Great Lakes Restoration Projects
Producing Results for People, Communities

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Stabilizing Bull Creek's streambed and banks prevented erosion and reduced sediment pollution in wetland habitats and Lake Michigan.

North of Chicago, Bull Creek flows into the wetlands of Illinois Beach State Park, which provide crucial habitat for several threatened species of migratory birds. The area surrounding Bull Creek before it flows into Lake Michigan is heavily developed due to its proximity to Chicago. When it rains, the paved surfaces nearby produce extremely fast and heavy stormwater runoff. This extreme runoff has eroded the streambed and stream banks of Bull Creek, resulting in heavy sediment and nutrient pollution that threatens the health of Illinois Beach State Park and degrades Lake Michigan’s water quality.

Thanks to a grant from the Great Lakes Restoration Initiative, Lake County was able to stabilize Bull Creek and reduce sediment and nutrient pollution. Workers carefully placed and positioned stones throughout the stream to slow down water flow and reduce erosion. Workers also enhanced and restored 2.3 acres of stream habitat. They removed invasive plants and planted native vegetation, and cleared dead ash trees to allow the native seeds to germinate. They also removed accumulated debris in Bull Creek’s floodplain. Primary construction concluded in December 2017, and Lake County plans to conduct two years of post-construction maintenance on the project site.

APPROXIMATE COST OF PROJECT: About $593,000, of which $446,603 was provided by the Great Lakes Restoration Initiative.

RESOURCE CHALLENGES ADDRESSED: Erosion, sediment runoff, nutrient pollution, loss of wetland habitat, and low water quality.


RESULTS AND ACCOMPLISHMENTS: This project stabilized streambeds and 1,475 linear feet of stream banks. This restoration reduced erosion and nutrient pollution that degraded wetland habitat and water quality in Lake Michigan. The project also enhanced 2.3 acres of stream habitat by planting native vegetation that stabilized soil on the riverbanks. Lake County expects these stabilization efforts to reduce nutrient pollution more than 6 percent and sediment runoff by 36.4 percent, annually. The cumulative benefits will substantially increase water quality in Bull Creek and Lake Michigan.
Installing nature-based infrastructure at three sites in Hobart, Ind., is preventing at least 800,000 gallons of polluted stormwater runoff from flowing into Lake Michigan annually.

The city of Hobart is located at the confluence of several rivers and creeks, where multiple tributaries connect with Deep River. While these waterways provide Hobart with an abundance of natural resources and wetlands, they are also conduits for polluted urban stormwater to enter the Deep River watershed and ultimately into Lake Michigan.

Thanks to a grant from the Great Lakes Restoration Initiative, the Delta Institute partnered with the city of Hobart to implement three projects that will decrease stormwater runoff and improve the quality of life in the community. These projects were installed in three publicly owned sites upstream of the Deep River to prevent polluted runoff from traveling further downstream.

At Hillman Park, workers transformed an existing drainage ditch between two baseball fields into a hybrid ditch and bioswale—natural, sloped features with plants that are designed to trap pollutants and runoff. Workers also removed invasive plants from the area and replaced them with native prairie plants. At Hobart Middle School, workers installed a rain garden in a concrete courtyard that was previously underutilized by students and teachers, along with seating and educational signs that explain how rain gardens work. And at City Hall, workers installed additional rain gardens, stormwater planters, and permeable pavement that allows rain to infiltrate into the ground, rather than collecting on paved surfaces and becoming stormwater runoff. The Delta Institute completed primary construction in 2018, and is currently developing strategies to monitor the performance of these natural infrastructure installations.

APPROXIMATE COST OF PROJECT: About $500,000, of which $355,370 was provided by the Great Lakes Restoration Initiative.

RESOURCE CHALLENGES ADDRESSED: Stormwater runoff, urban pollution, low water quality, lack of green infrastructure.


TYPES OF JOBS CREATED: Contractors, equipment operators, landscape architects, maintenance workers, and green infrastructure professionals.

WEBSITE: https://delta-institute.org/initiatives/

RESULTS AND ACCOMPLISHMENTS: These projects are expected to prevent at least 800,000 gallons of polluted runoff from entering Lake Michigan annually. The three project sites are all on public property in high-profile locations, beautifying the city and spreading awareness about stormwater management through nature-based infrastructure. In particular, the rain garden installed at the middle school provides a lot of educational opportunities for students. The school is already working on incorporating this space into science classes and environmental education programs.
Harvesting invasive cattails in 200 acres of coastal wetlands helped native plants return, restored habitat and paved the way for fish to flourish.

