

Great Lakes RESTORATION



Great Lakes Restoration Initiative Report to Congress and the President

Fiscal Year 2017



CONTENTS

Message from the Chair of the Great Lakes Interagency Task Force.....	2
Section 1 - Executive Summary.....	3
Section 2 - Program Accomplishments.....	5
Focus Area 1: Toxic Substances and Areas of Concern... ..	5
Focus Area 2: Invasive Species... ..	9
Focus Area 3: Nonpoint Source Pollution Impacts on Nearshore Health	13
Focus Area 4: Habitat and Species	17
Focus Area 5: Foundations for Future Restoration Actions... ..	21
Section 3 – Regional Partner Engagement.....	25
Section 4 – Financial Reporting.....	26
Appendix A – GLRI Action Plan II: Measures of Progress... ..	29

About This Report

This report presents an overview of the Great Lakes Restoration Initiative progress. It includes information on funding, project accomplishments, success stories, and performance on Action Plan Measures of Progress through Fiscal Year 2017. Data on direct spending is taken from the U.S. Environmental Protection Agency financial systems. Information on Great Lakes Restoration Initiative projects and activities is available at <http://glri.us>.

The EPA Administrator is required by Clean Water Act Section 118 (c)(7)H(iii), to provide this report to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate. This annual report provides a detailed description of the progress of the Initiative and the amounts transferred to participating Federal departments and agencies.

The report also satisfies the Action Plan II Measure of Progress for issuance of annual GLRI reports to Congress and the President.

MESSAGE FROM THE CHAIR OF THE GREAT LAKES INTERAGENCY TASK FORCE

The Great Lakes Restoration Initiative shows that we can both improve the health of our environment and the health of our economy. I am proud of the work done by the U.S. Environmental Protection Agency and our partners to improve the quality of the Great Lakes ecosystem and the health of the citizens who live within its midst. The success of this effort has required maintaining a steady balance between the health of our environment and the strength of state and local economies that rely on this binational treasure. Having grown up in Ohio, I personally understand and appreciate the importance and significance of the Great Lakes.

This initiative has been made possible through resounding bipartisan support, the cooperation of 11 federal departments, and their partners from states, tribes, municipalities, businesses, citizens' organizations, academia and other stakeholders within the Great Lakes Basin. Our joint efforts have resulted in unprecedented progress in Great Lakes restoration.



As this Report to Congress and the President shows, the GLRI has worked to clean up contaminated “Areas of Concern”— areas that, once restored, will increase property values and property tax bases. This program has worked diligently to prevent populations of Asian carp, a species that could do irreparable harm to the region’s economy and ecology if introduced, from entering the Great Lakes. In addition, GLRI investments have reduced nutrient runoff to our most sensitive waterways, such as Lake Erie, Saginaw Bay, and Green Bay, and helped farmers develop sustainable, yet productive methods for working in conjunction with the ecosystem they rely on.

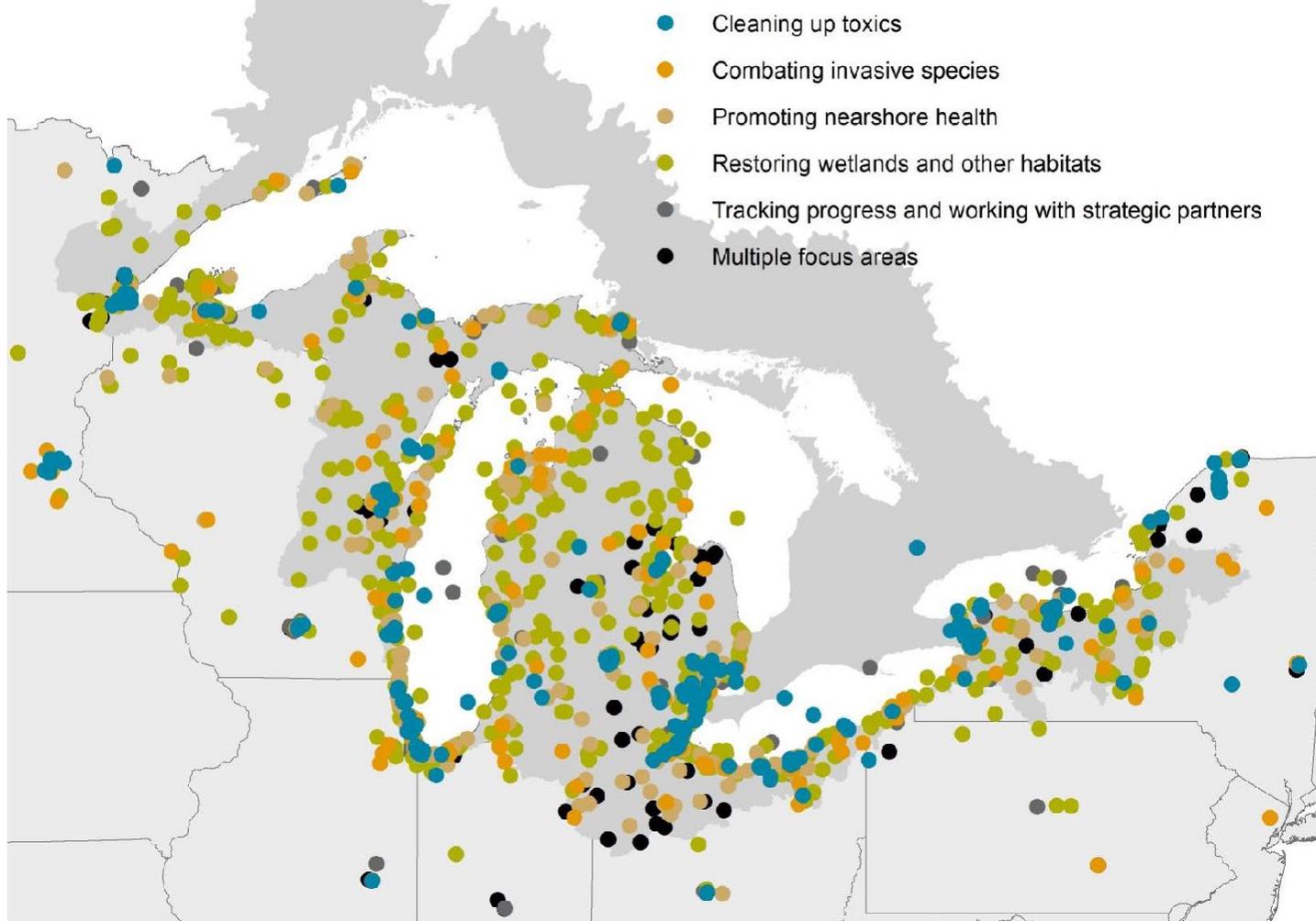
I am proud that since FY 2010, GLRI investments have spread across almost 300,000 square miles and have supported more than 4,000 projects within the Great Lakes basin. These investments have made a monumental difference in repairing and protecting one of the United States most unique and significant natural resources for the more than 24 million U.S. citizens who rely on the Lakes’ recreational and economic value. We are fulfilling our mission to restore and protect this ecosystem’s health so our country’s children and their children can live in safe, healthy, and prosperous communities for generations to come.

A handwritten signature in black ink that reads "Andrew Wheeler".

Andrew Wheeler
Chair, Great Lakes Interagency Task Force

Acting Administrator, U.S. Environmental Protection Agency

Great Lakes Restoration Initiative Projects from FY 2010 – FY 2017



Section 1 – Executive Summary

The Great Lakes Restoration Initiative, or the GLRI, was launched in 2010 to accelerate efforts to protect and restore the largest system of fresh surface water in the world, the Great Lakes. The GLRI has been critical to addressing the most persistent and challenging environmental problems facing this important ecosystem.

The GLRI has been a catalyst for unparalleled federal agency coordination – through both the Interagency Task Force (IATF) and the Regional Working Group (RWG), which are led by the EPA. This coordination has produced unprecedented results. GLRI, with the unique authority to supplement agency base budgets, has funded over 4,000 projects that address the most important Great Lakes environmental issues, including improving water quality, protecting and restoring native habitats and species, and preventing and controlling invasive species.

The Great Lakes Restoration Initiative Action Plan II, released in September of 2014 (<http://greatlakesrestoration.us/actionplan/pdfs/glri-action-plan-2.pdf>), identifies the most significant ecosystem problems that exist in the Great Lakes Basin and identifies ways to solve them.

In December of 2016, Congress amended Clean Water Act Section 118, to include authorization of the Great Lakes Restoration Initiative in the amount of \$300 million annually for fiscal years 2017 through 2021 and direction to address five priority areas including: (i) the remediation of toxic substances and areas of concern; (ii) the prevention and control of invasive species and the impacts of invasive species; (iii) the protection and restoration of nearshore health and the prevention and mitigation of nonpoint source pollution; (iv) habitat and wildlife protection and restoration, including wetlands restoration and preservation; and (v) accountability, monitoring, evaluation, communication, and partnership activities.

The first four of these priority areas correspond directly with the Action Plan II Focus Areas described below. The fifth priority area is addressed within Action Plan II Focus Area 5 - Foundations for Future Restoration Actions. This report provides an overview of progress during FY 2017 for each Focus Area of Action Plan II. It also includes select success stories, detailed information on funding, and performance information for Action Plan II Measures of Progress.

GLRI Action Plan II Focus Areas

1) Toxic Substances and Areas of Concern

In FY 2017, federal agencies and their partners completed all the management actions needed to delist three Areas of Concern (AOC): River Raisin AOC in Michigan, the St. Marys River AOC in Michigan, and the Lower Menominee Area of Concern in both Michigan and Wisconsin. In FY 2017, the GLRI, in coordination with its federal, state, and regional partners, removed eight Beneficial Use Impairments (BUI) in five AOC bringing the total cumulative number of Beneficial Use Impairments removed to 63 since the GLRI's inception in 2010 – more than six times the number removed in the previous 22 years. The GLRI also continued its work to protect human health from contaminants in Great Lakes fish and assess impacts of chemicals of emerging concern on fish and wildlife populations.

2) Preventing and Controlling Invasive Species

During FY 2017, federal agencies and their partners continued efforts to prevent the introduction of new invasive species and to control existing invasive species populations throughout the Great Lakes ecosystem. Ongoing work has thwarted the migration of Asian carp and prevented them from becoming established in the Great Lakes. Since the inception of the GLRI, federal agencies and their partners have taken actions to control invasive species on over 134,000 acres, including over 18,500 acres in FY 2017.

3) Nonpoint Source Pollution Impacts on Nearshore Health

The GLRI implemented focused conservation activities to reduce sources of phosphorus loadings that threaten the Great Lakes nearshore regions. During FY 2017, federal agencies and their partners worked collaboratively to reduce nonpoint sources of phosphorus runoff that contribute to harmful algal blooms around the Great Lakes in priority watersheds such as Lake Erie, Saginaw Bay, and Green Bay. Federal agencies project that over 767,000 pounds of phosphorus have been prevented from leaving farms and entering the Great Lakes cumulatively as a result of GLRI funded projects. During FY 2017, federal agencies and their partners worked collaboratively in urban areas to prevent over 120 million gallons of polluted storm water from entering the Great Lakes as a result of GLRI funded projects.

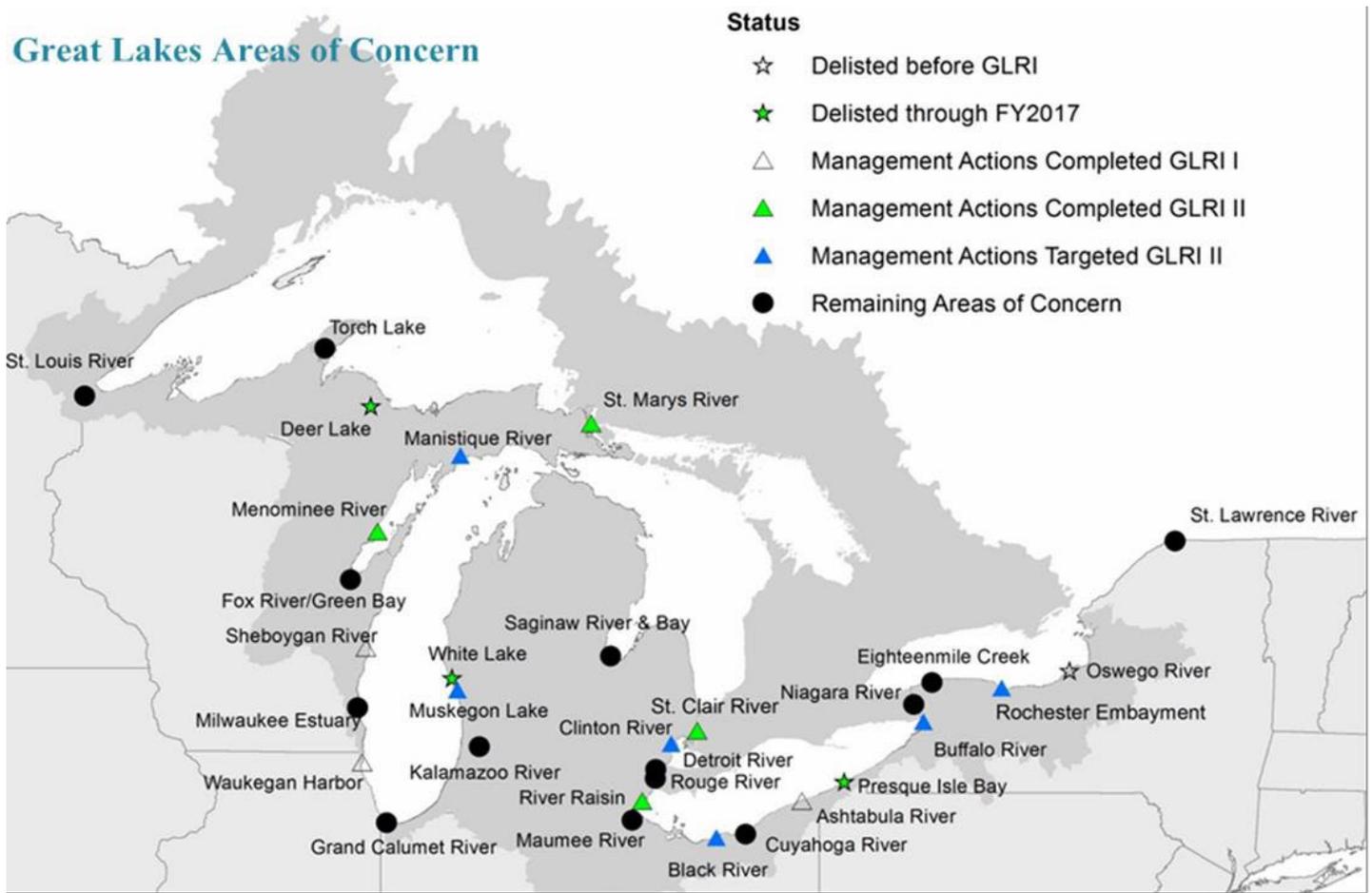
4) Habitat and Species

During FY 2017, a collaboration of federal agencies, states, tribes, cities, and their partners protected, restored, and enhanced habitats and native species throughout the Great Lakes basin. Examples of these efforts included removal of dams and restoration of rivers for increased fishing and recreational access; enhancing wetland habitats used by migrating birds, wildlife, and sportsmen; restoration and protection of populations of native offshore fish important to recreational and commercial fisheries; and the improvement of wildlife habitats on private lands. Since the start of the GLRI, more than 225,000 acres of habitat have been protected, restored, or enhanced, including over 40,000 acres in FY 2017.

