this early morning shot by Lac du Flambeau photographer Arnold Jack, a pair of sandhill cranes take flight amidst the haze of wildfire smoke. As the frequency and severity of wildfire increases, natural resources officials are working to limit the negative impacts of climate change on North American ecosystems. See page six for one recent meeting intended to build a foundation for collaboration between native tribes, educational institutions, and the US government.

Walleyes: GLIFWC biologists, interns dive into hooking mortality

Study evaluates survival after catch-and-release angling

By Jenny Van Sickle, Staff Writer

On average, more than 600,000 walleyes are caught-and-released every year on inland lakes, across the Wisconsin Ceded Territory without accounting for the potential mortality rate of these fish. Now, biologists are looking to calculate that mortality rate after designing methods to measure the impact on walleye by considering water temperature, capture techniques, and different expressions of stress to better understand the science of "hooking mortality" post catch-and-release.

"Hooking mortality is not accounted for when calculating safe harvest levels or designing regulations for a given body of water in the Ceded Territories of Wisconsin," said GLIFWC's Aaron Shultz, a climate change fisheries biologist.

GLIFWC's inland fisheries team is focusing their research catching walleye on the dark, cool waters of Tenderfoot Lake along the Upper Michigan boundary. Researchers catch walleye using varying types of live bait (minnows, worms, leeches) as well as artificial bait (light-colored plastic worms).

Once a walleye is caught, biologists and interns perform initial equilibrium tests (time it takes for fish to turn upright after being flipped upside down) eye-tracking, tank-tapping reaction and bite reflex as well as documenting the hooking (body) location, fight time, air exposure, and live well time.

Finally, every fish is tagged with a numbered, yellow "floy" or T-bar tag, just below the dorsal fin and released into underwater pens for observation. A submersible camera provides the ability to check on fish daily. In the pen, the fisheries team note the time it takes fish to recover (once they are upright and start to swim away).

The custom-built pens measure 10'x10'x30' and hold a maximum of five fish. To compare hook and line caught fish, a control group was constructed by netting walleye via electrofishing and tagged with a corresponding floy tag.

After five days of observation, crews drop anchor near a set of bright-orange buoys that mark where the live-pens have been set up. Then, interns outfitted in wetsuits descend into the water to release the fish.

"My experience on the water this summer has been full of learning and growth, and I have found a deep appreciation for walleyes," said Margaux Bress, **(see Hooking mortality, page 17)**

GLIFWC Inland Fisheries Interns, Annika Fagerstrom, Friends University, and Kayla Lenz, Northern Michigan University, check net pens for walleye as part of the mortality assessments. The walleye are held in the net pens for five days, after which the fish are checked for mortality, stress responses, and health factors such as injuries.

One of the walleye from a net pen is found to have a moderate-sized injury near its pelvic fin. Injuries such as this are documented by the inland fisheries interns.

(O. Gower photos)

Manoomin restoration & protection at Net River Impoundment gets $1.2 million funding boost

By James Rasmussen
GLIFWC Policy Analyst

Manoomin is found across the Ceded Territories within the Great Lakes Basin. Historically, manoomin was found at harvestable levels across the western Upper Peninsula of Michigan (the UP). However, manoomin has declined over the past century from historic levels primarily due to water fluctuations, degradation of water from mining, logging, and shoreline development. According to GLIFWC's 2023 Vulnerability Assessment published by our Climate Change Team and based upon western science and indigenous knowledge, manoomin is rated "highly vulnerable" to "extremely vulnerable" to climate. Since the early 90's, the Keweenaw Bay Indian Community (KBIC) has been working to restore manoomin across the UP landscape – honoring the First Treaty with Gitchi Manidoo by remembering the rights of all beings to exist within a clean, healthy environment.

Net River Impoundment. (KBIC Natural Resources Department photo)

Manoomin (wild rice) the "good berry" fulfilled the prophecies foretold in the Anishinaabe's migration from the east. Among the seven prophecies told to the Anishinaabe over one thousand years ago, the third prophecy directed the people to travel westward until they found the place where "food grows on the water" and upon arriving in the Great Lakes Region, discovered vast beds of wild rice fulfilling the prophecy.

"More and more ears are listening to the concerns of manoomin," says GLIFWC Wetland Ecologist Brandon Byrne.

One of the most promising manoomin restoration locations to date has been the Net River Impoundment, located in Baraga County, currently maintained by the Michigan Department of Natural Resources as a wildlife area. Since 2014, the KBIC Natural Resources Department (NRD) in partnership with the MDNR has put over 10,000 pounds of rice seed into this system with positive results.

In April 2022, there was a partial failure of the dam at Net River Impoundment. Until a full assessment and repair plan could be developed, water levels were reduced to the river channel. This left the wild rice bed exposed during the reseeding period and therefore was not planted by KBIC NRD in 2022. No seeding occurred at Net River in 2021 due to a lack of access to restoration seed in WI and MN. Although the water levels are currently low and not **(see Manoomin, page 22)**

Pulling for whitefish along the Keweenaw

Survey tracks spawning challenges for Gichigami fish

By Olivia Gower, Public Information Office & Division of Intergovernmental Affairs Intern

Great Lakes Fisheries team members Ben Michaels, Jake Parisien, Patrick Lagrew, Samson Wood, and Zachary Wamego pull the seine onto the beach, catching juvenile fish to be collected and studied.

Minnows from the net are collected into a container where alcohol is used to preserve them for later study by GLIFWC biologists and USGS scientists. (O. Gower photos)

Every two weeks during the summer, GLIFWC Great Lakes Section fisheries biologists, technicians, and interns travel to various sites around the Keweenaw Peninsula in Upper Michigan to perform beach seining surveys on the shores of Gichigami (Lake Superior).

These assessments have been conducted by the GLIFWC team each summer since 1997 to monitor the abundance of juvenile whitefish in select nearshore areas of Gichigami. The goal is to understand the long-term patterns of whitefish reproduction and the effects of certain environmental factors, including legacy mining waste.

During the second week of July, GLIFWC biology team members Ben Michaels, Jake Parisien, Patrick Lagrew, Samson Wood, and Zachary Wamego at whitefish survey sites across the peninsula. The day started early at the GLIFWC office in Odanah, where they prepared their equipment and vehicles for the trip out to the field sites. As the team had already been doing this study for the past few weeks, the preparations went quickly, and we were on our way.

A day at the beach

The first survey site was at Great Sand Bay on the northwest side of the Keweenaw Peninsula. Once the team was dressed in their waders, we went down to the beach and they took the large seine out of the equipment box. Wamego and Wood proceeded to bring the net out into the water until it was at its maximum length perpendicular to the shoreline. While one of them stood in place, the other moved the seine back towards the beach until it formed an arc against the shore. The net was then slowly walked up the sand while Michaels and Parisien held it in the correct position.

Once the seine was pulled fully onto dry land, they began searching through it to collect the various fish species. There were only a few fish in the first pull of the net, but the next two produced larger numbers of whitefish and other fish species. The team repeated this process of deploying the seine at least three times at each site.

Once they finished at the first location, we went on to Bete Grise Bay, located on the east side of the peninsula. However, at this site very few fish—none of which were juvenile whitefish—were caught in the seine. Similar results were observed at the third survey area, Grand Traverse Bay, where no whitefish were caught. The samples collected from each site were preserved in sample jars to be later identified by species, counted, and weighed.

(see The legacy of mining waste, page 22)

Climate workshop lays foundation for interagency collaboration

By Charlie Otto Rasmussen, Editor

Blistering heat waves, heavy wet snow, skies clogged with wildfire smoke, land-scouring rainstorms—weather extremes are becoming commonplace, testing the survival of Turtle Island's tiniest winged beings all the way to the ancient grandfather trees of the northern highlands.

Finding a good path through the excesses of climate change is a challenge beyond any one entity. And preserving not only ecosystems, but indigenous cultures as well, calls for establishing strong working relationships.

"Consent. Consensus. These are two very important ideas to remember," Rob Croll told an interagency gathering of some 80 environmental professionals—many from the Chequamegon-Nicolet National Forest (CNNF)—along with staff and traditional ecological knowledge-keepers from Gaa-miskwaabekaang (Red Cliff) and Mashkiiziibii (Bad River).

Croll, GLIFWC climate change program coordinator, was among a handful of facilitators working to establish a paradigm that helps federal natural resources managers address climate change with the benefit of indigenous knowledge.

Workshop facilitator Jerry Jondreau of Wiikwedong (Keweenaw Bay) stressed that effective tribal engagement and cooperative resource stewardship would entail taking a more intimate approach to thinking about ecosystems and the beings that live there.

"All these things were here before us and we have a responsibility to take care of them," Jondreau said. "These are our relations. These are things with their own sovereignty."

An acronym-heavy list of agency participants and associated action plans were featured at the June 26 & 27 working session on the Bad River Reservation. Among them, a dedicated tool to get the work rolling on lands managed by USDA Forest Service and Bureau of Land Management: the Tribal Forest Protection Act (TFPA), a bipartisan federal government investment in collaborating with tribes in culturally appropriate ways to protect and enhance tribal lands, resources, and values impacted by climate change and other threats.

USDA Forest Service is connecting with indigenous people from north country forests to the pueblo lands of the southwest. In the process, federal officials are reaffirming a commitment to protect treaty rights and the subsistence needs of American first nations.

"Engaging tribes is a pillar of our climate adaptation plan," said Kristen Schmitt, a Duluth-based specialist in the FS Office of Sustainability and Climate. "We recognize that tribes depend on ecosystems, those forests and landscapes that support culture, food sovereignty, and the well-being of communities."

Interagency workshop participants assemble color-coded cards ahead of a "gallery walk" of posters displayed on the walls of the Bad River Convention Center that represent various climate strategies. (COR)

Schmitt said the TFPA will help resource (or "being") co-stewards work within existing laws and programs to help build more resilience against climate change.

For the Great Lakes region, that may include diversifying both the composition and age structure of its iconic forests or maintaining habitat and travel corridors for threatened beings such as waabizheshi (American marten).

Dibaginjigaadeg Anishinaabe Ezhitwaad, the award winning Tribal Climate Adaptation Menu, developed by an interdisciplinary team including GLIFWC Climate Change staff, serves as another

(see Climate workshop, page 8)

Stamp sands may be affecting early life stages of fish on Buffalo Reef

By Ben Michaels, GLIFWC Fisheries Biologist

Buffalo Reef, located on the eastern side of the Keweenaw Peninsula in Lake Superior, continues to serve as a significant spawning and nursery area for commercially important lake trout and lake whitefish. This spawning ground, however, has been adversely affected by drifting stamp sands—a mining refuse material that was deposited on the shore of Lake Superior in Gay, Michigan by mining companies about a 100 years ago.

Today, biologists from various agencies are conducting studies to assess the degree of negative impacts of stamp sand on fish populations; one of the studies involves examining the influence of elevated copper on early life stages of lake trout and whitefish. It is becoming apparent that high copper concentration associated with stamp sand could be affecting the early life stage of whitefish on Buffalo Reef.

During fall 2020, GLIFWC Great Lakes Section staff collected lake whitefish eggs and sperm for an experiment that was conducted by the United States Geological Survey to evaluate the influence of copper-laden stamp sands on early life stage development of whitefish. Throughout the experiment, fertilized whitefish eggs were incubated at various levels of stamp sand concentration within a laboratory to determine what effects, if any, they had on egg development. The results indicated that increased levels of stamp sand within incubators negatively affected the numbers of eggs that successfully hatched (Figure 1) (Lowe et al., 2022).

The hatched larval whitefish were then subjected to swim tests within holding tanks where water flow was controlled. The larval fish that were incubated within higher levels of stamp sand exhibited reduced endurance when compared to fish that were incubated in tanks with no stamp sand present (Figure 2). Similar experiments will be conducted on lake trout eggs and larvae in the future.

Although these laboratory results suggest egg and larval fish development may be compromised on Buffalo Reef, especially as stamp sands continue to encroach on valuable spawning and nursery habitat, biologists realize more study is required to determine if early life stages are affected by stamp sand within the natural environment, and thus, assessments of water chemistry and sediment analysis on Buffalo Reef are currently underway.

(Lowe, MR, Michaels, SB, Mattes, W, Sitar, S, Binder, TR, Muir, M. ***Summary of current biological research at Buffalo Reef***. Buffalo Reef Alternatives Report (IPDS-141562).)

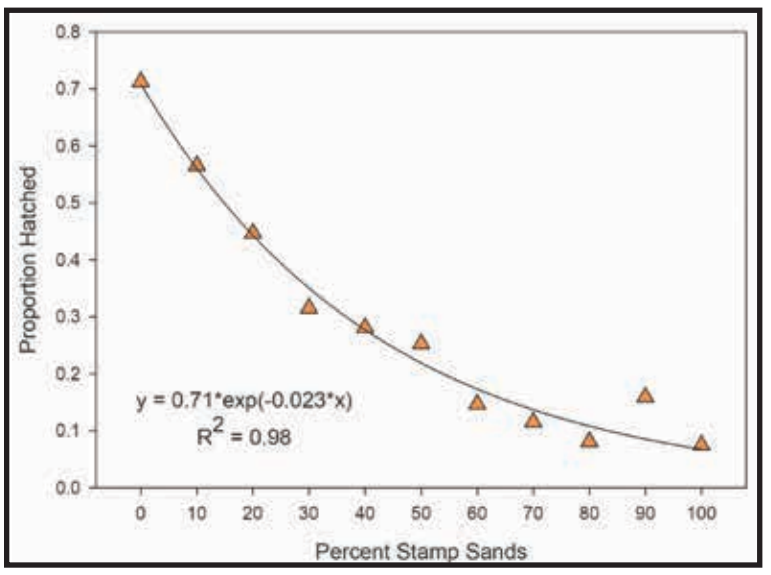


Figure 1. Proportion of lake whitefish embryos that successfully hatched following incubation in 11 levels of stamp sand concentration (Lowe et al., 2022).

