2022

Tribal Great Lakes Restoration

Culturally Inspired Restoration

Great Lakes RESTORATION

U.S. DEPARTMENT OF THE INTERIOR 1824 BUREAU OF INDIAN AFFAIRS

Cover Photo: 2022 BIA Tribal Great Lakes Restoration - Ho-Chunk Nation Eastern Meadowlark

Welcome Reader

Dear Reader,

The Great Lakes Restoration Initiative (GLRI) began in 2010 to accelerate efforts to protect and restore the largest system of fresh surface water in the world, the Laurentian Great Lakes. Indian country, comprised of reservation land bases and ceded territories where Tribes retain rights, represent millions of acres within the Great Lakes Basin.

Since 2010, the Bureau of Indian Affairs (BIA), with support from the U.S. Environmental Protection Agency, has provided GLRI funding to more than 30 Tribes and tribal organizations in the Midwest and Eastern Regions for Great Lakes protection and restoration efforts. In Fiscal Year 2020, the GLRI Regional Working Group initiated the first year of a GLRI Distinct Tribal Program (DTP). Administered by the BIA, the GLRI DTP provides annual support to Tribal priority efforts that are consistent with GLRI goals and objectives, while greatly enhancing flexibility and self-determination for Tribes. The GLRI DTP has served as a highly successful model of an interagency Tribal program.

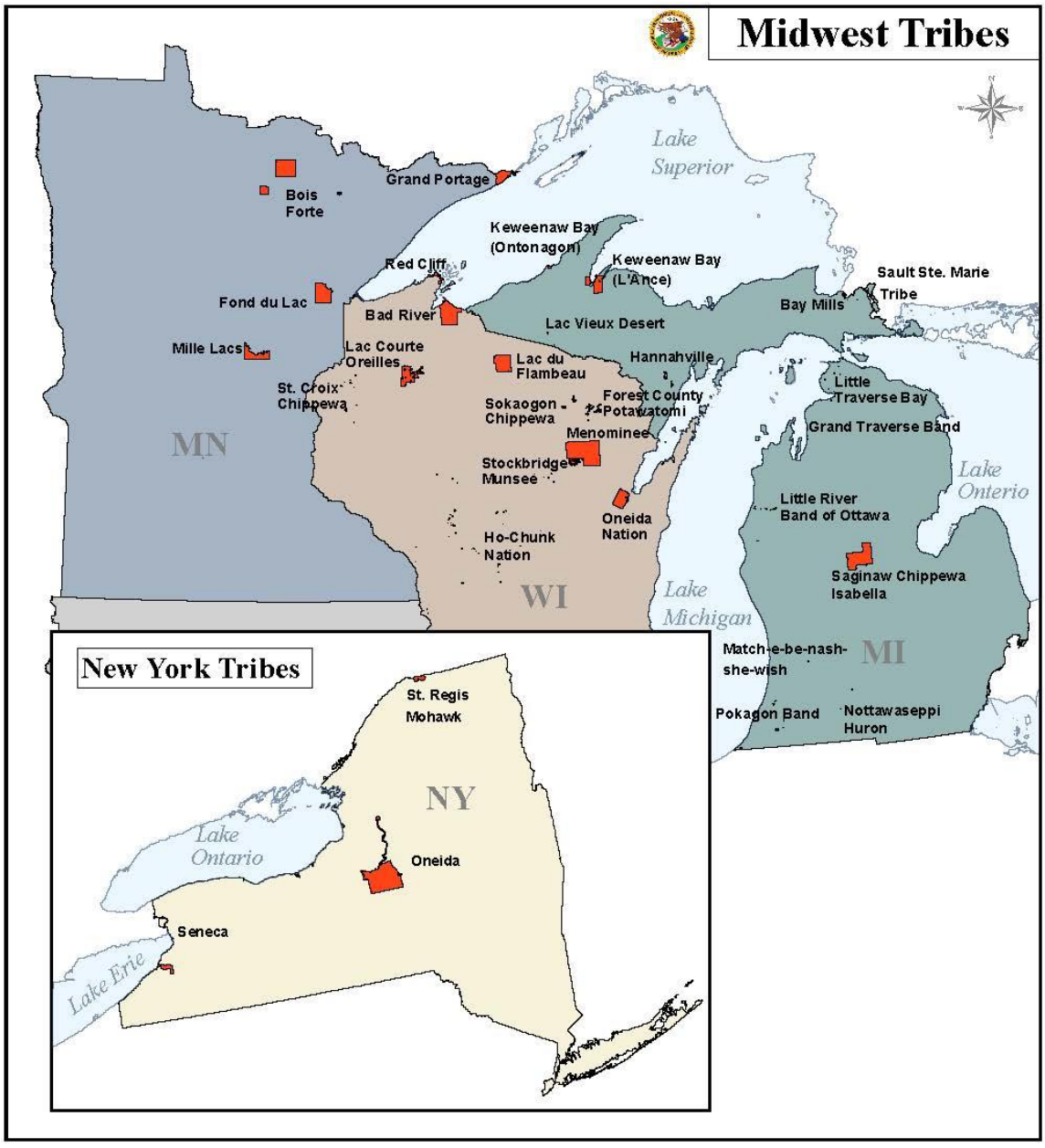
As of January 2023, BIA has provided over $113 million in GLRI funding to Tribes to implement almost 800 Tribally led restoration projects and capacity awards. These projects have protected and restored over 150,000 acres of habitats and approximately 225 miles of Great Lakes tributaries, treated over 41,000 acres for invasive species, and include over 130 distinct projects to protect and restore native species. GLRI has also been instrumental in building and enhancing the capacity of Tribes to participate in intergovernmental resource management for the Great Lakes alongside Federal, State, and other partners to address some of the most pressing challenges facing the Great Lakes.

The majority of Tribal GLRI projects work to assess, monitor, protect and restore local waterways, habitats, and species such as lake sturgeon, moose, and wild rice for tribal lifeways and cultural continuity. In this way, the GLRI has been a catalyst for not only the restoration of the natural environment of the Great Lakes, but for strengthening and revitalizing tribal cultures and traditions interconnected to the health of the Great Lakes and its ecosystems. As the original caretakers of the Great Lakes, Tribes have critical place-based insight and traditional ecological perspectives for understanding and protecting the Great Lakes for generations to come.

We invite you to read the following success stories from the 2020 – 2022 field seasons to learn how Tribes have been key contributors to the success of the GLRI overall, and most notably to the protection of habitats for native fish, plants, and wildlife populations throughout the Great Lakes.

Zachary Jorgenson
GLRI Program Manager
Bureau of Indian Affairs Midwest Region

Map of GLRI Region



Tribal Reservations Participating in the GLRI Program

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Capacity Support for Tribal Communities

In the Great Lakes Basin, Tribal reservation land bases and ceded territories represent millions of acres of land and water. Since 2010, the GLRI has been instrumental in building Tribal capacity to participate in intergovernmental stewardship of our relatives (often referred to as resource management) across the Great Lakes. Under the GLRI Distinct Tribal Program, which provides greater flexibility and further supports Tribal self-determination, twenty (20) Tribes have received capacity support to maintain and enhance participation in these intergovernmental partnerships, assisting in meaningful Tribal input in these processes. In addition, Tribal capacity supports efforts to foster collaborative partnerships and co-management activities and increase Tribal community awareness and educational opportunities on Great Lakes issues. These opportunities give the Tribes the freedom to share subsistence, cultural, and traditional practices with the Tribal community and Tribal youth. It is important for Tribal youth to be introduced to natural resources, a field that is lacking in Native representation, and traditional practices to ensure Tribal lifeways are passed along to the next generation.

Through this support, Tribes have participated and become leaders in Lakewide Management Partnerships, a multi-national effort to restore and maintain the health and wellness of all relatives and beings who are connected to water in the Great Lakes. Tribes have also participated in Great Lakes Area of Concern processes, cooperative invasive species management groups, and other intergovernmental stewardship groups across the Great Lakes. Tribal capacity support has helped Tribes develop and lead many valuable partnerships. Tribes have unique expertise and valuable place-based and traditional ecological perspectives for understanding and protecting Great Lakes resources. Ongoing support will ensure Tribes can continue to significantly contribute to shared protection and restoration goals for the Great Lakes and its ecosystems for future generations.

Turtle pouch making, a traditional practice, with Two-House Design Crafters at the Saint Regis Mohawk Tribe.

1854 Treaty Authority

Great Lakes Issues and Environmental Review, Climate Resiliency, Invasive Species Management, Fisheries and Wildlife

The 1854 Treaty Authority is an inter-tribal resource management agency governed by the Bois Forte Band of Chippewa and Grand Portage Band of Lake Superior Chippewa. The organization is charged to preserve, protect, and enhance treaty rights and related resources in the 1854 Ceded Territory. This ceded territory encompasses approximately 5.5 million acres of present-day northeastern Minnesota. Great Lakes Restoration Initiative funding has supported many projects and programs in their efforts to protect resources in the 1854 Ceded Territory and Lake Superior Basin.

Tribal Capacity Building

Lake Superior and St. Louis River Partnerships

The 1854 Treaty Authority remains active on issues impacting Lake Superior and its watershed. Participation is ongoing in the Lake Superior Partnership, other Great Lakes committees and workgroups, and St. Louis River Area of Concern activties. They participate in environmental review of projects or policies impacting the Lake Superior Basin and 1854 Ceded Territory. Ongoing work occurrs in the implementation and updating of their climate change vulnerabillty assessment and adaptation plan. Oversight is provided to the invasive species program and coordination occurrs with other management organizations. Monitoring of native species (with focus on sturgeon, walleye, moose, and wolves) is also ongoing.

Lake sturgeon assessment.

Boat inspection and decontamination.

Invasive Species

Prevention, Control and Education

Funding supports invasive species postions at the 1854 Treaty Authority. The positions assist with a variety of invasivie species detection, monitoring, and control efforts. Activities include boat inspection and decontamination, rusty crayfish trapping, spiny waterflea surveys, trawling surveys for invasive fish species in the St. Louis River estuary, aquatic vegetation surveys, zebra mussel detection, emerald ash borer surveys, and terrestrial plant detection and control. Education and outreach in cooperation with other partners also occurs.

Habitat and Species

Lake Sturgeon, Moose, and Wolves

Sturgeon assessments completed in Lake Superior and the St. Louis River estuary include larval drift net surveys, juvenile trawl surveys, and assessments targeting juveniles and sub-adults. Three (spring, summer, fall) bottom trawl surveys are completed every year to monitor annual and seasonal population trends of native and non-native fish communities within the St. Louis River estuary. Activities related to moose management included assisting with annual aerial surveys, completing vegetation surveys for habitat use, and exploring moose/deer/parasite interactions. Additional work has been completed capturing and collaring wolves to understand pack size and distribution, mortality, and pup production and survival. Funding also supported wild rice surveys, management, and restoration efforts (including within St. Louis River Estuary).

Wild rice restoration in St. Louis River Estuary.

Bad River Band of Lake Superior Chippewa Indians

Potato River Watershed Monitoring, Phragmites Control, Youth Outreach and Buckthorn Busting

The Bad River Reservation is home to the Bad River Band of Lake Superior Chippewa, or *Mashkiiziibii*, located on the southern shore of *Gichigami* (Lake Superior). The reservation is 124K+ acres of terrestrial and aquatic areas where tribal members thrive and exercise treaty rights. It also consists of a historical, spiritual, and critical 16,000-acre coastal estuary, the Bad River, and Kakagon Sloughs where *manoomin* (wild rice) is harvested. GLRI funding has directly benefited the tribal community and its precious natural resources by helping conduct regular watershed monitoring activities, provide youth outreach and education opportunities, and controlling *bakaan ingoji gaa ondaadag* (non-local beings; invasive species).