5) Foundations for Future Restoration Actions

In order to improve transparency and fiscal stewardship, the GLRI has established accountability mechanisms, management practices, and third party oversight to enhance effective management. In addition, during FY 2017, the GLRI trained 611 educators, reaching over 53,770 students on average each year, by incorporating Great Lakes specific material into their broader environmental education curricula. More than 35,000 people also were educated on the Great Lakes ecosystem through place-based experiential learning activities in FY 2017.

Section 2 – Program Accomplishments



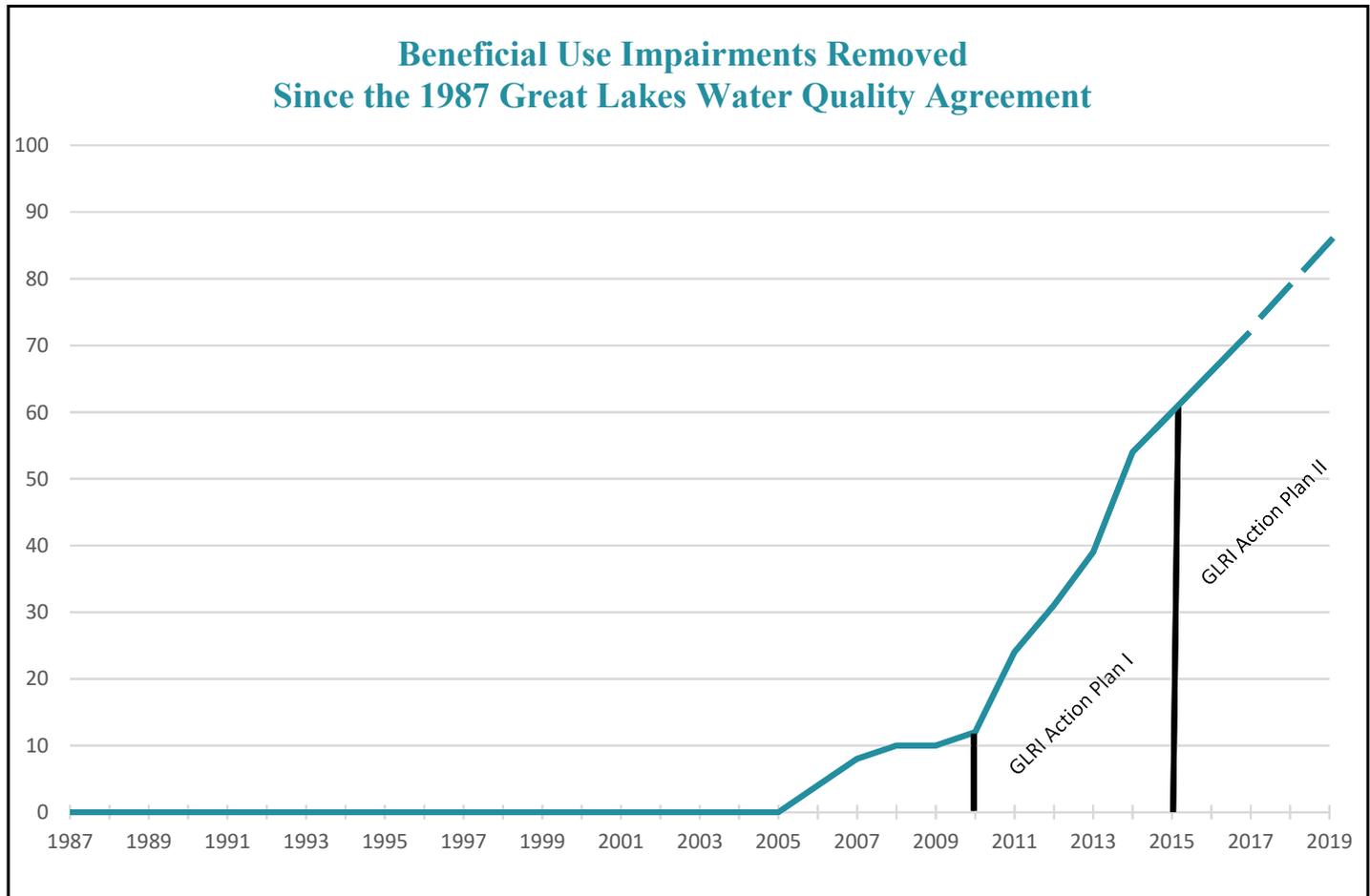
FOCUS AREA 1: Toxic Substances and Areas of Concern

Defined in the 1987 Great Lakes Water Quality Agreement, AOCs are the areas of the Great Lakes basin that are most heavily contaminated with legacy pollutants and show signs of environmental degradation such as habitat loss and fish consumption advisories. Federal agencies and their partners have completed all management actions required to delist eleven AOCs in the Great Lakes Basin.

In FY 2017, federal agencies and their partners finished all of the management actions needed to delist the St. Marys River AOC in Michigan, the Lower Menominee AOC in both Wisconsin and Michigan, and the River Raisin AOC in Michigan. In addition, substantial progress was made toward completion of management actions needed to delist another three AOCs: Buffalo River in New York, Clinton River in Michigan, and Rochester Embayment in New York. The completion of all management actions at the Rochester Embayment AOC is expected in FY 2018.



In FY 2017, federal agencies and their partners removed eight BUIs at five AOCs in four states, bringing the cumulative total BUI removals to 73. Since the start of the GLRI in 2010, 63 BUIs have been removed, more than six times the total removed in the preceding 22 years. BUIs are the benchmarks of environmental harm and characterize the AOC. Once an AOC's BUIs are removed, the AOC can move forward towards delisting.



During FY 2017, federal agencies and their partners implemented nine projects to protect human health from contaminants in Great Lakes fish. Federal agencies and their partners updated fish consumption advisories and provided public information on the health risks as well as the benefits of Great Lakes fish consumption. Specifically, advice was provided to over 120,000 people regarding the risks and benefits of Great Lakes fish consumption. Federal agencies and their partners focused on populations with the highest risk of contaminant exposure, including:

- Women of child bearing age
- Children
- Urban anglers
- Tribal communities
- Others who rely on Great Lakes fish as a significant part of their diet

Federal agencies and their partners continued their integrated efforts to identify the extent to which Chemicals of Emerging Concern (CEC) threaten Great Lakes fish and wildlife populations. They also continued to develop biological effects surveillance tools to inform resource management decisions. Through these efforts, GLRI partners have determined that CECs are ubiquitous throughout Great Lakes tributaries and occur in complex mixtures that reflect surrounding land use. These mixtures have the potential to impact reproductive fitness at levels currently found in the environment. As a result, GLRI partners are developing and refining biological surveillance tools that will predict adverse effects of CECs and allow resource managers to make the best decisions regarding the management of this valuable resource.

Focus Area 1 Success Stories

Clinton River AOC Corridor Habitat Restoration



During FY 2017, the GLRI began four projects at the Clinton River AOC in Michigan designed to improve ecological conditions in the river corridor. These projects targeted shoreline restoration, in-water habitat improvements, invasive species removal and sediment load reduction into the river. The projects will support removal of two BUIs: the loss of fish and wildlife habitat and the degradation of fish and wildlife populations. One project will work in the Galloway Creek tributary to improve fish passage and fish habitat in the stream near two road crossings to improve the existing degraded area. These four projects, in this highly urbanized area, will greatly improve the aquatic and upland habitat and foster redevelopment.



Final Habitat Project at St. Marys River AOC



During FY 2017, a project funded by the GLRI under the direction of the National Oceanic and Atmospheric Administration (NOAA) and working alongside the Great Lakes Commission and other regional partners, constructed a new 600-foot bridge to replace two deteriorating causeway culverts between the island ferry dock and Sugar Island proper at the St. Marys AOC located in Michigan. The completion of this project reestablished the flow of water for the first time in more than 50 years. The goal of the restoration project was to improve spawning and foraging habitat for fish important to local economies (walleye, lake sturgeon, lake whitefish, yellow perch, northern pike, cisco, chinook and Atlantic salmon), along with forage fish such as suckers and minnows and the invertebrates they feed on. Salmonids already have been observed on the restored rapids including steelhead and three species of salmon.



Grand Calumet River AOC Clean Up



In FY 2017, the GLRI completed cleanup activities at the West Branch Grand Calumet River Reaches 6 & 7 Great Lake Legacy Act project site in Indiana. Led by EPA, this cleanup project included the dredging and disposal of 14,515 cubic yards of highly contaminated sediment. To complete the cleanup, a multi-layer protective cap was installed that sequesters an estimated 27,600 cubic yards of contaminated sediment that remained in place. Overall, 42,115 cubic yards of contaminated sediment were remediated as part of this project. The West Branch Grand Calumet River cleanup was a cooperative effort between EPA, the State of Indiana Department of Environmental Management, the Indiana Department of Natural Resources, and the Northern Indiana Public Service Company. This cleanup will improve water quality and enhance recreational opportunities in this stretch of the Calumet River.



Focus Area 1 Success Stories

New Spawning Sites in the St. Clair and Detroit Rivers



In FY 2017, the GLRI, alongside regional partners in the United States and Canada, installed over 20 acres of fish spawning reefs in the St. Clair River and Detroit River in order to restore lost fish spawning habitat in these Michigan AOCs. This year, monitoring and surveillance of the new reefs shows evidence of increased fish production, with freshly spawned eggs and recently hatched fishes on or near the new reefs, along with added ecosystem resilience derived from the newly constructed reefs. Recent evidence shows that native fish important to local economies (such as walleye, lake whitefish, and lake sturgeon) use the new reefs immediately after creation and repeatedly in subsequent years. Reef projects restore lost ecosystem services in the Great Lakes and demonstrate a strong return on GLRI investment by increasing fishery production and habitat diversity.



Restoring Critical Aquatic Habitat at the St. Louis River AOC



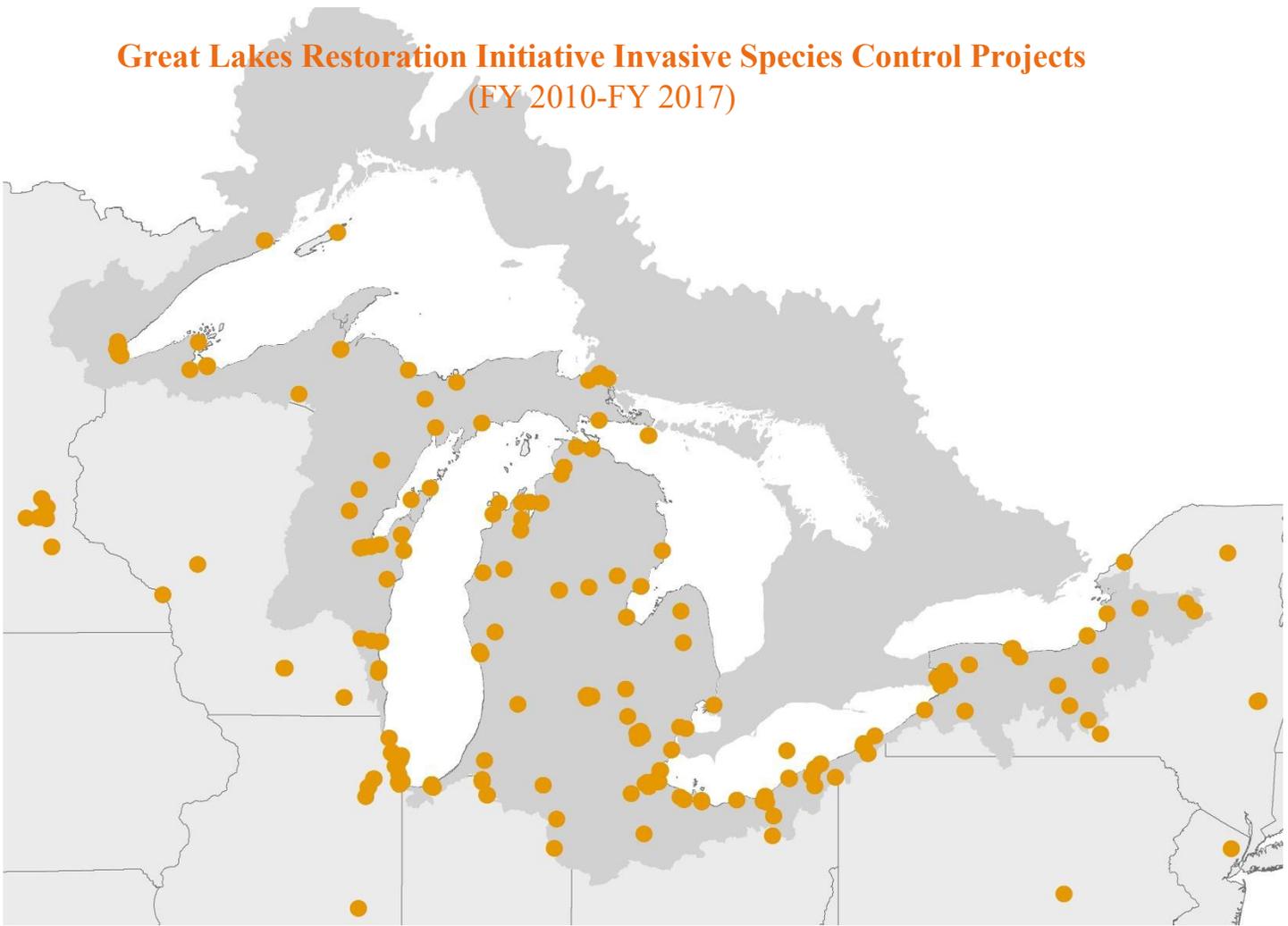
In FY 2017, the GLRI partnered with local agencies at the St. Louis River AOC in Minnesota and Wisconsin, on annual harbor maintenance, including the dredging of material that is being used to restore critical aquatic habitats. Following an innovative three-year pilot program used to determine if material from the Duluth-Superior harbor was safe enough to recycle back into the water, dredged material was placed on over 350 acres at multiple project sites. This priority Remedial Action Plan project addresses BUI removal requirements, as measured by benthic and vegetative community health. When completed, 1.1 million cubic yards of dredged material will have been placed, contributing to habitat enhancement through the creation of gradually sloped shorelines, additional shoals or islands, and the reduction of damage caused by excessive wave energy. Through this investment, redevelopment, navigation and ecological functions in the largest freshwater port in the Great Lakes will be greatly enhanced.

Emerging Contaminants Impacting Great Lake's Fish and Wildlife

In FY 2017, using GLRI funding, the U.S. Fish and Wildlife Service's (USFWS) CEC Team worked in collaboration with the Michigan Department of Natural Resources (DNR), Wisconsin DNR, Michigan State University, and Genoa National Fish Hatchery to raise over 500 lake sturgeon, a species that can experience a lifespan of more than 100 years. The USFWS CEC team evaluated the newly hatched sturgeon to better understand the extent to which CECs are impacting their health and their ability to imprint on their native waters allowing them to return for spawning. CECs impact fish and wildlife health, cause biological effects, and impact behavior. CECs have been detected in fish and mussels in Great Lakes tributaries and can be transferred up the food chain, potentially impacting the health of fish-eating birds such as double crested cormorants and herring gulls.



Great Lakes Restoration Initiative Invasive Species Control Projects (FY 2010-FY 2017)



FOCUS AREA 2: Preventing and Controlling Invasive Species

During FY 2017, federal agencies and their partners continued efforts to prevent the introduction of new invasive species and control existing invasive species populations in the Great Lakes ecosystem.