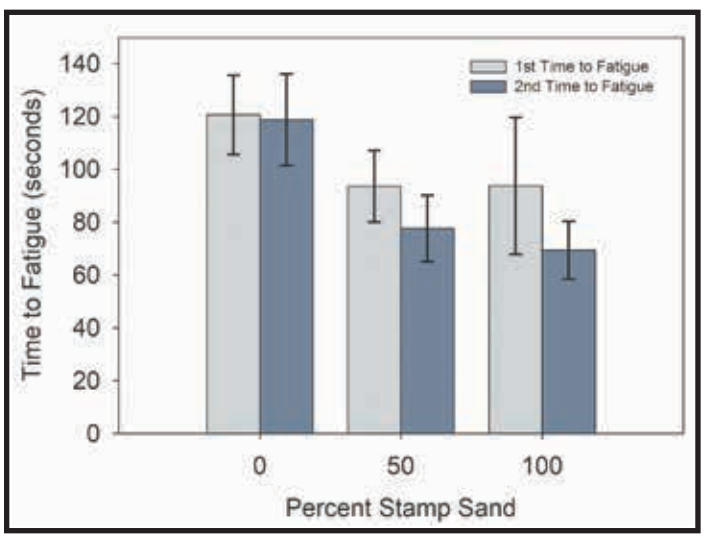


Figure 2. Time to first and second fatigue for recently hatched (1–3 days) lake whitefish exposed to 0, 50, and 100% stamp sand substrates during embryo incubation (Lowe et al., 2022).

Gichigami holds the line in "good" condition

2022 LAMP reports available

By Hannah Arbuckle For Mazina'igan

While the Great Lakes face difficult challenges ahead—such as climate change, increasing algae blooms, and continued land use changes—exciting new initiatives are having positive impacts on the Great Lakes and merit attention.

Released May, 2022, Lake Superior Lakewide Action Management Plan (LAMP) Annual Report highlights the progress of LAMP implementation and a few of the accomplishments of participating jurisdictions during the past year.

LAMP focuses on protection and restoration actions, science and monitoring, and outreach activities. The Lake Superior LAMP is developed and implemented by the Lake Superior Partnership Work Group, which includes tribal, First Nation, provincial, state, and federal agencies from around Lake Superior under the leadership of U.S. Environmental Protection Agency (EPA) and Environment Climate Change Canada (ECCC).

Together the work group facilitates information sharing, sets priorities, and assists in coordinating binational environmental protection and restoration priority actions.

In this year's annual report, the Lake Superior Work Group highlighted recent activities aimed at reducing pollution, managing nutrients and algae, preventing and controlling invasive species, and restoring and protecting habitat and species.

The annual report also continues to report that the Lake Superior basin ecosystem continues to be in "good" condition and that this condition is unchanging. Additionally, the report states that Lake Superior and its ecosystem have many healthy habitats, including coastal wetlands.

Although the report classifies Lake Superior and its ecosystems as "good," this is based on broadscale assessments. There is evidence that some locations are showing increased stress, such as the recent occurrence of harmful algal blooms around the Chequamegon Bay area.

Continued protection and restoration actions are needed to ensure the lake and its ecosystems are as resilient as possible. To learn more about these specific initiative details, and to access current and past LAMP Annual Reports for each of the Great Lakes see: *binational.net*.

New culverts to ease water flow, wildlife passage

Engineers contracted with Wisconsin Department of Transportation (DOT) oversaw the replacement of culverts that funnel water under US Highway 2 north to Lake Superior through much of the summer. Most of the recent installations on the Bad River Reservation matched the aperture of the old metal pipes—which had deteriorated and were clogged with debris—said Christena O'Brien, DOT communications manager. But at one location near New Odanah, engineers upped the pipe diameter from 24" to 30" to better handle extreme rain events like the one that occurred in 2016 that essentially turned some Bad River communities into islands. Up to 10" of rain fell over the course of eight hours, destroying bridges, roads, and homes. The region witnessed historic rain events in 2012 and 2018 as well, making infrastructure maintenance a growing priority across jurisdictions.

O'Brien said the work is also important to restore aquatic connectivity, allowing fish, amphibians, reptiles and others migration routes between breeding and nursery areas. Properly installed culverts can help some species of turtles safely navigate roadways and provide fertile hunting spots for mikinaakwag (snapping turtles) that feed on small fish and amphibians. **—CO Rasmussen**

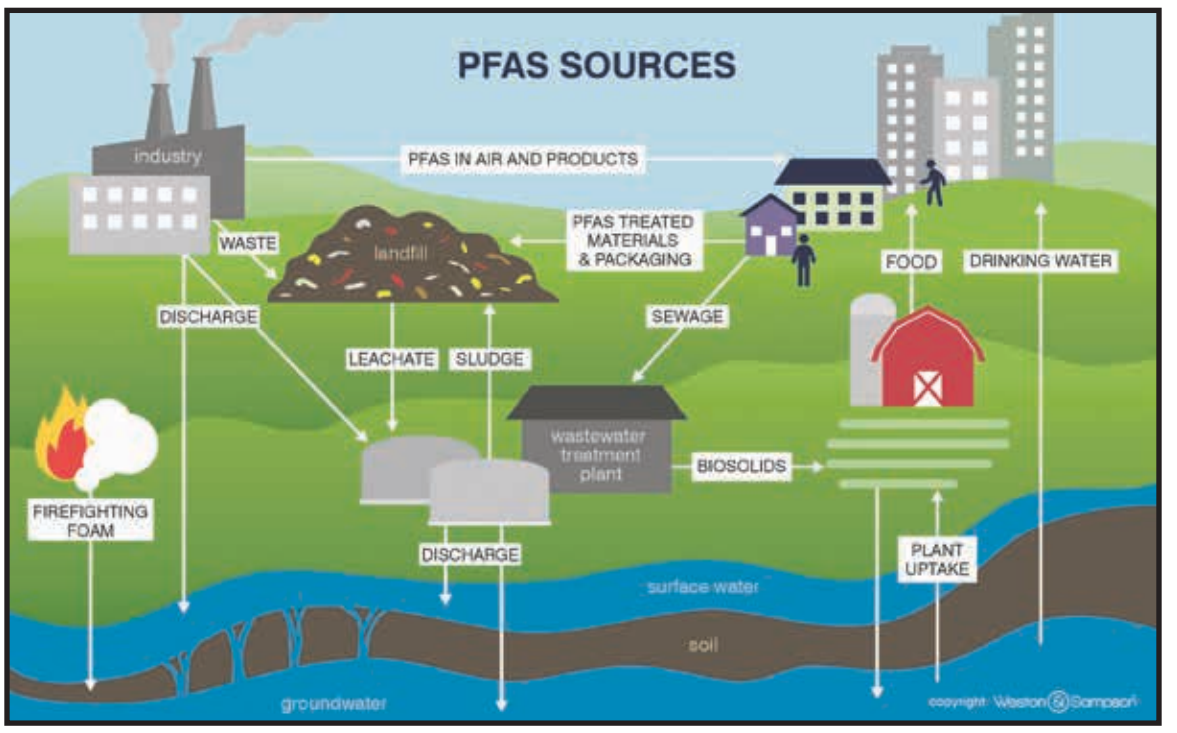
Part One: Consumers' Guide to PFAS

The good, the bad, the ugly

By Caren Ackley
GLIFWC Environmental Biologist

We should have all heard by now about PFAS, also known as "forever chemicals." With increasing media attention, many are alarmed about PFAS exposure and the associated health risks, but are left with more questions than answers. With all there is to think about in this busy world and our daily lives, we may wonder how common or serious the threat of PFAS exposure is, and if this issue is something we should be paying attention to or if we should trust that someone else is taking adequate steps to address PFAS contamination and keep us safe.

While many leaders and experts are working on this issue, there are things that we should know and steps we can all take right now to help protect ourselves and our communities, and ultimately the health of all human and non-human beings. But to fix this problem, we must first understand it, and once we understand the threat, we can make plans and support and commit to changes to reduce PFAS contamination in our homes and the environment.



PFAS sources in groundwater. (image courtesy of "Weston & Sampson)

The Good

PFAS is an acronym for per- and polyfluorinated alkyl substances, a family of over 12,000 manmade chemicals prized for their heat resistant, oil-and water-repellent, and anti-corosion properties. The combination of these heat-, oil-, chemical-, and water-resistant properties is what makes PFAS so useful in a multitude of products, probably one of the most common is non-stick cookware.

The ability of PFAS to withstand high temperatures, some greater that 1,800 degrees F, makes them an ideal component in Aqueous Fire Fighting Foam (AFFF), and electronics such as semiconductors and circuit boards. They are also used in fire-retardant and water-repellant fabric treatments for products such as carpet, furniture, and clothing, including baby clothes.

PFAS is present in food packaging, especially in paper and cardboard products including microwave popcorn bags. (JVS photo)

Their oil- and water-repellent properties make PFAS ideal for food packaging, especially in paper and cardboard products including microwave popcorn bags, muffin papers, fast food wrappers, take-out containers and paper plates.

PFAS are even used in personal care products including dental floss, contact lenses, pharmaceuticals, and menstrual products including leak-proof underwear, and added to cosmetics like lipstick, eye makeup, foundation, and nail polish for durability.

The Bad

The very properties that make PFAS so useful in our day-to-day lives are the exact same properties that make these chemicals so problematic. The building block of PFAS chemicals are a chain of carbon atoms linked to fluorine atoms. Because the carbon-fluorine bond is one of the strongest bonds known, these molecules are virtually indestructible, hence the moniker "forever chemicals". These stable chemicals do not break down in nature so once they are released into the environment, they could be there…well, forever.

The Ugly

PFAS bio-accumulate in the body, especially in the blood and bloody organs such as the liver. PFAS also bio-magnify, meaning they move up the food chain with every meal and are therefore more concentrated in beings at the top of the food chain, such as predatory fish and humans.

In fact, the Center for Disease Control (CDC) has estimated that 99% of Americans have detectable PFAS in their blood. PFAS poisoning has been linked to a multitude of health problems such as thyroid, liver and kidney disorders, certain cancers, high cholesterol and blood pressure, fertility issues, birth defects, developmental delays in children, immune system suppression, and reduced vaccine efficacy. These negative health impacts develop over time with prolonged and repeated exposure, and because PFAS are also odorless, tasteless, and colorless, making them mostly invisible, the only way to know if and how you are being exposed is through testing, and of the 12,000+ known PFAS compounds, current technology can test for around 150 of them while most labs only analyze 25-35.

There are three major point sources of PFAS, 1) chemical manufacturing facilities that create PFAS such as 3M, Dupont, and JCI/Tyco, 2) commercial facilities that use these chemicals in manufacturing consumer products, and 3) army bases and airports where Aqueous Fire Fighting Foam (AFFF) is routinely used in fire extinguishment training exercises and emergency response operations.

These chemicals can be released into the environment through spills, runoff, and deposition of airborne particles. They can also be introduced through industrial and consumer waste, directing them to landfills or wastewater treatment facilities that do not currently have the technology to filter them out of the waste stream.

Even if PFAS could be collected from wastewater and landfills, we are still left with the problem of how to "safely dispose" of them without putting them back in a landfill. This creates two critical non-point sources since 1) landfills leach water and other waste fluids into groundwater, and because 2) biosolids, a byproduct of treating wastewater, are often spread on farm fields as fertilizer.

Once on the field, PFAS may be absorbed by crops that are then eaten by humans and animals (animals that are often consumed by humans), or transported offsite through runoff, or more likely both. Once PFAS are released into the environment, their "anti-stick" properties help them move quickly and easily through air, soil, and water.

Editor's note: watch this space in the 2023-24 ***Mazina'igan Biboon*** issue for **Part Two: Identifying PFAS contamination, taking action**

The following state websites provide resources on the current state of knowledge on PFAS, and actions being taken to prevent, monitor, detect and remediate PFAS contamination.

PFAS | Minnesota Pollution Control Agency (state.mn.us)
pca.state.mn.us/pollutants-and-contaminants/pfas
PFAS | Wisconsin DNR
dnr.wisconsin.gov/topic/PFAS
Michigan PFAS Action Response Team (MPART)
michigan.gov/pfasresponse

Climate workshop

(continued from page 6)

blueprint for interagency cooperation on mitigating climate change.

With evidence of climate change accelerating all around us each year, sometimes blurring seasons together—other times seemingly bypassing calendar seasons altogether—finding consensus and taking co-stewardship actions for the benefit of all beings is critical.

A full list of climate workshop facilitators and participants includes representatives from GLIFWC and the Tribal Adaptation Menu (TAM) team, members of the Keweenaw Bay Indian Community, Fond du Lac Band, Bad River & Red Cliff Ojibwe Bands, plus Menominee, Oneida, and Navajo Nations; federal participants hailed from the Chequamegon-Nicolet National Forest USDA Forest Service (FS) Northern Research Station (NRS), Northern Forests Climate Hub, and Northern Institute of Applied Climate Science (NIACS) and Office of Sustainability & Climate. Native students from Bayfield High School's alternative education program also participated and planned a project focusing on re-establishing tribal relationships with (and co-stewardship of) the Moquah Barrens in the CNNF. Learn more about how the Forest Service will uphold its federal trust and treaty responsibilities at: *https://tinyurl.com/ycxdfxpp*

EPA: Tailings basin discharge to wetlands, rivers, & lakes require regulation

By John Coleman
GLIFWC Environmental Section Leader

In a landmark 2020 case the US Supreme Court ruled industrial waste-water discharges that pass through the ground for a short distance must be regulated under the Clean Water Act if the discharge is functionally the same as an end-of-pipe discharge directly to a surface water body.

In July of this year, the Environmental Protection Agency (EPA) found that the discharge of thousands of gallons per minute from the Minntac tailings basins to surrounding wetlands, rivers and lakes was functionally the same as if the waste-water had been dumped directly into the surrounding water bodies. This means that those tailings basin waste-water discharges will be regulated to reduce damage to surrounding waters and beings.

The U.S. Steel Minntac mine is one of the biggest iron mines in Minnesota. The open-pit mine and tailings basins cover an area of over 30 square miles northwest of Virginia, Minnesota. Since its start-up in the 1960s, the mine has been discharging tailings slurry into basins at the headwaters of the Sand and Dark Rivers. Those basins now cover a 12-square-mile area at the headwaters of these two rivers (Figure 1).