The coastal wetlands surrounding the Straits of Mackinac, where Lakes Michigan and Huron meet, are some of the highest quality wetlands remaining in the Great Lakes region. Unfortunately, many of these marshes have become overrun by non-native cattails, a water reed. In addition to outcompeting native plants, invasive cattails and their dead stalks clog the wetlands, altering their natural flow and harming habitat. They also prevent Great Lakes fish, such as northern pike and yellow perch, from accessing their spawning grounds in the coastal wetlands.

Thanks to a grant from the Great Lakes Restoration Initiative, researchers from Loyola University Chicago combined practical restoration of these wetlands with research into alternative approaches to cattail control. Their prior research demonstrated that commonly used controls such as fire and herbicide might effectively kill cattail stands, but did not remove the problematic dead stalks that block fish access. To address this, the researchers designed a new approach: using an aquatic tractor, workers harvested and removed invasive cattails from 200 acres of wetlands. In other areas, workers dug channels that allowed water to flow through the cattail stands, creating passageways for fish and other aquatic wildlife. The researchers also set up experimental plots to conduct variations on these treatment techniques. They are currently collecting and interpreting data from these experimental plots, and hope to understand which methods offer the most promise for future restoration success. The researchers are also investigating potential applications for the huge quantities of biomass they are harvesting, such as biofuel or compost.

**APPRAOCHC COST OF PROJECT:** $649,695, provided by the Great Lakes Restoration Initiative.

**RESOURCE CHALLENGES ADDRESSED:** Aquatic invasive plants, lack of fish and wildlife habitat, altered wetland water flow.

**KEY PARTNERS (PUBLIC AND PRIVATE):** Great Lakes Restoration Initiative, Loyola University Chicago, University of Connecticut, Oregon State University, Dartmouth University, University of Minnesota, Michigan Tech University, Sault Ste. Marie Tribe of Chippewa Indians, and Three Shores Cooperative Invasive Species Management Area.

**TYPES OF JOBS CREATED:** Researchers, equipment operators, and field technicians.

**WEBSITE:** https://www.luc.edu/sustainability/research/grantsfunding/

**RESULTS AND ACCOMPLISHMENTS:** Workers treated 200 acres of coastal wetlands to remove invasive cattail stands, restoring the natural flow of the wetlands, improving habitat, and allowing aquatic wildlife to access the wetlands from the open water. Removing the cattails also stimulates the germination of seed banks, allowing native plants to return to the marshes. Restoring plant diversity further enhances habitat quality. The experimental aspect of this project will give researchers and restoration managers a better understanding what technique produces the best results for coastal wetland restoration.
Removing invasive species and restoring 317 acres of land surrounding Duncan Bay improved aquatic habitat and fostered outdoor recreational opportunities.

Duncan Bay is located on Lake Huron, just outside of Cheboygan, Mich. Undisturbed areas surrounding Duncan Bay still support wide varieties of wildlife and habitat. A mosaic of marshes, dunes, swales, and upland forests provide habitat for many rare species and migrating birds. Unfortunately, as with many coastal ecosystems in this region, encroaching development and invasive plants threaten to degrade this special ecosystem. Furthermore, while this area provides important habitat for coaster brook trout, several road crossings with old, undersized culverts prohibit fish passage and introduce street pollution and sand into the streams.

Thanks to grants from the Great Lakes Restoration Initiative and others, the Huron Pines Resource Conservation and Development Council was able to create and protect a large tract of undisturbed land in this area. First, Huron Pines coordinated the purchase of 317 acres of coastal property, which were placed into a local preserve system. Workers then removed invasive plants, replacing them with native plants to restore the shoreline wetlands. Two old, failing culverts will be replaced with larger structures that naturalize stream flow, allowing brook trout to pass through them. Little Traverse Conservancy and their partners are also building a trail system, complete with a boardwalk and viewing platform, that will encourage recreational use of the area. Primary construction is expected to conclude in 2019, after which the property will be maintained by the Little Traverse Conservancy.