Federal agencies and their partners conducted early detection monitoring exercises and trained for rapid responses. During FY 2017, the GLRI funded seven early detection monitoring exercises that enhance the ability to detect and respond to new invasive species introductions. Federal agencies and their partners also completed a total of 25 exercises and responses, exceeding their target of eight rapid responses and exercises in FY 2017.

Federal agencies and their partners have further reduced the risk of invasive species entering the Great Lakes watershed by funding 15 projects that help block the pathways of introduction. These pathways include: canals and water ways, recreational boating, commercial shipping, illegal trade of banned species, release of aquarium species, and release of live bait.



Protecting the Great Lakes from Sea Lamprey

The GLRI provides support to the Great Lakes Fishery Commission’s Sea Lamprey Control Program. The GLFC has successfully implemented control techniques that have maintained Lake Michigan and Lake Ontario sea lamprey populations at target levels. Lake Superior, Lake Huron, and Lake Erie populations are above target levels and holding steady showing the critical need for continued and increasing sea lamprey control actions in these lakes to protect the Great Lakes fisheries. The GLRI is supporting research focused on enhancing sea lamprey control while reducing costs, including cutting-edge work on chemosensory cues like pheromones to attract sea lamprey and alarm cues to repel them.

During FY 2017, federal agencies and their partners restored sites degraded by aquatic, wetland, and terrestrial invasive species. Federal agencies also supported community efforts to control and reduce the spread of invasive species. These projects were implemented with partners who are expected to continue maintenance and stewardship beyond the duration of the federally funded project lifespan. In addition, federal agencies directly implemented control projects in national forests, parks, and wildlife refuges. In FY 2017, federal agencies and their partners managed and funded projects that protected over 18,500 aquatic/terrestrial acres from invasive species for a cumulative total of more than 134,000 acres since the start of GLRI.

During FY 2017, federal agencies and their partners developed and refined invasive species control technologies and management techniques while effectively minimizing harm to other non-invasive fish species. The GLRI supports invasive species control technologies with proven potential but that require additional testing. During FY 2017, in order to evaluate their effectiveness in controlling invasive species in the Great Lakes basin, federal agencies and their partners field tested 5 different technologies and methods, including new ballast water management systems.

In FY 2017, federal agencies and their partners continued to support and enhance a total of four species-specific “collaboratives,” which help communicate the latest control technologies and management techniques. Collaboratives are ongoing for the following species: Asian carp, phragmites, invasive mussels, and monoecious hydrilla. These collaboratives are actively involved in the protection and control efforts that achieve invasive species results under the Action Plan.

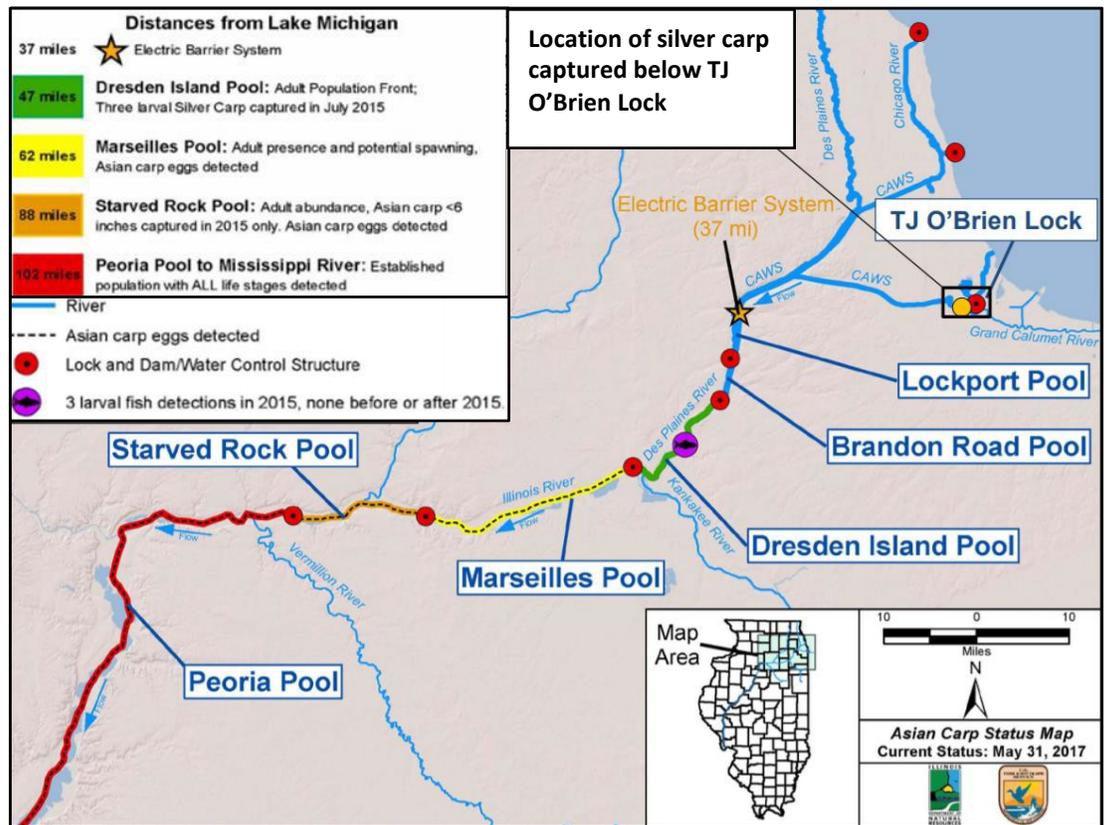


Protecting the Great Lakes from Asian Carp

The GLRI provides support to the Asian Carp Regional Coordinating Committee. More information about the ACRCC is available at <http://www.asiancarp.us>.

Operation Silver Bullet

The GLRI continued to provide support to the Asian Carp Regional Coordinating Committee (ACRCC), which has implemented the Asian Carp Action Plan – including surveillance, response actions, and testing of new control technologies. In FY 2017, the GLRI funded crucial contingency response actions undertaken by the ACRCC and its federal and state partners in the Upper Illinois Waterway. Detection of a silver carp above the electric dispersal barriers in the Chicago Area Waterway system triggered an intensive two week monitoring operation, guided by a Contingency Response Plan. In accordance with the Plan, four electrofishing crews, three contracted commercial fishers, and a specially outfitted netting boat were deployed daily below the T.J. O’Brien Lock and Dam in Lake Calumet, and in an area from the T.J. O’Brien Lock and Dam to Calumet Harbor. The operation covered a 13-mile section of the waterway and Calumet Harbor with intensive monitoring. No additional silver or bighead carps were seen or captured.



Focus Area 2 Success Stories

Acoustic Telemetry

In FY 2017, using GLRI funding support, the Great Lakes Fishery Commission created the Great Lakes Acoustic Telemetry Observation System (GLATOS) to advance conservation and management of Great Lakes fish. GLATOS is beneficial for numerous fish management systems within the Great Lakes. For example, results from sea lamprey studies contributed to several important decisions, including not to pursue lock-and-dam refurbishment that blocks the migration of sea lampreys in the Cheboygan River in Michigan, to discontinue releases of sterile male sea lampreys in the St. Marys River in Michigan, and to consider sterile-male releases as a possible control method in the St. Clair River in Michigan. In addition, annual adult lake trout survival estimates, generated using telemetry, were incorporated into Lake Huron harvest models used by management agencies to evaluate fishery regulations. GLATOS has revolutionized the ability of scientists to study fish movement and behavior, and fishery managers to understand stock structure and mixing.



Hydrilla Response in Michigan



In FY 2017, the GLRI supported a Hydrilla Collaborative response to a new hydrilla infestation on Cayuga Lake in Michigan. An aggressive eradication project was initiated, resulting in the prevention of further spread of the hydrilla in Cayuga Lake. Hydrilla is an aggressive, opportunistic, aquatic nuisance plant species that, if left unchecked, will form thick mats that displace highly valued native plant species and degrade critical habitats. In addition to ecological damages, hydrilla can have negative economic effects and diminish recreational uses of water bodies. Options to treat hydrilla include a number of registered aquatic herbicides, benthic mats that inhibit the growth of aquatic plants for small areas, and, in limited situations, the deployment of sterile grass carp.

Chemosensory Communication in Sea Lamprey Control

In FY 2017, GLRI funded advanced chemosensory communication research and advanced its development for use in sea lamprey control by at least a decade. Chemosensory cues are vital to sea lamprey survival and fitness by affecting their ability to find food, avoid risk, and reproduce. Minor changes in chemosensory cues can have significant impacts on sea lamprey survival rates. Chemosensory cues are natural compounds already present in the environment. Changes in these cues have little probability of causing harmful effects to the environment and non-target organisms if applied for sea lamprey control. Since 2010, 24 projects have been completed or are underway resulting in the discovery of at least 20 novel putative pheromone compounds. These projects have provided a better understanding of how to exploit chemosensory communication for use in the control of the invasive sea lamprey to protect Great Lakes fisheries.



Focus Area 2 Success Stories

Contract Fishing to Reduce Spread of Asian Carp

During FY 2017, the GLRI funded contract fishing in Illinois to shrink Asian carp populations. GLRI-funded contract fishing has removed over 6.2 million pounds of Asian carp near Lake Michigan since 2010. Contract fishing utilizes licensed and professional commercial fishers collaborating with Illinois DNR biologists to capture, remove, and collect data on Asian carp. These efforts are effective in removing Asian carp while having minimal effect on native sport fishing resources.



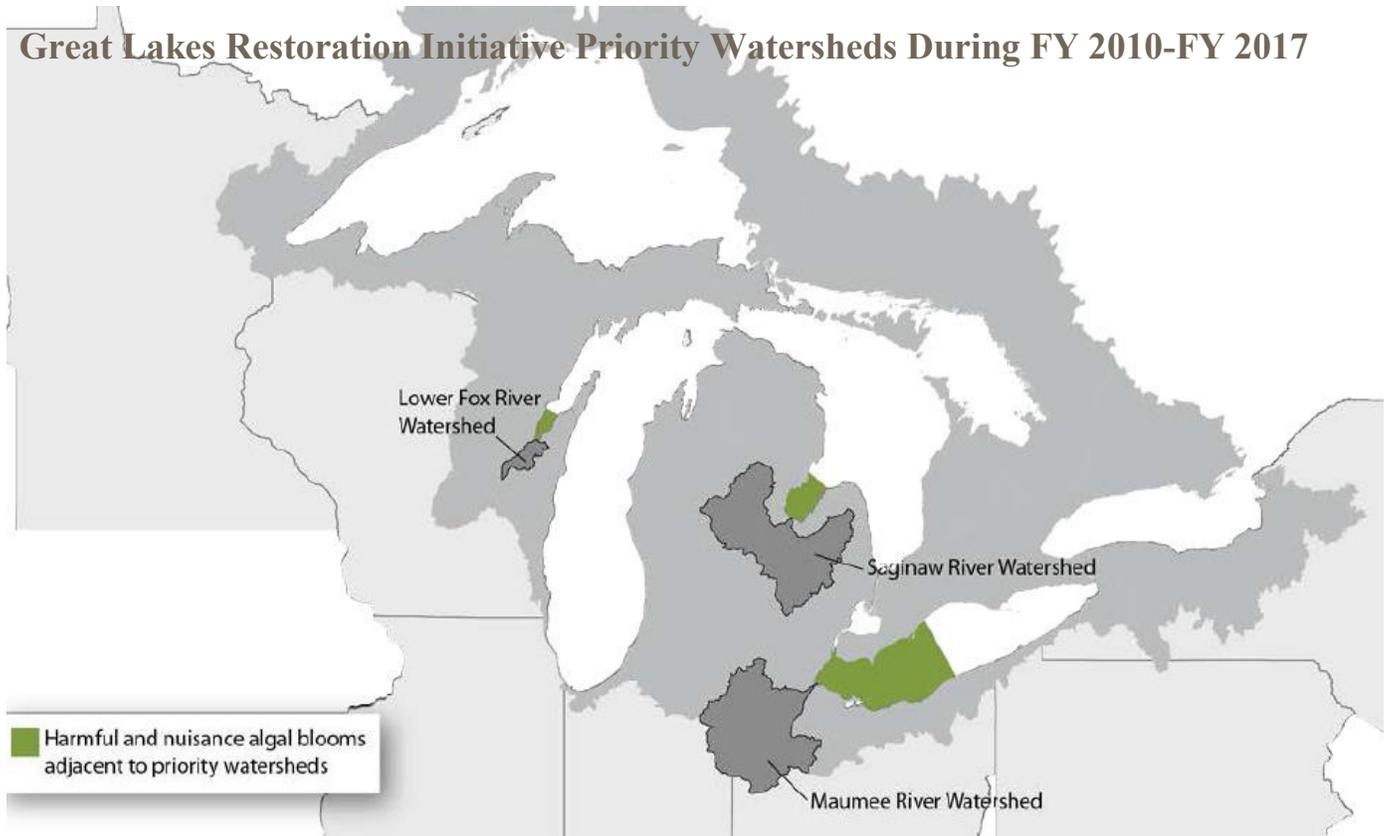
Utilizing both common-practice fishing methods and novel techniques, coupled with state and federal resource management expertise, contract fishing removes up to one million pounds of Asian carp annually. Contract fishing has contributed to reduced carp populations in the upper Illinois Waterway. Modeling efforts suggest that continued contract fishing will further reduce the spread of these invasive fish and protect the Great Lakes fisheries.

Comprehensive early-detection monitoring in Wisconsin

During FY 2017, GLRI funded comprehensive early-detection monitoring assessments to determine the potential impact of invasive species on public natural resources. The Apostle Islands National Lakeshore is a unit of the National Park Service (NPS) located within Lake Superior that offers scenic coastlines and maritime cultural resources that are at risk for invasion by zebra and quagga mussels. Goals of this assessment were to determine the status of zebra and quagga mussels, evaluate and compare a variety of methods for detecting them, collect environmental data to predict mussel introduction points and suitable habitats, and provide comprehensive baseline data on other aquatic invertebrates that these mussels could be impacting. The field campaign involved multiple research-vessel teams that collected over 700 biological and water-quality samples. Field crews reported that zebra and quagga mussels were not visibly present, but these mussels can be difficult to spot when small and not yet abundant. Using these techniques, a determination can be made whether zebra or quagga mussel specimens or their DNA are present. Early-detection will ultimately lead to improved lake quality which can enhance tourism and infrastructure in the region.