Habitat and Species

Potato River Watershed Monitoring

The MNRD completed a prelimianry water quality monitoring assesment in the Potato River Watershed focused on non-point source (NPS) pollution to better understand the levels of pollution across the watershed from its headwaters to its confluence with the Bad River. This preliminary Phase 1 monitoring work has helped shape a Phase 2 project to hone in on additional data collection on streams and rivers where elevated parameters were detected to refine the dataset and hopefully lead to identifying sites of concern for future partnership projects focused on reducing NPS polution.

Staff treating remaining phragmites located at Oak Point.

Foundations for Future Restoration

Non-Local Beings Outreach and Education

The tribe regularly conducts youth and young adult outreach and education activities to engage the younger generations of tribal members and students. The Bakaan Ingoji Gaa Ondaadag (Non-Local Beings) Program had the help of tribal youth in removing invasive buckthorn along a major thoroughfare next to a timber sale, and teamed up with other natural resources staff to give tours of the Bad River and Kakagon Sloughs. The students learned about non-native purple loosestrife, hybrid and narrowleaf *apakweshkway* (cattail), and pickerelweed (a native competitor for manoomin).

Buckthorn busting along Mack Road

Kakagon sloughs tour with Tribal Historic Preservation Office

Bay Mills Indian Community

Monitoring Walleye and Northern Pike

Bay Mills Indian Community is in Michigan's Eastern Upper Peninsula. The natural resources contained in the tribe's lands and surface waters, both on and adjacent to these lands, play a key role in the economic and cultural life of the community. These resources support commercial and subsistence fishing, hunting, and gathering, along with recreational activities (such as sport fishing, canoeing, hiking, and bird watching). The Bay Mills Indian Community relies heavily on commercial fishing, trade, tourism, and local forests for hunting and gathering. The Tribe recognizes the need to foster healthy ecosystems that will sustain fisheries, wildlife, and plants that are integral to its culture.

Habitat and Species

Fish Tracking and Management

Walleye and northern pike each play important roles ecologically and culturally within the St. Marys River near the Bay Mills Indian Community (BMIC). Walleyes are one of the most popular fish for both recreational and subsistence fishing in the St. Marys River. Pike are also very popular and are the eponym of the area where Bay Mills Indian Community now exists; at *Gnoozhekaaning* (the place of the pike). To improve the Tribe's understanding and support these culturally important fishes, BMIC has been tracking the movements of walleye and pike in the St. Marys River using acoustic telemetry since 2020.

Tagged pike ranged in size from 20.5 to 39.5 inches (the largest shown here).

Bay Mills Indian Community operates more than 40 acoustic receivers throughout the St. Marys River and into areas of Lake Superior. Receivers are stationery and record detections from any tagged fish that swim close by. Because each receiver has a known location, researchers can connect the dots between each fish detection on the receivers and use that information to answer questions about the movement patterns of fish.

Roughly 100,000 walleye are stocked in the St. Marys River at Bay Mills every spring to supplement an area of the river with low natural reproduction. This tagging study aims to answer the question of how many walleye stay within the St. Marys River and, therefore, contribute to the fishery and meet the stocking goals for the river. Preliminary results suggest that movement of walleye between the St. Marys River and Lake Superior is common. Therefore, the stocking rate of walleye in the St. Marys River should account for a high degree of movement across multiple management areas where catch rates and fishing pressure can vary significantly.

This study aims to answer a different question for northern pike. While walleye spawn on windswept rocky and gravel areas, pike spawn in shallow, vegetated areas of the Great Lakes. Due to recent higher-than-average water levels, many of the traditional spawning areas may now be too deep to support pike reproduction. It's also likely that new spawning habitat has become available due to other areas being flooded. To locate new spawning areas, the Tribe will continue to track northern pike.

Acoustic transmitters were surgically implanted aboard BMIC vessels to limit fish stress and expedite release.

Closing incision on walleye after implanting transmitter.

Chippewa Ottawa Resource Authority

Lakewide Partnership Participation for Treaty Rights Protection

The Chippewa Ottawa Resource Authority (CORA) is comprised of five Michigan tribes (Bay Mills Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, and Sault Ste. Marie Tribe of Chippewa Indians) that have court affirmed treaty fishing and harvest rights, and associated regulatory authority, under the 1836 Treaty of Washington. Treaty harvesting and fishing rights extend throughout the ceded lands and into the waters of Lakes Huron, Michigan and Superior.

Tribal Capacity Building

Supporting Member Tribes Through Lakewide Partnerships

The Chippewa Ottawa Resource Authority (CORA) has been the recipient of Great Lakes Restoration Initiative (GLRI) Tribal Capacity support for multiple years. Tribal Capacity support has assisted CORA in the ability to maintain participation in lakewide intergovernmental resource management groups and serve as a source of tribal input in these groups. Additionally, this support has allowed for CORA to be a contributing partner in supporting the achievements of both the objectives and goals of the Great Lakes Water Quality Agreement (GLWQA). CORA's participation in these activities and work groups also assists in efforts to protect resources specific to the ceded territories of the Great Lakes Basin and important to Tribal treaty rights, through the planning and implementation of Lakewide Area Management Plans (LAMPs) and Remedial Action Plans (RAPs). CORA has been a leader in helping to achieve increased Tribal participation, education and understanding of the LAMP and RAP processes within the Tribal communities they serve. The Environmental Coordinator, partially funded through GLRI, represents CORA as a member of; the Lake Michigan LAMP Partnership Work Group, the Lake Superior LAMP Partnership Work Group and Transportation Resource Extraction and Habitat committees, the Lake Huron LAMP Partnership Work Group, the St. Marys River Bi-national Public Advisory Council, the Great Lakes Commission Panel on Aquatic Nuisance Species, the Northern Michigan Area Committee for hazardous spill response, and the Sault Area Watershed committee.

Pulling trap nets during spring fish survey (Photo courtesy of Bay Mills Biological Services)

CORA's Environmental Coordinator providing public outreach on Lake Superior LAMP priorities

The GLRI Tribal Capacity support for CORA not only allows for greater engagement in lakewide resource management activities of the LAMP Partnerships, but also allows Tribal involvement in the planning and implementing of LAMP and RAP actions at local levels. One such action being planned for in the spring of 2023 is a fish sampling and analysis project in support of the RAP efforts in the St. Marys River Area of Concern (AOC). As part of this project, CORA's Environmental Coordinator has helped in determining sample site locations within the river system to best represent the entire water body. The results of this sampling effort will be used to assess the health of the fishery in the St Marys River following several years of environmental remediation efforts that have been taken to help meet the goals established for future de-listing of this AOC.

Forest County Potawatomi

Inventory and Prioritization of Stream Crossings and Wetland Delineations

The Forest County Potawatomi (FCP) have lived in Forest County, Wisconsin since the late 1800s. Life on the reservation is very different than it was for the elders. They have done much for the younger generation, and it is because of the elders that the younger generations are who they are today. The FCP have also worked hard to preserve its culture and honor its past. The Land and Natural Resources Division strives to enhance, protect, conserve, and manage the Forest County Potawatomi Community's unique and limited natural, cultural, and historic resources for current and future generations.

Oconto River Bridge before sampling for asbestos-containing materials.

Habitat and Species

Stream Crossing Inventory

Poorly installed stream crossings are one of the most prevalent non-point sources of pollution on FCP lands. Negative impacts to Tribal waters that are caused by poorly installed stream crossings include: temperature and flow modifications, sediment deposition, habitat degradation, and fish passage issues. Impacts from poorly installed crossings are not uniform, in that each crossing can influence each stream differently depending upon the road, crossing structure, and stream characteristics. Resolving the water quality issues that result at each crossing can be difficult, as each replacement requires a vast understanding of the specific crossing characteristics. Currently, the Tribe has a list of stream crossings that the Natural Resources Department has identified as non-point sources of water quality pollution. This list was developed through the Tribe's Non-Point Source Management Program. Several crossings have been replaced under this program, but stream crossing issues still prevail on FCP Lands. In order to further resolve these issues, FCP plans to complete a road/stream crossing assessment of all of the road crossings on FCP lands to assist in identifying and prioritizing potential crossing replacements, and to provide the Tribe with the data that is needed to determine the proper size and elevation requirements for future replacement structures.

Habitat and Species

Wetland Delineation

Eight wetlands were identified and delineated on FCP lands in 2021 Data sheets were completed for nine (9) sample points in the wetland areas and 14 sample points in the upland areas. Multiple soil probes were conducted to further define the wetland boundary. Artificial wetlands are exempt from state wetland laws and mitigation requirements. Per the 2017 Wisconsin ACT 183, artificial wetlands are a landscape feature where hydrophytic vegetation may be present as a result of human modification to the landscape or hydrology and for which the department has no definitive evidence showing a prior wetland or stream history that existed before August 1, 1991.

Wetland found south of Soper Street and west of the North Branch of Oconto River. Sample dominated by green ash (Fraxinus pennsylvanica), red maple (Acer rubrum), grey alder (Alnus incana), dark green bulrush (Scirpus atrovirens) and bluejoint grass.

Fond du Lac Band of Lake Superior Chippewa Indians

Wild Rice Protection and Enhancement, Invasive Species Management, and Lake Sturgeon Restoration

The Fond du Lac Band of Lake Superior Chippewa Indians is one of six federally recognized Bands that comprise the Minnesota Chippewa Tribe. The Fond du Lac Reservation is in Northeastern Minnesota adjacent to Cloquet, MN. The Fond du Lac Resource Management Division (FDLRMD) is responsible for managing and protecting the natural resources of the tribe. In 2022, the FDLRMD used GLRI funding to accomplish work on wild rice protection and enhancement, invasive species management, and lake sturgeon restoration.

Habitat and Species

Ganawenjigewin Manoomin (Wild Rice Management)

Fond du Lac has utilized GLRI funding to continue long-term efforts for the care and protection of manoomin both on the Fond du Lac Reservation and within the territories ceded under various treaties with the United States. The FDLRMD strives to maintain, enhance, and restore manoomin and its supporting habitat. To do so we actively manage water levels, perform aquatic plant community manipulations, conduct waterfowl herbivory reduction missions, and participate in reseeding and restoration efforts with State and Tribal partners throughout the Great Lakes region.

Wild rice flower on the Fond du Lac Reservation

Invasive Species

Implementation of Invasive Species Management Efforts

FDLRMD continued focus on surveillance, early detection and rapid response, and control efforts for the management of invasive species. Efforts utilized best management practices for prevention and control, while also performing education and outreach activities. In 2022, efforts included decontaminating spearing and netting equipment in the spring during the treaty fishing season, annual emerald ash borer surveys, eDNA sampling of 26 waterbodies around the reservation, control activities for multiple species on 185 acres, and educating over 900 individuals across eight events on invasive species prevention opportunities. In addition, the FDLRMD hosted the Minnesota Invasive Species Advisory Council for a tour of the St. Louis River Estuary; the first time a Tribal event has been showcased to this organization.

Field measurement of spawning female lake sturgeon

Habitat and Species

Ogidaajiwan Chi-gamii-ziibi Namekaaning Anji-nitaawigichigaazowag (Upper St. Louis River Lake Sturgeon Restoration

Namewag (lake sturgeon) were once common in the St. Louis River along the border of the Fond du Lac Reservation. FDLRMD uses funding provided by GLRI to continue a stocking and monitoring effort begun in 1998. Fond du Lac staff collaborate with the US Fish and Wildlife Service and Michigan DNR to capture spawning adults in the Sturgeon River in the Upper Peninsula of Michigan, collect gametes and hatch them out for eventual stocking into the St. Louis and Ontonagon Rivers in Minnesota and Michigan, respectively. In addition, capture and tagging of previously stocked year classes is performed in the St. Louis River annually to enumerate the population, monitor growth rates, and determine spawning location(s) of the reintroduced year classes.