APPROXIMATE COST OF PROJECT: About $900,000, of which $371,909 was provided by the Great Lakes Restoration Initiative via the National Fish and Wildlife Foundation - Sustain Our Great Lakes program, as well as the U.S. Fish and Wildlife - Coastal Service Program.

RESOURCE CHALLENGES ADDRESSED: Invasive species, lack of fish and wildlife habitat, sediment pollution, low aquatic connectivity.


TYPES OF JOBS CREATED: Field staff, conservation workers, AmeriCorps members, volunteers, and general labor.

WEBSITE: https://huronpines.org/2017/06/28/forever-duncan-bay/

RESULTS AND ACCOMPLISHMENTS: This project protected 317 acres of high-value coastal habitat and 3,500 feet of shoreline from being fragmented by future development. The project restored wetland and upland habitat by removing invasive plants and planting natives, and restored aquatic habitat by upgrading the culverts at two road-stream crossings to reduce sediment pollution and allow passage by coaster brook trout. A trail system will provide recreational access to the property and help connect the city of Cheboygan with the nearby Cheboygan State Park.
Stabilizing and restoring Knowlton Creek has reduced erosion and sediment pollution into Lake Superior, improved brook trout habitat, and enhanced outdoor recreation.

Knowlton Creek is a small tributary to the St. Louis River that has historically supported a variety of native wildlife, including brook trout. Unfortunately, a combination of factors significantly increased runoff into Knowlton Creek, which eroded stream banks and caused heavy sediment pollution that degraded trout habitat and contributed to pollution in the St. Louis River and Lake Superior. The deep erosion in the stream also prevented overflow into the floodplain of the creek, which further exacerbated erosion and sediment pollution.

Over the past several years, local organizations and governments have worked to reduce excessive runoff into Knowlton Creek. Thanks to grants from the Great Lakes Restoration Initiative and others, the Minnesota Department of Natural Resources built on this earlier work to restore the creek and its floodplain. Rocks and boulders were placed in and around the creek to slow the flow of water as a way to reduce erosion. In some stretches, workers installed rocks and logs along the shore and in the river to create an entirely new channel, which also provided brook trout habitat. Redirecting the stream also created valuable wetland habitat in the old stream channel. Primary construction for the project concluded in 2016, and early survey results indicate that reintroduced brook trout populations have been thriving in Knowlton Creek.

**APPROXIMATE COST OF PROJECT:** Approximately $1,600,000, of which $700,000 was provided by the Great Lakes Restoration Initiative.

**RESOURCE CHALLENGES ADDRESSED:** Sediment pollution, erosion, inaccessible floodplain, degraded fish and wildlife habitat.

**KEY PARTNERS (PUBLIC AND PRIVATE):** Great Lakes Restoration Initiative, City of Duluth, Spirit Mountain Recreation Area, U.S. Army Corps of Engineers, City of Cloquet, and Stantec Consulting.

**TYPES OF JOBS CREATED:** Contractors, construction workers, public employees, outdoor recreation industry jobs, and general labor.

**WEBSITE:** [https://www.dnr.state.mn.us/input/environmentalreview/knowlton/index.html](https://www.dnr.state.mn.us/input/environmentalreview/knowlton/index.html)

**RESULTS AND ACCOMPLISHMENTS:** This project restored 6,500 feet of coldwater stream habitat and 18 acres of riparian floodplain. The Knowlton Creek Watershed Project will also improve regional water quality in the St. Louis River Area of Concern—one of 43 areas of concern around the Great Lakes with high levels of habitat pollution or degradation. Brook trout reintroductions in 2014 and 2015 have proven to be successful following the completion of this work, and Knowlton Creek is now supporting the natural reproduction of brook trout. Brook trout is an important game species, meaning this project will also enhance outdoor recreation and benefit the local economy.
Planting native vegetation stabilized sand dunes near North Sandy Pond, protecting crucial nesting habitat for endangered piping plovers.

North Sandy Pond spans 2,400 acres and is located in the heart of a larger dune and wetland ecosystem near eastern Lake Ontario. The dunes, beaches, and near-shore sandbars in this region form a coastal barrier that shelters 5,000 acres of critical wetland habitat for a variety of native birds, including the federally endangered Great Lakes piping plover. North Sandy Pond is also a popular spot for recreationalists to anchor their boats before walking through the dunes to the lake shore. Unfortunately, this foot traffic damages the fragile but ecologically vital beach grass that stabilizes the dunes. Losing the beach grass makes the dunes more susceptible to wind erosion, resulting in blowouts that damage the dunes. These sand dunes cannot be replaced as they are a remnant of the post glacial period.

