

DETROIT RIVER AREA OF CONCERN-CONNECTING BLUE HERON LAGOON AND DETROIT RIVER

BRIEF PROJECT DESCRIPTION

The Detroit River Area of Concern Habitat Beneficial Use Impairments includes loss of fish and wildlife habitat. The Blue Heron Lagoon is a 41-acre lake/wetland on Belle Isle that discharges to the Detroit River. Direct access for fish from the River to the Lagoon is prohibited by sheetpile walls, grates and drop structures. This project proposes to reconnect and naturalize the mouth of the Lagoon to the Detroit River restoring fish access to 95 acres of wetlands, shallow and deep water habitat and 2.2 miles of canals. Enhancement of fish habitat in the Detroit River has been proposed by the Remedial Action Plan as one means of delisting impaired beneficial use.

8.0 FULL PROJECT DESCRIPTION

8.1. Project's Relevance to the Great Lakes

The Friends of the Detroit River (FDR) proposes to lead an interdisciplinary team to implement a key element in the habitat restoration plan for the Detroit River Great Lakes Areas of Concern located in southeast Michigan. FDR will have the primary responsibility of project management, administer all contracts and oversight and will be the sole facilitator with EPA.

Two Beneficial Use Impairments (BUI) relating to fish and wildlife have been identified in the Detroit River Area of Concern (DR-AOC): Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations.

Remedial actions to clean up the Detroit River over the past 30 years have restored adequate conditions for reproduction and early life history survival by a large number of native fish species. Adequate, suitable water and substrate quality now exists near Belle Isle for successful reproduction by 16 native fish species, including walleye and lake whitefish.

However, the fate of the fish larvae once hatched is critical for their survival. There is no suitable coastal wetland nursery habitat in the immediate area of the Belle Isle Sturgeon Spawning Reef or a recently identified spawning shoal just upstream.

In order to restore these beneficial uses, the project proposes to reconnect and naturalize the discharge of the Belle Isle's Blue Heron Lagoon to the Detroit River, restoring fish access to over 95 acres of existing wetlands, shallow and deep water habitat and over 2.2 miles of lotic (canal) habitat. In addition, the project will enhance five acres of coastal wetland specifically designed for fish rearing and nursery habitat.

The proposed project is:

- Identified in the *Delisting Targets for Fish/Wildlife Habitat & Population Beneficial Use Impairments for the Detroit River Area of Concern* (Project 2 ; pg 20; MDEQ:April, 2009) and
- Prioritized as a "Tier I Action (0-3 yrs)" in the MDEQ's "AOC Action Tracking Table" (RA1 N-72 Blue Heron Lagoon Restoration) as part of the MDEQ's *Strategy for Delisting Michigan's Great Lakes Areas of Concern* and
- Meets the objectives of the *Guidance for Delisting Michigan's Great Lakes Areas of Concern* (MDEQ; 2008. Report MI/DEQ/WB-06/001).

The Blue Heron Lagoon was ranked in the 95th percentile of publicly held sites that were considered in *Detroit River Candidate Sites for Habitat Protection and Remediation* (Manny, 2002), a USGS study that resulted from recommendations in the Detroit River Remedial Action Plan (RAP – 1991, updated 2002).

The objectives of the project have also been referenced in:

- EPA Strategic Plan (2008), *Improve the Health of the Great Lakes, Restore and Protect Critical Ecosystems*;
- Great Lakes Interagency Task Force and *Great Lakes Regional Collaborative Building on Success* (2009) *Habitat/Wetland Initiative*;
- *Great Lakes Restoration Initiative Multi-year Action Plan* (2009) Outline through FY2014;
- Lakewide Management Plans (LaMP);
- Comprehensive State Wildlife Action Plans, the Fish and Wildlife Service (FWS) National Fish Habitat Action Plan;
- *Joint Strategic Plan for Management of Great Lakes Fisheries*, the U.S.-Canada Great Lakes Fishery Convention and the Great Lakes Fishery Plan;

- *Ecological Recovery of the Detroit River*; <http://www.glsc.usgs.gov/files/factsheets/2006-2%20whitefish.pdf>>

8.2. Purpose and Need

The Detroit River is internationally recognized as a critically important commercial, recreational and natural resource used by millions of people. Numerous wildlife species live within, or travel along the river. Loss of habitat for fish and wildlife has been identified by the International Joint Commission (IJC) as an impaired Habitat Beneficial Use for the Detroit River. For this and other reasons, the Detroit River is designated an AOC by the IJC and the need for aquatic habitat improvement identified in the Remedial RAP. The Detroit River Public Advisory Council (PAC) has identified several projects including this Belle Isle project for implementation that will help address the delisting of Habitat Beneficial Use Impairment.