Great Lakes Indian Fish and Wildlife Commission

Contaminants testing and education; Manoomin Restoration; Identification of Pipeline Threats to Treaty resources.

The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) is a natural resources management agency with eleven member Ojibwe Tribes that have resource management responsibilities over their Ceded Territory (off-reservation) hunting, fishing, and gathering rights. These Ceded Territories extend over a 60,000 square mile area in Minnesota, Wisconsin, and Michigan. With the help of Great Lakes Restoration Initiative funding, GLIFWC has continued to expand its cooperative invasive species identification and treatment and manoomin restoration programs, as well as collection and sharing of baseline watershed data meant to help identify threats to aquatic habitats in the Ceded Territories.

Fisheries technician preparing ogaa for mercury analysis.

Tribal Capacity Building

Partnerships and Assessments

GLIFWC continued decades-long work that furthers Lakewide Area Management Plan (LAMP) and Great Lakes Water Quality Agreement (GLWQA) implementation, while also undertaking work to assess the impact water quantity and groundwater have on the overall health of Lake Superior and its ecosystems. This included work towards developing a greater understanding of the impacts of large-scale water uses and diversions on water and ecosystem quality, improving understanding of cumulative impacts on habitat scales, and investigating the scheme of groundwater governance in the basin.

Contaminants and Consumption Advisories

Mercury Assessment in Subsistence Fish

GLIFWC continued monitoring of mercury levels in fish, primarily ogaa (walleye), harvested from inland lakes across the Ceded Territories, adding to a valuable long-term dataset spanning more than three decades. Ogaa consumption advisory maps were updated and distributed to member tribes in March 2022. GLIFWC also printed and distributed a new Safe Eating Guide for muskellunge (Maazhiginoozhe). During 2021, in support of EPA's fish contaminant testing program, which provides an increased understanding of contaminant levels in widely harvested fish species, GLIFWC collected 46 Lake Trout during its fall assessment work. In addition, EPA requested prey fish, whereby GLIFWC collected 9 additional prey fish during its assessment work.

Habitat and Species

Manoomin Restoration

GLIFWC continued to protect and enhance over 5,000 manoomin (wild rice) water bodies by conducting surveys to monitor rice abundance, including the 368 sites described in the Wisconsin Ceded Territory Manoomin Inventory. With assistance from an intern, manoomin abundance surveys were conducted on over 20 rice waters, including seed and habitat evaluations, adding to decades of data. Manoomin restoration efforts, including seed coordination and distribution, assisted with over 20 acres seeded by tribal communities.

During 2021 and 2022 GLIFWC developed two story maps to organize and disseminate technical information on crude oil/natural gas pipelines and the activities of the Transportation and Resource Extraction Committee (TREC) of the Lake Superior Partnership Working Group. These story maps contain interactive mapping applications as well as technical and regulatory documents that allow agency staff and the public a cohesive guide for these complex environmental issues. The story maps can be accessed at the following links: Pipelines in the Ceded Territories: https://storymaps.arcgis.com/stories/3fc4d29577284948a9ff569bba7f8546, Transportation and Resource Extraction Committee (TREC): https://storymaps.arcgis.com/stories/7844034cf586455080e93bfa49139818

Manoomin intern conducting abundance surveys.

Grand Portage Band of Lake Superior Chippewa

Fisheries and Wildlife Research and Management

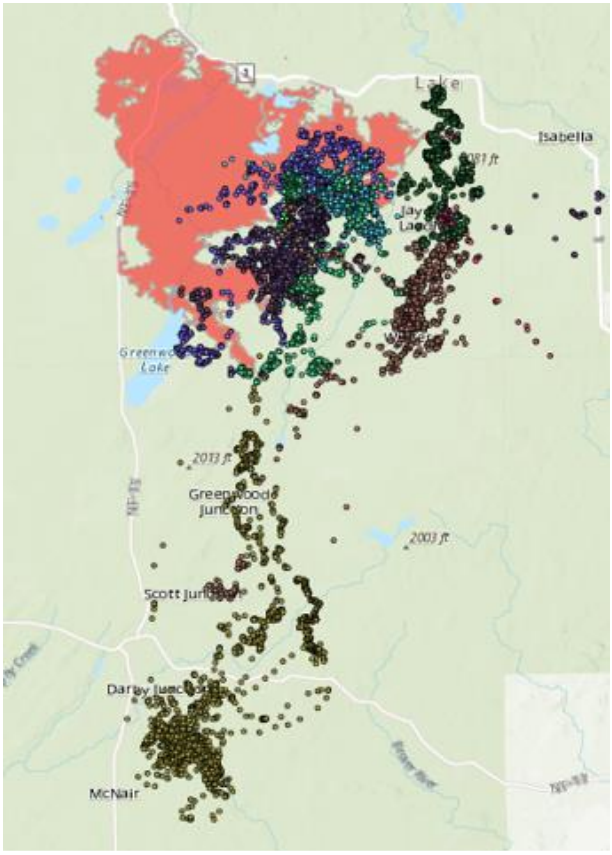
The Grand Portage Reservation is in northeastern Minnesota, along Lake Superior. The reservation land base encompasses approximately 47,500 acres of southern boreal forest. Grand Portage tribal members rely on subsistence species and value culturally important species, such as moose, white-tailed deer, gray wolves, beaver, and black bear. Due to changes in climate and the interactions of non-native species, populations of some native species like moose have been in decline. With funding provided by the Great Lakes Restoration Initiative (GLRI) Program, the Tribe has been performing long-term wildlife and fisheries research to effectively manage native populations of subsistence species.

Tribal Capacity Building

Lake Superior Partnerships

The Grand Portage Band utilized GLRI Tribal Capacity funding to participate in the Lake Superior Lakewide Action and Management Plan and Great Lakes Fisheries Commission Committees (Lake Superior Technical Committee, Lake Superior Committee, and Council of Lake Committees). This capacity allowed for coordination, implementation, and reporting on Lake Superior Coordinated Science and Monitoring Initiatives for lake trout, siscowet, brook trout, walleye, lake sturgeon, and cisco populations. Results were used to determine safe harvest levels of Lake Superior fish stocks, determine impediments to native species restoration, and develop strategies to guide future efforts.

Lake Sturgeon captured in CSMI surveys.



Initial moose locations in relation to the Greenwood Lake

Habitat and Species

Moose Assessment and Management

In 2021 the Greenwood Lake wildfire torched 26,000 acres in northeastern Minnesota near Isabella. The Grand Portage Band used this opportunity to capture, and GPS collar 10 moose (6 bulls, 4 cows) associated with the newly burned area the following winter to monitor how moose respond to this large disturbance. Collaboratively with tribal, federal, and state partners, Grand Portage staff began to measure fire severity, forest regeneration, moose browse, and initial habitats used by moose. Continued monitoring over time will reveal how important large-scale fires are for the moose population and help identify specific forestry actions to create preferred moose browse and habitats. On a larger scale, results will shape best forest management practices that will aid in the recovery of moose in the Lake Superior region.

The Grand Portage Band aslo utilized GLRI funding to lead moose and wolf research at Isle Royale National Park on Lake Superior. Extensive moose survey flights were flown to estimate the moose population on the island and track population demographics. Twenty moose were captured and outfitted with GPS tracking collars to identify habitats used and track mortality. Biological information collected from moose were used to determine moose health. Six wolves were also captured and collared to monitor wolf movements, estimate pack size, and home range. This research at Isle Royale National Park contributes to the longest running predator-prey study in North America.

Grand Traverse Band of Ottawa and Chippewa Indians

Aquatic Invasive Species Control, Watershed Connectivity Restoration, and Education and Outreach

The Grand Traverse Band of Ottawa and Chippewa Indians (GTB) administers membership services within a six-county service area located in northwest lower Michigan along the shores of Lake Michigan. The 1836 Treaty-Ceded Territory is comprised of landscapes that have uniquely supported traditional tribal lifeways for generations. With the support of the GLRI Distinct Tribal Program, GTB has improved water quality, recovered degraded fisheries and wildlife habitats and ecosystems, and enhanced tribal subsistence fishing by treating aquatic invasive species and reconnecting aquatic ecosystems through improving road stream crossings and removing barriers to migration and natural hydrologic function.

Invasive Species

Aquatic Invasive Species Control

GTB, in partnership with the Lake Leelanau Lake Association (LLLA) have made an effort over the past few years to bring Eurasian Watermilfoil (EWM) under control in Lake Leelanau, located in Leelanau County, using a combination of non-chemical approaches including benthic barriers, Diver Assisted Suction Harvesting (DASH), and hand-pulling. In all, 60-80% of EWM infestations were controlled over the past three years. GTB and LLLA will continue their efforts with a goal of controlling all large EWM stands in 2023 and continual monitoring and control of smaller infestations into the future.

2022 Burlap Deployments in Lake Leelanau

Habitat and Species

Watershed Connectivity Restoration, and Education and Outreach

GTB together with the Grand Traverse Road Commission and the Conservation Resource Alliance (CRA) utilized GLRI Distinct Tribal Program (DTP) funding, NRCS Regional Conservation Partnership Program (RCPP) funding, and other funding sources to install the Broomhead Road timber bridge over Ottaway (Boardman) River in Grand Traverse County in 2022. The installation of the timber bridge reconnected 30 miles of stream which improves native fish species habitat conditions and restores key elements of natural hydrologic function, sediment, and nutrient transport regimes critical for river ecosystem health and services.

The Broomhead Road timber bridge crossing of the Ottaway (Boardman) River is just one of dozens of projects coupling funding from the GLRI DTP and NRCS RCPP funding through the Tribal Stream and Michigan Fruitbelt Collaborative; along with other Federal and local funding. Among the proximate efforts to restore ecosystem connectivity, GLRI DTP funding was used to enhance human 'connectivity' to the importance of natural stream function through the production of a documentary showcasing the value and importance of taking action and supporting the improvement of intersection features of road stream crossings in a way that balances transportation needs with ecosystem needs. The film "Restoring Aquatic Ecosystems in Northwest Lower Michigan" can be found at https://naturechange.org and highlights Michigan's first indigenous-led, multi-agency collaborative created to restore and protect the ecology of streams and rivers across an entire region.

Broomhead Road timber bridge crossing of the Ottaway (Boardman) River installed in 2022.

Ho-Chunk Nation

Resource Management to Promote Natural Communities

Ho-Chunk Nation lands include approximately 15,000 acres spread over 23 counties in Wisconsin, Minnesota, and Illinois. These lands provide for everyday needs for the Tribal community including recreation, cultural practices and as a source of food. Management of these resources focuses on the preservation of intact natural communities and restoration of degraded habitat.

Invasive Species

Resource Management to Promote Natural Communities

The Ho-Chunk Nation (Nation) is concerned about the spread of invasive species because of the impact that these species can have on the tribal economy, human health, recreation, cultural practices, and overall ecological health of tribal lands. Invasive shrubs such as glossy buckthorn and honeysuckle prevent the regeneration of young trees, causing a long term and very serious impact on commercial forestry, traditional cultural uses, and ecosystem health.

The Nation launched invasive plant management activities in the Lake Michigan Basin beginning in 2014 through Great Lakes Restoration Initiative (GLRI) support. Funding was used to inventory approximately 4,300 acres of tribal land for the presence of invasive plants listed under the Wisconsin NR-40 Rule. The inventory included both individual plants and population resulting in the identification of 908 occurrences of 17 different species. These occurrences were then quantified and mapped for incorporation into the tribal Geographic Information System. A matrix tool was then developed to prioritize species, populations, and parcels for future management.