The basins' berms are built of coarse and fine tailings that allow thousands of gallons per minute of tailings water to escape to surrounding wetlands, lakes, and rivers. The high mineral content, particularly sulfate, in the tailings disposal water has wiped out the large stands of manoomin in the Twin Lakes that are one mile downstream from the basins.

For the past 17 years, tribal staff have been advocating for control and reduction of the high sulfate discharge from U.S. Steel's tailings basins. The State of Minnesota has very gradually required implementation of limited controls, but protection of wild rice waters has been hampered by disagreement as to whether the tailings basin discharges should be controlled under a Clean Water Act point source discharge permit. This uncertainty is because the tailings water seeps through the basin berm material before discharging to the surrounding wetlands and waters.

(see "Functionally equivalent discharge," page 23)

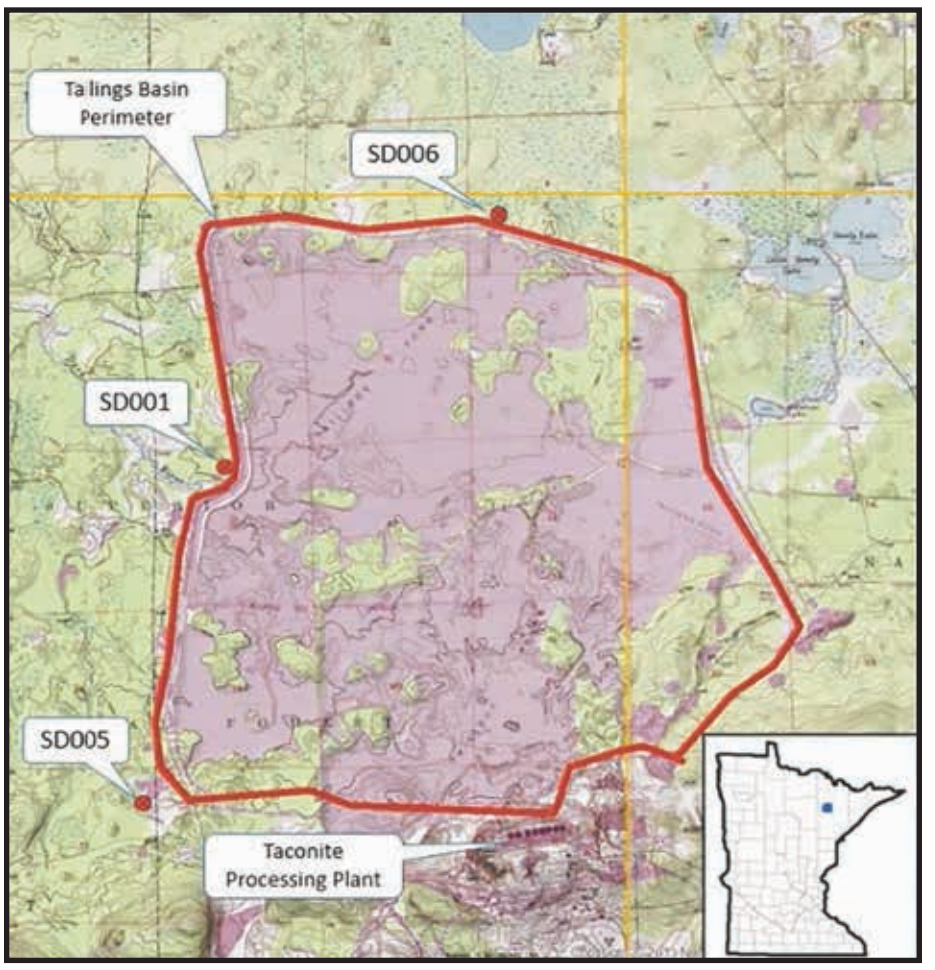


Figure 1. Topographic map of permitted facility. Red line represents the tailings basin area. (USGS map)

Staying in the hunt

Minnesota clamps down on captive deer farms

By Travis Bartnick,
GLIFWC Wildlife Biologist

As hunters prepare for the upcoming hunting season, a troubling disease continues to spread throughout North America, threatening the health of wild waawaashkeshi (deer) and omashkooz (elk) populations throughout the Ceded Territories.

Chronic wasting disease (CWD) is a neurodegenerative disease that is neither a virus nor bacteria, but rather a misfolded protein known as a prion (pronounced "pree-on"). CWD prions are an infectious agent that are very resistant to degradation and disinfection. Because prions can be so resistant, they can remain viable on the landscape for many years and are extremely difficult to contain.

The prions which cause CWD eventually become concentrated in the brain, spinal column, spleen, and lymph nodes of infected deer. A deer that becomes infected with CWD can initially look perfectly healthy. During the incubation period, CWD-infected deer can shed the prions across the environment for several months or even up to two years before showing any of the clinical signs of the disease. Once the deer begins to display clinical signs of having CWD like salivation, drooling, and emaciation, they will live anywhere from a few days to a little over a year before succumbing to the disease.

The deer farm factor

CWD has been detected in wild deer populations in Wisconsin for over 20 years and has continued to spread throughout the state ever since. In addition, CWD has been detected in many other states and provinces across North America, including both Minnesota and Michigan. Many of the detections have been found thanks in part to the efforts of concerned hunters who have submitted samples from their harvested deer for testing each deer season.

CWD is not just a concern for wild deer. Captive deer farming is a multi-million-dollar industry in many states, including Wisconsin, Minnesota, and Michigan. According to the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), 41 captive deer facilities have tested positive for CWD in the state of Wisconsin since 2001 (DATCP data last updated in January 2023).

Of those, over half (56%) of them were reported between 2018 and 2022. Nearly 20% (8 of 41) of CWD-positive captive deer facilities were reported in 2021 alone. The presence of CWD in captive deer farms and hunting ranches poses a significant risk to the health of wild deer and elk populations.

Minnesota has recently made some changes to the oversight authority of the captive cervid industry in the state. Legislators made a number of changes to how the captive cervid industry is regulated, including the transfer of oversight authority on all captive white-tailed deer facilities from the MN BAH to the MN Department of Natural Resources (MN DNR). The MN BAH will still retain oversight of other farmed captive cervids like elk, but most facilities in the state are white-tailed deer facilities. In fact, the MN DNR is regaining this management authority for white-tailed deer facilities.

In addition to the MN DNR assuming authority over the captive white-tailed deer farms as of July 1, 2023, state legislators also passed a law that prohibits the establishment of any new deer farms. Another new regulation would mandate that all captive deer facilities install fencing that would adequately prevent escape and prevent physical contact between captive deer and wild deer.

In addition, there were new restrictions placed on the importation of live cervids from outside of Minnesota. Many of these new regulations are finally addressing some of the issues with the captive cervid industry that the Ojibwe tribes in the region have expressed concerns about since the disease was first detected in Wisconsin over 20 years ago.

Test your deer for CWD: Hunters are encouraged to get their deer tested for CWD, especially if the deer is taken from an area where CWD has previously been detected, either in the wild or in a captive cervid facility. Contact your local tribal registration clerk, GLIFWC biologist, or local state biologist for more information.

Tribal hunters can drop off deer heads and fill out a simple data form to participate in CWD testing efforts. The results generally take about 10-14 days to get back to the hunter. Most tribal registration stations should have sampling stations available for testing deer for CWD. State agencies also offer CWD testing and often have self-service sampling stations.

Ceded Territory SCIENCE

Assisted reproduction:

An alternative to fish hatcheries on Minocqua Lake

By Kayla Lenz
Inland Fisheries Intern

Ogaa (walleye, *Sander vitreus*) are native to Canada's inland waters, the Great Lakes, Missouri River basin, and upper Mississippi River basin (National Wildlife Federation (NWF)).

Ogaawag (walleyes) are threatened by warming waters due to climate change, human activity on spawning grounds, invasive species, and overfishing (NWF). This is of special concern for the Anishinaabeg people, for whom ogaawag are not only an important food source but also a close relative (Shultz et al., 2022).

It is important for the Anishinaabeg to protect natural resources to be available for at least seven generations to come, so it is imperative that action be taken to preserve ogaa. To improve survival, in conjunction with the Wisconsin Department of Natural Resources, Lac du Flambeau tribe, Walleyes for Tomorrow, and GLIFWC have initiated assisted reproduction programs.

Starting around age three-four years, ogaawag spawn in the shallows shortly after ice-off in the ziigwan (spring) over rocks or gravel (US Fish & Wildlife Service). These sites also allow the current to clear sediment from and aerate the eggs, which helps improve survival (NWF). Optimal water temperatures for walleye spawn are 40˚ to 50˚F (Oswald, 2016). A female walleye will deposit as many as 100,000 eggs each year, but only 5-20% of them will hatch (Oswald, 2016). Even fewer will survive the fry stage (when hatchlings reach one inch in length).

GLIFWC biologists express milt and eggs from captured walleye. (K. Lenz photo)

Minocqua Lake in Oneida County, Wisconsin, is a popular spot for water-based recreation of all kinds and has struggled to maintain its fish population, particularly that of popular fish such as walleye.

These problems may arise due to effects of climate change, overfishing, pollution, nutrient input from the sewage systems of the homes on the lake, many of which are a century-plus old, or a combination of these factors. The popularity of the lake also makes it susceptible to erosion and egg destruction by human activities.

Ice-off on Minocqua Lake in 2023 was on Friday, May 5th—slightly later than has been observed for the last few years. Snow, ice, and cold temperatures persisted longer and in greater volumes than usual that winter. Quickly rising temperatures at the end of April and into May resulted in rapid snowmelt and warming of the area's waters. This resulted in a remarkably short spawning season for the walleye of Minocqua Lake—only about one week.

To support the fishery, assisted reproduction tactics are being employed in the ten-year-long walleye rehabilitation project that is expected to wrap in 2025.

Kayla Lenz, Inland Fisheries intern, mixes the milt and eggs before the mixture is dispersed onto prime spawning grounds. (GLIFWC photo)

On the Water

From May 5th to May 10th, the inland fisheries section at GLIFWC ran an assisted reproduction program for walleye in Minocqua Lake with the goal of quantifying the survival of fertilized eggs to the age-0 life stage.

Walleye were captured using fyke nets placed near spawning grounds throughout the lake. Captured fish were removed from the holding tank, measured, and weighed. The ventral posterior area of the female fish was dried with a towel to avoid activating the eggs which become sticky when wet. Researchers expressed the eggs into a sterile container.

Next, the researchers dried off the ventral posterior area of a male walleye and expressed the milt (sperm) into a different container. Milt from at least two other male walleye went into the same bowl. The milt and eggs were mixed for one to two minutes before being dispersed onto prime spawning grounds. One of the primary causes for egg mortality is lack of gas and nutrient exchange to the eggs due to their cohesive nature (Baker, 1985). Manually spreading the eggs decreases the occurrence of these fatalities.

The team took fin clips from each fish so that parentage of any offspring can be determined. This process was repeated three times a day over the study period. Cameras were placed near the egg distribution sites to monitor egg predation by other fish species.

GLIFWC and/or the Wisconsin Department of Natural Resources plan to return this fall to take a survey of age-0 abundance in Minocqua Lake. Fin clips will be taken from all age-0 walleye to determine if any of the fish were produced from the assisted reproduction in the spring, which male(s) and female(s) walleye contributed the most to age-0 production and which part of the spawning period resulted in the greatest survival rate.

The results from this study will guide tribes and GLIFWC's conservation measures to ensure the continued availability of walleye.

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Canoomin course glides into Bay Mills ahead of ricing season

By Destiny Hering, GLIFWC Enforcement Intern

It was time to grab your ricing knockers and push poles when GLIFWC Wardens, Steve Amsler, Roger Weber, and Jason Higgins partnered up with Bay Mills Indian Community Inland Fisheries Department for a community Canoomin course. On July 6, GLIFWC wardens held an all-day class for those interested in canoe safety, along with proper wild ricing techniques taught by Roger LaBine.

The word "Canoomin" is a hybrid term that includes canoe safety plus manoomin, which means wild rice in the Ojibwe language. Canoomin was first developed and introduced by the GLIFWC Conservation Enforcement Division.

The focus of the course is to teach canoe safety and traditional activities to new ricers. This event was a great way to bring community members together to become more involved with Ojibwe culture and connect with nature.

On the water

The course was held at Monocle Lake in the eastern Upper Peninsula of Michigan and included 12 students with a variety of ages. Participants learned a wide variety of canoe-related topics starting with the four W's (water, weather, wind, and waves), to learning how to get back into your canoe when it has capsized and learning the push pole method when collecting wild rice.

Lac Vieux Desert's Roger LaBine instructs Bay Mills Indian Community members Karol Perron Healy and Kate Perron VanHouten proper ricing techniques at the July 6 Canoomin course held at the Bay Mills Indian Community.

Bay Mills Indian Community (BMIC) members Kayla Perron Assinewe, Jalyn LeBlanc, Robear Assinewe (Sagamok/BMIC), and Roger Mason Cameron listen as Roger LaBine educates Canoomin participitants on the proper way of using a push pole.

In order to participate and ensure safety of everyone, you had to wear a life jacket. While wild ricing is primarily in shallow waters, the wardens made it very clear that your life jacket is a lifesaving device—especially in situations where you need to paddle across deep waters in order to reach the wild ricing beds. Among the eight different life jacket types, they all have one thing in common: if it isn't on you, it doesn't have the chance to save your life when you need it most.

Wardens demonstrated ricing techniques and canoeing skills, encouraging the participants to try them out. For example, Warden Amsler and I showed the participants what to do if your canoe capsized, and how to get back in using two different recovery methods. The first method was the T-rescue and the second was the heel-toe method to get back into the canoe. Participants were able to get the hang of both skills demonstrated by the end of the day.

Overall, the Canoomin course was a day filled with lots of learning and fun while having a great turnout from the Bay Mills Indian Community. If you wish to learn more or have any further questions, please feel free to reach out to Warden Amsler at *samsler@glifwc.org*.