Thanks to a grant from the Great Lakes Restoration Initiative, the New York State Office of Parks, Recreation, and Historic Preservation was able to stabilize these dunes while taking steps to prevent future erosion. The office hired several Dune Stewards to replant beach grass to stabilize the sand. The stewards mapped larger populations of invasive plants to aid in future control efforts, while removing invasives where they could. Snow fencing was installed to direct foot traffic away from sensitive vegetation, while also capturing wind-blown sand, preventing it from leaving the dune complex. Dune Stewards installed fencing to protect important nesting areas for birds and conducted daily monitoring of piping plover populations. In 2019, a walkway will be constructed to allow visitors to access the lakefront without damaging the newly planted dune grass.

**APPOROXIMATE COST OF PROJECT:** About $210,000, of which $149,060 was provided by the Great Lakes Restoration Initiative.

**RESOURCE CHALLENGES ADDRESSED:** Erosion, loss of wildlife habitat, invasive species, and damaging recreational activities.


**TYPES OF JOBS CREATED:** Dune Stewards, public employees, volunteers, and equipment operators.

**WEBSITE:** https://parks.ny.gov/parks/153/details.aspx

**RESULTS AND ACCOMPLISHMENTS:** By protecting the dunes, the project will also protect the 2,400-acre North Sandy Pond and its surrounding wetland habitat, which is sheltered by the dunes from storm surges coming off of Lake Ontario. These efforts have resulted in the first successful nesting of piping plovers on the eastern shore of Lake Ontario in over 30 years. The project will allow responsible recreational use of North Sandy Pond and the dunes to continue.
Removing invasive Phragmites reeds and installing native plants and trees has restored Mentor Marsh, resulting in the return of a variety of native fish and wildlife species, including otters and beavers.

Mentor Marsh is one of the largest natural marshes remaining along Lake Erie’s shoreline. The 4-mile long marsh was originally a swamp forest that several species of Lake Erie fish used as spawning and nursery grounds. The swamp forest was also recognized by the National Audubon Society as an important birding area, providing migratory and nesting habitat for a wide variety of song birds and waterfowl. The health of this unique ecosystem began to degrade in the 1960s, however, when a salt landfill was installed at the swamp’s perimeter. The drastically increased salinity quickly killed many of the swamp trees and marsh plants that had defined the ecosystem. In their absence, non-native Phragmites—a water reed—gained a foothold, dominating the ecosystem within just a few years. Phragmites grows in very dense stands, outcompeting native plants for resources and degrading habitat for native fish and wildlife.

Thanks to several grants from the Great Lakes Restoration Initiative and others, the Cleveland Museum of Natural History has been able to remove most of the Phragmites and restore the natural ecology of Mentor Marsh. Workers sprayed large Phragmites stands with herbicide from helicopters and took amphibious vehicles into the marsh to remove persistent stands by hand. As the invasive Phragmites were removed many native plants, such as bur-reed, began to naturally reemerge from the long-dormant seed bank. Workers accelerated the transition to a natural ground cover by planting and staking over 19,000 native plants such as willow and button bush. So far, over 200 acres of Mentor Marsh have been successfully restored. The Museum is working to secure additional funding, and hopes to eventually eradicate invasive plants from the site.

**APPROXIMATE COST OF PROJECT:** About $1 million, including two grants totaling $170,639 provided by the Great Lakes Restoration Initiative.

**RESOURCE CHALLENGES ADDRESSED:** Invasive species, degraded fish and wildlife habitat, lack of access to site for outdoor recreation.

**KEY PARTNERS (PUBLIC AND PRIVATE):** Great Lakes Restoration Initiative, The Cleveland Museum of Natural History, The Nature Conservancy, Ohio Department of Natural Resources Division of Natural Areas and Preserves, Lake County Soil and Water District, and the City of Mentor.