Forest edge, pre-treatment.

Forestry mowing, post treatment.

The Nation has since implemented management actions on approximately 725 acres of tribal land in the Lake Michigan Basin in order to control the spread of terrestrial invasive plants. GLRI funding awarded in 2020 and 2021 was used for management actions in Shawano County, WI which included a variety of techniques including spot foliar herbicide treatments, basal bark treatments, cut-stump treatments, and forestry mowing. Multiple years of GLRI funding have been needed to treat major populations of common buckthorn and other species that have gone unchecked for many years. The Nation has made significant progress towards controlling the spread of invasive plants in this area and has tipped the scale in favor of the natural communities we are trying to preserve and enhance. In addition, the knowledge and experience gained from this project has been directly transferable to invasive species management efforts on Ho-Chunk tribal lands throughout the state.

Keweenaw Bay Indian Community

Lake Sturgeon Assessment and Invasive Species Control

The Keweenaw Bay Indian Community (KBIC) is located on the L'Anse Indian Reservation in Baraga, Marquette, and Ontonagon Counties in Michigan's Upper Peninsula on Lake Superior. The Reservation consists of approximately 59,000 acres, which is heavily forested and rich in water resources. These diverse habitats sustain a healthy population of fish, wildlife, and plant species. Funding through the Great Lakes Restoration Initiative (GLRI) has supported a number of projects lead by the Natural Resources Department, including, but not limited to: long-term species monitoring, native plant restoration, addressing invasive species, habitat assessments, and environmental contamination.

Lake Sturgeon Assessment

Habitat and Species

Lake Sturgeon Assessment

The robust KBIC Coldwater Hatchery Program focuses on native species restoration in Lake Superior and regional inland lakes and streams. A critical component of our native fish management strategy is to evaluate hatchery fish contribution in the wild. GLRI support has allowed KBIC to allocate more focus and effort on ascertaining KBIC hatchery brook trout survival on an expanding list of streams receiving prescriptive stocking, and stream electro-fishing surveys have been intensified in recent years to collect information to best manage our local and regional brook trout fisheries.

GLRI funding support has been critical in maintaining KBIC conductance of Lake Superior Lake Sturgeon assessments in recent years. Nearshore index sites in Huron and Keweenaw Bays, South Portage Entry, and the mouth of the Ontonagon River have been visited for several years as a component of multi-agency, Lake Superior basin-wide efforts to track lake sturgeon population and distribution trends through time. One thousand (1000) foot gangs of graded mesh gillnet comprise the standard gear for these assessments, with several agencies conducting similar work throughout Lake Superior. KBIC appreciates support to continue our contribution(s) to this basin-wide assessment effort.

Invasive Species

Invasive Species Control

With continued GLRI support, KBIC has managed to maintain annual aquatic invasive species (AIS) Early Detection, Rapid Response (EDRR) surveys following protocols prescribed by the U.S. Fish and Wildlife Service. This work commenced in 2016, and GLRI funding has provided the opportunity for KBIC to establish and manage a long-term AIS database for EDRR work in Keweenaw and Huron Bays, Lake Superior; and at times additional regions of interest (Keweenaw Waterway, Marquette Harbors). Multiple gear and effort types are deployed in tandem during these EDRR surveys to maximize the likelihood of encountering all fish species present. From 2020-2022, graded gillnet array deployments, electrofishing efforts, nearshore fyke netting, offshore trawling, and extreme nearshore beach seining comprised the KBIC EDRR efforts, with collected data being shared with multiple agencies.

KBIC employs control efforts and monitors for invasive species including Japanese barberry, purple loosestrife, Eurasian watermilfoil, and emerald ash borer. In 2022 across all species, KBIC surveyed, monitored and/or controlled over 8,100 acres within the reservation. They regularly collaborate with the Ottawa National Forest and Keweenaw Invasive Species Management Area to expand their outreach and impact on the landscape.

Invasive Species Management

Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin

Invasive Species Prevention and Control and

The Lac du Flambeau (LDF) Reservation covers approximately 86,500 acres which includes: 41,733 acres of forested uplands, 24,000 acres of wetlands, and 17,897 acres of lakes and rivers. Nearly one-half (48.4%) of the reservation's overall surface is under water. Through the help of GLRI funds, the LDF Natural Resources Department is able to protect, maintain, and prevent any negative impacts from LDF tribal members traveling through the Great Lakes basin while exercising their treaty rights

Invasive Species

Prevention and Control

For the 2022 field season, LDF staff completed aquatic and terrestrial surveys. Lac du Flambeau provided clean boats clean water trainings that also had surveyors collecting valuable user data. In 2022 there were also two aquatic invasive species workshops were performed over the course of the winter. The band also ordered signs for cultural species and will be installing those in the near future. Staff drafted harvest season brochures and distributed them amongst the harvesters.

For 2022 LDF staff treated 34 Acres of purple loosestrife, Twenty-nine acres on Haskell Creek system and 5 acres in the White Sand Lake area.

Several lakes were monitored/treated during Tribal harvest during spearing season. There was also 20 acres of wildlife habitat created off East Boundary Trail in the Lac du Flambeau area, 17 acres of habitat off the east boundary trail were also enhanced. FDL staff worked on growing over 50 plants for habitat in enhancement.

Currently LDF's new staff are being trained on bird survey techniques and data collection. Staff are preparing for wildlife surveys for next season as well as prepping for duck box maintenance.

Staff treating tribal vessel after coming off a lake with known invasive species.

Lac Courte Oreilles Band of Lake Superior Chippewa Community

Tribal Youth Apprenticeship, Wild Rice Seeding and Education Outreach

The Lac Courte Oreilles Tribe (LCO) is one of six federally recognized Bands of Lake Superior Chippewa. The Lac Courte Oreilles Reservation or Odawa Zaagaainganing (Lake of the Ottawa), as traditionally referred to by the LCO people, is situated on 76,500 acres in Northern Wisconsin with several diverse habitats within its exterior boundaries. The LCO Tribal Government has many different entities, one of which is the LCO Conservation Department (LCOCD). The Tribe also supports three different schools; the LCO Ojibwe University, LCO K-12 school with an Ojibwe Language Immersion school, and an Environmental Charter school. Over the last few years, the LCOCD has worked with all three schools on Great Lakes Restoration Initiative projects.

Foundations for Future Restoration

Tribal Youth Apprenticeship Program

Recruitment of the next generation of Natural Resources professionals has become a focus for the LCOCD in the last few years as their professionals have started to transition to elderhood. This transition has made apparent the need for transfer of knowledge and support in the natural resource field. In 2021, BIA's Tribal Youth Initiative program provided the means to initiate this work, and as a result the Tribal Youth Apprenticeship (TYA) program was created. In 2022, the TYA program was able to hire three tribal youth apprentices and was able to successfully certify two apprentices in boater and ATV safety, provided youth with work gear, and hands on experience out in the field doing Natural Resource projects. With GLRI funding in 2022 this program will continue to be supported in the upcoming year. Two tribal youth will be returning to the program, building additional hands-on experience already gained in the program. Tribal youth apprentices work with all LCOCD professionals and then begin focusing in on their desired career choice.

Wild Rice Seeding and Education Outreach

One of the Great Lakes region's most important species is Manoomin, or wild rice, and it has been a long-time goal of the community to care for and sustain Manoomin due to its cultural importance. For the past ten years the LCOCD has been seeding and maintaining Manoomin beds on the reservation, one of which is a converted cranberry marsh. These beds provide Manoomin to elders and opportunities for youth to receive hands-on experience harvesting, monitoring, and stewardship. Tribal youth learn both the western science of a Natural Resource professional and the community's traditional knowledge. Tribal Youth use western science when assisting in monitoring and estimating biomass for wild rice, while also learning traditional knowledge through stories, observations, and practices such as the harvesting and binding of Manoomin.

Converted cranberry farm to a Manoomin bed.

Wild Rice Technician Nicholas Quagon shows students how to harvest Manoomin.

Little River Band of Ottawa Indians

American Marten Distribution and Abundance in the Lower Peninsula of Michigan, Connectivity assessment of four at risk turtle species

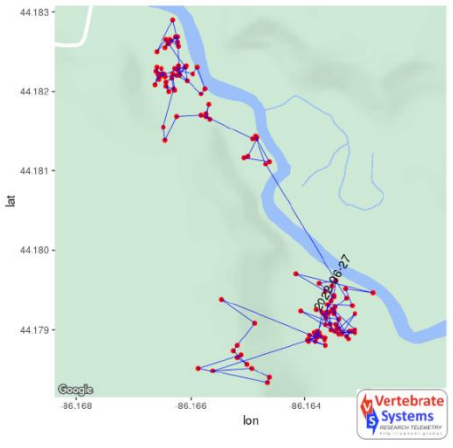
The Little River Band of Ottawa Indians (LRBOI) is in the Lower Peninsula of Michigan along the lower portion of the Manistee River. The Tribe is committed to protection and restoration of important cultural and ecological natural resources through the implementation and development of Native Species Stewardship plans. With the help of GLRI grant funds, the Tribe has continued working on the restoration of the Manistee River Nmé (Lake Sturgeon) population, researched and community outreach for the re-introduction of Nmégos (Arctic Grayling), and Manoomin (Wild Rice) monitoring and restoration.

Habitat and Species

American Marten Distribution

GLRI funding has been utilized by the Little River Band of Ottawa Indians (LRBOI) to complete vital work on American marten. American marten is both ecologically and culturally significant to the LRBOI and are a species of concern. Restoration and stewardship of native species is a high priority, as is Native culture for LRBOI. A complete understanding of where American marten may have dispersed from regarding reintroduction sites, or where possible remnant populations remain is lacking. A GLRI project relating to American martin distribution and abundance in the lower peninsula of Michigan was recently completed by the LRBOI. The goal of this project was to use occupancy modeling to estimate occupancy and detection probability of marten throughout the northern lower peninsula of Michigan (NPL). During the project 240 sites were surveyed and nearly 350,000 images were processed. This project was a great example of how lower cost occupancy data allows for sampling a much larger area while simultaneously estimating abundance and density. This work can now be used to demonstrate the use of occupancy modeling as an aid to determining species distribution and improving management decisions for this imperiled species throughout its range in Michigan.

American Marten caught on camera



Map of woodland turtle movements

Connectivity assessment of four at risk turtle species

Among Michigan's native turtles are four species (Blanding's, Eastern box, Spotted, Wood) that are experiencing widespread population declines and would benefit from landscape level conservation actions. Additionally, turtles from this region occupy a place of cultural importance for the LRBOI Tribe. Landscape management is particularly challenging for species with seasonally dependent habitats, as linkages between multiple habitats must be maintained. Undertaking a comprehensive connectivity assessment within the region encompassing LRBOI Tribal Lands and Manistee National Forest (MNF) where all four species co-occur will yield important insights about landscape factors governing species persistence and reveal opportunities for habitat management. The LRBOI has conducted visual and trapping surveys during the Spring/Summer of 2022 documenting locations for any observed individuals of the four target turtle species. They have also deployed 18 GPS loggers on Blanding's (10 total) and Wood (8 total) turtles that are collecting location data every four hours. Movement data from these animals will be used to develop a resistance surface for Spotted turtle that will be compared to a habitat suitability-based resistance surface. Genetic samples from all new Blanding's, Spotted, and Wood turtles captured during the 2022 survey period were taken.