Fall 2023 GLIFWC Enforcement safety class

Class	Where	When (must attend all classes)	Cost	Contact
Hunter	St. Croix Tribal Health Clinic 4404 State Road 70 Webster, WI 54893	September 14 & 15 5:30pm–8:30pm September 16 9:00am–5:00pm September 17 9:00am–noon	$10	Warden Brad Kacizak 715-562-0030 *bkacizak@glifwc.org* or register at *gowild.wi.gov*
ATV	Bad River Emergency Services Building 53923 Birch Street • Odanah, WI 54861	September 30 12:00pm–4:00pm October 1 12:00pm–4:00pm	$10	Warden Jim Stone 715-292-3234 *jstone@glifwc.org*
Hunter	Bad River Emergency Services Building 53923 Birch Street • Odanah, WI 54861	October 2 5:00pm–7:00pm October 9, 11 & 12 5:00pm–8:00pm October 14 9:00am–2:00pm	$10	Warden Jim Stone 715-292-3234 *jstone@glifwc.org*

2023 Healing Circle Run connects Ojibwe communities

Second annual Lacrosse game at Fond du Lac. (K. Smith photo)

Talking circle at Mille Lacs. (A. Welsh)

Red Cliff. (Red Cliff photo)

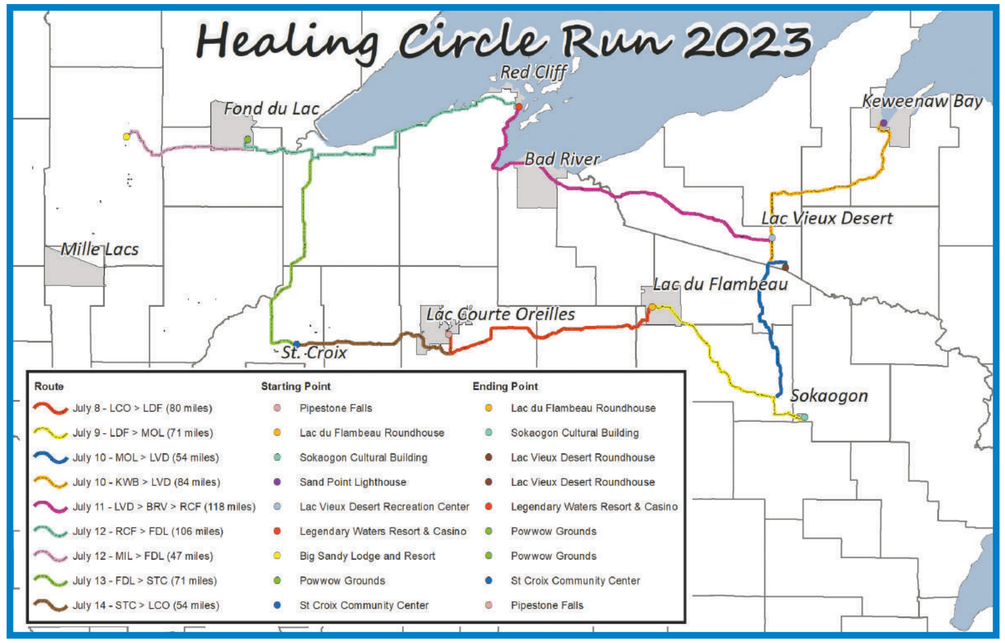
Bad River. (Bad River photo)

Healing begins with the individual.

As a person heals, they can help their family heal.
As families heal, they can help their communities to heal.
As communities heal, they can help their nations to heal.

As individuals, families, communities, and nations heal, they can help Aki and our plant and animal relatives to heal.

St. Croix, final leg of the 2023 Healing Circle Run. (photo submitted)



Established in 2001, the annual Healing Circle Run spanned seven days in July, connecting 10 Ojibwe communities across the Ceded Territory. This year, the Mille Lacs Band runners organized their section of the walk to pass through Tamarack, Minnesota to raise awareness about the Talon Metals Corp. proposed nickel mine near their homelands and waterways. (M. Falck map)

Sand Point, Baraga, Michigan. (V. Gagnon photo)

mamaajiin. anami'aan. maamawi.
(move. pray. together)

Lac Courte Oreilles. (JVS photo)

Lac du Flambeau. (J. Krueger-Bear photo)

Mole Lake. (J. Krueger-Bear photo)

Lac Vieux Desert. (J. Krueger-Bear photo)

2023 GLIFWC Interns

Students return for another great summer of internships

By Olivia Gower, Public Information & Division of Intergovernmental Affairs Intern

This summer, various divisions at GLIFWC welcomed thirteen students for the annual internship program. The interns took part in numerous opportunities throughout the summer, and we are so thankful have shared another amazing year with the program.

Biological Services

Chris-Ann Lauria, a fisheries, wildlife, and conservation biology major at the University of Minnesota-Twin Cities, has enjoyed diverse experiences with the inland fisheries, wildlife biology, and environmental biology teams during her time with the Biological Services Division this summer. She has also appreciated the numerous opportunities to partake in cultural activities like collecting and preparing medicines, taking Ojibwemowin (Ojibwe language) lessons, and helping with and running in the annual Healing Circle Run. In continuing the pursuit of her third degree, Lauria is grateful to have learned how traditional ecological knowledge (TEK), Western science, and Ojibwe cultural teachings can be woven together.

Interns Parker Krueger and Ethan Greene have been working with the Biological Services Division on a project to determine if and how logging affects forest structure and marten habitat. Martens, known as Waabizheshi in Ojibwemowin, require complex forest structures and are usually found in mature stands.

A member of the Red Cliff Band, Krueger's favorite part of the internship has been connecting with co-workers and working in a position where he is physically active each day. Krueger will begin his first year at Northland College in Ashland, Wis. this fall, and his work with GLIFWC has supported him in choosing to study fisheries and wildlife ecology.

Greene, a member of the Bad River Band of Lake Superior Chippewa, is a sophomore at the University of Wisconsin-Madison. He is studying real estate and urban land economics and hopes to work on land and home evaluation in the future. Greene's favorite part of the internship has been gaining professional experience and working with all of the great people at GLIFWC.

Inland Fisheries

Inland fisheries interns Margaux Bress, Kayla Lenz, Annika Fagerstrom, and An Nguyen have spent the summer at Tenderfoot Lake on the Wisconsin and Upper Michigan border conducting surveys on hooking mortality and the stress responses of ogaa (walleye). They have been working out of the University of Notre Dame Environmental Research Center (UNDERC) which is located next to Tenderfoot Lake.

Bress, from Madison, Wisconsin, will begin her third year at Northland College this fall where she is majoring in natural resource management and minoring in outdoor education. She says that her favorite part of the internship has been meeting and connecting with like-minded people.

A White Earth Band descendant, Annika Fagerstrom attends the Friends University in Wichita, Kansas where she will begin her junior year studying conservation science and zoo science. She has particularly enjoyed being able to work with different kinds of giigoonh (fish) during her internship, and she plans to take the skills she has learned at GLIFWC, like handling wildlife and data management, into a career working with wildlife.

Originally from southern Vietnam, An Nguyen is a student at University of Wisconsin-Stout starting her senior year studying environmental science with a concentration in natural resource conservation in the fall. Her favorite part of the internship has been working in the beautiful outdoor environments, and specifically the angling work that was a part of the ogaa survey. Nguyen's experience with GLIFWC has strengthened her love of research and fieldwork, and she hopes to continue this type of work in grad school.

A Minocqua, Wisconsin native, Kayla Lenz has had a great summer with GLIFWC, and especially appreciates the work that the inland fisheries crew has done as a team. Lenz will begin her senior year at Northern Michigan University this fall where she is studying environmental science as well as German and geographical information services (GIS). She is very grateful for the skills she has learned through this internship and hopes to apply them to a future career in the environmental science field.

(see GLIFWC Interns, page 15)

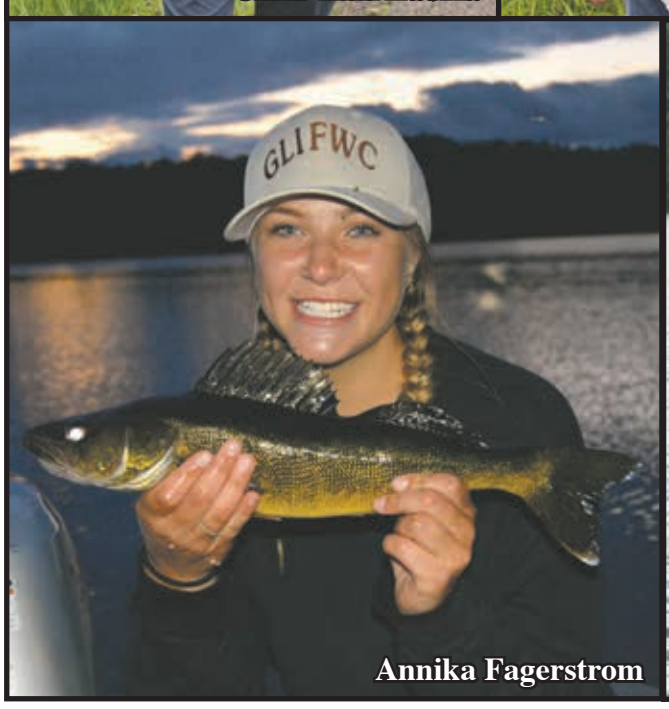
GLIFWC staff would like to say chi-miigwech for your hard work this summer.


Chris-Ann Lauria

Parker Krueger

Ethan Greene


Margeaux Bress



Annika Fagerstrom


An Nguyen

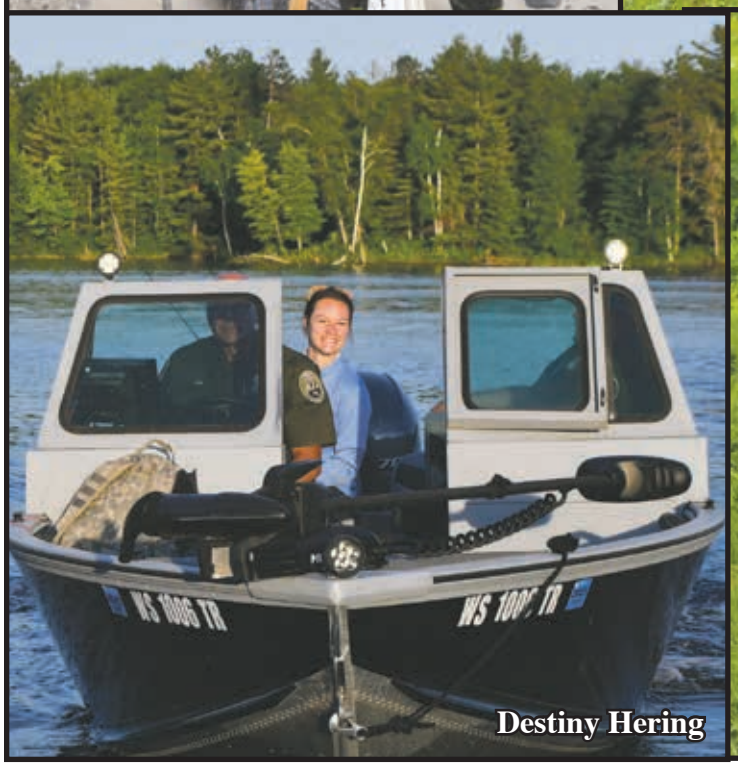
Kayla Lenz

Interns get hands-on career experience


Zachery Wamego


Ursula Charles


Augustin Rasmussen


Destiny Hering


Ethan Milner

Olivia Gower

(continued from page 14)

Great Lakes Fisheries

Zachary Wamego got an early start with the Great Lakes Section this spring and summer, working with sea lampreys, gathering walleye samples, and assisting with other surveys based in Lake Superior. Wamego is a member of the Prairie Band Potawatomi Nation and is currently in his third year studying fish and wildlife management at Purdue University. One of his favorite experiences of the summer has been setting gill nets for the annual siscowet trout surveys. Wamego is excited to take the knowledge about managing fish and wildlife that he has gained at GLIFWC back to school in the fall.

Manoomin

Ursula Charles, from Madison, Connecticut, was back for a second season with GLIFWC and this summer they worked with the Manoomin project, where they learned about wild rice and other plants, how to protect these plants, and how to advocate for the communities that depend on these resources. Charles is starting their junior year at Northland College, where they major in ecological restoration. Some of their favorite parts of the internship were gathering and braiding sweet grass, canoeing, and surveying manoomin lakes. Charles wants to apply this knowledge in a future career working with plants and people.

Planning and Development

Augustin Rasmussen has spent his third summer with GLIFWC in the Planning and Development Division. Rasmussen, who is originally from Ashland, will be receiving his Bachelor's in exercise science and public health from the University of Wisconsin-Superior at the end of the summer. He has spent his internship educating communities about traditional foods at health fairs, organizing equipment to be used in food preparation at the Sandy Lake feast, and promoting information about GLIFWC's Model Food Code.

In addition to these activities, he has enjoyed opportunities like wiingashk (sweet grass) gathering which have allowed him to dive into nature and learn more about the cultural significance of these medicines. After this internship, Rasmussen plans to pursue a graduate degree in physical therapy applying what he has learned about traditional foods and public health while at GLIFWC.

Enforcement

Destiny Hering, who is a member of the Red Cliff Band of Lake Superior Chippewa, has enjoyed doing community outreach and ride-a-longs with the GLIFWC wardens as well as taking part in medicine gathering events during her internship. Her favorite part of the program has been the connections she has made with the people at GLIFWC and in the local community. In the fall Hering will start her sophomore year at Minnesota North College-Vermillion, where she is studying Wildland and Wildlife Law Enforcement. After college, she plans to pursue career in law enforcement.

Division of Intergovernmental Affairs

A member of the Little Traverse Bay Band of Odawa Indians, Ethan Milner has spent his summer researching and commenting on policy changes introduced by various Federal agencies and assisting with grant applications for the Division of Intergovernmental Affairs. Milner has enjoyed the opportunities to participate in the various cultural teachings and activities, but he also feels that one of the most beneficial parts of the internship has been gaining real-world experience in a professional setting and the opportunity to live more independently.

At the end of the summer, he will begin his junior year at Michigan State University where he is studying Pre-Law Political Science and English with a minor in Law, Justice, and Public Policy. Milner hopes to utilize his experience at GLIFWC in future internships and hopefully at law school in the coming years.