**TYPES OF JOBS CREATED:** Consultants, contractors, and general labor.

**WEBSITE:** [https://www.cmnh.org/mentor-marsh](https://www.cmnh.org/mentor-marsh)

**RESULTS AND ACCOMPLISHMENTS:** Over 200 acres of Mentor Marsh have been successfully restored by removing invasive Phragmites and allowing native marsh plants to reemerge from the seed bank. Fish and wildlife not seen in the marsh for years or even decades have begun returning, including river otters and beavers. Northern pike and yellow perch have started using Mentor Marsh as spawning and nursery habitat again. Bald eagles, marsh wren, Virginia rail, sora rail, least bittern, and American bittern have been seen nesting there, while several sparrow species have begun feeding in Mentor Marsh during their migrations. The return of these birds has also significantly enhanced opportunities for bird-watching.
Replacing a culvert, stabilizing a road to prevent sedimentation and restoring fish habitat allowed for fish passage in a small stream that eventually feeds into Lake Ontario.

About 20 years ago a culvert was installed beneath a private driveway in Potter County to accommodate a small tributary stream which eventually flows into Lake Ontario. Unfortunately, this culvert created a barrier that prevented brook trout from migrating to prime upstream habitat. This loss of quality habitat was exacerbated by the erosion of a small dirt and gravel road adjacent to the stream during storms, resulting in heavy sediment build up that degraded the stream’s habitat.

Thanks to several grants, including one from the Great Lakes Restoration Initiative, the Potter County Conservation District was able to replace this culvert, improve trout habitat, and stabilize the road to prevent sediment pollution. The new culvert allows for a more natural stream flow and enables aquatic organism passage. Workers further enhanced trout habitat by installing boulders and logs in the stream to produce ripples, pools, and other trout habitat features. Workers also installed natural features to improve drainage and reduced stormflow in the adjacent road. Finally, they partially resurfaced that stretch of road to reduce erosion caused by automobile traffic, and planted willow saplings between the road and the stream to further stabilize the soil.

APPROXIMATE COST OF PROJECT: About $260,000, of which $99,477 was provided by the Great Lakes Restoration Initiative.

RESOURCE CHALLENGES ADDRESSED: Poor fish habitat, barriers to fish migration, sedimentation, erosion.

KEY PARTNERS (PUBLIC AND PRIVATE): Great Lakes Restoration Initiative, Potter County Conservation District, Trout Unlimited, Genesee Headwaters Watershed Association, Pennsylvania Department of Transportation, Bingham Township, Center for Dirt and Gravel Roads, National Fish and Wildlife Foundation, and Potter County.

TYPES OF JOBS CREATED: Contractors, suppliers, manufacturers, construction workers, public employees, and equipment operators.


RESULTS AND ACCOMPLISHMENTS: This project opened up 10 miles of prime upstream habitat for brook trout spawning in the Genesee River tributary. The project also stabilized 2.5 miles of an adjacent dirt and gravel road to reduce sedimentation, protecting brook trout habitat. Potter County Conservation District and its partners are currently measuring the performance of this project through fish tagging and stream monitors. They hope that this project becomes a model for Potter County townships and private landowners interested in improving fish habitat and opening up previously blocked habitat, and they are securing funding to perform similar projects on other priority sites throughout the county. By improving brook trout habitat and migration, this project will enhance sport fishing and other recreational opportunities in the area.
Removing Phragmites and other invasive plants has allowed native plant communities to recover, restoring healthy habitat and enhancing opportunities for outdoor recreation.

Western Pennsylvania’s Presque Isle is an arching spit of land that juts out into Lake Erie. The beaches, dunes, and emergent wetlands that make up Presque Isle provide a rich habitat for native plants and wildlife. The 3,200 acre park supports the largest concentration of rare plants in Pennsylvania, including twig rush and whorled water milfoil, and provides crucial habitat for endangered birds such as piping plover and least bittern. Unfortunately, its location also makes Presque Isle susceptible to invasive plants such as the non-native water reed Phragmites. Over the past several decades, the entire peninsula has been overtaken by invasive plants that push out native plants and severely degrade wildlife habitat.

Thanks to a grant from the Great Lakes Restoration Initiative, Ducks Unlimited and several partners have been working to remove these invasive plants and plant native species. Workers combined hand-pulling and herbicide application to eradicate Phragmites and other invasives from over 400 acres of wetland habitat. Native plants were transplanted to the treated wetlands to restore the habitat. Ducks Unlimited and its partners finished these efforts in 2018, and are currently monitoring the recovery of native plant and animal populations in the park. Going forward, they hope to expand on this project, and have already successfully applied for a grant that will enable them to treat an additional 800 acres of Presque Isle beginning in 2019.