Little Traverse Bay Bands of Odawa Indians

Aquatic Organism Passage and Wild Rice Restoration

Based along Lake Michigan's northeastern coast, The Little Traverse Bay Bands of Odawa Indians has 215,954 acres of Tribal lands within the Lake Michigan and Lake Huron watersheds. This includes 103.5 miles of Great Lakes shoreline, 394 miles of creeks, rivers, and streams, 27,553 acres of lakes, and 35,647 acres of wetlands. With the help of Bureau of Indian Affairs (BIA) Great Lakes Restoration Initiative (GLRI), the tribe has been able to continue restoration, monitoring, collaboration, and policy efforts within the Great Lakes basin.

Habitats and Species

Restoring Connectivity on Tannery Creek

The Little Traverse Bay Bands of Odawa Indians (LTBB) recently completed the fourth and final replacement of undersized culverts on Tannery Creek, a tributary of Little Traverse Bay in northeastern Lake Michigan. Tannery Creek is home to native Brook Trout and contains spawning habitat for many anadromous Lake Michigan fishes. Because of its central location and fishing opportunities, the creek is heavily utilized by LTBB citizens exercising treaty fishing rights. Unfortunately, the creek has become heavily impacted by urbanization and has been plagued by flooding in recent years due to undersized culverts. Aside from flooding impacts, many of the culverts have become perched and contribute to extensive erosion. These impacts have led to a reduction in connectivity throughout the watershed and degradation of fish spawning habitat due to sedimentation. Since 2018, LTBB has used GLRI funding in a multi-phased approach to replace four failing culverts along Tannery Creek. Two culverts were replaced in the summer of 2021, while work wrapped up on the last two culverts in October of 2022. Altogether these projects reconnected 3.22 miles of stream and reduced erosion by 4.861 tons of sedimentation per year.

https://www.youtube.com/watch?v=QzEkhTpkjck

A restored culvert along Tannery Creek.

Manoomin enclosure

Identifying Variables Impacting Manoomin Restoration Efforts

A productive manoomin (wild rice) stand has enough rice to not only provide habitat for wildlife but also for LTBB's cultural needs. Despite seeding efforts since 2006, no stands of such magnitude currently exist on the LTBB reservation. The Tribe has implemented multiple efforts to evaluate and determine what variables may be impacting wild rice seeding efforts. The two variables most likely impacting success is plant consumption by wildlife and seeding sources. Across the Great Lakes Basin, Canadian geese are known grazers of wild rice and can significantly reduce wild rice success. In 2021, LTBB used enclosures to reduce herbivory of wild rice by Canadian geese during the growing season. At locations with enclosures, waterfowl grazing was light and seed production was excellent. In addition to enclosures, LTBB is also comparing the genetics of wild rice collected from different sources. It is thought that local seed may be better suited for some waterbodies where seeding efforts have not been as successful. Initial results show that there is a genetic diversity between wild rice collected at different waterbodies. Future seeding efforts will include prioritization of using seed collected locally that may be more genetically suited to restoration areas.

Lac Vieux Desert Band of Lake Superior Chippewa Indians

Invasive Species Prevention and Water Quality Monitoring for Wild Rice and Walleye Protection and Rehabilitation

The Ketekitegaaning Band of Lake Superior Chippewa Indians, also known as the Lac Vieux Desert Band of Lake Superior Indians (Tribe) has cultural ties to the water and other natural resources within the Great Lakes Basin and the Mississippi watershed. The traditional homeland is at the crossroads of three watersheds: the Lake Superior watershed, the Lake Michigan Watershed, and the Mississippi watershed. The name of the Tribe comes from their historical presence on Lake Lac Vieux Desert (LVD Lake) where they maintained a subsistence lifestyle.

CD3 Boat Wash Station Locations

Invasive Species
Boat Wash Stations

The harvesting of walleye, musky, northern pike, pickerel, and pan fish; trapping; hunting waterfowl; and harvesting manoomin (wild rice) has been a way of life for the LVD Tribe for centuries. During this time the Tribe has inhabited, and recently owned trust land, on Lake LVD that is vital for cultural and recreational purposes. Currently, aquatic invasive species (AIS) threaten LVD's homeland watersheds. There are many lakes around the LVD reservation that are currently being rehabilitated with wild rice and walleye, and the AIS within these lakes are taking a toll on successful rehabilitation efforts. Great Lakes Restoration Initiative funding was awarded to assist in preventing the spread of AIS within lakes that border the LVD reservation.

In 2022 CD3 Waterless boat wash stations were deployed at three different locations to help prevent the spread of AIS. Two were placed on Lake Lac Vieux Desert and one at the LVD casino, which is a high traffic area for boaters visiting the area. The CD3 Waterless Boat wash stations are interactive stations that are used to clean boats as they are taken out of the water with built in computers that allow the Tribe, and other interested parties, access to the station's usage records. The portable boat wash stations record the number of boats cleaned each day, when the machine needs maintenance, and when the vacuum is required to be pumped out. In reviewing 2022 data, records showed stations were used frequently. LVD is evaluating the potential to deploy similar stations at other lakes within the proximity of Watersmeet, where the tribal community frequently visits during open water activities.

In 2022 LVD also purchased Continuous Data Loggers in lakes important for wild rice protection and rehabilitation. These data loggers will help monitor various water quality parameters including water levels, temperature, and conductivity. This data will assist LVD in understanding changing water conditions in wild rice lakes that are vital to the Band. Data loggers were assembled in 2022 and will be deployed in the spring of 2023.

Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians

Aquatic Invasive Species Management, Mnomen Restoration, Nmé Rehabilitation

The Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians (Gun Lake Tribe) is in southwest Michigan. The Environmental Department serves the Tribe with protection, conservation and stewardship of environmental and natural resources. The GLRI allowed the Tribe to work on aquatic invasive species management on and off Tribal lands, in partnership with local Cooperative Invasive Species Management Areas, to monitor and restore mnomen (wild rice) in the area and to work on nmé (lake sturgeon) rehabilitation in the Kalamazoo and Grand Rivers.

Invasive Species

Aquatic Invasive Species Management

Vegetation surveys were conducted on seven lakes (210 acres) noting the presence of native and aquatic invasive species (AIS) while additional waterbodies totaling 77 miles were surveyed for priority AIS in both 2021 and 2022. Work was coordinated with partner agencies on AIS management efforts and to coordinate early detection and rapid response of European frogbit, red swamp crayfish and water lettuce. Other treated species on Tribal properties included invasive cattails, non-native phragmites and reed canary grass.

Invasive European Frogbit.

Mnomen harvest.

Habitats and Species

Mnomen Restoration

Over 38 acres were seeded in 2021 to restore mnomen in the Kalamazoo River and nearby waterbodies The seeding efforts utilized over 40 grain bags of seed that was harvested by the Gun Lake Tribe in Michigan waters. The inaugural Mnomen Mentor Program was held in 2022 where staff visited and learned from Tribal elders along with select youth. Additional tool building workshops, mnomen field trips, education opportunities at the Tribe's Jijak Youth Camp, and a Community Harvest were held in 2022.

Nmé Rehabilitation

A record making nmé egg collection took place in 2021 with 2,403 naturally spawned nmé eggs collected. These were raised in a streamside rearing facility, resulting in a total of 1,277 juvenile nmé released back into the Kalamazoo River. During the 2021 and 2022 field season, 16 adult nmé were captured on the Grand and Kalamazoo Rivers and most were tagged. Twenty-five miles of the Kalamazoo River was mapped using Side Scan Sonar to aid in the analysis of substrate composition that will be used to determine high-quality habitat for nmé.

Adult Nmé (lake sturgeon).

Menominee Indian Tribe of Wisconsin

Invasive Species Management and Lake Sturgeon Reintroduction Efforts

The Menominee Indian Reservation, nearly 236,000 acres, features some of the best-managed forestland within the Great Lakes Basin. Today the reservation contains an abundance of pristine water resources, many with little or no connected development. Reservation waters drain, at the surface, into Lake Michigan via the Wolf River Watershed in the Lower Green Bay Basin, and the Oconto River Watershed in the Upper Green Bay Basin. Water quality conditions within the reservation play a role in water quality conditions of Lake Michigan and the entire Great Lakes Basins.

Invasive Species

Collaborative Partnerships for Invasive Species Management

The MITW Environmental Services Department (ESD) and its partners have continued to work collaboratively within the Menominee community with a focus on control, outreach, planning and education of invasive species. Collaborative efforts are implemented and guided by the approved Menominee County and Menominee Indian Tribe Invasive Species Management Plan. In 2021, the MITW ESD employed control efforts on a total of 224.97 acres with a focus on Eurasian honeysuckle, garlic mustard, spotted knapweed, non-native buckthorn, Japanese knotweed, Japanese barberry, phragmites, and wild parsnip. In 2022, the MITW ESD continued control efforts on a total of 153.99 acres, focusing on the same species. The invasive species treated in previous years have already shown a positive impact with some areas showing a reduced density while other areas are fully exterminated from the targeted invasive species. Other efforts have included the collection and release of beetles (*Galerucella sp.*) to control purple loosestrife along select areas of the Wolf River, collection of emerald ash borer (EAB) samples by hanging purple prism traps in different locations, and collection of oak ambrosia beetle samples by hanging funnel traps along other areas of the Menominee Indian Reservation. In August 2022, Menominee County and Wisconsin Department of Natural Resources confirmed the collection of an EAB near one of MITW's sample locations, whereupon MITW also confirmed the presence of an EAB in a trap at that location. MITW is collaborating with both Menominee County and Menominee Tribal Enterprise for continued monitoring for EAB. The MITW ESD continued to encourage Tribal members to be aware of invasive species, report new identifications, and try to limit their spread by using best practices.

Wild parsnip that was targeted for control efforts in 2022

Fisheries Biologist Ryan Wehse holding one of the lake sturgeon.

Habitat and Species

Reintroduction of Lake Sturgeon in the Upper Wolf River

Lake sturgeon in the Wolf River-Lake Winnebago System historically migrated upstream to spawn at Keshena Falls, within the current boundaries of the Menominee Reservation. While the habitat for lake sturgeon in the Upper Wolf River is very high quality and perhaps the best spawning habitat in the system, sturgeon have been extirpated from the upper system since the 1950's due to construction of dams lower in the system. The Menominee Indian Tribe of Wisconsin (MITW) has used GLRI funding to reintroduce lake sturgeon to historic spawning habitat in the Upper Wolf River, track their movements with sonic transmitters and remote receivers, and conduct larval sampling to document whether successful spawning has taken place. In 2022, MITW purchased and surgically implanted acoustic tags into adult lake sturgeon in the Red River during spring spawning periods and in age-0 sturgeon in late summer in the Wolf River. Both active and passive tracking methods were used to locate the sturgeon after stocking. Preliminary results indicate that adult sturgeon did not go above one of the natural barriers in question and a small number of juvenile lake sturgeon remained above the Balsam Row dam for several weeks after being stocked. MITW will continue evaluation of lake sturgeon spawning in the Upper Wolf River to inform future management efforts.

Nottawaseppi Huron Band of the Potawatomi

Wild Rice Restoration and Fen Habitat Assessment

The Nottawaseppi Huron Band of the Potawatomi (NHBP) has stewardship over an approximately 80acre wetland system within the Pine & Nottawa Creek. These wetlands are associated with a higher-value wetland complex that is part of the headwaters of St. Joseph River, which discharges into Lake Michigan. The Tribe considers Pine Creek as one of the crucial cultural and wildlife assets in their care. To demonstrate this, in 2001, the Tribe designated this area as the Chief Moguago Wetland Preserve via a Tribal Resolution.

Wild rice survey and GPS mapping.