Great Lakes Restoration Initiative Priority Watersheds During FY 2010-FY 2017

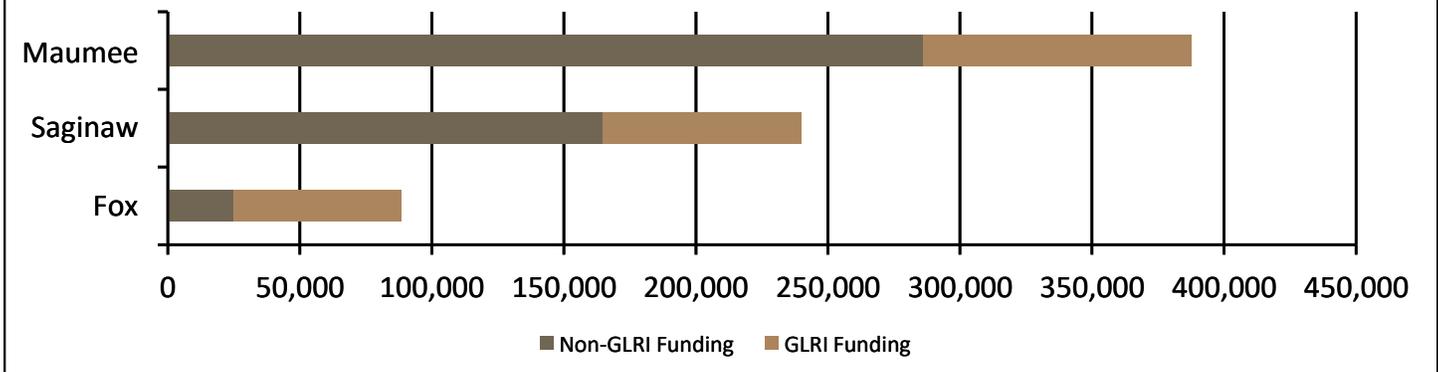


FOCUS AREA 3: Nonpoint Source Pollution Impacts on Nearshore Health

During FY 2017, federal agencies and their partners reduced nutrient loads into the Great Lakes. The GLRI implemented focused conservation activities to reduce sources of phosphorus loadings that threaten the Great Lakes nearshore regions and projects have been undertaken in selected agricultural priority watersheds. The largest nonpoint source of phosphorus loadings that threaten the Great Lakes nearshore areas is the nutrient runoff from agricultural lands.

Excess phosphorus loadings threaten the Great Lakes ecosystem by contributing to harmful algal blooms that cause human health effects, drinking water impairments, ecological dead zones, and beach closures that result in lost recreational opportunities. The GLRI agencies project that over 364,000 pounds of phosphorus will be prevented from entering the Great Lakes as a result of GLRI funded projects in FY 2017.

GLRI Funding Increased Acreage Enrolled in Agricultural Conservation Programs in Priority Watersheds through FY 2017



During FY 2017, federal agencies and their partners funded nutrient and sediment reduction projects on over 168,000 acres of targeted watershed in the Great Lakes basin using GLRI funding.

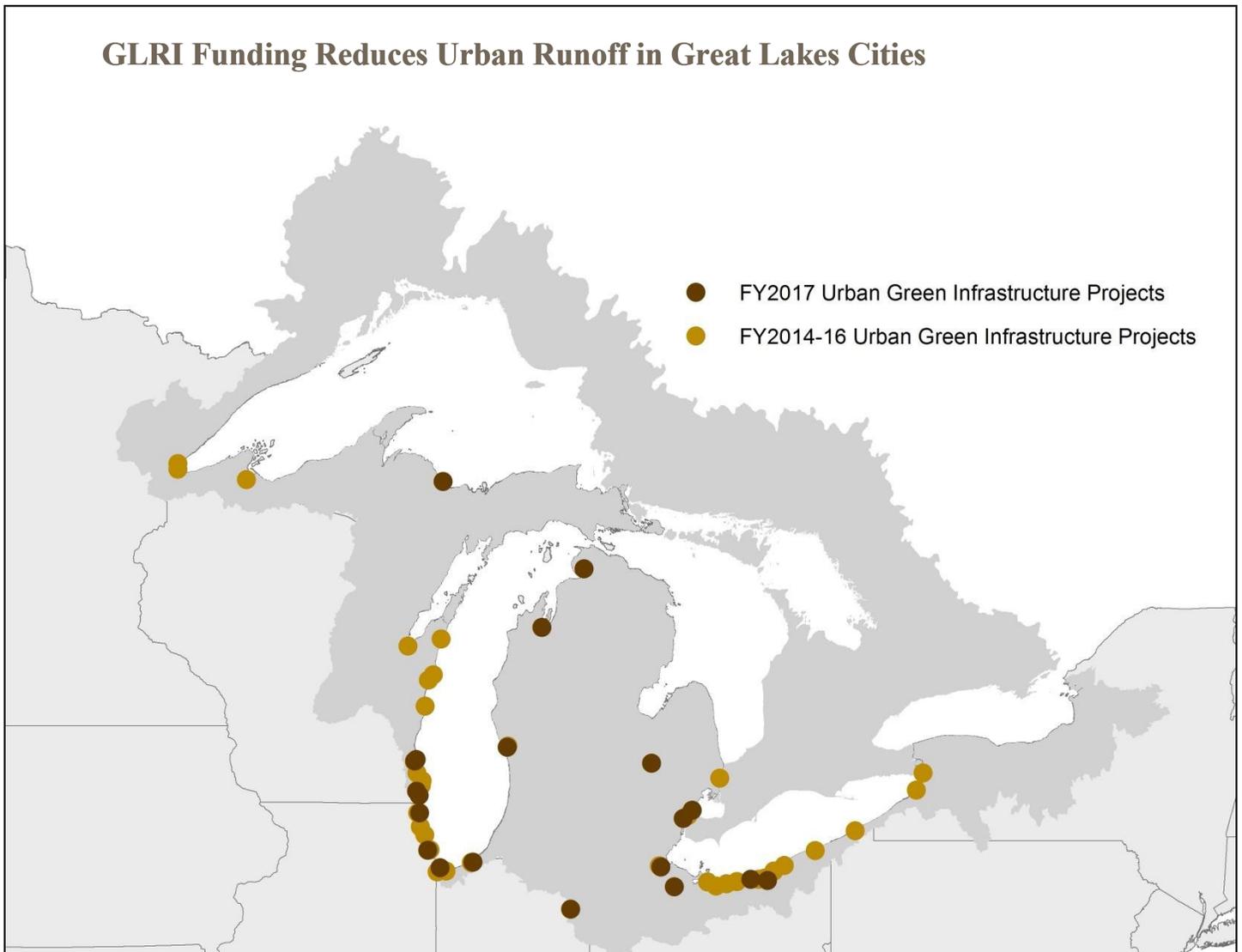
During FY 2017, federal agencies and their partners reported a capture projection of an average annual volume of more than 120 million gallons of untreated urban runoff per year from GLRI-funded urban runoff projects. These projects reduce flooding, increase green space in urban areas, and return vacant properties to productive use. Federal agencies and their partners have funded urban watershed management projects to implement best management practices that address nonpoint source pollution in urban areas. The practices implemented include:

- Tree plantings
- Constructed wetlands
- Bioretention ponds
- Porous pavement
- Bioswales
- Rain gardens

In FY 2017, the GLRI also funded green infrastructure projects in the following 13 Great Lakes shoreline cities:

- Chicago, IL
- Michigan City, IN
- Fort Wayne, IN
- Oregon, OH
- Cleveland, OH
- Toledo, OH
- Detroit, MI
- Flint, MI
- Marquette, MI
- Muskegon, MI
- Traverse City, MI
- Milwaukee, WI
- Kenosha, WI

Projects in these shoreline cities will treat, slow, or capture untreated stormwater runoff, helping to improve water quality conditions within the Great Lakes basin.



Focus Area 3 Success Stories

River-edge Revitalization in Milwaukee



In FY 2017, GLRI funds were awarded to the Redevelopment Authority of the City of Milwaukee, Wisconsin to stabilize 900 linear feet of the Menomonee River bank with native plants and trees, excavate contaminants, and provide additional public access to the river. The project is part of a larger initiative to turn a former rail yard into 60 acres of job-rich redevelopment and 73 acres of ecological and river-edge revitalization. The business park is currently home to ten businesses and 1,300 jobs. The ecological revitalization includes a 24-acre park on the southern banks of the Menomonee River called Three Bridges Park and approximately 1,200 feet of riverbank restoration adjacent to the GLRI project area.



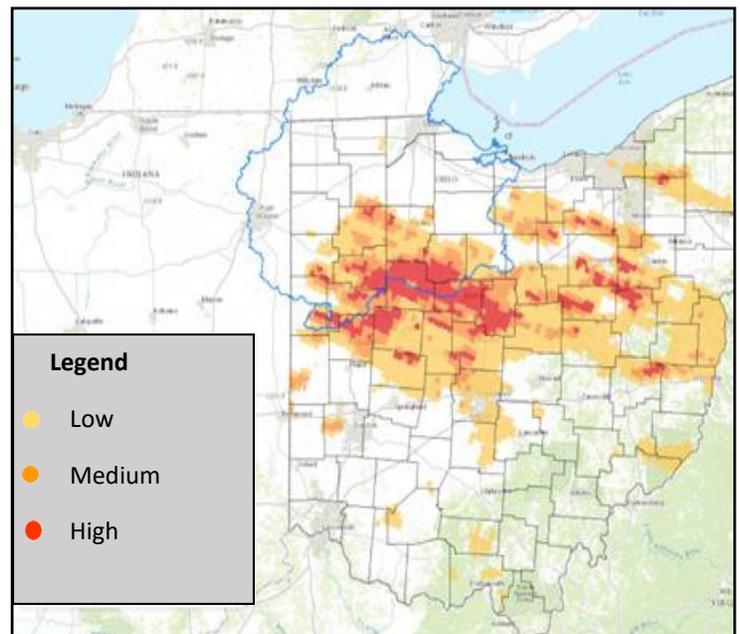
Urban Forestry to Reduce Runoff in Detroit's Rouge Park



During FY 2017, a GLRI grant, administered by the U.S. Forest Service, funded the Greening of Detroit who, working with local volunteers, planted 1,250 new trees in Rouge Park. This green buffer was planted between a highly urbanized neighborhood and a tributary of the Rouge River. This is an area of the City of Detroit identified as prone to extreme flooding. These trees will prevent approximately 74,000 gallons of runoff in the first year, growing to as much as one million gallons annually as the trees grow over the next 20 years. The Greening of Detroit engaged Citizen Foresters, who provided over 800 volunteers and young job trainees in the Green Corps program to plant and maintain these trees moving forward.

Runoff Risk Advisory Tools

In FY 2017, a GLRI grant, administered by the NOAA's National Weather Service (NWS), helped implement beta versions of real-time decision support tools for nutrient applications across Ohio and Michigan. These tools are based on a unique and successful collaboration between multiple federal and state agencies, universities, and industry. Relying on real-time NWS models that were validated against edge-of-field datasets, farmers and producers were alerted to future conditions that were unsuitable for nutrient application due to impending transport risks to nearby water bodies resulting in less nutrient loss to nearby streams. With this additional tool in the conservation practice toolbox, Michigan and Ohio have dedicated staff time and funding to develop and maintain websites to host these tools as well as coordinate outreach and training. GLRI funding will continue to implement these tools, as well as similar nutrient management tools across the rest of the Great Lakes states.



Focus Area 3 Success Stories

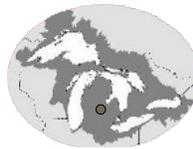
Decreasing Lake Erie Sedimentation in Wine Country



In FY 2017, the GLRI, through the Natural Resources Conservation Service (NRCS), addressed non-point source pollution and decreased sedimentation on over 1,800 specialty crop agricultural acres. These agricultural acres are located in the Concord grape belt of Erie County Pennsylvania, along the shore of Lake Erie. Local growers and farmers are using nutrient management and cover crops to improve the water quality of Lake Erie. These practices allow farmers to manage the amount and placement of nutrients and reduce soil erosion on their farms. Additionally, these practices have made agricultural operations more efficient, enabling farmers to reduce input costs and make operations more resilient.



Drainage Water Management



During FY 2017, the GLRI continued to support innovative conservation practices like field drainage water management systems. These systems are a relatively new conservation practice that helps farmers by holding back drainage, allowing crops to fully utilize the water and nutrients instead of allowing the nutrients to enter drainage ditches where they find their way into the Great Lakes. In Ohio, as part of a nonpoint source pollution control project, the Defiance Soil and Water Conservation District successfully constructed practices like a runoff detention wetland and 33 water management control structures and also installed Ohio’s first saturated buffer. In Michigan, during a dry 2017 growing season, water control structures were installed on farms to manage drainage water.



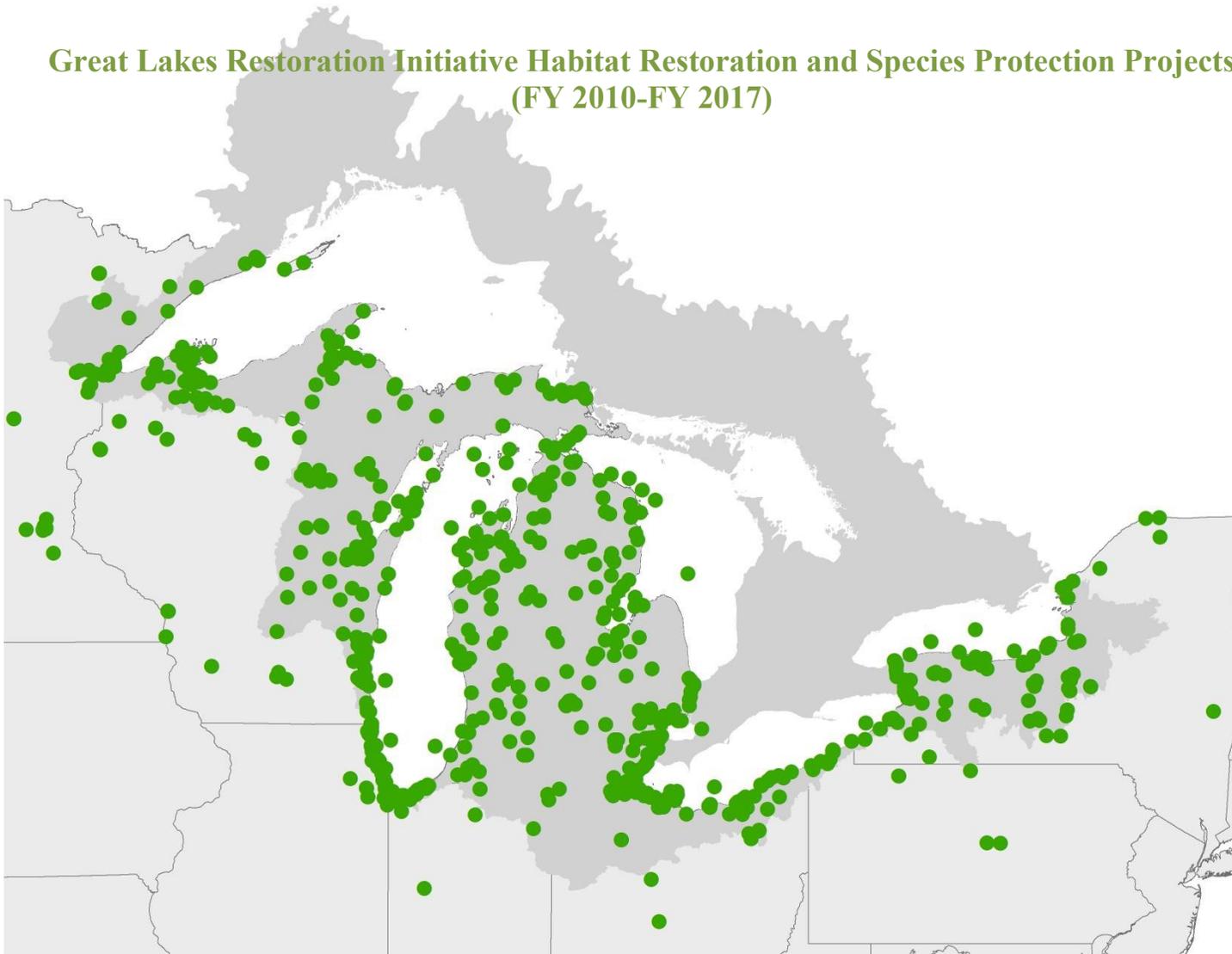
Storm Water Retention Wetland Treats Urban Runoff



In FY 2017, GLRI funding allowed the Wisconsin Department of Natural Resources and the City of Superior Environmental Services Division of Public Works to install green infrastructure in the form of a 1.1-acre stormwater retention wetland basin that will collect and retain stormwater from a 76-acre urban area. Stormwater currently being discharged into a combined sewer system will be redirected into the wetland basin, where contaminated sediments and nutrients will be captured. The treated stormwater will then be discharged into a small creek which drains into Superior Bay and Lake Superior. The wetland basin will not only clean stormwater, but it will reduce the chance of localized flooding as a result of heavy rain events.