**APPROXIMATE COST OF PROJECT:** $987,415, including a grant for $525,626 provided by the Great Lakes Restoration Initiative.

**RESOURCE CHALLENGES ADDRESSED:** Invasive species, lack of fish and wildlife habitat, less outdoor recreation access.

**KEY PARTNERS (PUBLIC AND PRIVATE):** Great Lakes Restoration Initiative, Ducks Unlimited, Regional Science Consortium, Tom Ridge Environmental Center, Environment Erie, Pennsylvania Department of Conservation of Natural Resources, Pennsylvania Game Commission, Northwest Pennsylvania Planning Area, Erie Bird Observatory, Penn State University, and California University of Pennsylvania.

**TYPES OF JOBS CREATED:** Resource managers, professors, university staff, public employees, interns, and graduate students.

**WEBSITE:** http://www.ducks.org/pennsylvania/pennsylvania-conservation-projects/pennsylvanias-presque-isle-wetlands-being-restored

**RESULTS AND ACCOMPLISHMENTS:** This project has successfully removed Phragmites and other invasive plants from over 442 acres of wetland habitat, exceeding the project’s original goal of 400 acres. Removing invasives and restoring native plant communities improves land and aquatic habitat, as well as water quality. There has been anecdotal evidence that amphibian, reptile, and bird populations are recovering. Nesting pairs of piping plovers have been spotted in the park for the first time in 50 years. Improving fish and wildlife habitat has also enhanced opportunities for bird and wildlife viewing, fishing, and hunting. This increased tourism and outdoor recreation benefits the local economy.
Constructing a wetland retention basin in Superior’s Central Business District is reducing damaging floods and the flow of pollutants into Lake Superior.

The City of Superior has recently seen several storms cause sewer overflows and flooding, resulting in significant property damage. During one large storm in 2012, hundreds of basements in the city’s Central Business District flooded. These fairly regular floods also overwhelm the city’s wastewater treatment plant, resulting in untreated stormwater carrying pollutants into the St. Louis River and Lake Superior.

Thanks to several grants, including one from the Great Lakes Restoration Initiative, Superior installed a wetland retention basin to hold rain water so that it does not overwhelm the sewer system and flood people’s homes and neighborhoods. In 2016 workers began excavating the basin at a former parking lot in the Central Business District. During heavy rains the stormwater flows into a pool where pollutants can settle out of the water before entering into a meandering wetland, allowing more time for pollutants to be removed from the water. Workers also installed trees and native plants along the shoreline to absorb additional stormwater, which in turn created wildlife habitat and an appealing green space for residents. The City of Superior is designing informational packets on the basin and stormwater management for local schools. They also plan to provide funding for field trips that allow students to visit the basin for water quality testing and wildlife viewing.

**APPROXIMATE COST OF PROJECT:** $740,000, including a grant of $250,000 provided by the Great Lakes Restoration Initiative.

**RESOURCE CHALLENGES ADDRESSED:** Stormwater runoff, flooding, property damage, pollution and sedimentation, poor water quality.

**KEY PARTNERS (PUBLIC AND PRIVATE):** Great Lakes Restoration Initiative, City of Superior, and Limnotech.

**WEBSITE:** [https://www.ci.superior.wi.us/574/Stormwater-Management](https://www.ci.superior.wi.us/574/Stormwater-Management)

**RESULTS AND ACCOMPLISHMENTS:** Based on past results from earlier retention ponds installed in Superior, the city expects this project to almost completely eliminate basement flooding in the Central Business District. The project will also improve stormwater treatment by decreasing demand on the wastewater treatment plant during storms, which will enhance the water quality in Lake Superior. The plants and trees around the shoreline provide habitat for a variety of wildlife. The basin is also an attractive green space that people can visit in a part of the city without many natural areas.
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Prepared for the
Healing Our Waters—Great Lakes Coalition
by
Andrew Whelan

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of more than 150 groups representing millions of people, whose common goal is to restore and protect
the Great Lakes. Learn more at healthylakes.org. Follow us on Twitter @healthylakes.

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