Work on addressing the Fish and Wildlife Habitat/Populations Beneficial Use Impairments has already begun; in 2004, the “*Belle Isle/Detroit River Sturgeon Habitat Restoration, Monitoring, and Education Project*,” a multi-partner team led by Michigan Sea Grant, constructed artificial reefs to provide spawning substrate for lake sturgeon (*Acipenser fulvescens*). The spawning reefs significantly enhanced fish use of the area and directly enhanced reproduction in the Detroit River. The results of the pre- and post-construction assessments by the USGS Great Lakes Science Center include the following points:

- **Restoration of native fish populations in Detroit River is limited by spawning and nursery habitat.**
- Fish are spawning in the Detroit River. Walleye are spawning at the head of Belle Isle.
- State endangered northern madtom (*Noturus stigmosus* Taylor) and brindled madtom (*Noturus miurus* – state special concern), are present in the Detroit River. The northern madtom is considered critically imperiled in Michigan and is listed as endangered in Canada, also.
- Increased knowledge of native fish habitat restoration techniques are being applied based on findings from this project to other habitat restoration efforts and management activities.

However, the fate of the fish larvae once hatched is critical for their survival. There is no suitable coastal wetland nursery habitat in the immediate area of the Belle Isle Sturgeon Spawning Reef or the recently identified spawning shoal just upstream. Two proposed projects within the City of Detroit Belle Isle Park will provide nursery habitat adjacent to and downstream of these known Belle Isle spawning shoal sites.

8.3. Location: Belle Isle, City of Detroit

Belle Isle is a 982-acre city park located in the Detroit River and has long been considered the crown jewel of the City’s park system. Close to the city’s center, the park is also centrally located in a flyway that supports more than three million migratory birds each year and an important Great lakes waterway that supports hundreds of species of fish and waterfowl. The City of Detroit has made significant strides in protecting its natural heritage by including consideration of Belle Isle Park’s natural features in its Master Plan; its goals visibly demonstrate the City’s recognition and commitment to the value of the island’s natural areas and its role in stewardship:

- Preserve and enhance valuable habitat for threatened plant species, migratory birds and other wildlife;
- Enhance recreational opportunities for those who use the lagoon for fishing, walks and wildlife observation;
- Expand the City’s ability to involve children and youth in environmental learning and stewardship;
- Offer a place to educate the public about environmental restoration, and the wildlife and plant communities characteristic of SE Michigan; and,
- Enhance an important environmental connection with the U.S. Fish and Wildlife Service’s

International Wildlife Refuge on the City's southwest side.

As documented in the "*Belle Isle Canal Rehabilitation*" (January, 1993), a comprehensive capital improvement project was implemented that resulted in greatly improved water quality and aquatic habitat in the park's lakes and canal system.

In 2003 the Blue Heron Lagoon Natural Area project included an inventory, analysis, design and implementation of enhancement to a nine-acre site located on the north side of the Blue Heron Lagoon. The project restored fragments of an existing lakeplain prairie complex with high species diversity and a well-developed structure. The project included a self-guided interpretive trail with signage, highlighting plants and fish and wildlife using the Blue Heron Lagoon, which will be enhanced to discuss the importance of the reconnection of Blue Heron Lagoon to the Detroit River ecosystem.

Belle Isle's location within several migratory flyways provides additional opportunity for wildlife benefit. According to *Belle Isle Bird Surveys – 2005*, (Chartier), 205 bird species were observed on Belle Isle. As of 2009, 241 species have been noted on the island (personal communication – Allen Chartier). However, evidence of breeding activity has been noted for only 63 of these species. Additional coastal marsh would provide opportunities for breeding by additional species such as blue-winged teal, sora, Virginia rail, and black-crowned night heron,

The island already has small populations of reptiles and amphibians that would also benefit from the restoration of coastal marsh; 17 species have been found there in recent years including the state threatened eastern fox snake (*Pantherophis gloydi*), and the state special concern Blanding's turtle (*Emys blandingii*).