Habitats and Species

Wild Rice Monitoring, Seeding, and Transplanting

The NHBP has been leading a successful wild rice restoration program for many years to protect and enhance this Tribally important species. The program has benefited from Great Lakes Restoration Initiative (GLRI) support to enhance their efforts. Between 2020 and 2022, annual monitoring and tracking of wild rice beds in the Kalamazoo and St Joseph Watersheds continued, including coordination with NOAA for review of multi-spectral high-resolution aerial photography that was taken along the watersheds. Wild rice seed and transplants were distributed across approximately 10 acres in the Pine Creek and Nottawa River in the 2022 field season. The NHBP will continue these monitoring and restoration efforts while working with recognized regional wild rice leadership to provide Traditional Ecological Knowledge (TEK) as an important element of the ongoing efforts.

Fen Assessment for Mitchell's Satyr Butterfly and Eastern Box Turtle

Lehr Lake, a Tribally controlled lake in Branch County, MI, discharges to the St. Joseph River. Through prior assessments and as part of an Integrated Resource Management Plan, a high-value fen was revealed in this area that is host to several endangered species that are being threatened from advancing invasive species. In 2022, the NHBP completed an additional evaluation of Lehr Lake Fen, surveying for Mitchell's satyr butterfly habitat and eastern box turtle. A buffer strip of native vegetation was also planted in 2022 along the west side of Lehr Lake to improve habitat for native species. The Band will be using invasive species control measures in future years to reduce invasive species populations that are threatening native species in this Tribally and ecologically important habitat.

Eastern box turtle

Oneida Indian Nation

Invasive Species Mitigation

Oneida Indian Nation (Nation) lands are comprised of an approximately 300,000-acre Reservation in Central New York State that was created and recognized by the 1794 Treaty of Canandaigua, which was entered into between the Nation and the fledgling United States of America. Approximately 18,000 non-contiguous acres of Reservation land is owned by the Nation or held in trust for the benefit of the Nation. Nation lands include many tributaries and water bodies located within the Great Lakes Basin along with related wildlife and their habitats, including species of Native American cultural or traditional importance and species that are not hunted or fished. Reflective of enduring cultural values, the Nation's environmental policy requires sound environmental management practices to preserve and protect its environment and natural resources and ensure a safe, healthful, and productive environment for current residents and visitors on its lands, as well as for the seventh generation to come. Since 2018, with the assistance of BIA Great Lakes Restoration Initiative (GLRI) funding, the Nation has implemented and expanded a program to control identified invasive species affecting Nation lands.

Invasive Species

Prevent and Control Invasive Species

The Oneida Indian Nation has, to date, identified five invasive species within its jurisdiction: Water Chestnut, Giant Hogweed, Phragmites, Emerald Ash Borer, and Wild Parsnip. These invaders adversely impact the ecology of Nation lands because they out-compete native plants, spread rapidly, restrict recreational activities such as hiking, boating, and swimming, and can pose a significant risk of harm to humans. With support from the BIA GLRI program, the Nation has actively worked to limit the presence and control the spread of these invasive species on land and water.

Water Chestnuts BEFORE Treatment

Water Chestnuts AFTER Treament

Water Chestnuts: This invasive species must be manually removed from the water bodies it infests. The Nation engages a firm to utilize a harvester in the Nation's marinas to physically pull the water chestnuts from the water and deposit them where they can be safely destroyed. Each year of treatment improves the status of the marinas for the following year. In 2022, water chestnuts were also discovered in several ponds located on Nation property, and the Nation has since expanded these mitigation efforts to cover all such affected bodies of water.

Giant Hogweed: The Nation's efforts to combat giant hogweed, which can cause serious burns to the skin, have made a significant impact on the population of the species on Nation land. For several years, Nation staff have conducted surveillance activities to find and treat the plants. Each year, the population diminishes, and fewer treatments with herbicides and physical cutting of the plants are necessary.

Phragmites: In a relatively water-rich environment, Nation lands include a wide variety of ponds that are habitats for local plants and animals. Phragmites tend to grow quickly and take over the water bodies, damaging the natural habitat and limiting the recreational uses of the ponds. To manage this invasive species, the Nation treats the plants with an approved herbicide and then cuts and removes the plants.

Emerald Ash Borer: Ash trees have been a staple in the forests of the Oneida Indian Nation since time immemorial, and the emerald ash borer is causing devastation to the entire population throughout the region. The loss of these trees reduces forest density and the ability of the environment to respond to climate change and other impacts due to human use. Dead and dying trees can fall and cause damage to life and property. It can take years for an infestation to become apparent and to permanently damage the trees. Each infested tree must be treated early with an approved insecticide or safely removed and destroyed if the tree is beyond saving.

Wild Parsnip: Wild parsnip causes physical harm to humans when touched, and spreads quickly throughout Nation lands. The use of an approved herbicide to treat the plants reduces the population of the plants and prevents damage to the residents and guests of Nation lands. The Nation has recently begun to undertake mitigating measures to address this invasive species.

Oneida Nation

Invasive Phragmites Control, Overwinter Grazing, and Native Species Monitoring

The Oneida Nation Reservation is 65,430 acres in size located in the greater Green Bay area of the Fox River Basin. This includes wetlands, prairies, forests, and agriculture land. Great Lakes Restoration Initiative (GLRI) funds have supported multiple priority efforts for the Oneida Nation, including expanded grazing on agriculture lands, instead of row cropping, to reduce nonpoint pollution; increase wildlife habitat through native prairie plantings; and reduce invasive species by targeted spraying, mowing, and biocontrol.

Invasive Species

Biological Control of Invasive Phragmites

The Oneida Invasive Species Program has received GLRI support to implement invasive species control efforts and to continue to be an active partner in the Green Bay area and Fox River Basin. Phragmites poses a risk to multiple habitats important to the Oneida Nation. The Oneida Nation Invasive Species Program and Green Bay Botanical Gardens partnered with local and state organizations to raise and release *Galerucella* beetles to control invasive Purple Loosestrife. Since 2001, thousands of beetles have been released at numerous roadsides, wetlands, and natural areas on the Oneida Reservation and Green Bay Botanical Gardens property. The Tribe will continue survey and control efforts to protect and enhance ecologically and culturally important habitats.

Releasing Galerucella beetles.

Cattle winter grazing.

Nonpoint Pollution Prevention

Overwinter Grazing to Reduce Nonpoint Pollution

The Oneida Nation Reservation is in a largely agricultural watershed where high phosphorus and sedimentation levels are negatively impacting the watershed. One of the Tribes top priorities is addressing these water quality concerns. To address these issues, Oneida installed a high-tensile wire fence on the perimeter of a 240-acre row cropped field to utilize the corn stubble, instead of plowing, for outwintering about 100 cattle to improve soil and animal health, reduce manure storage, and reduce feed and fuel costs. An estimated 200 pounds of phosphorus will be reduced annually according to SNAP Plus calculations. Another 360 acres will be fenced in the summer of 2023 using GLRI support.

Acoustic recorder deployed at a restored wetland.

Habitats and Species

Bird and Bat Monitoring

Remote acoustic bird and bat monitoring continued in 2022 and incorporated refinements from the 2021 monitoring protocol. Forest, grassland, and wetland habitats are being monitored with acoustic recorders with point-count verification by ornithologists. This data is being utilized to make informed habitat management decisions and provides an indication of habitat quality.

Herpetology Research

Turtles are extraordinary creatures that can live as long, if not exceed, a human's lifetime. Oneida has had the privilege of monitoring turtle movements from favorite sunbathing, nesting, and hibernation locations for the past 4 years. This has been made possible with radio-telemetry transmitters and tracking equipment. Knowing the seasonal habitats these turtles use allows the Tribe to better manage their lands to protect these at-risk populations. To date Oneida Nation has documented and continued to monitor the movements of 12 turtles within the Oneida Reservation.

Alaina Noll, water resource specialist, tracking turtles.

Pokagon Band of Potawatomi Indians

Fish Contamination, Aquatic Invasive Species Prevention, River Restoration and Wild Rice Monitoring

The Pokagon Band of Potawatomi Indians (PBPI), located in Southwest Michigan and Northwest Indiana has tribal properties consisting of 6,720 acres within a ten-county service area. Habitat types include prairie, upland and lowland forests, wetland complexes, rivers, streams, lakes, and agricultural fields. The Pokagon Band's Department of Natural Resources (PBDNR) is responsible for managing habitat and wildlife populations on these lands.

Contaminants and Consumption Advisories

Eat Safe Fish

As part of the Eat Safe Fish project, PBDNR used electrofishing, hook and line fishing, and opportunistic collection to capture fish in tribal waters during 2021 and 2022. Fish were filleted and submitted to a lab for analysis of mercury and PCBs on two separate occasions. The results will be compiled to create locally relevant advisories for tribal citizens.

Invasive Species

Aquatic Invasive Species Units

Three aquatic invasive species (AIS) units were wrapped with a design that was developed collaboratively with PBDNR, Language and Culture, and Communications PBPI departments. The units incorporate Potawatomi language to provide a message of not transporting AIS and keeping them out of tribal waters. One unit was placed at a Michigan Department of Natural Resources boat launch via a cooperative agreement. Aquatic species surveys are being conducted for multiple seasons at the three launch locations to determine what species are currently present.

Aquatic invasive species unit.

Dowagiac River March 18, 2022

Habitats and Species

Dowagiac River Restoration

This project seeks to restore five historic meander bends through two phases, creating 1.29 river miles from 0.66 dredged and straightened river miles. The project will restore hydrology to approximately 53 acres of wetland through the reconnection of the river to its floodplains using natural channel design and creating complex in-stream habitats. Work began in early March 2022, and over 6 months two meander bends were restored. Phase two of the project began during the third quarter of 2022, with three meander bends to be restored during the spring and summer of 2023.

Dowagiac River September 9, 2022

Mnomen Monitoring

Since 2020, the PBDNR has monitored mnomen within Indiana Dunes National Park (INDU). PBDNR surveyed over 900 acres within the park and has collected seed for planting within the park. PBDNR continues to work collaboratively with INDU and has provided multiple educational opportunities for the community related to mnomen within the park. Additionally, PBDNR has worked with INDU to reduce invasive species that are negatively impacting the dune and swale environment within the park.

Another mnomen project includes monitoring rivers, creeks, and streams within and adjacent to the Pokagon Band's designated Service Area, ongoing since 2020. During the summer growing seasons, an average of 20 river miles have been surveyed (approx., 48 acres). Survey data included GPS location, number of mnomen and flowering stalks, stalk height, water depth and other plants, insects, or diseased mnomnen stalks present. An additional 250 acres of potential mnomen sites were surveyed but yielded no mnomen.

Red Cliff Band of Lake Superior Chippewa

Historic Lake Trout Spawning

The Red Cliff Band of Lake Superior Chippewa reservation is in far northern Wisconsin on the Bayfield Peninsula on the shores of Lake Superior and the Apostle Islands. The 14,500-acre Red Cliff Reservation stretches for 22 miles along the Lake Superior shoreline at the tip of the Bayfield Peninsula – the most northern part of mainland in what is now known as Wisconsin.

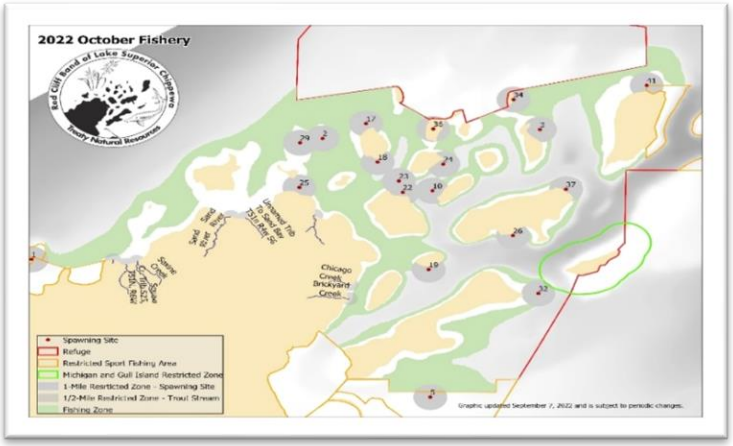
Habitat and Species

Fish Spawning Assessment

Through the use of Great Lakes Restoration Iniaitive (GLRI) support, the Red Cliff Band initiate a study to assess the current use of historical namegos (lake trout) spawning shoals near the Red Cliff Reservation and Apostle Islands. These shoals documented namegos use in a 1982 USFWS report.