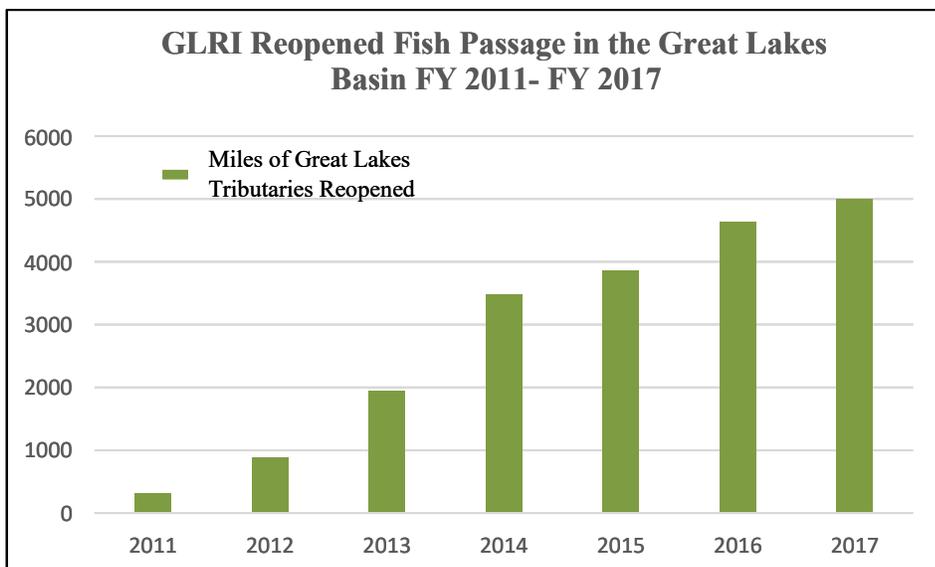
Great Lakes Restoration Initiative Habitat Restoration and Species Protection Projects (FY 2010-FY 2017)



FOCUS AREA 4: Habitat and Species

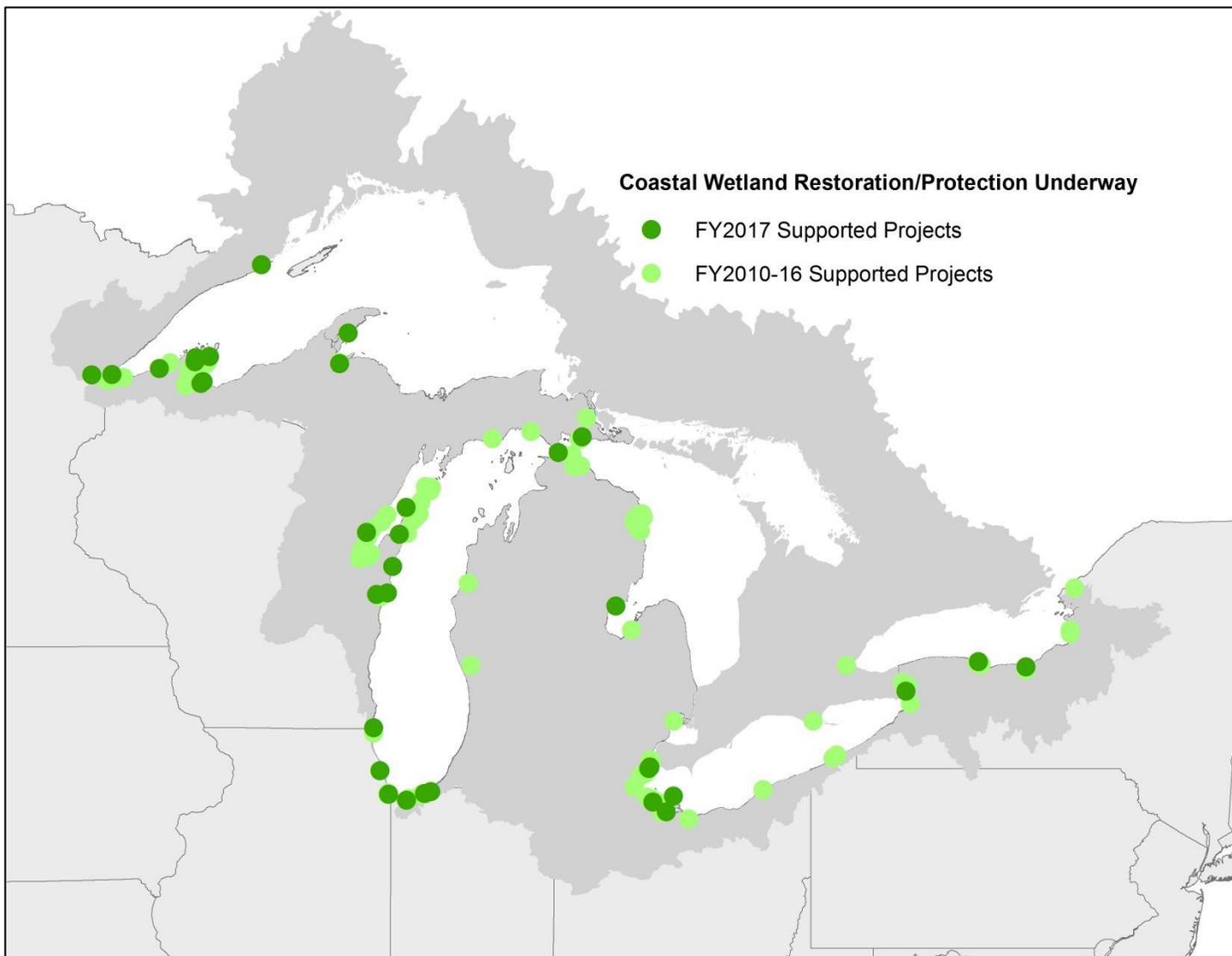
During FY 2017, federal agencies and their partners protected, restored, and enhanced habitats and native species throughout the Great Lakes basin. In FY 2017, GLRI agencies and their partners implemented 47 habitat and native species projects adding to the more than 965 habitat and native species projects underway or completed by federal agencies and their partners since the inception of the GLRI.

Through FY 2017, federal agencies and their partners implemented protection, restoration, and enhancement projects that have reopened 5,000 miles of Great Lakes tributaries and increased aquatic connectivity for numerous fish species. Projects that addressed aquatic connectivity in FY 2017 assisted local dam owners, states, and transportation authority's seeking to address aging infrastructure while simultaneously restoring rivers.



The GLRI Action Plan II continues to emphasize efforts that protect, restore, and enhance coastal wetlands. Great Lakes coastal wetlands provide residents of the Great Lakes with many economic benefits including property protection against high water levels and wave action, removal of nutrients from rivers and the nearshore areas of the Great Lakes before they feed harmful and nuisance algae, and fish nursery habitats necessary to support recreational and commercial fisheries. The Great Lakes coastal wetlands are ecologically and culturally important because of the many species that depend entirely on these places and the unique resources provided to many Great Lakes Tribal Nations. Through FY 2017, federal agencies and their partners have protected, restored, and enhanced over 24,000 acres of Great Lakes coastal wetlands.

In FY 2017, projects implemented in the Great Lakes basin were directed towards protecting and restoring native shorebirds and fish important to individual Great Lakes states, tribes, and federal agencies. Piping plover, a federally endangered shorebird, are now found at the highest numbers in decades. In 2017, there were approximately 152 breeding piping plovers, an additional 30 non-breeders, and 112 chicks. For example, piping plover are now found at the Cat Island Dredge Materials Management Area in Green Bay, Wisconsin. The Cat Island Dredge Materials Management Area is a GLRI supported project which serves dual purposes for economical placement of dredged sediments from the Green Bay harbor while creating new habitats for fish and wildlife. Populations of lake trout, a native offshore top predator, continued to be restored through enhancement stocking and monitoring in Lakes Michigan, Huron, and Ontario. More than 50% of the lake trout from Lake Huron and 17% from Lake Michigan are now wild fish that hatched from spawning reefs constructed in the Lakes using GLRI funds – a significant outcome of GLRI restoration efforts.



Focus Area 4 Success Stories

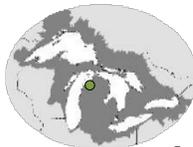
Boardman River Dam Removal and Channel Restoration



In FY 2017, GLRI funds were used to remove the Boardman River Dam in Michigan to restore the historic river channel. The dam removal increases connectivity along this river and an adjacent riparian corridor for aquatic and terrestrial wildlife, fishers, paddlers, and naturalists between Boardman River, Grand Traverse Bay, and Lake Michigan. Restoration activities will enhance the local economy and allow natural movement of wood and sediment through the river system and restore the natural balance between coldwater and coolwater species in this river, including various species of trout. This restoration project meets the goals of the numerous project partners, including the Michigan Department of Natural Resources, Michigan Department of Environmental Quality, Bureau of Indian Affairs, Grand Traverse Band of Ottawa and Chippewa Indians, Great Lakes Fishery Commission, and the Conservation Resource Alliance.



Protecting the Great Lakes Endangered Pitcher's Thistle



In FY 2017, GLRI funding allowed the National Park Service (NPS) and the U.S. Geological Survey (USGS) to re-establish monitoring for Pitcher's Thistle at Sleeping Bear Dunes and Pictured Rocks National Lakeshores in Michigan, and Indiana Dunes National Lakeshore. Sleeping Bear Dunes National Lakeshore is home to 95% of the world's population of Pitcher's Thistle, a federally-designated threatened plant that is endemic to the sand dune ecosystems on the shores of the Great Lakes. The information obtained through monitoring is providing up-to-date status and trend analysis of Pitcher's Thistle across its range of occurrence in this delicate ecosystem. This monitoring has allowed for the identification of new threats to this plant species at these locations for the first time. The identification of new threats is leading to the development of new protective methods.

Reconnecting Lake Erie and Historic Coastal Wetlands

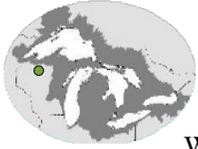


In FY 2017, GLRI funding allowed collaboration between the Nature Conservancy and Ducks Unlimited to restore hydrologic connectivity to more than 340 acres of wetlands along the Lake Erie coastline in Ottawa National Wildlife Refuge in Ohio. This project established a coastal reconnection (i.e., fish passage structures) between a coastal wetlands and Lake Erie benefiting fish communities, migratory birds, wildlife habitat, and water quality. This restoration project has provided improved wetland filtration resulting in the reduction and retention of phosphorus and other harmful nutrients that contribute to poor water quality conditions within Lake Erie. The results and knowledge obtained from this restoration project are being used to develop new strategies that will reconnect additional coastal wetlands improving both water quality and fish and wildlife habitat conditions in Lake Erie.

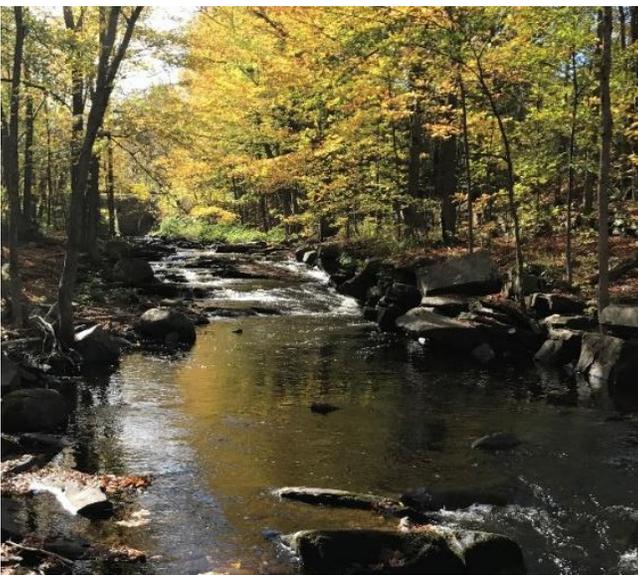


Focus Area 4 Success Stories

Improving Aquatic Connectivity for Halley Creek



In FY 2017, Trout Unlimited, with GLRI funding, replaced a series of under-sized road culverts at Halley Creek in the Chequamegon-Nicolet National Forest in Wisconsin. Under-sized road culverts impeded the natural movement of fish and other aquatic organisms. The road culverts at Halley Creek were in poor condition and in danger of failing, jeopardizing this Class I trout stream containing native Wisconsin brook trout. The old road crossing was replaced with a large aluminum box culvert containing a streambed that restored the natural movement of aquatic organisms, water, wood and sediment through the crossing. The new culvert design is more resilient to potential increases in storm water surges. It also provides a safe, low maintenance stream crossing that allows the stream to function naturally.



Saint Regis Mohawk Tribe Restores Riparian Habitat



In FY17, GLRI funding, through the Bureau of Indian Affairs (BIA), supported the Saint Regis Mohawk Tribe in accelerating habitat restoration and revitalization of Atlantic Salmon in upstate New York. The Hogansburg Dam on the St. Regis River was removed in 2017 restoring connectivity with the St. Lawrence River after almost 100 years. Approximately 267 river and stream miles of aquatic habitat were re-opened for migratory fish species including lake sturgeon, walleye, Atlantic salmon, and several threatened fish species. Immediately following dam removal, the Saint Regis Mohawk Tribe utilized GLRI funding to play a pivotal role in accelerating habitat and species restoration through vegetative stabilization, localized erosion control structures, invasive species control, and the stocking of Atlantic salmon fingerlings and smolts in an upstream tributary.