With the implementation of the various elements of the Master Plan, the City of Detroit Recreation Department is a strong partner and will be providing in-kind match in support of the project and are dedicated to having an active role in preserving and enhancing rare and valuable fish and wildlife habitat



Detroit River Area of Concern



Aerial of Blue Heron Lagoon



8.4. Blue Heron Lagoon Project

During the course of the master planning and design, it became apparent that Great Lakes fisheries was of premier interest to island visitors and fishing is still one of the most popular recreational activity. The Blue Heron Lagoon is located at the east end of Belle Isle and receives flow from the 2.2 mile canal system and discharges to the Detroit River. The Blue Heron Lagoon itself is 41-acre lagoon containing 205 acre-feet of water, almost one-half of the total water volume of the canal and lagoon system. The Lagoon's bottomland is flat and homogenous so its depth is a constant five feet. The banks are typically steep and three to five feet high.

Prior to canal rehabilitation in 1994, the Blue Heron Lagoon supported the pump house that pumped water from the Detroit River into the canal system. The pumps that controlled water flow in and out of the lagoon were removed in the 1990's, but water still flows through sluice gates under the pump house, out of the lagoon and into the river. The floor of the pump house is at an elevation of approximately 578.2-foot IGLD 85—which is 2-feet above the ordinary high water mark of the Detroit River at the east end of Belle Isle (576.0 IGLD 85). Direct access of fish from the River to the Lagoon is prohibited by this elevation as well as steel sheetpile, grates and drop structures.



View of the Structural Barrier to the Detroit River



View of the Connection with Detroit River



The *Belle Isle Canal Rehabilitation* report included concepts for reconnecting the Blue Heron Lagoon with the Detroit River by removing the concrete channel, control gates and racks for the purpose of providing over 95 acres of wetland and shallow water habitat for Detroit River fish and wildlife. This habitat is not available along this reach of the Detroit River as the entire shoreline of the River is hardened and stabilized with seawalls, concrete walls and steel.

This project proposes to reconnect and naturalize the mouth of the Blue Heron Lagoon to the Detroit River, create fish habitat structure, stabilize and enhance the Lagoon banks, create wetland edges and provide deep holes. The project already has detailed habitat restoration design and thus meets the “shovel-ready” criteria.

8.5 Enhancement to Belle Isle Spawning Shoal

Just upstream from the mouth of the Blue Heron Lagoon; unpublished data (B.A. Manny¹, G.W. Kennedy, J.C. Boase², J.D. Allen, and E.F. Roseman, U.S. Geological Survey (USGS), Great Lakes Science Center), has documented a spawning shoal used by walleye and suckers. The USGS collected viable, fertilized walleye and white sucker eggs deposited over a wide area on the River bottom at the head of Belle Isle in April 2005. Sympatric, sequential deposition of walleye then white sucker eggs at this active spawning ground in the Detroit River occurred even though the ideal rock-rubble and gravel substrates preferred by walleye and white sucker for spawning was scarce at this Belle Isle spawning ground.

From a fishery resource perspective, enhancing the spawning shoal with rock-rubble and gravel substrates and better connecting the Blue Heron Lagoon to the Detroit River would be desirable. This project could greatly increase the productivity of the Detroit River fishery in an easily monitored part of the ecosystem. The USGS Great Lakes Science Center and Michigan Department of Natural Resources and Environment (DNRE) have been baseline monitoring the Detroit River for many years. Enhancement of fish spawning habitat in the Detroit River has been proposed as one means of delisting loss of fish and wildlife habitat as an impaired beneficial water use in the Detroit River (Manny 2003). A draft fish-community and habitat goal and objective of maintaining stable, self-sustaining stocks of walleye developed for the Detroit River Area of Concern lists walleye as the first management priority (Hartig 1993). Protection and restoration of self-sustaining stream-spawning stocks of walleye is also one of the fish community objectives for Lake Erie (Ryan et al. 2003). Protection and enhancement of active, known walleye spawning grounds in the Detroit River would achieve another draft fish habitat objective for the Detroit River: no net loss of productive capacity of habitats supporting the fishery (Hartig 1993). For example, habitat enhancement and protection of this spawning shoal at Belle Isle during the spring spawning period from potentially detrimental human activities, such as dredging (Manny et al. 2007), could be included in fisheries management plans for walleye in Lake Erie within a framework like that recommended for Lake Ontario and its drainage by Minns and Wichert (2005).