Public Information Office

I, Olivia Gower, have spent my amazing summer split equally between the Division of Intergovernmental Affairs (DIA) and the Public Information Office (PIO). Originally from southern Oregon, I recently received my Bachelor of Arts degree from The George Washington University in D.C., where I studied anthropology and political science. As someone who is interested in how culture and community engagement influences and is influenced by policy and legislation, this internship was an incredible opportunity to learn about and take part in the way these two spheres intersect.

This experience has been so beneficial to me that after the internship period ends, I will be staying at GLIFWC to work with DIA and PIO. I hope to eventually apply what I have learned in my time at GLIFWC to pursue a career in Tribal law and policy.

Fragrant wiingashk builds community in Indian Country

By Augustin Rasmussen
GLIFWC Traditional Foods Intern

GLIFWC staff and the summer interns took to Upper Michigan June 29th for their annual sweetgrass gathering. The group was led by Dawn White, treaty resource specialist, Kathleen Smith, ganawandang manoomin, and Dara Unglaube, database manager. In a lush area near Lake Gogebic, the group assembled at a beautiful highway-side trove of sweetgrass and many other plants.

Upon arrival, White and Smith informed everyone of hazards such as oncoming traffic and poison ivy growing throughout the area. The pleasant smell of sweetgrass filled the air as the group ventured over to the side of the road where a dip formed, holding an abundance of the desired plant.

Prior to gathering sweetgrass, tobacco was distributed to be offered up to the Creator—perhaps at the foot of a beautiful tree or other spot—as White explained the significance of sweetgrass and the purpose of the harvest. All the sweetgrass gathered, known as wiingashk in the Ojibwe language, would be utilized to make braids the following day.

Making a connection

White, who has had experience with sweetgrass and numerous other traditional plants, described how she originally made her connection with the plant: "I didn't grow up traditionally, so I didn't become acquainted with sweetgrass till I began graduate school at the University of Montana-Missoula. I spoke to the Salish Tribal Historic Preservation Officer who informed me of a project relating to concerns over the local sweetgrass population. One of the nearby highways was going to be expanded which would directly go through areas where sweetgrass grew abundantly.

GLIFWC Treaty Resource Specialist Dawn White shares her knowledge of sweetgrass with interns and staff. (A. Rasmussen photo)

From there, I researched different areas of sweetgrass to find where it grew best based off photosynthetic rates."

White realized that she had a real connection with the plant after graduating and returning to the areas she studied. "All the time I spent with sweetgrass down close, looking at the lengths, and becoming familiar with it led to this connection being made. It's almost like having a friend you return to after a long period of time and it's just a great feeling to have."

The next day the interns joined White and Rose Wilmer, acting deputy administrator, in GLIFWC's main conference room at the Chief Blackbird Center to begin the sweetgrass braids. Wilmer instructed the group on how to create the proper braids with a partner that would end up being the perfect gift to be offered to elders.

One of the interns, Ursula Charles, shared her insight on the experience: "I've always wanted to gather sweetgrass and it made the experience special with Dawn as a teacher. The way she described our connection to the sweetgrass just really brought together the fact of how we are all connected as a whole. It was a beautiful process with all the good and positive energy we're able to put into the braids and then take our creation and gift it to others throughout the Ceded Territories."

GLIFWC's Acting Deputy Administrator Rose Wilmer shares her sweetgrass braiding expertise with Intern Ursula Charles. (A. Rasmussen photo)

All the interns successfully made beautiful sweetgrass braids that were gifted to the elders before the beginning of the Healing Circle Run and at the Mikwendaagoziwag Ceremony at Sandy Lake, Minnesota.

Chippewa Flowage centennial

30th edition of Partners in Fishing looks back, welcomes new leaders

By Charlie Otto Rasmussen, Editor

Lac Courte Oreilles, Wis.—While the decades motor on, the universal goal of fostering a healthy walleye population in the Wisconsin Ceded Territory remains the same. In support of that objective—state, tribal, GLIFWC and federal representatives gather annually on an afternoon of guided fishing to nurture the interpersonal relationships between natural resources managers. It's a formula that's been working for three decades since Robert Jackson and Dick Rose organized the very first Partners in Fishing in the early 1990s.

"There were only a handful of us in those first few years," said Jackson, a retired biologist with the Bureau of Indian Affairs. "We've grown and expanded and there's a lot of interest in supporting the fishery."

Two of the primary management agencies—Wisconsin Department of Natural Resources and Great Lakes Indian Fish & Wildlife Commission—both introduced new leaders to the gathering that numbered around 150 this year on the shore of the Chippewa Flowage. The Partners welcomed Secretary Adam Payne, who assumed his role atop the Wisconsin DNR at the beginning of the year; and Jason Schlender, who stepped into the GLIFWC executive administrator that very day, June 8.

The place that was flooded

While the fish were biting, the weather outstanding with blue-black waters shimmering in the sunlight, Schlender reminded the assembly that the creation of the reknown Chippewa Flowage came at a high cost. One hundred years earlier, engineers closed the gates on the newly-constructed Winter Dam—a transformative structure built for generating hydropower and controlling water flow on the Chippewa River that upended the lives of Lac Courte Oreilles members

"This is a place we call Mooskadoojiigan—the place that was flooded, this place we reference as the Chippewa Flowage," explained Schlender, a Lac

An intertribal drum plays an honor song at the 2023 Partners in Fishing gathering at Lac Courte Oreilles. (CO Rasmussen photo)

Courte Oreilles citizen and west shore flowage resident. "We remember how the flowage was created. It is not to be forgotten."

Despite repeated protests from residents throughout the 1910s, some 525 acres of the Lac Courte Oreilles reservation were engulfed by flood waters, wiping out some of the area's finest wild rice stands, cranberry beds, gardens, and village of Post where generations of Ojibwe ancestors rested within gravesites and a cemetery. While the modern view of the flowage evokes a place of wilderness charm and beauty—supporting a high-quality fishery—the creation of the man-made lake was devastating for the families that lived there as well as their descendants.

The 2023 edition of Partners in Fishing intersected with two very different anniversaries, giving participants from across the state plenty to think about on the water and on the road home to Madison and elsewhere.

Mikwendaagoziwag gathering a time for reflection at Sandy Lake

Honoring the sacrifice of Ojibwe ancestors in the 1850s, people gathered by the hundreds for the annual Mikwendaagoziwag Memorial Ceremony at Big Sandy Lake near McGregor, Minnesota on July 26. The event included a commemorative paddle across Sandy Lake to the Mikwendaagoziwag Memorial site located at the Army Corps of Engineers Recreation Area.

"For all the tribes that are here today, we are one people," said Mike Wiggins, Bad River Band Chairman, following a traditional feast that also included contemporary foods to help provide for the overflow assembly. "We're here like our ancestors were here, and we honor them."

An illegal government plot put into motion in 1850 sought to remove Ojibwe tribes from their eastern homelands to territory west of the Mississippi River by moving the annual annuity payment site from Madeline Island to Sandy Lake. The annuity payment was delayed into the winter of 1850-51 in an attempt to trap the Ojibweg over the winter and coerce them to take up residence. Disease and hunger spread through the confined camps of 5,000 Ojibwe who traveled to Sandy Lake and the people ultimately left for home amid harsh winter conditions. At the lake and the difficult walk home—as the riverways were frozen over—400 Ojibwe men, women and children died.

The past summer—like every year since 1999—tribal citizens from Minnesota, Wisconsin, and Michigan declared that the Ojibwe sacrifice in 1850-51 would always be remembered. Army Corps and other US government representatives also joined the day's ceremonies in solidarity with the tribes. Following the Sandy Lake Tragedy, the 1854 and 1855 Treaties established homeland Ojibwe reservations ending the removal effort led by Alexander Ramsey.

Learn more at *glifwc.org/publications/pdf/SandyLake_Brochure.pdf*

—CO Rasmussen

GLIFWC Executive Administrator Jason Schlender guides a canoe to the landing at the Mikwendaagoziwag Memorial site on Big Sandy Lake, Minn. Jaime Pinkham, Nez Perce citizen and principal deputy assistant secretary of the Army for Civil Works joined Schlender on the four-mile commemorative paddle across the lake. (JVS photo)

Bad River Band's Bill Roundwind (left) and Chairman Mike Wiggins pause to reflect at the Mikwendaagoziwag monument prior to the traditional feast. (CO Rasmussen photo)

US Supreme Court upholds Indian Child Welfare Act

By Ethan Milner, Division of Intergovernmental Affairs Intern

On June 15 the Supreme Court of the United States released its long-awaited decision on *Haaland v. Brackeen*—a case brought by several U.S. States and individual plaintiffs which challenged the constitutionality of the Indian Child Welfare Act (ICWA).

Enacted in 1978, the federal law provides added protections for Native children in state custody proceedings, allows for guardianship preferences to keep Native children within their tribal community, and allocates to tribes concurrent (and exclusive when on-reservation) jurisdiction over foster care placement proceedings involving Native children.

In what has widely been seen as a landmark victory for Indian law and tribal sovereignty, the Court ruled 7-2 to reject all challenges to the statute, thereby affirming the constitutionality of ICWA and all of its provisions.

GLIFWC interns spoke with Philomena Kebec, Bad River Tribe's Economic Development Coordinator, who has done legal work directly with ICWA in the past and has been closely following the movement of this case through the courts.

"There was quite a lot at stake. It was a full-frontal attack," said Kebec, herself a Bad River tribal member. "The decision itself was surprising, given the nature of the court. But this decision is very much in line with the Mille Lacs case, the Holyfield case, and a lot of the foundational cases that have upheld tribal sovereignty [and] tribal sovereign immunity." Kebec voiced her initial excitement in hearing the court's final decision, recognizing it as a historic contribution to a long-enduring canon of law which affirms tribal sovereignty as the supreme law of the land.

Although the outcome of this case has been a massive relief for tribal communities everywhere, it is certainly not the end of the path for safeguarding the rights of native families and children, instead being fresh pavement which allows tribes to move forward. "We still deal with much higher removals at the county level than are really necessary," Kebec explained.

While she no longer works directly with ICWA, the values behind the statute—the protection of tribal self-governance and culture—are still a cornerstone of the economic and community development work she engages in for the tribe.

"In my opinion, there's a lot more reform that needs to happen in order to maintain protection for our kids and our families. Ultimately, a lot of that is going to be economic—providing workforce opportunities for folks, providing better quality treatment, and opportunities to reconnect with cultural and spiritual traditions," she said. It seems that, at least now, tribes can continue the work of honoring these values without the need for worry about the fate of ICWA itself.

As for the Supreme Court, Justice Gorsuch, who concurred with the court's decision, wrote in his own separate opinion an expression of hope that "in time, [the Court] will follow the implications of today's decision where they lead and return us to the original bargain struck in the Constitution—and, with it, the respect for Indian sovereignty it entails."

Supreme Court. (K. Hammond USDA photo)

Hooking mortality study

(continued from page 5)

an inland fisheries intern who is a student at Northland College in Ashland, Wisconsin.

The research, led by Mac McPherson a member of the Menominee nation—and former GLIFWC intern and fishery technician—is part of his online master's program at the University of Illinois with Dr. Cory Suski and Dr. Aaron Shultz (GLIFWC) as his primary advisors.

For this phase of the data collection (May-Oct.) inland fisheries' goal is to compare just under 100 walleyes in each group being studied. The primary focus now is compiling the data collected during the warmer months before looking to extend the study through the ice fishing season.

Currently in Minnesota, the Department of Natural Resources does account for post-release mortality at Mille Lacs Lake. For Wisconsin, the results could help shape regulations in the Ceded Territory once scientists have a better understanding of how hooking mortality contributes to the overall condition of fish populations.

—Olivia Gower contributed to this article

Grants support manoomin & ishkode conservation priorities

By James Rasmussen
GLIFWC Policy Analyst

The America the Beautiful Challenge is a public-private grant program for locally-led ecosystem restoration projects that invest in watershed restoration, resilience, equitable access, workforce development, corridors and connectivity, and collaborate conservation, consistent with President Biden's America the Beautiful Initiative.

A philanthropic group called Native Americans in Philanthropy (NAP) has partnered with the National Fish and Wildlife Foundation (NFWF) to support tribal applicants in pursuing millions of federal funds through the competition. In 2022, nearly $86 million was awarded, and that number is expected to grow to $116 million in 2023 in year two of this five-year competition.

GLIFWC, the Wisconsin Department of Natural Resources, Lac Courte Oreilles Tribe, Menominee Tribe, and Lac Vieux Desert Band have been selected as among 40% of applicants to submit a full proposal for this year's competition. Partners have collaborated on two projects with Wisconsin DNR including a planning grant for manoomin caretaking and an implementation grant to expand barrens ishkode caretaking, especially in the Northwest Sands Region of Wisconsin. Other partners include Ho-Chunk, American Bird Conservancy, county departments, and conservation organizations like Friends of Crex Meadows.

Intergovernmental Collaboration for Manoomin (Wild Rice) Stewardship in Wisconsin is a three-year planning grant that will fund strategic research, education, project management, and development of detailed implementation strategies to allow state and tribal governments to collaborate for effective wild rice management.

Previously, GLIFWC's Climate Change program identified wild rice as extremely vulnerable to climate change. The grant will build capacity for tribal-led research and a new Manoomin Wiidookaage (helper of people for wild rice) position at GLIFWC to assist with outreach and education. Also included, strategic research to braid TEK in a good way to determine the health of manoomin wetlands, and compile tribal-led theories to study and identify positive and negative stressors on wild rice in light of our changing climate to improve manoomin habitat and abundance throughout the Ceded Territory.

Fire, or ishkode, is an essential management tool to enhance and maintain barrens habitat for sharp-tailed grouse, known as aagask in Ojibwemowin. (CO Rasmussen photo)

Wisconsin Oak & Pine Barrens Ishkode (Prescribed Fire) Partnership is a four-year implementation grant with the goal of enhancing and increasing connectivity between existing, globally imperiled pine-oak barrens in Wisconsin. The Proposal seeks to enhance or restore 18,250 acres of barrens habitat. Implementation will revitalize and restore tribal-led prescribed fire management to these landscapes and support climate vulnerable more-than-human-beings such as aagask (fire bird; sharp-tailed grouse), miin (blueberries), omashkooz (elk), and mizise (wild turkey). The grant supports capacity to coordinate tribal participation in implementation, develop ishkode and barrens TEK with the goal to braid into educational materials, state habitat management guidelines, and to apply to Commission caretaking of rare pine-oak barrens communities. Efforts will complement and seek to connect habitat with core barrens USFS work with Red Cliff Band at the Moquah Pine Barrens.