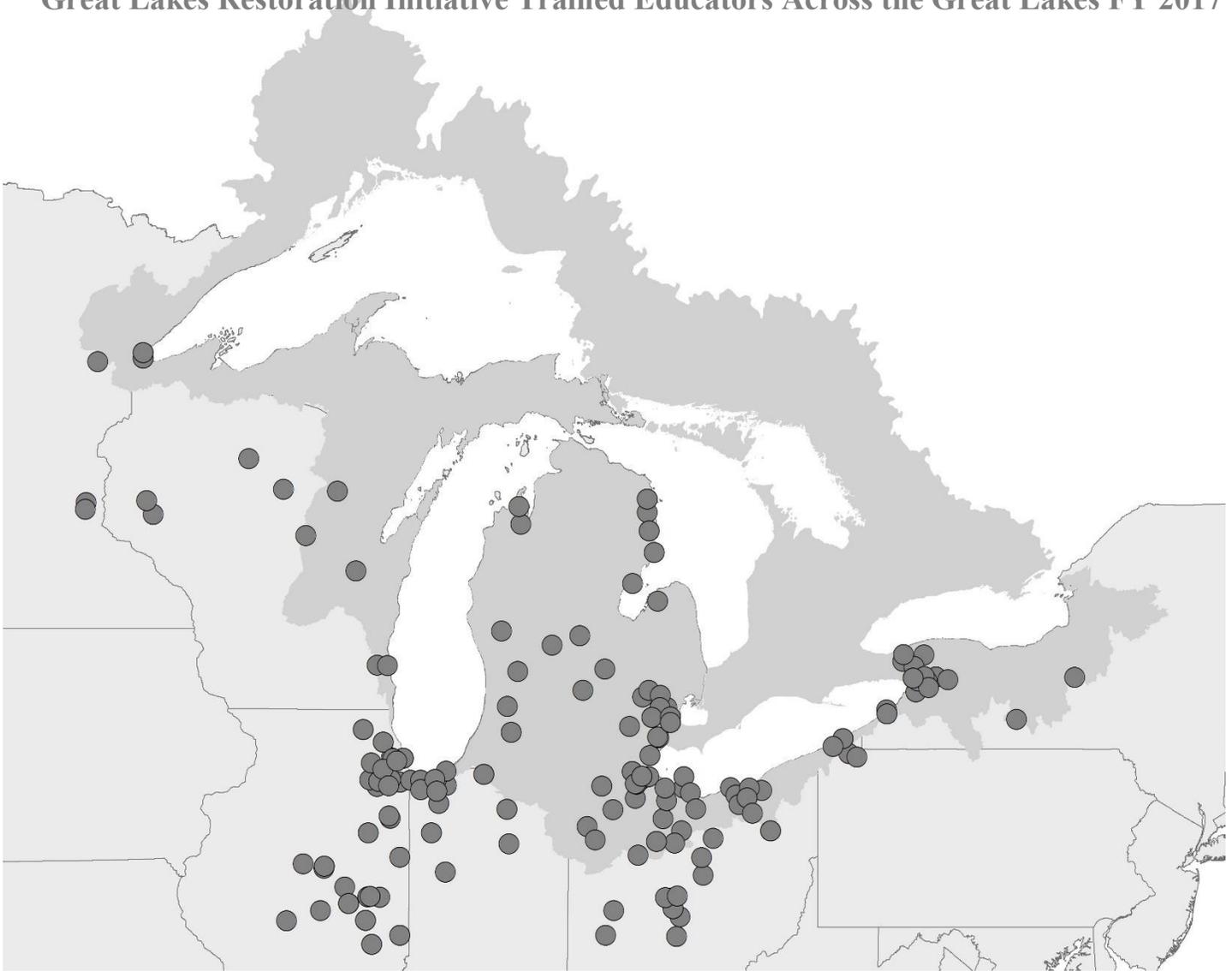
Improving Fish Spawning Habitat in the Kalamazoo River



In FY 2017, the GLRI funded the USFWS, in collaboration with the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians and the Michigan Department of Natural Resources, to increase suitable spawning habitat and increase the reproductive success of lake sturgeon in the Kalamazoo River. Through this project, lake sturgeon spawning habitat was restored in the Kalamazoo River. The restoration was assessed by conducting egg deposition surveys and larval drift surveys before and after habitat improvements to document the reproductive success of the lake sturgeon. Education and outreach efforts related to this project improved cultural connections and tribal involvement in research and restoration opportunities.



Great Lakes Restoration Initiative Trained Educators Across the Great Lakes FY 2017



FOCUS AREA 5: Foundations for Future Restoration Actions

In order to improve transparency and fiscal stewardship, federal agencies have established accountability mechanisms, management practices, and third party oversight to effectively manage the GLRI.

The GLRI Action Plan II laid out steps for agencies to develop and incorporate climate resiliency criteria in project selection, planning, and implementation. During FY 2017, federal agencies and their partners used a standardized set of criteria to help GLRI funded projects be more resilient to the effects of more frequent and intense storms and shifts in ranges of particular species.

The GLRI continues to promote Great Lakes-based ecosystem education and stewardship. During FY 2017, federal agencies and their partners trained 611 National Park Service (NPS) and Bay Watershed Education and Training (B-WET) educators through the Center for Great Lakes Literacy, a Great Lakes Sea Grant-funded program, NOAA's Great Lakes B-WET Program and National Park Service interpretive programs. These programs provide hands-on experiences, educational resources, and networking opportunities to promote Great Lakes literacy among an engaged community of educators, scientists, and citizens. Almost 54,000 students are expected to benefit each year from the training of these educators.

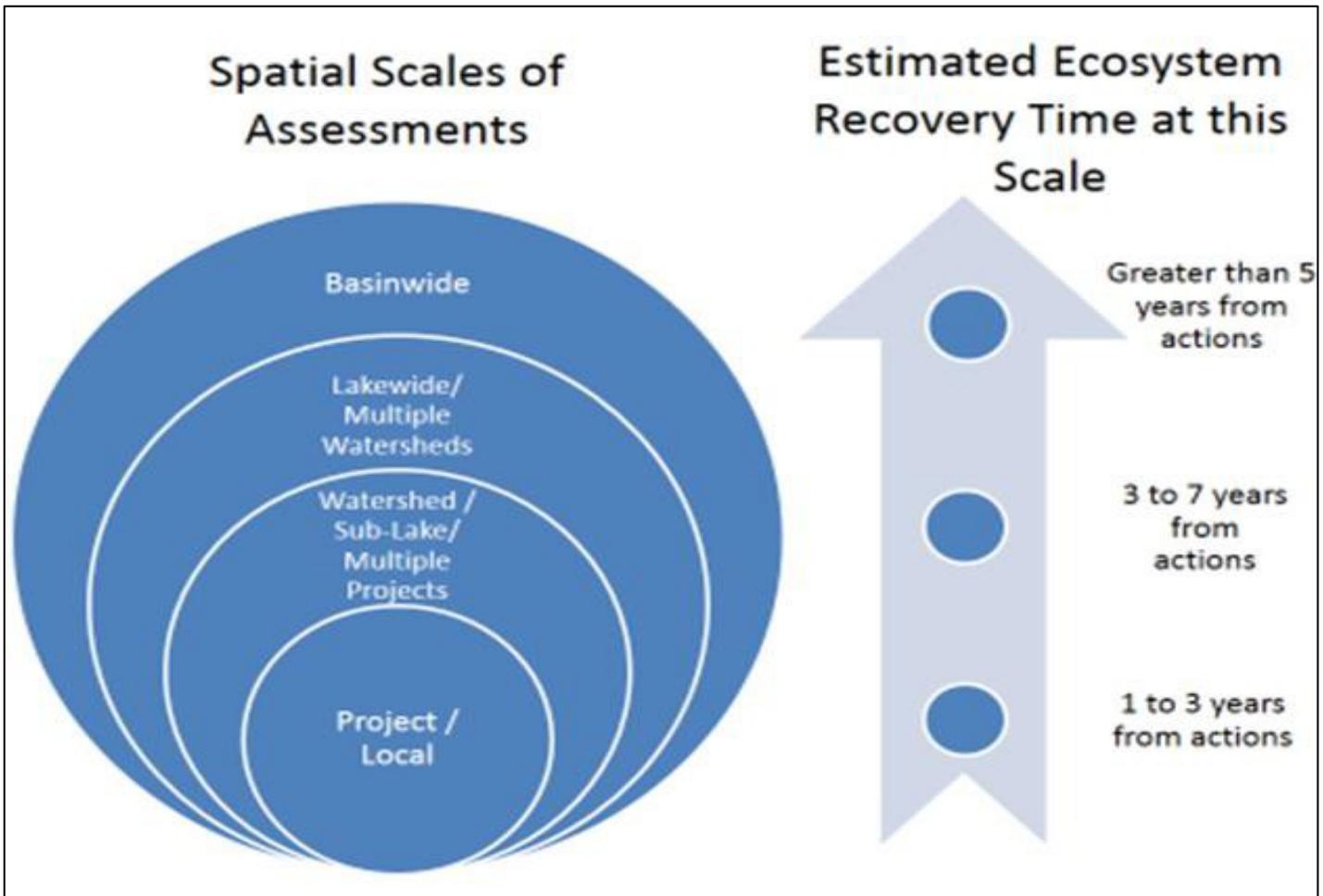
In addition, federal agencies and their partners educated over 35,000 people about the Great Lakes ecosystem through place-based experiential learning activities on federally managed lands, primarily through interpretative programs at national parks and lakeshores.

During FY 2017, federal agencies and their partners conducted comprehensive monitoring to assess the status and trends of environmental indicators in the Great Lakes ecosystem. Monitoring data is used to prioritize future GLRI-funding decisions by identifying the most significant ongoing and emerging problems in the ecosystem. The State of the Great Lakes Reports were released in FY 2017. These reports assess the status and trends of the Great Lakes ecosystem using a suite of nine indicators of ecosystem health, supported by 44 sub-indicators that were developed by over 180 governmental and non-governmental Great Lakes scientists and other experts.

The GLRI agencies and partners identified watersheds, habitats, and species to be targeted for potential additional restoration activities using monitoring data, assessments, models, and other decision support tools. The Great Lakes Advisory Board, states, tribes, and other stakeholders also provided input to the GLRI agencies on a variety of topics including restoration priorities, project longevity and duration, and the next GLRI Action Plan.

During FY 2017, federal agencies and their partners continued to track the progress of GLRI-funded projects. The GLRI agencies utilized the Environmental Accomplishments in the Great Lakes (EAGL) tracking system, an accountability system, that tracks the effectiveness of GLRI-funded projects in meeting the Measures of Progress defined in the GLRI Action Plan II. To improve the quality of reporting, EPA conducted the first annual system-wide EAGL audit in accordance with the FY 2016 EAGL Implementation Manual.

The GLRI Action Plan II incorporates a science-based adaptive management framework that is designed to guide restoration and protection actions by using the best available science and lessons learned from GLRI investments. During FY 2017, federal agencies distilled the results of an adaptive management pilot project, initiated in FY 2016, on GLRI projects in the Western Basin of Lake Erie. In FY 2018, this multi-agency effort will provide recommendations for processes and methods that will enhance continued multi-agency coordination, ultimately improving restoration outcomes.



Focus Area 5 Success Stories

Education at Sleeping Bear Dunes National Lakeshore



In FY 2017, GLRI funding allowed the National Park Service to hire a team education technician at Sleeping Bear Dunes National Lakeshore. This resulted in greatly expanded educational offerings to teachers and students at the park. The Sleeping Bear Dunes National Lakeshore in Michigan was host to a teacher workshop about place-based education, in partnership with the Grand Traverse Stewardship Initiative. This initiative worked across park divisions to develop educational programs and student field trips with advice from natural resource experts in avian botulism and piping plover conservation, all with support from GLRI funding. In FY 2017, over 4,600 students attended place-based GLRI related education programs at Sleeping Bear Dunes National Lakeshore.



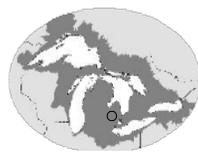
Evaluating the Changing Nature of Lake Huron



The Lake Huron food web has changed dramatically over the past decade, including declines in the recreationally valuable Chinook salmon fishery. In FY 2017, to address the changing nature of the lake, GLRI funded the Cooperative Science and Monitoring Initiative (CSMI) to conduct extensive field research in Lake Huron. CSMI partners evaluated how nutrients from the watershed are incorporated into lower food web components and larval fish production in different areas of the lake, assessed the lake-wide abundance and distribution of benthic organisms, determined the best methods for quantifying round goby abundance and biomass across a wide range of habitat types, and assessed the diets of predatory fish in the lake. Results will be used to address a broad range of management issues in Lake Huron, from water quality managers dealing with nuisance *Cladophora* in nearshore areas to fishery managers concerned about sufficient prey fish biomass that supports key recreational fisheries.



Meaningful Watershed Educational Experiences



In FY 2017, GLRI funding supported NOAA's Great Lakes Bay Watershed Education and Training Program, and the Southeast Michigan Stewardship Coalition, to carry out a professional development sequence to teachers around Southeast Michigan focusing on designing and implementing year-long meaningful watershed educational experiences. Each professional development and coalition gathering supported teachers, partners, and ultimately students from a total of 18 different schools and 13 partner organizations. As a result, over 600 students participated in a dozen different stewardship projects throughout the year. Stewardship activities included: water quality monitoring and filtration projects, salmon in the classroom, creating and presenting a short film on Great Lakes water issues, tree planting, cultivating butterfly and rain gardens, invasive species removal, and community engagement activities.



Focus Area 5 Success Stories

Mapping and Characterizing Lake Trout Habitats



In FY 2017, the GLRI funded a benthic mapping project on Lake Superior in support of interagency lake trout research using sonar surveying. The mapping has allowed for the characterization of lake trout habitats at the preferred spawning locations around Isle Royale. Isle Royale is the only place in Lake Superior that has all four morphotypes of lake trout. In addition, in FY 2017, the GLRI funded surveying research and mapping of the historic lake trout reefs in conjunction with the Red Cliff Band of Lake Superior Chippewa at the Apostle Islands National Lakeshore. This research will identify reefs that are in poor condition, either from stream sedimentation or human alteration, and set the stage for future restoration. These two GLRI-funded projects produced new details of the spawning reefs as well as unveiling additional, unique, and previously unknown habitat types.



Educating Great Lakes Educators

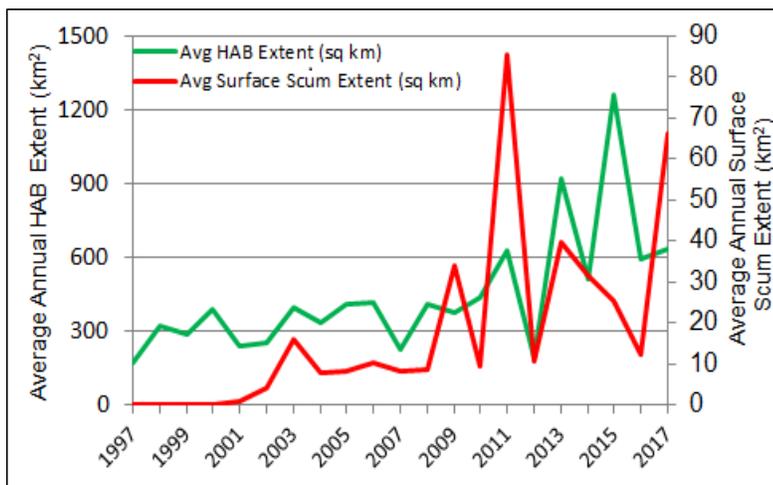


In FY 2017, GLRI funding supported the Center for Great Lakes Literacy (CGLL) staff to bring in scientists to assist in their educator workshops. Many of these teachers make long-lasting bonds with these scientists, which adds substantial value to Great Lakes education. Frequently CGLL staff partner teachers with scientists from the EPA Lake Guardian vessel to bring critical knowledge, such as the study of limnology, into their classrooms through Skype sessions. Teachers work with scientists and other educators to learn more about Lake Erie's water quality using CGLL's LimnoLoan equipment during summer workshops and even join research expeditions on numerous projects. These educators bring this engagement into their classroom where students can do things such as raise trout, study local watersheds, and create life-size fish murals. Work like this has encouraged over 500 students within the Great Lakes basin to become future stewards of the Great Lakes.

Harmful Algal Blooms on Western Lake Erie



In FY 2017, GLRI funding supported NOAA's Lake Erie monitoring efforts leading to the determination of the Western Lake Erie Harmful Algal Bloom (HAB) average extent. The yearly HAB average extent provides valuable feedback on how Lake Erie is responding to nutrient loading. In FY 2017, the bloom initially formed east of Monroe, Michigan and later moved to the southern part of Western Lake Erie. Overall, the average yearly extent of Western Lake Erie HABs has been increasing since 2010. The low nutrient input during drought conditions in 2012 led to a low areal extent and is considered a target for load reductions recommended under the Great Lakes Water Quality Agreement.