8.6. Project Objectives

- Delisting of fish and wildlife Beneficial Use Impairments under the Great Lakes Water Quality Agreement for the Detroit River AOC;
- Define an understanding of fishery needs in terms of size, location, and proximity of associated spawning to nursery habitats, including connectivity to increase survival of young fish produced on the spawning habitat;
- Provide resource managers with decision support tools and scientific information for fish and habitat restoration in the Huron-Erie Corridor;
- Transfer and adapt findings and lessons learned from this project to other AOCs, especially connecting channels such as the St. Mary's River, the Niagara River and the St. Lawrence River;
- Inform local, regional, and national audiences (educators, legislators, general public) about the fish habitat restoration results of this project and the importance on the connection between fish life cycles and habitat restoration; and,
- Enhance public understanding of the importance of fish and wildlife habitat to quality of life and economic health of the region.

8.7. Project Scope:

Within 90 days of the award date, the project team (FDR, City of Detroit,) will:

- Competitively bid and select an engineering consultant.
- Complete biological assessment of the site to determine fish usage prior to construction, including fish species, life history stage(s) present, relative abundance, and current use for later evaluation of project objectives;
- Verify existing concept plans and develop design consensus;
- Begin construction design, engineering and construction drawings; and,
- Submit a joint US Army Corp of Engineers (ACOE) and Michigan Department of Natural Resources and Environment (DNRE) permit application to construct on Michigan Great Lakes bottomlands;

Within 270 days of the award date, the project team will:

- Obtain a joint ACOE and MDEQ permit to construct habitat on Michigan Great Lakes bottomlands;
- Provide construction documents, bid and award for a contractor; and,

- Construct the naturalized connection between Blue Heron Lagoon and the Detroit River using standard construction techniques.

The remainder of the 24-month award period will include post-construction assessment of the fish rearing and nursery sites to measure use of the Lagoon by native, larval fish and presence of young fishes in nursery habitat. Outreach and education activity for local school-age children (K-12) and members of the interested public, will be informed about the importance of habitat restoration, protection, and enhancement in the Detroit River AOC.

8.8. Project Timeline:

	Q1			Q2			Q3			Q4			Q5			Q6			Q7			Q8		
ACTIVITY	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
<i>Construction</i>																								
Refine designs	X																							
Complete Permit Application	X																							
Complete construction docs		X	X																					
Receive Permit				X																				
Issue RFP			X																					
Bid & Award				X																				
Construction					X	X	X																	
<i>Pre-Construction Assessment</i>																								
Adult Fish Survey		X																						
Larval Fish Survey		X	X																					
Small Fish Survey				X	X																			
<i>Post-Construction Assessment</i>																								
Fall 2010							X	X																
Spring 2011											X	X												
Summer 2011																X								
Fall 2011																	X	X						
<i>Education/Outreach</i>																								
Develop/Implement Program		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<i>Grant Administration</i>																								
Progress Reports				X			X			X			X			X			X			X		
Complete Final Reports																					X	X	X	

8.9. Monitoring and Assessment:

The project team proposes to monitor the construction site over two full years (spring/fall spawning and summer larval and juvenile fish). Under this grant, the project team will be able to conduct two summer assessments (one pre- and one post-construction), and two fall spawning season assessments (both post-construction) as well as two spring spawning season assessments (one pre and one post construction). Subsequent monitoring resources will be sought to support at least one more summer and fall assessment. The Huron Erie Corridor Initiative team has successfully sought resources to support similar activities in the past from the USFWS Great Lakes Coastal Program, the Great Lakes Fishery Trust and USGS Science Support Partnership Program, and anticipates seeking additional post-project support from one or several organizations. The following protocols outline proposed pre- and post- construction monitoring and assessment activities.

Baseline Limnology Assessment – USGS/DNRE

There has been Pre-construction assessment work in progress by the USGS and the DNRE of the project area for several years. Independent from this project there will be additional funding allocated to the USGS through the Great Lakes Restoration Initiative (GLRI) to continue this important assessment. The information provided by the USGS/DNRE will be utilized to develop baseline assessment within the Detroit River and the Blue Heron Lagoon. The distribution of fish will be characterized by USGS utilizing side-scan sonar (SSS) and underwater video (UTV) if funded. Water current velocity will be confirmed with the use of an Acoustic Doppler Current Profiler (ADCP).

Project Pre- and Post-Construction (spring 2010 through fall 2011).