Of the sites Red Cliff has sampled through 2022, thirteen (13) have been classified as likely spawning areas, ten (10) as unlikely, twelve (12) require additional sampling to determine status, and eight (8) sites have yet to be investigated. This work will continue until all the historic sites have been reevaluated.

Information from this work has been used to craft fishery regulations for the 2022 Experimental October Whitefish Fishery. The Experimental October Whitefish Fishery restricted fishing areas that were created around likely spawning sites and other areas that were undetermined as being spawning sites to reduce the unintentional catch of spawning namegos during the month long targeted adikameg (lake whitefish) fishery.



Map of historical spawning sites

Researcher collecting black bear hair

Mainland-Island Black Bears

The Red Cliff Band is cooperating with the University of Wisconsin-Madison and the National Park Service Apostle Islands National Lakeshore to conduct a study quantifying connectivity and viability of bear populations between Red Cliff and the Apostle Islands National Lakeshore. The third and final field season was completed in 2022. The processing and analyzing of results from those samples has been initiated. Final analyses and report writing by university partners will be occurring in 2023.

After initial evaluations and genotyping of 2020 and 2021 samples, 103 unique individual bears were identified. Looking at bear abundance through time (where it has previously been documented), it appears to be highly variable between subpopulations and over time on the islands but remained stable on Red Cliff between 2020 and 2021.

Saginaw Chippewa Indian Tribe of Michigan

Invasive Species Surveys, Prevention, and Control for Native Species Protection

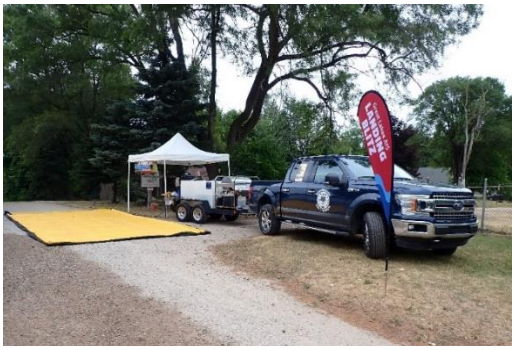
The Saginaw Chippewa Indian Tribe (SCIT) is comprised of 4,830 acres in Michigan's Isabella, Arenac, and Iosco counties. Many of the Tribe's properties have been taken over by both terrestrial and aquatic invasive species that threaten native species culturally significant to the Saginaw Chippewa Tribe. The Tribe has received a GLRI funding to establish an invasive species program and to begin treating invasive species so the lands can be restored with native plants.

Invasive Species

Management & MISIN Paddle of Chippewa River

The Saginaw Chippewa Invasive Species program has surveyed and inventoried approximately 3,500 acres of Tribal lands finding a range of invasive species including: black locust, Norway maples, autumn olive, narrow leaved cattail, purple loosestrife, *Phragmites*, reed canary grass, spotted knapweed, and European frogbit. Through collaborative efforts with local, national, and international organizations, Tribal Natural Resource Specialists also surveyed 15 miles of the Chippewa River and reported the presence of invasive species for the Midwest Invasive Species Information Network (MISIN); reporting autumn olive, curly pondweed, dame's rocket, garlic mustard, *Phragmites*, purple loosestrife, and quagga and zebra mussels. This information will prioritize future management efforts

2022 Chippewa River Invasive Species Paddle MISIN.



2022 Clean Boats, Clean Waters.

Clean, Drain, Dry

The SCIT's Environmental team coordinated with multiple State, Federal or local partners, while utilizing Great Lakes Restoration Initiative (GLRI) funding, to support the Clean Boats, Clean Waters program. Boat cleaning equipment was purchased and staff setup at local boat launches, providing no-cost boat washes to interested individuals. At the same time SCIT staff educated boaters on state boating laws and how to clean, drain, and dry their equipment to prevent the spread of aquatic invasive species (AIS). As part of the Great Lakes AIS Landing Blitz the Tribe was able to raise awareness about preventing AIS at Coldwater Lake, which in the past has had issues with zebra mussels.

Habitats and Species

Wild Rice Restoration

The SCIT purchased a Diver Assisted Suction Harvesting (DASH) boat that allows a diver to remove Eurasian watermilfoil from the bottom of a lake and send it to the boat through a suction hose. The AIS is then bagged and disposed of in a landfill or composting facility. DASH is the most effective treatment because it removes the entire plant, preventing spread, and keeps chemicals out of the lake that could negatively impact native species. As of fall 2022, SCIT has removed over 3,200 pounds of Eurasian watermilfoil from Tawas Lake, home of the largest wild rice bed in the State of Michigan.

Wild rice at Tawas Lake.

Saint Regis Mohawk Tribe, Akwesasne Mohawk Community

Food Plant Contaminant Testing, Area of Concern Co-Coordination Partnership, Invasive Species Monitoring and Control, and Lake Sturgeon Tracking

The Saint Regis Mohawk Tribe (SRMT) is located on the southern shore of the St. Lawrence River with tribal waters in the St. Regis and Raquette River, and Treaty Rights in the Grasse and Salmon Rivers. Fishing, trapping, medicinal plant harvesting and basket making are just some of the thriving cultural practices that depend upon the vitality of surrounding environment habitats.

Collection of water lily and cattail for chemical analysis .

Contaminants and Consumption Advisories

Contaminant Screening in Indigenous Medicinal and Traditional Food Plants – Phase I

With assistance from a local Mohawk medicinal plant and healing knowledge holder and SRMT contracted Ethnobotanist, a field study design was developed to target key plant species with food and medicine value for contaminant sampling. Phase I only covers a limited portion of the St. Lawrence River Area of Concern (AOC), targeting the 7-mile lower Grasse River Superfund Site – same areas as Mohawk 1796 Treaty reserved "Indian meadows". In 2021, over 20-plant species growing in the shoreline or riverbank were targeted for collection. Samples were process and frozen. In 2022, 40 samples were submitted to a laboratory for PCB congener analysis, with a subset of samples tested for pesticides and dioxin/furans. Results will be used to inform community of safe harvest zones in the Superfund Site for these legacy contaminants.

Tribal Capacity Building

St. Lawrence River Area of Concern (AOC) at Massena/Akwesasne

The SRMT and New York State Department of Environmental Conservation co-coordination partnership continues to make progress in developing removal criteria and management actions to remove the six beneficial use impairments (BUIs) in the St. Lawrence River AOC. Degradation of Benthos removal criteria and management actions were created and approved to correct impairments specific to the remediation areas. The Mohawk Cultural Use team drafted BUI removal criteria integrating traditional ecological knowledge (TEK) designed to teach traditional, cultural methods for multi-generational transmission of the traditional skills, knowledge, language, and stories related to fish, wildlife, and plants.

Pre-treatment monitoring of invasive Phragmites.

Invasive Species

Invasive Species Control and Native Vegetation Restoration

A multi-year project began in 2019 to manage invasive plants (invasive *Phragmites* and Japanese Knotweed), along tribal shorelines to promote riparian ecosystem function and availability of culturally significant and native plant species. Following an Integrated Pest Management approach, all project sites were confirmed to have one of the target species present. These were monitored for baseline data (e.g., pre-treatment data included area, stem density, height of the tallest stalk, and other site conditions such as proximity to buildings and roads), treated using an herbicide via foliar application or wicking depending on site conditions. Treated and dead stalks were later cut and burned to remove plant debris from the site to allow for easier detection of new growth, and sites were monitored for post-treatment changes. Simultaneously, the SRMT Native Plant Nursery, under the guidance of the Native Plants Working Group, identified species that should be propagated for shoreline restoration following invasive plant removal, and began seed and vegetative cutting collections to propagate the plants to meet the anticipated restoration effort needs. The Native Plants Working Group, comprised of Akwesasne community members, traditional medicine practitioners, traditional horticulturists, traditional basket makers, agriculture/ nursery workers, beekeepers, and other environmental professionals, meet quarterly to discuss local plant needs to ensure the plant nursery is taking these multiple and varied perspectives into consideration as the SRMT plans for the future landscape of Akwesasne.

Lake sturgeon monitoring.

Habitat and Species

Lake Sturgeon Monitoring Program

The SRMT has successfully completed three years of lake sturgeon sampling efforts (2019-2021). The Lake Sturgeon Monitoring Program used traditional practices of sturgeon fishing such as gill nets and baited trot lines to catch, document, PIT tag and release twelve lake sturgeon of various sizes from approximately 12" to over 36". Tracking of lake sturgeon will provide important information for future management efforts.

Sault Ste. Marie Tribe of Chippewa Indians

Coastal Wetland Restoration, Development of Adaptive Management Frameworks for Wildlife, Whitefish Rearing, and Deepwater Fish Community Assessments

The Sault Ste. Marie Tribe of Chippewa Indians (Sault Tribe) maintains a relatively small land base (<4,000 acres), while serving the largest membership of the tribes east of the Mississippi River (>40,000 members). Annually, the Sault Tribe's approximately 5,000 license holders exercise treaty rights across 36 Michigan counties within the 1836 Ceded Territory. The Natural Resources Department is charged with managing, protecting, and enhancing treaty rights opportunities across the 1836 Ceded Territory.

Invasive Species

Coastal Wetland Conservation and Restoration Initiative

Sault Tribe actively works to conserve and restore Great Lakes coastal wetlands for the benefit of wildlife, wetlands, and people in the 1836 Ceded Territory, including through monitoring and surveillance of invasive species. Great Lakes Restoration Initiative (GLRI) funding has supported Sault Tribe's efforts to initiate an invasive species surveillance and management program in the St. Marys River. Following systematic invasive species surveys, Sault Tribe conducts annual invasive species removal in priority locations. Alongside invasive species removal efforts, Sault Tribe is working to restore manoomin (wild rice) to suitable locations. GLRI funding has supported staffing for these efforts as well as the purchase of seed for restoration efforts.

Sault Tribe staff seeding manoomin (wild rice)

Sault Tribe utilizes trail cameras for ma'iingan assessments

Habitats and Species

Remnant Boreal Forest Ecosystem Initiative

Sault Tribe is engaged in several projects to better understand forest and wildlife ecology within the 1836 Ceded Territory to support development of adaptive management frameworks and plans for important wildlife species. Ongoing work supported by the GLRI includes development of an adaptive management framework for ruffed grouse in the Eastern Upper Peninsula of Michigan, Canada lynx habitat assessments on the major islands of the St. Marys River, pre- and post-burn monitoring to inform an inter-agency ishkode (fire) adaptive management plan with the United States Forest Service, and adaptive management of ma'iingan (gray wolf) in remnant boreal forest ecosystems.

Whitefish Rearing

Sault Tribe has been conducting an experimental lake whitefish rearing program for four (4) years through GLRI support. Under this support, a lot has been learned on the intricacies of rearing this important cultural, subsistence, and commercial species that has seen devastating impacts from invasive species. Rearing whitefish was completed in 2022 in earthen ponds for the first time with great success. Some of the largest whitefish reared in a hatchery setting were achieved through this project. Sault Tribe will continue evaluating whitefish rearing processes to determine how best to rear whitefish for stocking purposes

Deepwater Fish Community Assessment

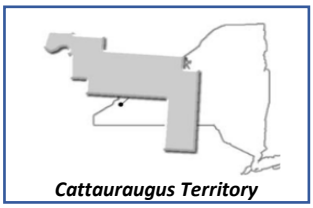
Sault Tribe conducted a deepwater fish community project offshore from Fairport, MI. Gillnets were paired with a remotely operated vehicle (ROV) to conduct surveys in waters that are rarely surveyed. This project, implemented with GLRI support, has vastly grown the capacity of Sault Ste. Marie Tribe to assess deep water fish communities and to visually inspect the lake floor in areas difficult to survey.