Section 3 – GLRI Regional Partner Engagement

The federal agencies that make up the GLRI collaborate and coordinate extensively with numerous entities to address the challenging ecosystem problems that affect the Great Lakes. Below are just a few examples of this engagement.

Great Lakes Tribes

For Tribal Nations within the Great Lakes basin, support from the GLRI has fostered valuable partnerships and led to the performance of much important work, including controlling invasive species, reducing nutrient and phosphorous loadings into waterways, reopening tributaries to restore fish passage, protecting Lake Superior coastal wetlands, and restoring several culturally-significant species such as lake sturgeon, moose, and wild rice.

In FY 2017, the GLRI enhanced its commitment to improving communications and relationships with its Great Lakes tribal partners by leading an in-person Tribal Forum in May, hosted by BIA, with tribal representatives and leaders. This forum provided an opportunity to discuss program processes and goals, tribal recommendations and concerns, and methods to improve communication, collaboration and consultation. In FY 2017, the GLRI agencies created a framework to guide continued engagement with tribes regarding the GLRI.

Accompanying the GLRI's FY 2017 congressional appropriation (P.L. 115-31) was explanatory language (163 Cong. Rec. H3883) stating that tribal-related funding and activities should be funded at no less than FY 2016 levels. FY 2017, funding to tribes totaled over \$13.6 million, more than \$3.7 million above FY 2016 tribal activity funding. Since its inception in FY 2010, tribes have directly received a total of over \$65.7 million in GLRI funding. This funding has been instrumental in building tribal resource management capacity and contributing to the protection and restoration of treaty-reserved resources and culturally-significant habitats and species that support tribal life-ways.

Great Lakes State Partners

The GLRI is committed to working with the eight states that fall within the Great Lakes Basin. These states have a vested interest in the health and restoration of the Great Lakes to ensure the quality of their economies and the health of their citizens. The partnership between Great Lakes states and the GLRI continues to result in important work ranging from controlling invasive species threatening fisheries, reducing nutrient and phosphorous loadings into waterways, capturing and treating urban runoff, to delisting AOCs and addressing environmental justice concerns. Since its inception in FY 2010, the GLRI has awarded over \$375 million in Great Lakes state funding including over \$38 million from FY 2017 funding.

In FY 2017, the GLRI enhanced its commitment to improving communications and relationships with our Great Lakes state partners by leading an in person state Forum in May, hosted by EPA, with state environmental representatives and leaders. This forum provided an opportunity to discuss program processes and goals, state recommendations and concerns, as well as ways to improve communication and collaboration. In FY 2017, the GLRI agencies created a framework to guide continued engagement with Great Lakes states regarding the GLRI.

Leveraging Funds

Some GLRI funds are routinely leveraged to achieve substantially more than would be possible with GLRI funds alone. Leveraging of GLRI funds generally refers to situations where a funding recipient or a third party provides additional funds or resources, above and beyond the GLRI funds, to support or complement their project. Federal agencies reported leveraging up to 35% of their GLRI funds through FY 2017 for their programs. Percentages for programs ranged from 5% to 70%.



Section 4 – Financial Reporting

From FY 2010 to FY 2017, the U.S. Environmental Protection Agency has been appropriated approximately \$2.56 billion in GLRI funds. The agencies that receive GLRI funds use multiple funding mechanisms, including interagency agreements, competitive grants, and capacity-building grants to states and tribes.

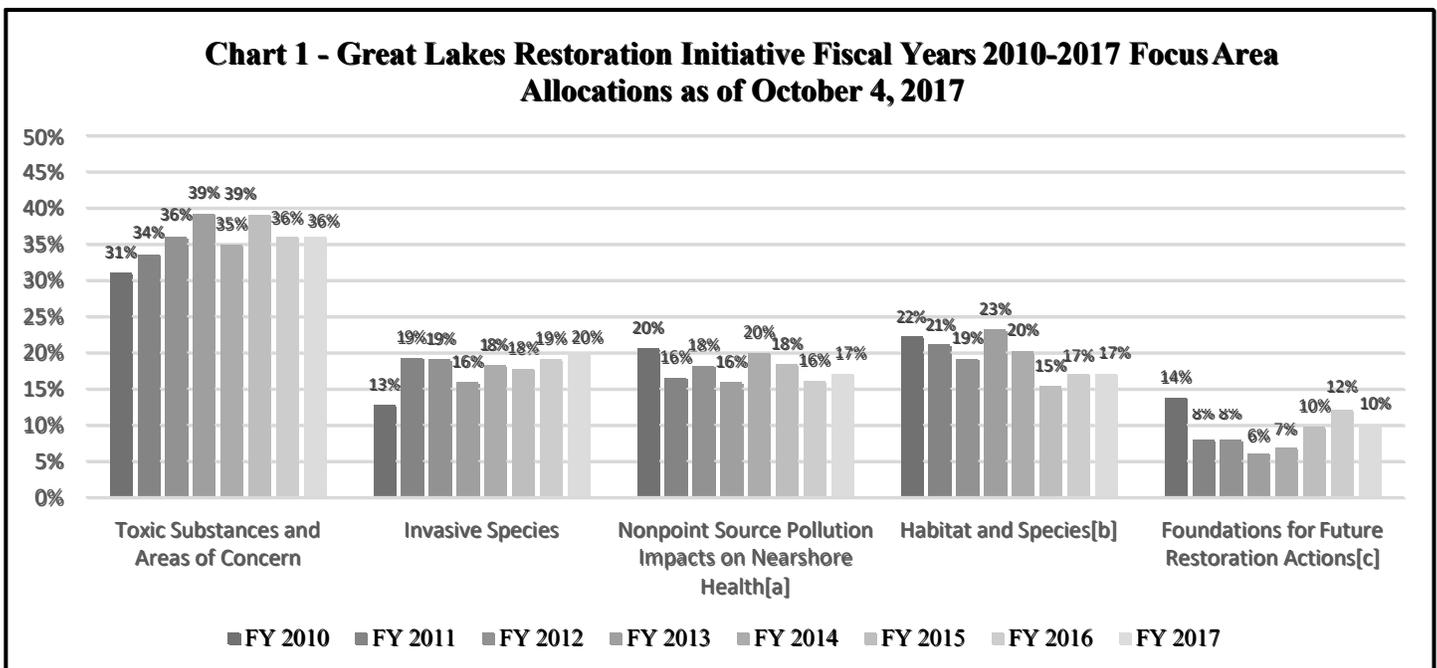
Table 1 and Chart 1 provide information on FY 2010 - FY 2017 GLRI funding by focus area. Table 2 provides summary information for Fiscal Years 2010 -2016 of GLRI funding by Agency (more detailed information can be found in the GLRI Reports to Congress and the President for FY 2010 - FY 2016). Table 3 provides more detailed information for FY 2017 by Agency.

Focus Area	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY2017
Toxic Substances and Areas of Concern	\$146,946	\$100,400	\$107,500	\$111,000	\$104,600	\$117,000	\$108,000	\$108,000
Invasive Species	\$60,265	\$57,500	\$56,900	\$45,000	\$54,600	\$53,000	\$57,000	\$59,000
Nonpoint Source Pollution Impacts on Nearshore Health^[a]	\$97,331	\$49,250	\$54,300	\$45,000	\$59,700	\$55,000	\$49,000	\$52,000
Habitat and Species^[b]	\$105,262	\$63,000	\$57,200	\$65,500	\$60,600	\$46,000	\$51,000	\$50,000
Foundations for Future Restoration Actions^[c]	\$65,196	\$29,250	\$23,500	\$17,000	\$20,500	\$29,000	\$35,000	\$31,000
TOTAL	\$475,000	\$299,400	\$299,500	\$283,500	\$300,000	\$300,000	\$300,000	\$300,000

^[a] Nearshore Health and Nonpoint Source Pollution in FY 2010-2014.

^[b] Habitat and Wildlife Protection and Restoration in FY 2010-2014.

^[c] Accountability, Education, Monitoring, Evaluation, Communication, and Partnerships in FY 2010 – 2014.



^[a] Nearshore Health and Nonpoint Source Pollution in FY 2010-FY 2014.

^[b] Habitat and Wildlife Protection and Restoration in FY 2010-FY 2014.

^[c] Accountability, Education, Monitoring, Evaluation, Communication, and Partnerships in FY 2010 – FY 2014.

Table 2- FY 2010 – FY 2016 Great Lakes Restoration Initiative Funding by Agency as of October 4, 2017
(Dollars in Thousands)

Agency ^[a]	Obligations ^[b]							
	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	Total
DHS-USCG	\$6,144	\$1,618	\$2,513	\$2,451	\$1,278	\$2,006	\$1,274	\$17,285
DOC-NOAA	\$30,537	\$17,600	\$16,243	\$25,505	\$35,170	\$24,818	\$30,740	\$180,612
DOD-USACE	\$49,272	\$30,663	\$35,409	\$31,589	\$28,504	\$48,159	\$33,369	\$256,965
DOI-BIA	\$3,416	\$6,316	\$4,719	\$3,985	\$3,950	\$4,750	\$6,203	\$33,338
DOI-NPS	\$10,480	\$4,861	\$3,527	\$3,013	\$3,177	\$3,142	\$3,799	\$31,999
DOI-USFWS	\$69,349	\$48,690	\$45,700	\$40,001	\$49,038	\$41,393	\$48,118	\$342,288
DOI-USGS	\$23,717	\$14,532	\$13,052	\$12,662	\$19,832	\$23,433	\$22,960	\$130,187
DOT-FHWA	\$2,500	\$1,218	\$1,221	\$973	\$965	\$0	\$0	\$6,877
DOT-MARAD	\$4,000	\$2,695	\$2,447	\$2,311	\$1,791	\$1,291	\$2,106	\$16,640
HHS-CDC/ATSDR	\$5,500	\$2,196	\$2,200	\$1,416	\$1,739	\$1,738	\$1,692	\$16,481
USDA-APHIS	\$1,885	\$598	\$1,086	\$871	\$1,239	\$1,246	\$1,089	\$8,013
USDA-NRCS	\$34,092	\$16,788	\$25,603	\$19,253	\$24,280	\$23,281	\$19,062	\$162,360
USDA-USFS	\$15,458	\$8,501	\$6,718	\$5,929	\$6,401	\$6,290	\$10,822	\$60,118
IA Totals:	\$256,349	\$156,276	\$160,436	\$149,957	\$177,363	\$181,546	\$181,234	\$1,263,162
EPA, GLFC, IJC, Misc. IA	\$212,727	\$135,046	\$135,210	\$130,641	\$121,178	\$117,483	\$116,379	\$968,664
Obligated	\$469,076	\$291,322	\$295,646	\$280,598	\$298,541	\$299,029	\$297,613	\$2,231,825
Returned^[c]	\$5,924	\$8,078	\$3,874	\$3,100	\$1,459	\$971	\$2,387	\$25,793
GLRI Totals	\$475,000	\$299,400	\$299,520	\$283,698	\$300,000	\$300,000	\$300,000	\$2,257,618

^[a] Individual Agency allocations from each appropriation can be found in previous Reports to Congress and the President.

^[b] Obligations are the amount of orders placed; interagency agreements, contracts or grants awarded; and similar transactions by EPA. The amount also reflects deobligations. Deobligation generally results from events such as completing a project under budget, contract termination, changes in project scope or focus, or other unforeseeable circumstances.

^[c] Returned funds are determined by subtracting obligations as of October 4, 2017 from appropriated funds. Returned funds generally result from deobligating funds as a result of completing a project under budget, contract termination, changes in project scope or focus, or other unforeseeable circumstances. The amount in this line also can include reserves that have been established to provide for contingencies or to effect savings under the Antideficiency Act.

**Table 3 - Great Lakes Restoration Initiative Fiscal Year 2017 Funding by Agency as of October 4, 2017
(Dollars in Thousands Rounded)**

Agency	FY 2017 Initial Allocation ^[a]	FY 2017 Actual Allocation ^[b]	FY 2017 Total Obligations
DHS-USCG	\$1,580	\$1,580	\$1,100
DOC-NOAA	\$12,027	\$12,027	\$12,027
DOD-USACE	\$29,103	\$60,062	\$60,062
DOI-BIA	\$10,031	\$10,106	\$10,106
DOI-NPS	\$4,379	\$4,604	\$4,379
DOI-USFWS	\$40,494	\$41,794	\$41,794
DOI-USGS	\$22,196	\$26,817	\$26,817
DOT-MARAD	\$800	\$800	\$800
HHS-CDC	\$593	\$593	\$593
USDA-APHIS	\$1,262	\$1,262	\$1,262
USDA-NRCS	\$19,072	\$22,072	\$19,072
USDA-USFS	\$13,446	\$11,355	\$11,355
IA Totals:	\$154,982	\$193,071	\$189,366
EPA, GLFC, and Misc. IAs	\$145,018	\$106,929	\$93,322 ^[c]
GLRI Grand Totals:	\$300,000	\$300,000	\$282,688 ^[d]

^[a] Based on allocations to each Agency distributed to the Regional Working Group June 16, 2017.

^[b] Federal agencies work collaboratively to ensure that funding is used for the highest priority Great Lakes projects. The “Actual Allocations” (funding provided to each agency) reflect adjustments made to address emerging priorities (e.g., keep Asian carp from becoming established in the Great Lakes) and to maximize environmental outcomes.

^[c] Components are: (i) grants totaling \$61,284,562 (including funding for the Great Lakes Fishery Commission, an organization identified in the President’s Budget); (ii) Great Lakes National Program Office support costs (payroll, travel, general expenses, and working capital) totaling \$12,121,318; and (iii) contracts and miscellaneous interagency agreements (each less than \$1 million) totaling \$19,915,983.

^[d] EPA expects to award funding under existing funding proposals for agencies, States and Tribes, and identified AOC restoration projects for outstanding unobligated funding.

APPENDIX A – GLRI ACTION PLAN II: MEASURES OF PROGRESS

This table provides an overview of the results achieved for each of the 34 Measures of Progress in the Great Lakes Restoration Initiative Action Plan II. Targets for Measures of Progress were established under assumptions contained in Action Plan II. Ten Measures of Progress have annual targets. The remaining Measures of Progress will be reported annually to track progress towards long-term goals that will take more than five years to reach. Detailed information is provided in the following pages. *Red indicates the target was not met, green indicates the target was met, and gray indicates that only results will be provided since a target does not apply. Cumulative measures indicated with an **.