The project team will identify adult fish use of the area immediately around the naturalized opening of the Blue Heron Lagoon and the Detroit River utilizing fyke nets, gill nets, and/or minnow traps during ice-free months. In addition, in cooperation with USGS if funded, an assessment may be completed by an Unmanned-Aerial Vehicle (UAV) equipped with a Dual-Frequency Identification System (DFIDSON), which is high definition imaging sonar, in year two, spring and fall spawning, to identify adult fish usage of the Lagoon and compare results against other methods, e.g. field gear, side-scan sonar (SSS), underwater video (UTV), and/or diver reconnaissance. Water current velocity, will be assessed immediately after construction and periodically thereafter to monitor changes in the current flow in and out of the Lagoon. Pre-construction monitoring of larval fish in the area immediately around the Blue Heron connection, upstream, and near suspected natural spawning site will be evaluated using towed larval plankton net sampling on established cross channel transects. Post Construction (summer 2011) will employ the same assessment methods as the pre-construction.

Nearshore Small Fish Survey (spring 2010 and 2011) will evaluate the establishment of fish populations in the Detroit River AOC upon the success of larvae after they leave the spawning beds. The project team will evaluate existing USGS hydrologic models of lake and river circulation to predict connectivity between the existing spawning shoal and downstream Blue Lagoon nursery habitat. The presence and abundance of young fish from species spawned at the spawning shoal, as established by USGS and DNRE will help determine optimal connectivity. Young fish will be collected in and around the Blue Heron connection and upstream in the Detroit River using a combination of gear including electro-fishing, small-mesh fyke nets, minnow traps, light traps, and beach seines. Fixed sampling locations will be established during the first 90 days of the project to sample over multiple time periods. Control sites away from the connection will be assessed as well to determine abundances of juvenile fish in areas away from the new connection. Post-Construction (spring and summer 2011) young fish will be collected using the gear listed above at the fixed sampling locations over monthly time periods during spring and summer.

8.10. Public Education and Involvement

The Friends of the Detroit River partner regularly with a number of organizations to promote environmental health and education along the river. Each year, in cooperation with the Detroit Recreation Department and the Friends of Belle Isle, they sponsor the “Shiver on the River, a family event which features displays and coordinated programming at all of the island’s cultural venues. This event presents an excellent forum for public education regarding the Blue Heron Lagoon restoration and the many benefits it provides to fish and wildlife in the Detroit River.

The **Belle Isle Nature Zoo**, an outpost of the Detroit Zoological Institute, has an annual attendance of over 60,000 people. In addition, it provides public outreach to 6,000 schoolchildren and on site programming for an additional 4,500 children each year. It also hosts a mentoring program for Detroit and Pontiac elementary school teachers in cooperation with Northern Michigan University. Its staff is trained in the Michigan Environmental Education Curriculum Support (MEECS) program. Currently, the Nature Zoo incorporates water quality monitoring with stream invertebrates and beach monitoring into its public programming and would develop programs on other aquatic ecology topics as the restoration of Blue Heron Lagoon progresses. The Nature Zoo makes its facilities available to a wide variety of local environmental organizations for public programs, workshops and stewardship events.

The **Detroit Recreation Department (DRD)** provides outreach and educational programming about the natural world to participants of all ages. DRD has conducted such programming in Belle Isle Park and Rouge Park, as well as at county and MetroPark facilities. Each summer, the Recreation Department conducts 6-9 week day camps for 400 children from 3-12 years old throughout the city. Day campers are exposed to the natural world through field trips to Belle Isle. The Blue Heron Lagoon is frequently chosen as the site to teach children about wildlife, both aquatic and terrestrial. The children are thrilled when they learn to identify specific species of birds, fish and amphibians. In an effort to create future environmental stewards, DRD, with the able assistance of the Belle Isle Nature Zoo, has given the children hands on experience in habitat restoration along the edges of the Lagoon. DRD’s partner, the Friends of Belle Isle, is currently working to form adult Volunteer Stewardship Cadres. Their mission will be to help manage and maintain the island’s natural areas.



Blue Heron Lagoon Interpretive Signs

The **Stewardship Network** is a grassroots cooperative organization working to protect, restore, and manage Michigan's natural lands and waters. In late 2008, it formed the **Lakeplain Cluster** to organize and train volunteer land stewards working in southeast Michigan, including Belle Isle. In late 2009, the Cluster convened a meeting of the various environmental groups that operate on Belle Isle to explore opportunities for cooperation and expanded programming. Cluster activities have focused on terrestrial

activities to date but will be expanding to include public programs, workshops and stewardship opportunities for aquatic habitats also. To date, it is sponsoring 4 public programs on Belle Island and cooperating with the Friends of Belle Isle to recruit and train volunteers for 8 stewardship work days in 2010.