(L) Still image taken from video captured by the ROV in 115-m of water. Quagga mussel colonization is greater than 70% in this photo.

(R) Pond-reared whitefish being released into Nunns Creek

Seneca Nation of Indians

Eastern Brook Trout Restoration



The Seneca Nation's Cattaraugus Territory comprises 22,060.77 acres (34.47 square miles) in a primarily rural region of southwestern New York State. Located in the Great Lakes Basin, the Cattaraugus Territory has 1.1 miles of Lake Erie shoreline, with an additional 56.6 miles of streams and creeks. With funding from the Great Lakes Restoration Initiative, the Nation's Cattaraugus Territory has made great strides in habitat and species protection and restoration, as well as in eradication of invasive species.

Habitats and Species

Stream Restoration and Eastern Brook Trout Introduction by the Seneca Nation of Indians:

In 2021, the Seneca Nation of Indians began implementation of an in-stream and riparian restoration project on a Tribally important stream in the Cattaraugus Territory using support from the Great Lakes Restoration Initiative. The restoration will include the introduction of Eastern brook trout, a culturally and traditionally important species for the Seneca Nation that also provides sustenance for the Tribe and their neighbors. The Eastern brook trout are widely seen as a sign of clean freshwater, but the species has seen a dramatic decrease in the Great Lakes due to water quality and habitat loss. The Cattaraugus Territory is also home to a genetically unique population of Eastern brook trout. To increase habitat and improve water quality for this important species, the Tribe has implemented multiple stream restoration projects to reduce barriers and increase natural stream flows. In 2021, the Seneca Nation removed an old collapsed pipe in the Longhouse Road Spring Fed Creek and replaced it with a new pipe. Limestone was also added to the banks to reduce the potential for erosion along the streambank and around the culvert. Additionally, Eastern brook trout were released into the stream in 2020 and 2021 to increase native populations with this increased stream access. Using GLRI funds, the Seneca Nation of Indians will continue to conduct in-stream and riparian restoration projects in the Cattaraugus Territory that will create additional suitable and sustainable habitat for the Eastern brook trout.

Longhouse Road wild brook trout reintroduction.

Sokaogon Chippewa Community

Restoration of the Lake Michigan Strain of Walleye, Establishment of Monitoring and Early Detection Program for Aquatic Invasive Fish

The Sokaogon Chippewa Community, Mole Lake Band of Lake Superior Chippewa, is in the town of Nashville, in Forest County, Wisconsin. The reservation is southwest of the city of Crandon. The Mole Lake Indian Reservation is 4,904.2 acres in size, and includes land around Rice Lake, Bishop Lake, and Mole Lake. Approximately 500 Tribal Members live on the reservation, with an additional 1,000 Members living off the reservation. The Sokaogon Chippewa Community continues to harvest wild rice and spear fish in traditional ways and exercise their treaty rights. The Tribe utilizes state of the art technology to protect the resources of their environment for future generations.

Invasive Species

Early Detection Program for Aquatic Invasive Fish

Using a combination of boat electrofishing and fyke nets, the Tribe performed fish surveys to detect the presence/absence of aquatic invasive species (AIS) during the late summer – late fall of 2021. Both techniques are very effective at capturing fish species of all sizes, including very small fish. Surveys were aimed at aquatic invasive fish species of the highest priority including Eurasian ruffe, European rudd, rainbow smelt, round goby, redear sunfish, and three spine sticklebacks. The surveys were performed on twelve lakes. Electrofishing surveys were performed in early to late fall. Specifically, each night, 0.5-mile shoreline segments of a lake were surveyed. In each segment, all fish species of all sizes were netted and identified to species. A representative sample of each fish species were measured, and all fish were counted. Fyke netting occurred in late summer. Up to 10 mini-fyke nets were set around the shoreline perimeter of a lake for three days. Nets were emptied each day, and as above, all fish species were identified, measured, and counted. Mini-fyke nets have a very small mesh size and are very effective and efficient in capturing the smallest fish in the lake. No AIS species were found during 2021 surveys.

Fyke net set

Habitat and Species

Restoration of the Lake Michigan Strain of Walleye in the Treaty Territory of Wisconsin

Walleyes are an important fish species to the Sokaogon Chippewa Community. The Tribe is proactively involved in the management of walleye with the goal of maintaining healthy populations for generations to come. Many walleye populations are down from historic levels for a variety of reasons, most often from the reduction or elimination of natural recruitment. Possible causes include the impacts from invasive species, climate change, fish community shifts, and habitat loss. In early spring 2021, the Tribe collected spawn from walleye adult broodstock in the Menominee River at Marinette, WI. Walleye were captured in early spring as they migrate from Lake Michigan up the Menomonee River to spawn. Through previous genetic testing, this population of walleye has been confirmed to be the Lake Michigan strain. Fertilized eggs were then returned to the Tribal fish hatchery complex where they were incubated and hatched. Hatched walleye fry were stocked into Tribal rearing ponds in mid-May, and then raised to large fingerling size (6-9 inches in length) on minnow forage. In early October 2021, walleye were removed from rearing ponds and stocked into lakes within the Lake Michigan watershed and the historical native range of the Lake Michigan walleye strain. In all, 48,084 large fingerlings were raised and stocked into ten lakes. Lakes ranged in size from 73 to 1,272 acres, and walleye were stocked at rates of 5 to 15/acre. Walleye were of high quality (7.5-inch average length, 8.5 walleye/lb). The Sokaogon Chippewa Community will continue walleye collection, rearing, and stocking to restore populations to levels allowing exercising of treaty rights and traditional lifeways.

Walleye Stocking

St. Croix Chippewa Indians of WI

Extended Growth Walleye Rearing

The St. Croix Chippewa Indians of Wisconsin have several small communities over a three-county area in northwest Wisconsin. All communities are found near lakes or rivers, as well as several other habitat types including forest, wetlands, Pine Barrens, and some small patches of tallgrass prairie. With the help of GLRI funding the St. Croix Tribe has been working to restore Ogaa, or walleye, a species of cultural significance to the tribe.

Habitats and Species

Ogaa Rearing and Stocking in Tribally Important Lakes

Through Great Lakes Restoration Initiative (GLRI) support, the St. Croix Tribe (STC) initiated a project to rear ogaa (walleye) fingerlings for stocking for the Oneida Nation of Wisconsin. Ogaa have seen significant population declines across the Great Lakes Basin, including in lakes important to Tribes. The populations declines are due to multiple environmental stressors and human impacts, including land use changes. Through this GLRI support, ogaa will be stocked into waterbodies designated as culturally important by the Oneida Nation. STC will collect walleye spawn, incubate the eggs, and then rear the fingerlings to an average of 6" minimal length before transfer to important water bodies. This larger size allows for greater survival (especially compared to walleye stocked at 2"). Walleye are tested for viral hemorrhagic septicemia (VHS), by the University of Minnesota. A veterinarian will also perform a health check prior to stocking, providing vital health aspects of the large fingerlings while also looking for any parasites or diseases. This assessment also allows STC to compare size and health factors of those fingerlings to past fingerlings reared.

Unloading fingerlings by net and by hose into Oneida Nation waterbody.

At the harvest kettle.

Pulling the seine net across the pond bottom to move large fingerlings toward the outlet.

Stockbridge-Munsee Community

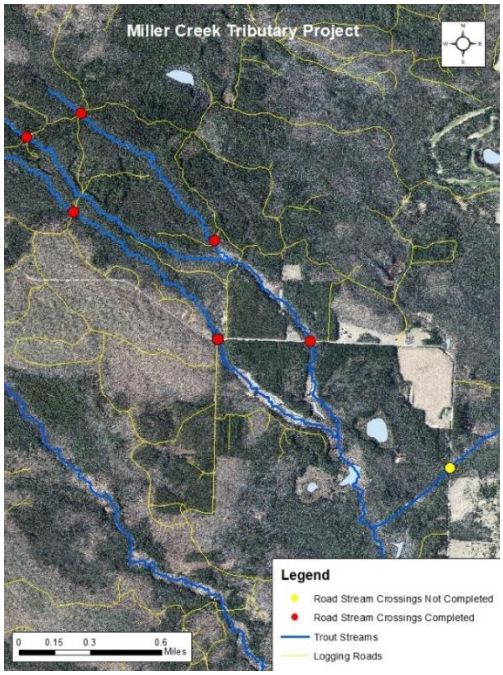
Miller Creek Tributary Project

The Stockbridge-Munsee Community (SMC) is a federally recognized Indian Tribe occupying the Reservation established by the Treaty of 1856 in the Townships of Bartelme and Red Springs, Shawano County, Wisconsin. SMC oversees the management of approximately 24,928 acres of land and a wide variety of fish and wildlife that reside within reservation boundaries.

Habitat and Species

Miller Creek Tributary

Using previous Great Lakes Restoration Initiative (GLRI) support, the Stockbridge-Munsee Community (SMC) completed a Reservation-wide culvert inventory which identified several culverts that were undersized, perched, misaligned, etc., and needed to be replaced to improve habitat for the brook trout (*Salvelinus fontinalis*), a culturally significant species to the tribe and a major source of sustenance for Tribal members. In addition, SMC utilized GLRI support to have staff complete the Aquatic Organism Passage, (AOP), stream simulation training conducted by the U.S. Forest Service. This training has helped to build capacity within SMC departments and will allow SMC staff to replace problem culverts without the use of outside contractors. In 2022, the SMC began replacing multiple culverts that were identified in the inventory, focusing on seven (7) culverts in tributaries to Miller and Gardner Creeks. Culvert replacements resulted in 5.96 miles of aquatic organism passage reconnected. A total of five (5) road stream crossings were replaced and or removed (four (4) replaced and one (1) removed) on tributaries to Miller Creek. The road leading to the one removed culvert has been decommissioned and seeded with native forbs and grasses. This crossing was deemed redundant and was not needed for Tribal activities. Brush bundles were added along the banks and staff will continue to monitor this crossing to ensure it remains closed to vehicle traffic. A total of two (2) culverts were replaced and removed on tributaries to Gardner Creek. The removed road stream crossing was not needed and the road leading to the crossing has been decommissioned, seeded with native forbs and grasses, and had brush bundles installed along the banks. SMC staff will continue to monitor the culvert replacements and decommissioned road stream crossings in future years to ensure activities had the desired impacts and repair any issues that may arise. SMC also had participants from the SMC Wisconsin Department of Natural Resources (WDNR) Summer Tribal Youth Program (STYP) assist with project activities. A total of ten (10) students over the grant period had hands on work experience with culvert replacements and removals. Staff discussed the importance of aquatic organism passage with the students and how correct placement and designing of road stream crossing can improve habitat for certain species.



Miller Creek Tributary map.

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Compete road stream crossing.

Tribal Great Lakes Restoration

Additional GLRI Photos

Saint Reais Mohawk Tribe – Native Plants Medicinal Tea Demonstration

Gun Lake Tribe – Frogbit Pull

Additional GLRI Photos

Nottawaseppi – Site Visit Aug 2022

Grand Traverse Band – CD3 Boat Wash Station

Fond du Lac – Poling through Manoomin

Keweenaw Bay Indian Community – Sand Point Restoration


Great Lakes
RESTORATION