Focus Area	GLRI Action Plan II Measures	Result/Target		
		FY 2015	FY 2016	FY 2017
Toxic Substances	1.1.1 AOC Management Actions*	7/8	8/9	11/11
	1.1.2 BUIs*	60/60	65/65	73/72
	1.2.1 People Provided Fish Consumption Information	220,843	207,953	66,552
	1.2.2 Fish/Wildlife Emerging Contaminant Projects	14	7	9
Preventing and Controlling Invasive Species	2.1.1 Rapid Response Exercises	21/8	11/8	25/8
	2.1.2 Projects Blocking Pathways	8	14	15
	2.1.3 Early Detection Activities	15	3	7
	2.2.1 Aquatic /Terrestrial Acres*	101,392/94,500	115,889/110,000	134,856/120,000
	2.2.2 Invasive Tributary Miles	0	0	0
	2.3.1 Invasive Technologies*	62	65	70
	2.3.2 Invasive Collaboratives*	4	4	4
Nonpoint Source Pollution Impacts on Nearshore Health	3.1.1 Ag. Phosphorus Reduction Projected* (lbs.)	160,117/130,000	402,943/310,000	767,864/525,000
	3.1.2 Nutrient/Sediment Reduction Projects (acres)	101,574	89,211	168,545
	3.1.3 Nutrient/Sediment Reductions* (lbs.)	NA	NA	NA
	3.2.1 Urban Runoff Projected* (millions of gallons)	37/30	116/70	239/120
	3.2.2 Urban Runoff Projects	18	36	36
	3.2.3 Urban Runoff Captured of Treated*	NA	NA	NA
Habitats and Species	4.1.1 Habitat Tributary Miles*	3,855/2,200	4,615/4,200	4,967/4,900
	4.1.2 Shoreline Miles*	313/75	662/350	947/725
	4.1.3 Coastal Wetland Acres*	7,033/7,000	17,540/15,000	24,306/30,000
	4.1.4 Other Habitat Acres*	146,815/127,000	167,218/167,000	201,663/187,000
	4.2.1 Federally-Listed Species Projects	10	17	24
	4.2.2 Self-Sustaining Species Projects	47	28	23
Foundations for Future Restoration Actions	5.1.1 Climate Resiliency Criteria Developed (2016)	NA	Developed	NA
	5.1.2 Climate Resiliency Criteria Incorporated (2017)	NA	NA	Incorporated
	5.2.1 Trained Educators	331	407	611
	5.2.2 People Educated	24,785	27,989	35,078
	5.3.1 Evaluations	Completed	Completed	Completed
	5.3.2 Annual Monitoring	Conducted	Conducted	Conducted
	5.3.3 Targeted Watersheds, Habitats, Species to prioritize Funding	Identified	Identified	Identified
	5.3.4 Annual GLRI Reports	Issued	Issued	Issued
	5.3.5 Triennial GLWQA Reports	NA	Issued	NA
5.3.6 Triennial State of the Lakes Report	NA	NA	Issued	
5.3.7 Online Information	Updated	Updated	Updated	

GLRI Action Plan II Measures of Progress – Detailed Information

	Measure	Target	Result	Explanation/Additional Information
1.1.1	Areas of Concern in the Great Lakes where all management actions necessary for delisting have been implemented (cumulative) ^[a]	FY 17: 11 FY 16: 9 FY 15: 8 Baseline: 7 ^[c]	FY 17: 11 FY 16: 8 FY 15: 7	AOC Management Actions were completed at the River Raisin, MI (12/5/2016), St. Marys River, MI (8/28/2017), and Lower Menominee, MI/WI (5/17/2017).
1.1.2	Area of Concern Beneficial Use Impairments Removed (cumulative) ^[a]	FY 17: 72 FY 16: 65 FY 15: 60 Baseline: 52 ^[c]	FY 17: 73 FY 16: 65 FY 15: 60	Restrictions on Fish and Wildlife Consumption: Black River, OH (10/11/2016) Eutrophication: Black River, OH (10/11/2016) Eutrophication: St. Marys, MI (12/18/2016) Degradation of Benthos: Lower Menominee River, MI/WI (5/18/2017) Restrictions on Dredging: Menominee River, MI/WI (5/18/2017) Bird/Animal Deformities or Reproductive Problems: St. Clair River, MI (6/2/2017) Degradation of Benthos: Rochester Embayment, NY (7/11/2017) Loss of Fish and Wildlife Habitat: St. Clair River, MI (9/9/2017)
1.2.1	Number of people provided information on the risks and benefits of Great Lakes fish consumption by GLRI-funded projects	NA	FY 17: 66,572 FY 16: 207,953 FY 15: 220,843	Information was provided by HHS-ATSDR and EPA. This result is lower for FY 2017 than previous years because several grants closed in 2017, resulting in less outreach as the work is closed out. In addition, GLRI has not funded any new grants since 2016 that would contribute to this measure.
1.2.2	Number of GLRI-funded projects that identify and/or assess impacts of emerging contaminants on Great Lakes fish and wildlife	NA	FY 17: 9 FY 16: 7 FY 15: 14	Project partners include EPA (GLNPO and ORD), NOAA, USGS, USFWS, and USACE.

2.1.1	Number of GLRI-funded Great Lakes rapid responses or exercises conducted	FY 17: 8 FY 16: 8 FY 15: 8 Baseline: NA ^[c]	FY 17: 25 FY 16: 11 FY 15: 21	The eight Great Lakes states have committed to conducting annual training exercises, but prioritize activities to respond to detections of new invasive species. In FY 2017, multiple state agencies and others completed 25 actual responses.
2.1.2	Number of GLRI-funded projects that block pathways through which aquatic invasive species can be introduced to the Great Lakes ecosystem	NA	FY 17: 15 FY 16: 14 FY 15: 8	Projects included work to reduce the spread of invasive species by hunters, anglers, and the recreational boat pathways.
2.1.3	Number of GLRI-funded early detection monitoring activities conducted	NA	FY 17: 7 FY 16: 3 FY 15: 15	Early detection activities were conducted in FY 2017. Activities included both conventional monitoring techniques (nets, traps, electroshocking) as well as environmental DNA sampling.
2.2.1	Number of aquatic/terrestrial acres controlled by GLRI-funded projects (cumulative)	FY 17: 120,000 ^[b] FY 16: 110,000 ^[b] FY 15: 94,500 ^[b] Baseline: 36,000 ^[c]	FY 17: 134,856 FY 16: 115,889 FY 15: 101,392	Targets were raised during budget development when end-of-year results exceeded previously set cumulative targets. Federal agencies allocated additional funding to on-the-ground work with local partners, resulting in an exceedance of the FY 2017 target.
2.2.2	Number of tributary miles protected by GLRI-funded projects	NA	FY 17: 0 FY 16: 0 FY 15: 0	Projects have been planned and designed; however additional efforts are still underway to complete coordination with USACE, stakeholders, and real estate interests as well as obtaining requisite 35% cost share.
2.3.1	Number of technologies and methods field tested by GLRI-funded projects	NA	FY 17: 70 FY 16: 65 FY 15: 62	Technologies were field tested by federal agencies and their partners. Technologies included ballast water management systems and a tool for detecting Asian carp.
2.3.2	Number of collaboratives developed or enhanced with GLRI funding	NA	FY 17: 4 FY 16: 4 FY 15: 4	Invasive species Collaboratives counted under this Measure include the Asian Carp Regional Coordinating Committee led by USFWS, the Monoecious Hydrilla Collaborative led by USACE, the Mussels Collaborative led by USGS, and the Phragmites Collaborative also led by USGS.

3.1.1	Projected phosphorus reductions from GLRI-funded projects in targeted watersheds (measured in pounds) (cumulative)	FY 17: 525,000 FY 16: 310,000 FY 15: 130,000 Baseline: NA ^[c]	FY 17: 767,864 FY 16: 402,943 FY 15: 160,117	Results can vary each year due to the nature of voluntary conservation assistance programs. The targets for 3.1.1 were developed based on assumptions about funding levels, the types of conservation practices that would be adopted by private landowners, and their effectiveness. In FY 2017, agricultural landowners adopted practices that included a considerable number of waste storage facilities, which resulted in an exceedance of performance goals for phosphorus reduction.
3.1.2	Number of GLRI-funded nutrient and sediment reduction projects in targeted watersheds (measured in acres)	NA	FY 17: 168,545 FY 16: 89,211 FY 15: 101,574	Contributing agencies: NRCS, EPA, and USACE. Practices implemented in FY 2017 include: bioswales, rain gardens, bioretention ponds, porous pavement, tree plantings, and constructed wetlands.
3.1.3	Measured nutrient and sediment reductions from monitored, GLRI-funded projects in targeted watersheds (measured in pounds)	NA	FY 17: NA FY 16: NA FY 15: NA	Results are reported for this measure after a reduction has been measured and quantified through the implementation of standardized USGS monitoring and statistical designs. As quantification of these results requires long-term monitoring, preliminary results are not anticipated until FY 2018 at the earliest.
3.2.1	Projected volume of untreated urban runoff captured or treated by GLRI-funded projects (measured in millions of gallons) (cumulative)	FY 17: 120 FY 16: 70 FY 15: 30 Baseline: NA ^[c]	FY 17: 239 FY 16: 116 FY 15: 37	Result includes EPA shoreline cities grants in: Chicago, IL, Michigan City, IN, Fort Wayne, IN, Oregon, OH, Cleveland, OH, Toledo, OH, Detroit, MI, Flint, MI, Marquette, MI, Muskegon, MI, Traverse City, MI, Milwaukee, WI, and Kenosha, WI. GLRI agencies have learned more about which management practices work best and have used opportunities to implement projects with these best management practices, thus yielding better results than originally projected.
3.2.2	Number of GLRI-funded projects implemented to reduce the impacts of untreated urban runoff on the Great Lakes.	NA	FY 17: 36 FY 16: 36 FY 15: 18	Practices implemented in 2017 include: bioswales, rain gardens, bioretention ponds, porous pavement, tree plantings, and constructed wetlands.
3.2.3	Measured volume of untreated urban runoff captured or treated by monitored	NA	FY 17: NA FY 16: NA FY 15: NA	Results for this measure are reported after a measured reduction has been quantified through USGS monitoring and statistical designs. As monitoring and statistical designs are still under development by

	GLRI-funded projects			USGS, results are not anticipated until FY 2018 at the earliest.
4.1.1	Number of miles of Great Lakes tributaries reopened by GLRI-funded projects (cumulative)	FY 17: 4,900 ^[b] FY 16: 4,200 ^[b] FY 15: 2,200 Baseline: 1,900 ^[c]	FY 17: 4,967 FY 16: 4,615 FY 15: 3,855	Projects to remove dams and impediments to fish passage.
4.1.2	Number of miles of Great Lakes shoreline and riparian corridors protected, restored and enhanced by GLRI-funded projects (cumulative)	FY 17: 725 ^[b] FY 16: 350 ^[b] FY 15: 75 Baseline: 0 ^[c]	FY 17: 947 FY 16: 662 FY 15: 313	In FY 2017 agencies continued to accelerate projects to protect, restore, and/or enhance targeted coastal habitats and key river corridors in the Great Lakes.
4.1.3	Number of acres of Great Lakes coastal wetlands protected, restored and enhanced by GLRI-funded projects (cumulative)	FY 17: 30,000 FY 16: 15,000 FY 15: 7,000 Baseline: 0 ^[c]	FY 17: 24,306 FY 16: 17,540 FY 15: 7,033	In FY 2017, in addition to significant on-the-ground restoration accomplishments, significant planning and design activities were initiated in order to greatly accelerate acres of coastal wetlands restored in FY 2018 and FY 2019 and achieve targets in those years.
4.1.4	Number of acres of other habitats in the Great Lakes basin protected, restored and enhanced by GLRI -funded projects (cumulative)	FY 17: 187,000 FY 16: 167,000 ^[b] FY 15: 127,000 Baseline: 117,000 ^[c]	FY 17: 201,663 FY 16: 167,218 FY 15: 146,815	In FY 2017, federal agencies completed work in terrestrial and aquatic Great Lakes systems as well as targeted actions on federal and state protected lands.
4.2.1	Number of GLRI-funded projects that promote recovery of federally-listed endangered, threatened, and candidate species (cumulative)	NA	FY 17: 24 FY 16: 17 FY 15: 10	In FY 2017, continued significant progress was made on the recovery of piping plover. Federal agencies reprioritized actions for an additional seven federally listed species.
4.2.2	Number of GLRI-funded projects that promote populations of native non-threatened and non-endangered species self-sustaining in the wild	NA	FY 17: 23 FY 16: 28 FY 15: 47	Projects focused efforts on protecting lake sturgeon, lake trout, and deep water coregonid. Actions were undertaken by federal agencies guided by emerging science, needs of individual states, and directions from multi-state fishery agencies.
5.1.1	By 2016, a standardized set of climate resiliency criteria will be	FY 17: NA FY 16: Developed FY 15: NA	FY 17: NA FY 16: Developed FY 15: NA	Federal agencies developed climate resiliency criteria in FY 2016.

	developed for GLRI projects			
5.1.2	Starting in 2017, projects will include climate resiliency criteria in planning and implementation	FY 17: Incorporated FY 16: NA FY 15: NA	FY 17: Incorporated FY 16: NA FY 15: NA	Climate resiliency criteria were incorporated by all of the 14 applicable agencies.
5.2.1	Number of educators trained through GLRI-funded projects	NA	FY 17: 611 FY 16: 407 FY 15: 331	GLRI funding helped train 611 educators in FY 2017.
5.2.2	Number of people educated on the Great Lakes ecosystem through GLRI-funded place-based experiential learning activities	NA	FY 17: 35,078 FY 16: 27,989 FY 15: 24,785	GLRI educated over 35,078 people on the Great Lakes ecosystem through GLRI-funded place-based experiential learning activities through National Park Service interpretative programs.
5.3.1	Project evaluations completed and used to prioritize GLRI funding decisions each year	NA	FY 17: Completed and used FY 16: Completed and used FY 15: Completed and used	GLRI-funded projects were routinely evaluated to ensure that they will be implemented as proposed. Progress in achieving objectives for existing projects was used to prioritize GLRI-funding decisions.
5.3.2	Annual Great Lakes monitoring conducted and used to prioritize GLRI funding decisions each year	NA	FY 17: Conducted FY 16: Conducted FY 15: Conducted	Federal agencies and partners conducted comprehensive monitoring to assess the status and trends of the Great Lakes ecosystem. Long-term monitoring of coastal wetlands, contaminants, nutrients, zooplankton, phytoplankton, harmful algal blooms, benthic communities, and prey fish, among many other components, was conducted throughout the basin. The monitoring data and information from previous years was used to identify the most significant Great Lakes problems and prioritize funding decisions to address those problems.
5.3.3	GLRI-targeted watersheds, habitats and species identified and used to prioritize GLRI funding decisions	NA	FY 17: Identified and used FY 16: Identified and used FY 15: Identified and used	GLRI agencies and partners identified watersheds, habitats, and species to be targeted in FY 2017 and beyond. The Great Lakes Advisory Board, states, tribes, and other stakeholders provided input to the agencies on how best to target GLRI resources. As part of efforts in all five focus areas, GLRI continues to prioritize work to accelerate the cleanup of Areas of Concern, reduce harmful

				algae, and prevent the introduction of new invasive species.
5.3.4	Issue Annual GLRI Reports to Congress and the President	NA	FY 17: Issued FY 16: Issued FY 15: Issued	The Great Lakes Restoration Initiative Report to Congress and the President is issued annually.
5.3.5	Issue Great Lakes Water Quality Agreement Triennial Progress Reports of the Parties	NA	FY 17: NA FY 16: Issued FY 15: NA	The Great Lakes Water Quality Agreement Triennial Progress Reports of the Parties was issued in September of 2016.
5.3.6	Issue triennial State of the Lakes reports	NA	FY 17: Issued FY 16: NA FY 15: NA	The Triennial State of the Lakes Reports, under the 2012 Great Lakes Water Quality Agreement, were issued in FY 2017.
5.3.7	Periodically update publicly available online information about GLRI	NA	FY 17: Updated FY 16: Updated FY 15: Updated	Updates included: publication of the FY 2016 GLRI Report to Congress and the President; project updates; Great Lake Advisory Board information; and links to information from other agencies.

^[a] Results from this Action Plan measure are achieved through GLRI funding as well as other non-GLRI federal and/or state funding.

^[b] This target has been adjusted from the Action Plan

^[c] Baseline year is FY 10, the first year of GLRI