The **Friends of Belle Isle** is a voluntary organization which promotes the preservation of natural beauty, restoration and preservation of Belle Isle's historical sites, and the adaptive use of existing structures on the island for the enjoyment and use by all people. In 2009, its members began monitoring water quality in the Island's lagoons, and also spearheaded a drive to fund and implement a *Phragmites* control program in cooperation with the Detroit Recreation Department and a number of other partners. Later that year, the Friends convened an **Environmental Stewardship Committee**, which is charged with facilitating invasive species control, volunteer stewardship and public education.

Bird Studies Canada's **Marsh Monitoring Program** (MMP) is a long-term, Great Lakes basin-wide marsh amphibian and bird monitoring program, employing the skills and dedication of hundreds of Citizen Scientist volunteer participants. Since 2007, the MMP has been active in the Detroit River Area of Concern (AOC) and its surrounding watersheds. Monitoring marsh bird and amphibian diversity and abundance is an effective means of assessing the general health of wetlands and the surrounding environment as restoration efforts are implemented. MMP participants played a vital role in monitoring wetland health on Belle Isle for the first time in 2009. The baseline information that they provided will improve wetland management and help establish conservation strategies to benefit the full spectrum of marsh dependent species as restoration proceeds.

Communities along the Great Lakes are tied economically to their waterfronts. Businesses, communities, natural resource professionals and citizens rely on current education and information to help keep businesses profitable, manage natural resources and sustain their communities. **Michigan Sea Grant** provides up to date educational programs and information to help keep these waterfront environments sustainable into the future. Mary Bohling, Michigan Sea Grant Urban Educator in SE MI establishes and nurtures partnerships with Federal, State, Tribal and Local decision-makers in a position to effect policy change or provide resources to accomplish program initiatives. She also works to increase the awareness of the public about the importance of sustaining coastal economies and resources. Current partners include Milliken State Park, City of Detroit and Friends of the Detroit River, all of which are involved in the GLRI proposal "*Connection of the Detroit River to Belle Isle Blue Heron Lagoon*". Mary will continue to work with the partners to enhance education and outreach associated with the proposal as part of her existing work plan.

Sea Grant's outreach and education team are actively engaged in activities that benefit the fish and wildlife of the St. Clair and Detroit Rivers. Communications and education team members have developed award-winning web, print and museum-quality fisheries education materials. They distributed 115,000 publications to targeted users in 2008, including *Upwellings* newsletter, PDF downloads, and specific web page visits. Sea Grant's award-winning exhibits on lake sturgeon at Belle Isle were viewed by estimated 3.5 million visitors to the New Detroit Science Center and the Detroit Metropolitan Airport.

9.0. Outcomes, Outputs and Expected Results

Within 24 months of the project start date, this project will:

- Open direct access to 95 acres of wetlands, shallow water and deep water habitat. It will also open 2.2 miles of canals for native fish rearing and nursery habitat in the Detroit River AOC;
- Enhanced reproductive success and productivity of native fish;
- Increase our understanding of connectivity between spawning sites and nearshore habitat. In order to have a significant impact on native fish populations and restore beneficial uses related to

fish habitat and populations, it will be necessary to treat large areas of the Detroit River. Using information about fish preference, a variety of nearshore habitats could be constructed throughout the Detroit River to benefit multiple species. The project team plans to coordinate with the Huron-Erie Corridor Initiative's restoration work in the Detroit River AOC with the long-term goal of enhancing native fish productivity to the extent that both beneficial use impairments related to fish are delisted. Sharing this information with other AOCs will also be important. This will be facilitated by team members that include agencies with jurisdiction throughout the U.S. portion of the Great Lakes basin, e.g., USGS, USFWS, Michigan Sea Grant and Michigan DNR, and entities with strong relationships in the international fishery management community; and,

- Establish a coordinated outreach and education effort between the William G. Milliken State Park (Detroit) and Belle Isle for outdoor classroom-piloted, activity-oriented, outreach programming.