These projects represent ongoing collaboration between GLIFWC and WDNR and among tribes, counties, townships, NGO caretakers, private industry, sportsmen, and landowners to address tribal conservation priorities. These are just some examples of how GLIFWC has collaborated and fulfilled co-management responsibilities with the Wisconsin DNR in a meaningful and effective way to remain competitive at a federal funding level. Ongoing and regular collaboration between GLIFWC and WDNR and between Tribes and other caretakers to meet Tribal conservation priorities at a landscape level is not something that is often prioritized as was the case in developing these proposals. These collaborative efforts may serve as a framework to expand caretaking across as additional federal monies become available to support these works.

Climate change vulnerability assessment:
Manoomin is the most vulnerable being

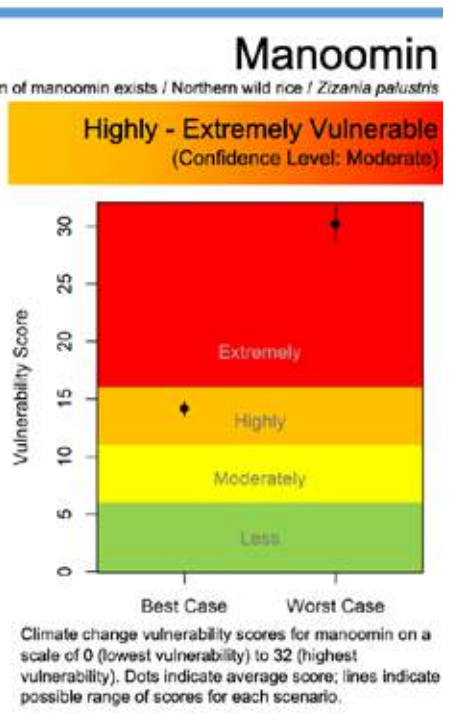
Manoomin (wild rice) was the most mentioned being in the Traditional Ecological Knowledge (TEK) interviews that informed Aanji-bimaadiziimagak o'ow aki (the GLIFWC Climate Change Vulnerability Assessment). Nearly every interviewee mentioned manoomin, and they all spoke of their relationship with, and their love and concern for this plant relative.

Manoomin is also the most vulnerable being in the assessment. Manoomin is vulnerable to climate change impacts in almost every way a plant can be, and yet GLIFWC and the member tribes spend critical funds and staff time to research, monitor, restore, and defend manoomin.

While we recognize that the world is changing, regarding "the food that grows on water," our goal will always be to resist these changes and keep manoomin on the landscape, to preserve this sacred food, ceremony, and cultural lifeway for the next seven generations, and all the generations that follow.

What changes are you seeing where you live or harvest? Let us know at *climate@glifwc.org*. —**R. Croll**

Range map of manoomin.



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

General Description

To the Ojibwe, manoomin is considered a special gift from the Creator which ties them to this plant both spiritually and culturally. One story tells of Wenaboozhoo worrying about what the Anishinaabe people would eat during long hard winter months. Many winters went by where little food was available and the Anishinaabe people were suffering. Wenaboozhoo wanted to help them, so he went into the woods to fast for four days. He dreamed of dancing with others in a river. The Ojibwe dancers with them wore elaborate headdresses with the feathers waving back and forth. When he woke up, he remembered the dream and saw tassels waving above the water. As he went closer, he realized that long seeds were hanging from the tassels. He gathered some of the seeds and brought them with him to continue his fast. When he fell back asleep, he had another dream of gathering the seed and eating it. He returned to his village to share his dream with the people. Together, they harvested enough manoomin to get them through the long winter.

Manoomin typically grows in lakes, streams, and rivers, in shallow water (1-3 feet) in places with soft, organic sediment. It requires flowing water and grows best in waters with low levels of sulfide. It is an annual plant that grows from seed each spring. Its life stages include a submergent stage, in which the plant is developing under the water, a floating leaf stage, in which one or two leaves float on the surface of the water, and an emergent stage, in which the plant grows out of the water. It then develops flowers and seeds that ripen in late summer/early fall.

Manoomin is found across the Ceded Territories, mostly concentrated in northern Minnesota and northern Wisconsin. Manoomin varies substantially in abundance from year to year, depending on factors including weather, water and/or nutrient levels, and presence of manidoonsag (little spirits – a word used to describe insects and pathogens), though not all of these factors are well understood. Many tribes have long-standing manoomin restoration programs, both on- and off-reservation, reflecting their concern and care for this being.

Particular effort has been made within GLIFWC to gather Traditional Ecological Knowledge specific to manoomin. The following are a few of the major themes mentioned across interviews.

Concern was expressed by many tribal members regarding the decrease and overall health of manoomin in many areas throughout the Ceded Territories. In Waaswaaganing (Lac du Flambeau), manoomin was once plentiful, but after the installation of a dam, it is now mostly just present on the rivers. Some feel it is being destroyed in areas such as Clam Lake (Burnett County, Wisconsin), but efforts on the lake are underway to remove carp and restore manoomin. Brown spot infestation has been seen in several areas since at least 2003.

Many stories were shared about poor harvest years or other harvesting issues. Several Mashkiiziibiing (Bad River) members related that they experienced multiple issues with their harvest from 2014 to 2016. Among other concerns, the air was too humid during the period the manoomin was laid out to dry, which caused manoomin to mold and resulted in a partial loss of their harvest. A Gaa-miskwaablikaang (Red Cliff) tribal member expressed concern over being forced to travel at least 200 miles from the reservation during the 2016 harvest season after severe storms earlier in the year heavily impacted manoomin beds closer to the reservation.

Much of the knowledge shared about when or how to harvest manoomin has the potential to be impacted by climate change. For example, it was said that if the mitigomizhiig (white oaks) are hanging with mitigominan (acorns), it will be an unusually productive year for manoomin. Additionally, the gathering period is only about two weeks long during what is known to the Anishinaabeg as Manoominike-giizis (Rice-making Moon). Climate change may cause these seasons to shift and disrupt these relationships that have been held for centuries, threatening the practice of harvesting manoomin.

Most interviewees felt that manoomin is vulnerable to climate change due to changes in water level, stronger and more frequent storm events, pollution, and many other factors. Overall, manoomin harvesters would like to see it be more plentiful on the landscape and are strong advocates of restoration.

(see Manoomin vulnerability, page 22)

Producers, educators reel public into Michigan fish expo

By Laurie White, GLIFWC Traditional Foods Project Manager

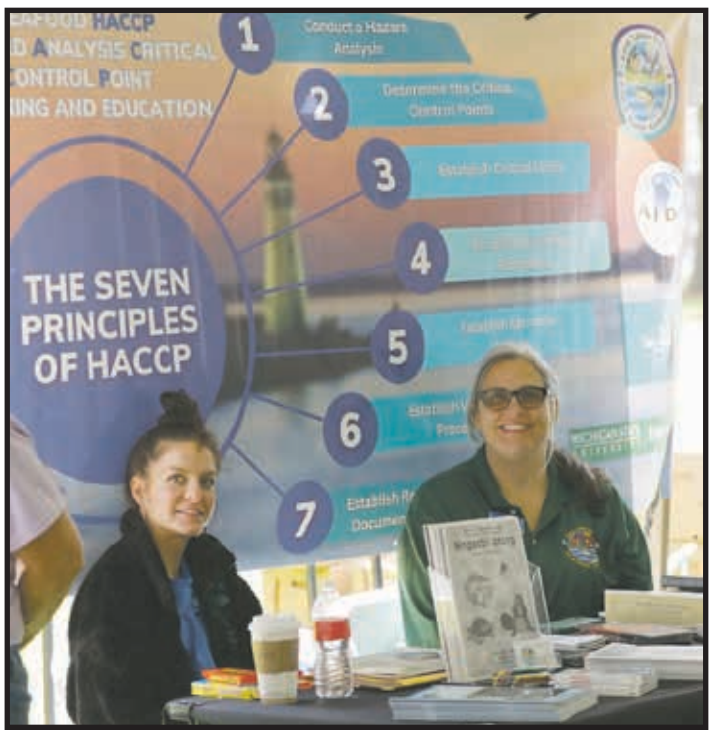
Lansing, Mich—The Michigan Fish Producers Association and Michigan Aquaculture Association along, with Michigan State University (MSU) Extension Sea Grant, proudly hosted the Michigan Fresh Fish Expo marketing event last June.

GLIFWC and tribal representatives also joined the gathering, which served as a platform to showcase Michigan's thriving fishing industry, promote sustainable practices, and highlight the importance of preserving our aquatic ecosystems.

The Michigan Fresh Fish Expo was a testament to the state's rich fishing heritage and contribution to the local economy. This event brought together anglers, fish farmers, seafood processors, and policymakers to explore the latest advances in fishing techniques, aquaculture practices, and emerging trends in seafood consumption.

This event emphasized the benefits of consuming local and sustainably sourced seafood. Visitors interacted with fish farmers and seafood processors, learning about the health benefits of consuming fresh fish, and access a wide range of delectable seafood options from various regions of Michigan.

The expo educated the public about sustainable fishing practices that help protect and conserve Michigan's aquatic resources. Attendees gained insights into the importance of responsible fishing methods, including catch-and-release, and understanding bag limits to maintain a balanced ecosystem that supports thriving fish populations for future generations.



Lac Vieux Desert member Jordan McGeshick (left) and GLIFWC's Traditional Foods Grant Project Manager Laurie White shared details about GLIFWC and Keweenaw Bay Indian Community fishery and food safety programs with Expo attendees. (submitted photo)

The expo also served as an educational platform, addressing the environmental challenges faced by the Great Lakes region and raising mindfulness of the available sustainable fishing practices to encourage everyone to become effective stewards of these irreplaceable natural resources.

Leadership through partnerships

The Fresh Fish Expo facilitated collaboration among researchers, policymakers, and conservationists through its exhibitions and interactive displays. Partnerships between governmental bodies, environmental organizations, and all fishing communities help raise awareness about conservation initiatives, support habitat restoration projects, and address pressing issues such as invasive species and water pollution.

Jordan McGeshick, a Lac Vieux Desert Band member and a descendant of Keweenaw Bay Indian Community (KBIC), helped engage visitors at the GLIFWC display table during the expo. McGeshick is working as an MSU Extension employee in partnership with Keweenaw Bay Ojibwe Community College, KBIC Natural Resources Department, and First Catch Fishing, LLC on an undergraduate internship with KBIC Food Sovereignty.

GLIFWC's attendance at the expo celebrated the twenty-five-year partnership with Michigan Sea Grant and MSU Extension to provide HACCP training to tribal commercial fishermen. More than 500 people made their way through the exhibits including GLIFWC's display where they learned about future food safety training, mercury maps, treaty rights, and why HACCP certification is essential to a seafood business.

Fish, garden production provides foundation for community nutrition

By Laurie White, GLIFWC Traditional Foods Project Mgr.

As the growing season got underway in Upper Michigan, the Keweenaw Bay Indian Community (KBIC) began collaborating with avid gardeners who take care of hoop houses and also involved students from local schools in these activities.

"Students come out twice a week, and they're rooting around in there [hoop houses] and finding stuff to eat. It's super cute," said Cindy Wiltse, a knowledgeable and enthusiastic KBIC Natural Resources Department (NRD) employee involved in various gardening and natural resources projects. Also involved was Zach Osborne, who recently did a soil building workshop for KBIC. Osbourne is a teacher who supports homeschooled kids by leading workshops in L'anse and all over the Upper Peninsula—purposefully creating time and space for socializing homeschooled children.

The KBIC NRD values community involvement in food production and provided about 20-30 garden plots for community members, helping with natural fertilizer, tilling, and plant starts. Additionally, walleye ponds on the property increase fertility in the gardens by scraping out the dry residue to spread on the beds and engaging in fish-related activities such as releasing fingerling size walleye to stock lakes.

During a visit to the new community kitchen and processing building on Brewery Road, tribal members Kathy Smith and family participated in a gillnet-making workshop led by Patrick LaPointe, a KBIC NRD employee. The facility has a large work area for various activities and workshops, such as gillnet tying, a commercial kitchen to prepare and process foods with plenty of refrigerator space, a walk-in cooler outside the building, and a fish processing area dedicated to raw meat processing.

Patrick LaPointe fillets his walleye harvest at the KBIC community kitchen. (L. White photo)

Wiltse, who recently completed the Seafood HACCP course, shows dedication and excitement for the natural resource projects aimed at creating sustainable and community-oriented initiatives. She acknowledges that there is still much to learn. Overall, Wiltse is a proactive and motivated individual who promotes gardening, natural resources, and community engagement. In the future, Wiltse believes there is a possibility of starting food boxes for production, and she emphasizes the importance of aiming for this enterprise. Wiltse is also interested in beekeeping.

Freshly processed manoomin. (GLIFWC photo)

Manoomin surveys

(continued from page 1)

rice on the nearby Totogatic Flowage is confined to a sparse patch in the center of the lake; what rice is there has been heavily grazed by waterfowl.

Further east into the 1842 Territory, Aurora Lake was teeming with rice as far as the eye could see. Island Lake rice beds appear to have receded compared to last year. Rice on Island is densest and most abundant near the inlet of the Manitowish River and tapers near the peninsula north of the boat landing.

Despite the lushness of a few lakes, a bird's-eye view (and rice worm's view) throughout the ceded territories tells a less exciting story. Many seem to be having an average or slightly below average year. More aerial surveys will paint a clearer picture of this year's manoomin abundance as flights continue through the end of August.

We extend a very heartfelt chi-miigwech to manoomin for its teachings and patience as we round out another field season of learning.

Zaasijiwan
•It Ripples•

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

"Dagwaagin. Waatebagaa-Giizis wa'aw giizis. Gemaa a'aw giizis izhinikaazo Manoominike-Giizis. Danakamigad omaa miinawaa imaa. Binaakwe-Giizis. Aniibiishkaa omaa. Gashkadino-Giizis wa'aw giizis. Gisinaa dibikak dagwaaging. Gashkii-dibikad. Nibiindigenise. Wii-soogipon awaswaabang. Gaye, ganabaj wii-kichi-zoogipon. Minonaagwad zoogipong. Indaa-dazhiikemin agwajiing noongom. Aabawaa agwajiing. Niminwendam izhaayaan agwajiing. Gidoozhiitaa na? Nindoozhiitaa. Izhaadaa!

("It is autumn. The colorful leaves moon is this moon. Or perhaps that moon is called the wild rice harvest moon. It happens here and there. The falling leaves moon. There are many leaves here. The freezing over moon is this moon. It is cold when it's night in fall. It is very dark at night. I bring firewood inside. It might snow the day after tomorrow. Also, maybe it will snow a lot. It appears beautiful when it snows. We could play outside today. It is warm outside. I'm happy when I go outside. Are you getting ready? I'm getting ready. Let's all go!")

Bezhig—1 OJIBWEMOWIN (Ojibwe Language)

Double vowel system of writing Ojibwemowin.
—Long vowels: AA, E, II, OO
W<u>aa</u>booz—as in f<u>a</u>ther
Miigw<u>e</u>ch—as in j<u>ay</u>
Aan<u>ii</u>in—as in s<u>ee</u>n
M<u>oo</u>z—as in m<u>oo</u>n

—Short Vowels: A, I, O
D<u>a</u>sh—as in <u>a</u>bout
<u>I</u>ngiw—as in t<u>i</u>n
Niizh<u>o</u>—as in <u>o</u>nly

—A glottal stop is a voiceless nasal sound as in A'aw.

—Respectfully enlist an elder for help in pronunciation and dialect differences.

Howah!

Q: *Aaniin ezhichigeyan?*
—What are you doing?

•*Megwaayaak, nindanokii.*
—In the woods, I am working.

•*Wiisiniwigamigong nijiibaakwe.*
—At the restaurant, I am cooking.

•*Zaaga'iganiing ninandawishibe.*
—At the lake, I am duck hunting.

Nindakandoowin indayaan.— A duck blind, I have it.

Nibawa'am.—I knock rice.

Nimanoominike.—I harvest/process rice.

Anishinaabe-manoomin.—Native rice.

Manoonminikaa.—There is a lot of wild rice.

Niizh—2 *Circle the 10 underlined Ojibwe words in the letter maze. (Translations below)*

A. Nindagindaan: "Plants Used by the Great Lakes Ojibwa.

B. <u>Wiigob</u>(iig). Nibiiminakwemin.

C. <u>Zhingob</u>(iig), zhingobaandag(oog). Mino-<u>mashkikiike</u>.

D. Ninzaagitoomin, <u>ode'imin(an)</u> <u>omaa</u>.

E. Aagimaak/Wiisagaak. <u>Ganabaj</u>, gidoozhitoon <u>aagimaak</u>-makak.

F. Mashkiigwaatig. <u>Niibidoon</u> mashkimod.

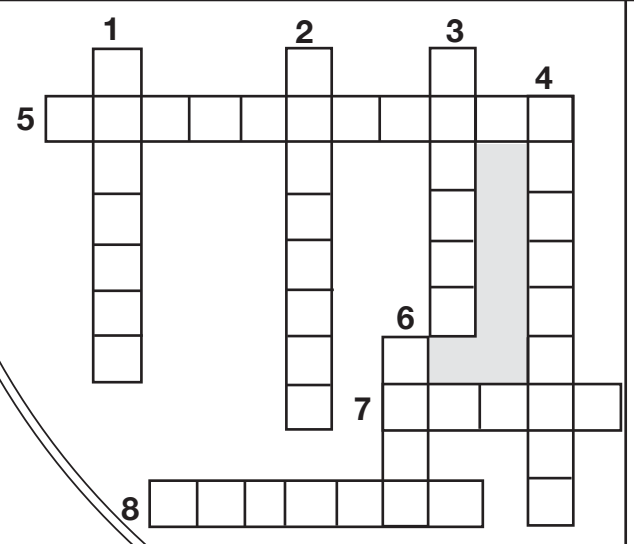
G. Waabandan <u>manoomin</u> <u>iwidi!</u>

O	N	J	M	I							
B	M	Z	A	A	S						
E	A	D	H	'	N	E					
'	S	W	I	I	G	O	B				
G	H	A	K	E	N	I	O	O			
A	K	A	O	W	D	G	T	M	W		
N	I	I	B	I	D	O	O	N	I	J	
A	K	'	W	N	J	A	N	B	E	N	G
B	I	I	A	A	G	I	M	A	A	K	A
A	I	G	D	K	S	E	K	A	O	M	A
J	K	O	D	E	'	I	M	I	N	A	N
S	E	N	A	W	H	O	N	Z	H	O	B

nika—goose
nikag—(geese)

Niswi—3

IKIDOWIN ODAMINOWIN (word play)



DOWN:
1. it is cold
2. let's all go
3. moon/sun/month
4. outside
6. here

Across:
5. you are getting ready
7. a certain amount
8. when/if it is night

Nika animise zhaawanong.
—The goose flies south.

Online Resources
ojibwe.lib.umn.edu
ojibwe.net
glifwc.org
glifwc-inwe.com

Niiwin—4

Dagwaaging.—<u>When it's</u> fall...
Gigibabiinzikawaagane.—*S/he wears a coat.*
Gikinoo'amaagozi**wag**.—**They** go to school.
Nimikaan weba'aagonaan.—**I** find a shovel.
Gigigiminjikaawane.—**You** wear mittens.
Manoominike**wag**.—**They** harvest wild rice.
Nindizhaa gitigaaning.—**I** go to a garden.
Nindaashiga'igemin.—**We** split wood.
Miskobagizi.—*S/he has red leaves.*
(to the) South—Zhaawan(ong)
(to the) North—Giiwedin(ong),
(to the) East—Waaban(ong)
(to the) West—Ningabii'an (ong)

Eya'!—Yes!
VAI's patterns above:
S/he...—Root verbs.
#3 is a VTI.

Giwii–

–wag

–ong

Nin

–gii

1. Biijinaago in____-izhaa iwidi gichi-gitigaaning.

2. _____gigiminjikaawane noongom agwajiin

3. Inganawaab giiwedin_____ waawaateg.

4. Noongom, _____gigibabiinzikawaagane imaa.

5. Manoominike_____. Niwii-manoominike dash.

6. _____! Gakina-awiiya dagwaaging, Ojibwemodaa!

Translations:

<u>Niizh—2</u> **A.** I am reading the book "Plants Used by the Great Lakes Ojibwe." **B.** Basswood tree(s). We make rope. **C.** Balsam fir(s), evergreen tree(s). S/he makes good medicine. **D.** We love strawberry(ies) here. **E.** Black ash tree. Perhaps you make a black ash basket. **F.** Tamarack tree. Weave a basket. **G.** Look at the wild rice over there!

<u>Niswi—3</u> ***Down:*** **1.** Gisinaa ***2.*** Izhaadaa ***3.*** Giizis ***4.*** Agwajiing ***6.*** Omaa ***Across:*** ***5.*** Gidoozhiita ***7.*** Minik ***8.*** Dibikak

<u>Niiwin-4</u> **1.** Yesterday, I **went** over there to the large garden. (gii-) **2. I** wear mittens now outside. (Nin-) **3.** I look **to the** north when there is a display of the northern lights. (-ong) **4.** Today, you **will want to** wear a coat there. (Giwii-) **5. They** harvest wild rice. I will harvest wild rice as well. (-wag) **6.** Yes! Everybody as it is fall, let's all speak Ojibwe! (Eya')

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 <u>The Concise Dictionary of Minnesota Ojibwe</u> 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*.

Maajii-Ojibwemowag They Begin to Speak Ojibwe

Manoominikeyaang

Stories of the Plants: A Zhaawanong Book

Manoomin and the Ojibwe

Manoomin (wild rice) is an important food to the Ojibwe people.

The migration story of how the Ojibwe came to the Midwest features a prophecy which foretells their travel from the east along the various waterways, searching for a place where is "food that grows upon the water." The Ojibwe traveled and settled along the Great Lakes when they came upon manoomin growing in lakes and along rivers in the Gichigami region.

Manoomin plays a pivotal part in the lives of the Ojibwe people who would travel to wild rice beds in the autumn, creating camps to process the wild rice to store it for the future.

(*Manoomin Teacher/Caregiver Supplemental Document)*

Manoominikeyaang—When We Harvest Wild Rice
Story by Dennis and Cleo White
Illustrations by Wesley Ballinger

For more information

Zhaawanong: Stories of the Plants is produced by GLIFWC's Administration for Native Americans Language Preservation and Maintenance project. There are four sets of books in this series: *Waabaanong: Stories of the Four-legged*, *Zhaanong: Stories of the Plants*, *Ningaabii'anong: Stories of the Swimmers*, and *Giiwedinong: Stories of the Flyers*.

Interactive webpages have been developed as a companion resource to Maajii-Ojibwemowag. The webpage (*glifwc-inwe.com*) features digital versions of the storybooks with audio and simple animations, and age-appropriate language learning games.

A printables webpage provide a PDF version of each storybook, supplemental documents, and a coloring book adapted from each storybook can be downloaded and printed for free.

Manoomin vulnerability

(continued from page 18)

Summary of climate threats:

Manoomin was the most vulnerable being in this assessment and has already begun to respond to climate-related effects across the Ceded Territories. It is sensitive to many different potential climate effects in each stage of its life cycle. It is also sensitive to many anthropogenic changes. Factors that affected the vulnerability of manoomin include natural barriers; human land use changes; limited dispersal as well as thermal and hydrological niche; sensitivity to disturbance; dependence on snow and ice; dependence on uncommon landscape features; sensitivity to pathogens, predators, and competition; and limited genetic variation.

Factors that increase the vulnerability of manoomin to climate change:

SI — Natural barriers: Upland habitat and Lake Superior form natural barriers to manoomin.

SI — Human land use changes: Land use changes resulting from human responses to climate change vary, but warmer temperatures may cause increased boat traffic, which often disturbs manoomin. Hydroelectric dams, installed as renewable energy sources, would likely negatively affect manoomin through artificial controls of water levels. Altered land use in response to climate change and an increase in tourism in the Ceded Territories would also negatively affect manoomin.

I — Dispersal: Manoomin is capable of dispersing downstream when moving water transports seeds, but not upstream or across unsuitable upland habitat. Its seeds are heavy, without wings, and generally fall into the water near the plant. Many manoomin beds are the result of human seeding because the plant's natural dispersal is so limited.

I — Physiological thermal niche: It is likely that warmer temperatures will decrease seed production. Following milder winters, spring germination rates appear to be lower. Manoomin is also found near the central or southern end of its range in the Ceded Territories, and therefore warming temperatures may negatively affect this being.

I — Physiological hydrological niche: Manoomin is sensitive to changes in water level. It is well adapted to annual fluctuations in water levels; however, changes in precipitation that cause multiple years of low or high water are likely to prevent it from growing in a given location. Inter-annual fluctuations can also affect manoomin – high water during the floating leaf stage can drown or uproot the plant.

SI/I — Disturbance regime: Manoomin does depend on some level of disturbance (such as fluctuations in annual water level), but major disturbance events can be detrimental. A 2012 flood destroyed entire manoomin beds, and a 2016 flood also negatively affected the manoomin crop for the year. Hail, heavy rain, and wind can damage plants directly. Severe storms can also damage dikes and dam infrastructure, affecting manoomin beds.

I — Dependence on snow or ice: Ice cover on waterbodies in the winter provides low oxygen conditions that help the seed emerge from dormancy in the spring. Thickness and duration of ice cover also has an influence on aquatic plant competition – thicker and longer-lasting ice will prevent perennial and/or non-local beings from outcompeting this annual plant.

N/SI — Uncommon landscape features: Manoomin depends on a particular type of wetland which is not common in the Ceded Territories – wetlands with water depths of 1-3 feet; soft, organic sediment; and slow-moving water.

SI/I — Pathogens or natural enemies: Warm, humid nights (with dewpoints above 70°F) support diseases such as brown spot disease. These conditions have already and will continue to increase in the Ceded Territories. Brown spot disease causes lesions on manoomin leaves that can reduce seed production by up to 90%. Common carp can also disturb sediments and reduce aquatic vegetation, including manoomin. "Rice worms," a moth larva, bore into manoomin stems and also cause a large decrease in seed production. Warmer winter conditions are likely to allow these "worms" to overwinter in higher numbers. Nikag (Canada geese) and waabizilg (Trumpeter swans), both of which have expanded their ranges and populations in the Ceded Territories substantially in recent years, have been known to decrease or even decimate manoomin populations on some water bodies in the Ceded Territories.

SI — Competition: Many native and non-local aquatic plants have the potential to outcompete manoomin, including pondweeds, water lilies, hybrid cattail, flowering rush, and *Phragmites*.

N/SI — Genetic variation: Research is limited but suggests that genetic interchange between populations may be lower than historical levels, because of locations that can no longer support manoomin.

I — Documented response to climate change: GLIFWC data show a reduction in abundance that is consistent with climate effects such as flooding and disease outbreaks.

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

Download Aanji-bimaadiziimagak o'ow aki *at tinyurl.com/27b7a5wkc*.

Shared GLIFWC/ Wisconsin Sea Grant scholar hits the books

India-Bleu Niehoff (she/hers) a first-generation college student recently graduated from the University of Wisconsin-Madison with a major in Gender and Women's Studies plus a certificate in Global Health.

As a summer scholar, Neihoff experienced internship duties through a partnership with GLIFWC's Public Information Office and Sea Grant's Wisconsin Water Library with Anne Moser to elevate Indigenous language, natural resources, and the cultural significance of the Great Lakes.

Neihoff coordinated Maadagindan! (Start Reading!) book club selections and distributed materials designed for educators, community programs, and caregivers to enhance literacy and connection.

"I'm really thankful for the consultation with GLIFWC's Michael Waasegiizhig Price to create our Ojibwemowin orthography for the water library's materials," Neihoff said.