10.0. Collaboration, Partnerships and Overarching Plans

10.1 Partnerships

These projects represent an opportunity to implement an aquatic rehabilitation program that will result in increased biodiversity of the Detroit River ecosystem consistent with the goals and objectives of the IJC, Detroit River RAP, the proposed USFWS Focus Area, and the City of Detroit. The projects will represent a true partnership between the City of Detroit and the following agencies:

- Friends of the Detroit River,
- USGS Great Lakes Science Center,
- Friends of Belle Isle,
- Friends of Belle Isle Aquarium,
- Stewardship Network
- Canada's Marsh Monitoring program
- US Army Corps of Engineers,
- Detroit River Remedial Action Plan (RAP) and Public Advisory Council,
- Southeast Michigan Council of Governments,
- US Fish and Wildlife Service,
- Michigan Department of Natural Resources and Environment (DNRE), Fisheries Division and Michigan Natural Features Inventory.
- Huron Erie Corridor Initiative

10.2 Existing Strategic Plans

The proposed project is a recognized part of an approvable Fish & Wildlife Habitat/Population restoration plan submitted to the MDEQ and is identified in the MDEQ's AOC Action Tracking Table (RA1 N-72 Blue Heron Lagoon Restoration) as part of the MDEQ's Strategy for Delisting Michigan's Great Lakes Areas of Concern. The project is identified in the *Delisting Targets for Fish/Wildlife Habitat & Population Beneficial Use Impairments for the Detroit River Area of Concern* (Project 2 ; pg 20; MDEQ:April, 2009) and meets the objectives of the *Guidance for Delisting Michigan's Great Lakes Areas of Concern* (MDEQ; 2008. Report MI/DEQ/WB-06/001).

10.3 Initiatives related to the Huron Erie Corridor Initiative (HEC)

Baseline Limnology Assessment conducted by USGS Great Lakes Science Center (USGS) and DNRE has included Pre-construction assessment work in the project area for several years. Additional funding is being allocated to the USGS through the Great Lakes Restoration Initiative (GLRI) to continue this important assessment. The information provided by the USGS/DNRE will be utilized to develop baseline assessment within the Detroit River near the Blue Heron Lagoon. The distribution of fish will be characterized by USGS utilizing side-scan sonar (SSS) and underwater video (UTV). Water current velocity will be confirmed with the use of an Acoustic Doppler Current Profiler (ADCP).

Larval fish studies conducted in the 1970s and 1980s found 25 species of larval fish in the HEC (Hatcher and Nester 1983, Muth et al. 1986). These studies found alewives, rainbow smelt, and gizzard shad as the most abundant species in their collections. Yellow perch, logperch, emerald shiners, and other Cyprinidae were also common. Other species represented in the catch tended to be much less abundant (< 1/1,000 m³ of water sampled). Sampling in these studies was restricted to deeper open-water areas; therefore the relative importance of submersed and emergent vegetation as nursery areas was not assessed. In contrast, Duffy et al. (1987) observed the abundance of larval fish to increase with distance away from the channel areas into submersed and emergent vegetation in the St. Marys River. The USGS study will examine vegetated sites as well as deep open-water areas of the Detroit River to quantify fish use of these areas. During 2006-2008, larval fish collections in the Detroit River showed a vastly different pattern in community composition and relative abundance than was observed during the study in the 1970-80s (E.F. Roseman, USGS GLSC, unpublished data). Common species during 2006-2008 included lake whitefish, yellow perch, white bass, suckers, and gizzard shad. In contrast with Hatcher and Nester (1983), alewives and rainbow smelt were rare in 2006-2008.

10.4 Activities for 2010

The USGS Great Lakes Science Center will continue its work in 2010. Coordination of the Belle Isle Project with the USGS will be ongoing and beneficial for both parties. For instance, pelagic larval fish in the main channel of the Detroit River will be sampled with a paired bongo sampler during daylight hours.

During 2006-2008, slack water areas were sampled in the Detroit River (McDonald 2008) and a subset of these sites will be sampled again during 2010 concurrently and using similar methods as in the St. Clair River. Examination of the larval fish community in slack water areas adjacent to the main channel will occur concurrently with bongo sampling to assess the extent these areas are used as nursery habitats by larval fishes. Bongo samplers will be used in slack water areas to collect larvae only where habitat conditions allow (lack of vegetation, sufficient depth, room to maneuver vessel). Alternative sampling methods (single 0.5 m towed conical, light traps, larval seine) will be employed in areas where habitat conditions disallow bongo sampler deployment.

11.0. Programmatic Capability and Past Performance

The FDR has been in existence for almost 20 years and has received and completed numerous grants from the federal and state government and Environment Canada. In addition, grants have been awarded to the FDR by several non-profit organizations.

The FDR has access to a variety of environmental consultants and contractors to assist the FDR in executing all types of environmental projects. In addition, the FDR has several Board Members who have many years of experience in environmental project and project management. These Board Members provide guidance to each of the grant projects and will also sit on project Technical Advisory Committees (TAC) that are established for each project undertaken by the FDR. The TAC is also where other technically oriented members of the FDR are included. For example, the FDR has, as members, professional biologists, engineers, scientists, teachers, hazardous waste specialists; etc. These technical FDR members are asked to assist in the TAC assigned to each grant project, where applicable.

In the last three years, the FDR has received and completed the following grants related to environmental projects:

1. **National Fish and Wildlife Foundation (NFWF)** (Grant #2007-0085-015) that addressed the shoreline and habitat restoration of the Frank & Poet Creek in Trenton, MI. The Frank & Poet Creek is a tributary to the Detroit River. The grant was for \$40,000 with a match of \$40,000.
2. **Michigan Department of Environmental Quality (MDEQ)** (Grant #480371-07) that addressed the Detroit River monitoring and Observation program conducted by the Detroit Riverkeeper. The grant was for \$46,632 with no match required.

3. **Environmental Protection Agency (EPA)** – Grant #GL975443-01-0) that addressed sediment removal technology at a site along the Detroit River. This grant closed due to the fact that suitable sites (without contaminated sediments) were not found that contained the volumes of sediment required to test the removal technology. The grant was for \$88,650.

Other smaller grants have been received from the MDEQ, the Great Lakes Commission, the Erb Foundation, and the GLAHNF.

Successfully Complete and Manage

The grants awarded to the FDR have been successfully managed and completed due to a variety of factors. These factors include:

- An experienced project manager (Mr. Charles Bristol, P.E.) who is on the board of the FDR and is the FDR Treasurer. He has over 30 years of environmental project management experience.
- Excellent technical contractors who were hired to complete aspects of each grant. These technical experts were used to complete the grant work and were selected through a variety of competitive procedures.
- All the grant projects were completed under budget. Some required extensions to complete the required work, primarily to environmental adverse conditions delaying the project progress. The NFWF grant project was completed at about 80% of project budget.

Meeting Reporting Requirements

The FDR met all the reporting requirements for each of the grants mentioned above. Each granting agency (EPA, MDEQ and MFWF) had different reporting requirements in both content and frequency. The final reports submitted for each grant were accepted.

Report on Making Progress

During the grant project execution, there are times when circumstances beyond the control of the FDR affect the schedule and work scope of the project. All potential problems – technical, budgetary and schedule – were identified as early as possible in the periodic reports. When required, special face to face meetings were held to discuss project status and to develop solutions to any problems that may have arose.

12.0. BUDGET

The total estimated cost of the project as envisioned is **\$1,451,649**. This includes both grant funding and local match – which will be provided by in-kind services of City of Detroit employees and volunteer efforts for monitoring and education. The table shows both requested grant funds *and matching funds*. Additionally contractual consultant and construction services are shown. The table summarizes the costs associated with the project. Contractors working on site will be competitively selected by the Friends of Detroit River and approved technical advisors. Detail breakdown of the budget costs are presented at the FDR website; www.detroitriver.org/GLRI .

**Detroit River AOC Habitat Restoration Project – Blue Heron Lagoon Site
Line Item Cost Breakdown**

DETAIL COSTS BREAKDOWN	GRANT	MATCH
Personnel/Salaries	\$ 45,000	\$30,655
Fringe Benefits	\$ 14,995	\$ included
Travel.	\$ 1,000	\$ 0

Equipment.	\$ 2,000	\$ 0
Supplies. Outreach	\$ 5,000	\$
Design/Engineering	\$95,600	\$
Contract costs.	\$ 1,195,000	\$
Other Costs. Monitoring	\$ 70,399	\$
<i>Total Direct Charges</i>	<i>\$ 1,428,994</i>	<i>\$ 30,655</i>
<i>Indirect Charge</i>	<i>\$ 0</i>	<i>\$ 0</i>
	<i>Total Cost</i>	<i>\$ 1,459,649</i>

13.0. ACORN STATEMENT

The FDR is aware that Congress has prohibited the use of federal funds to award grants to the Association of Community Organizations for Reform Now (ACORN) or any of its affiliates, subsidiaries, or allied organizations. The FDR affirms that they are no way affiliated with ACORN and thus are not subject to this prohibition. In addition, the FDR will pass this funding prohibition on to any and all sub-awardees, sub-grantees and/or contractors that may partner in this effort.

14.0. ATTACHMENTS – Can be found on the FDR web site www.detroitriver.org/GLRI

- Overarching plan
- Budget details
- Resumes / curriculum vitae
- Letters of support
- Scientific peer review
- Maps and/or charts