This fall, she will begin her graduate studies at the University of Wisconsin-Madison's iSchool to earn her master's degree in library and information studies. Over the last two years Niehoff also participated in the Information Specialist Internship Program with UW Libraries. **—JVS**

The legacy of mining waste

(continued from page 6)

While GLIFWC has performed this assessment independently for several decades, it has become a collaborative effort with the Keweenaw Bay Indian Community and the United States Geological Survey since 2019. The parties work together to collect juvenile whitefish samples, which are sent to a USGS laboratory. Tests are conducted to assess growth rates and to determine how stamp sands are affecting the health and reproductive success of whitefish in that area.

Stamps sands are mining refuse which was deposited in Grand Traverse Bay during the early 1900s. These sands are a byproduct of the copper mining process in which the ore was pounded to extract the copper.

The sediment left over from the extraction process are stamp sands, which retain low levels of copper content that can be toxic to organisms like fish.

One of the areas affected by the stamp sands is Buffalo Reef in Grand Traverse Bay. The reef is a vital area for lake trout and whitefish spawning, and the toxic metals in the stamp sands are threatening this foundation of the ecosystem. GLIFWC's juvenile whitefish assessment is one of many projects aiming to document and understand the effects of stamp sands on the local aquatic habitat.

This long-term study has shown that abundance of juvenile whitefish at each site can vary year to year. However, GLIFWC biologists have been seeing decreased numbers of juvenile whitefish at Grand Traverse Bay over time, and they hypothesize that this is connected to the presence of stamp sands.

Manoomin restoration

(continued from page 5)

ideal, the rice is proving resilient and growing at Net River (based on site visits by KBIC NRD and MDNR in late July 2023).

In upholding its shared caretaking responsibilities for the impoundment, the Michigan Department of Natural Resources (MDNR), "supports creating conditions at the Net River Impoundment that will allow wild rice restoration in the river for its wildlife habitat benefits, as a future seed source and recognizing its important cultural significance to many tribes indigenous people(s)," says MDNR Acting Director Shannon Lott.

Recently, Governor Whitmer approved the MDNR budget, which included $1.2 million for the Net River Impoundment project. The MDNR anticipates plans for reconstruction/modernization of the dam to be finalized this winter, with construction starting in early spring/summer 2024 .

This is good news for the future of wild rice in this location and across the region.

Ecologist gets feet wet in manoomin waters

Having worked on two other Great Lakes—Huron and Michigan—Brandon Byrne feels fortunate to be settling down along the south shore of what he describes as, "the greatest lake" Gichigami, or Lake Superior, to take on his new role as a wetland ecologist.

Byrne's interests and work experience range from studying the feeding ecology of fish-eating birds to monitoring plants and amphibians in coastal wetland communities. During free time, Byrne enjoys hiking, wildlife photography, and playing the guitar. Originally from Hammond, Wisconsin, he is eager to contribute to the protection of treaty resources throughout the Ceded Territories.

Byrne's role has two major components: the first is partnering with Keweenaw Bay Indian Community tribal member and GLIFWC specialist Kathy Smith, Genawendang Manoomin, (she who cares for the rice) to support manoomin. A high priority for Ojibwe tribes, wild rice work includes restoring, monitoring, and protecting manoomin waters. Byrne is also charged with overseeing waterfowl and aquatic plant management activities.

Prior to joining GLIFWC, Byrne earned his bachelor's degree in biology and master's degree in environmental science and policy from the University of Wisconsin-Green Bay. Byrne looks forward to protecting plant beings, wetland habitats, and working alongside the wealth of Traditional Ecological Knowledge keepers within GLIFWC and among member tribes. **—JVS**

Biologist shifts focus from water resources to ma'iingan, wildlife

Allie Carl joined the GLIFWC biological services team this year as a wildlife biologist, focusing mainly on animals known as furbearers, which include otter, bobcat, marten, and fisher.

She helps coordinate work between member tribes and outside agencies, monitoring and reporting tribal harvest, and assisting in the development of species stewardship plans.

Among her most impactful responsibilities is helping partner agencies better understand the traditional Anishinaabe relationship with wolves and how to foster respectful relations with ma'iinganag.

Carl was born and raised in Pittsburgh, Penn., spending several years traveling around the country pursuing education and employment. In Ohio, Carl earned a BS in Biology from the University of Dayton in 2014, and went on to complete a Master of Science in wildlife ecology from Oklahoma State University in 2018 where she studied wild turkeys.

Prior to GLIFWC, Carl spent the last 3.5 years working at Gaa-miskwaabikaang for Red Cliff Band of Lake Superior Chippewa as their water resources program manager, monitoring water quality in reservation streams. Carl is excited to get back into the wildlife field, continuing to learn from animals.

When she can, Carl enjoys spending time in the woods and on the water. She enjoys hiking, camping, fishing, kayaking, and hunting. **—JVS**

Forest ecologist elevates Ojibwe perspectives

Taking on a newly established position at GLIFWC, Forest Ecologist Travis Swanson is working as an interagency liaison, helping integrate tribal goals and traditional ecological knowledge into U.S. Forest Service management decisions.

"I'll be working with each of GLIFWC's member tribes to help convey their knowledge and concerns to the managers of public lands within the Ceded Territory," said Swanson, a Bad River tribal member whose family has been in the area since before logging and homesteading era.

An Ashland High School graduate, he went on to complete a bachelor's degree in 2015 from the University of Wisconsin-Stevens Point in Resource Management specializing in Ecosystem Restoration & Wildland Fire Science.

Swanson previously worked as an assistant engine captain for the Bureau of Land Management in the North Central Montana District and has experience with various organizations including the Wisconsin Department of Natural Resources, BIA-Great Lakes Agency, BIA-Pine Ridge Agency, and the USDA-Forest Service Chequamegon-Nicolet National Forest. Most recently, Swanson worked in the School District of Bayfield as a paraprofessional in special education.

Swanson and his wife Kaela are raising their children Luke, 5, and Aubree, 2, with an appreciation for the natural world and showing them the ways of the woods by guiding their treaty-reserved harvests.

"My role will be to ensure tribal voices are being heard," he said adding that his career goal is to restore historical natural processes and increase biodiversity richness across the landscape. He wants to ensure the natural community is balanced and healthy for the enjoyment of future generations. **—JVS**

"Functionally equivalent discharge"

(continued from page 9)

In 2020, the Supreme Court ruled in what is known as the "Maui Case" that water discharges that travel from a point of discharge through the ground should be regulated under the Clean Water Act if the resulting discharge to surface waters is "functionally equivalent" to a direct point source discharge to those waters. The U.S. Steel discharge of tailings slurry to the Minntac tailings basins is a situation where the Maui case seemed to apply.

On July 18, 2023, the U.S. EPA announced its finding that the discharge to the Minntac tailings basins were equivalent to a direct discharge to the surface water bodies and, therefore, subject to regulation under the Clean Water Act. This will require the State of Minnesota to develop and issue National Point Discharge Elimination System permits for the discharge with limits on pollutants such as sulfate.

GLIFWC policy analysts said this appears to be the first implementation of the Maui Case decision nationally and will set a precedent for mines discharging tailings slurry that ends up in surrounding public waters. Staff were pleased to see that tribal data and analysis contributed to the EPA decision. Among the inputs from tribal staff, groundwater modeling was used by the EPA to estimate the flow of pollutants from the Minntac tailings basins to surrounding wetlands and manoomin waters (Figure 2).

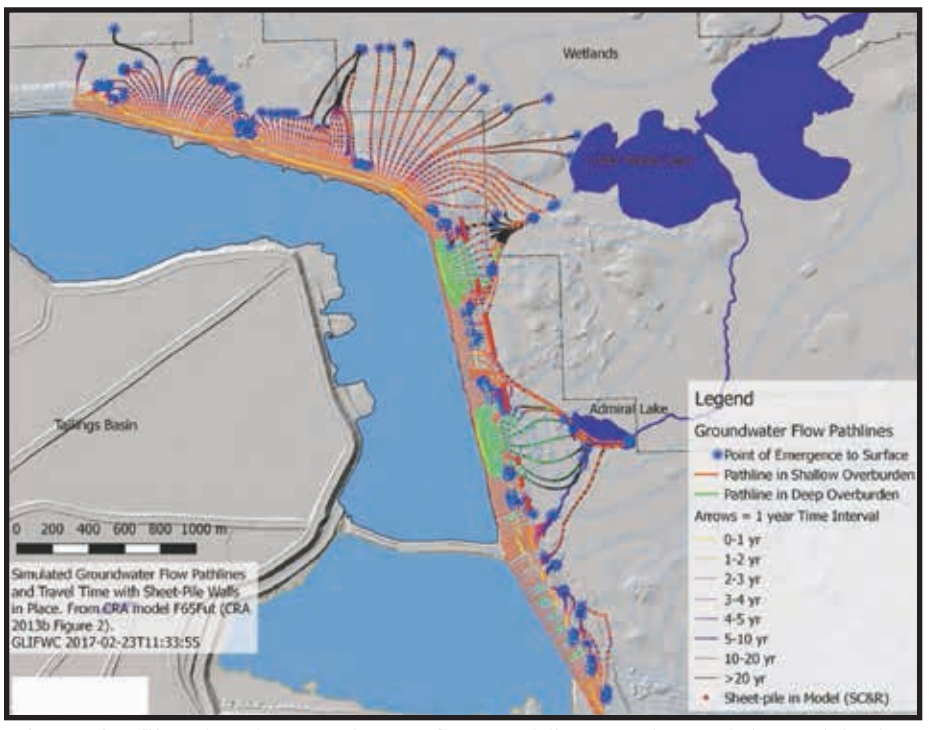


Figure 2. Simulated groundwater flow pathlines and travel time with sheet pile walls in place. (GLIFWC 2017)

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ODANAH, WI 54861

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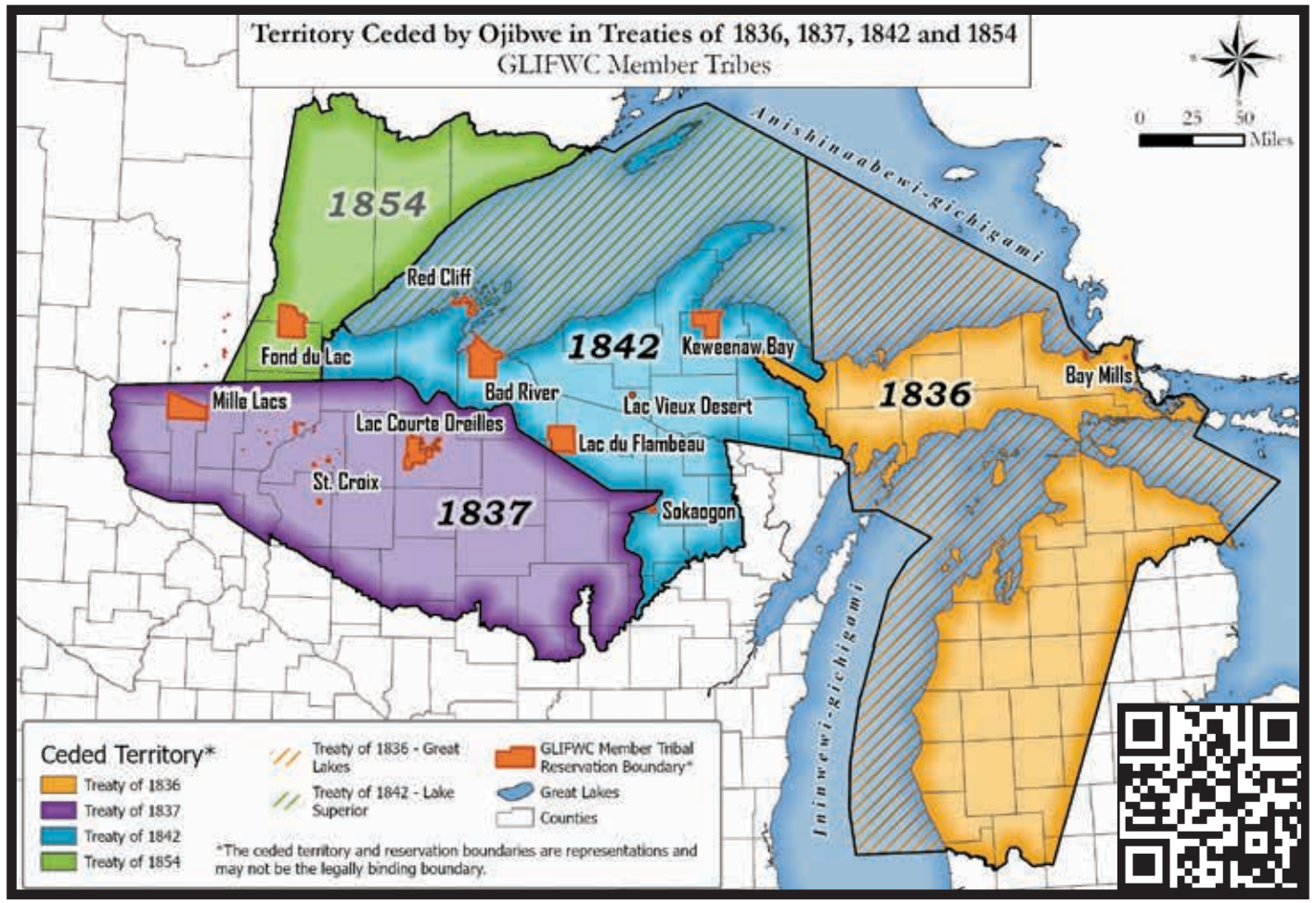

GLIFWC/US Forest Service Camp Onji-Akiing preview

Around forty-five children from tribes and communities across the Great Lakes region arrived at Camp Nesbit in the Ottawa National Forest in early August where Camp Onji-Akiing (From the Earth) takes place.

Jointly run by GLIFWC's Enforcement Division and the US Forest Service, the campers took part in numerous cultural activities over five days, including fishing, archery, using wiigwaas (birch bark) to make necklaces, learning about plants and how they are used by Ojibwe people, and so much more.

The camp and all the activities centered around the Anishinaabe teachings and focus on leadership, environmental stewardship, and natural resources.

Learn more about all the fun things that happened at this year's Camp Onji-Akiing in the upcoming biboon (winter) issue of the Mazina'igan. **—O. Gower**

Mazina'igan
A Chronicle of the Lake Superior Ojibwe