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| 1. <u>RFP NUMBER</u> | EPA R5-GL2010-1 |
| <u>FOCUS AREA</u> | Habitat And Wildlife Protection Restoration |
| <u>PROGRAM</u> | Habitat Restoration In Great Lakes Area Of Concern |
| 2. <u>NAME OF PROPOSAL</u> | CAT ISLAND CHAIN RESTORATION PROJECT |
| 3. <u>POINT OF CONTACT</u> | Dean Haen, Brown County, Wisconsin,
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Phone: 920.492.4953 Fax: 920.492.4957
Email: haen_dr@co.brown.wi.us DUNS Number: 04263634 |
| 4. <u>TYPE OF ORGANIZATION</u> | Other Public or non-private agencies, institutions or organizations |
| 5. <u>FUNDING REQUEST</u> | \$1,500,000 |

6. PROJECT DESCRIPTION

Habitat destruction and degradation due to fluctuating lake levels have negatively impacted habitat and wildlife in this Area of Concern (AOC). This destruction has led to altered food webs, a loss of biodiversity, and a poorly functioning ecosystem. Restoring the Cat Island Chain is an opportunity for the protection and restoration of the largest and most critical wetland habitat in the Great Lakes. Restoration of the Cat Island Chain addresses many of the Great Lakes needs and priorities established by the following federal, state and local agencies including; U.S. Environmental Protection Agency (USEPA), National Oceanic Atmospheric Administration, U.S. Army Corps of Engineers (USACE), Wisconsin Department of Natural Resources (WDNR), Port of Green Bay and Brown County through documents including the USEPA Strategic Plan, Great Lakes Regional Collaboration, Lakewide Management Plan, Wisconsin Great Lakes Strategy, Remedial Action Plan (RAP) and others. Locally this project has been identified in the RAP with over 40 Green Bay and Great Lakes resource managers and scientists as the top priority.

Reconstruction of the Cat Island chain would consist of constructing a 2.5 mile wave barrier along the remnant Cat Island shoals. The wave barrier will immediately protect and restore 1,225 acres of shallow water and wetland habitat. Upon the wave barrier 272 acres of islands will be constructed upon the historic footprints using clean dredged material from the Green Bay Harbor. Restoring the islands will lead to recovery of a significant portion of the lower bay habitat and will benefit sport and commercial fisheries, colonial nesting water birds, shorebirds, waterfowl, marsh nesting birds, amphibians, turtles, invertebrates, and fur-bearing mammals.

Green Bay has been referred to as the largest freshwater estuary in the world due to its estuarine-like nutrient and productivity gradients and the strong influence of the Fox River. Historically, the Cat Island Chain of barrier islands was part of the largest Great Lakes coastal wetland located in the lower Green Bay AOC and provided protection to this area from high energy wave and storm effects

A 1994 Nature Conservancy report indicated the islands supported habitat for critically-imperiled species and communities. U.S. Fish & Wildlife Service (USFWS) surveys in the 1990's documented that the Cat Islands provided nesting habitat for 13 species of colonial nesting water birds -- the highest species diversity of any island in the Great Lakes. The west shore of Green Bay is a geographic feature known as a "leading line" that guides migrating birds from a broad northern opening to the southern tip of the Bay. Shallow waters and extensive beds of aquatic vegetation have provided a major stopover for waterfowl and other migrating birds as well as habitat for diverse populations of water birds, furbearers, invertebrates, and native fishes.

During extremely high water levels in the mid-1970's, a series of severe storms during ice breakup resulted in catastrophic erosion of the islands and lose of habitat. Reestablishing the islands and wetlands will

provide nesting and brood-rearing habitat for waterfowl, shorebirds and water birds. Emergent wetlands will provide important feeding habitat for waterfowl and colonial nesting birds as well as feeding, spawning and nursery habitats for various fish species including yellow perch, walleye, northern pike, and smallmouth bass. Although no federally-listed species are currently known to be present the endangered piping plover historically used the lower bay habitat during migration. The USFWS has indicated the piping plovers may attempt to nest on the created islands. A number of Wisconsin State-listed bird species such as the great egret, snowy egret, Caspian tern, Forster's tern, and common tern are regular summer residents and will nest in the lower bay.

7. **SITE LOCATION** HUC CODE: 04030103 CITY OF GREEN BAY, BROWN COUNTY, WISCONSIN
LONGITUDE/LATITUDE: 44.34 88.00

8. **FULL PROJECT DESCRIPTION**

A. **Background**

Green Bay of Lake Michigan is an elongated freshwater estuary over 100 miles long, oriented southwest to northeast and averages about 15 miles in width. At the head of Green Bay is the mouth of the Fox River, which is the outlet for the 6,385-square mile drainage of the Wolf-Fox River basin (USACE 1998), and the City of Green Bay, Brown County, Wisconsin. Green Bay has been referred to as the largest freshwater estuary in the world due to its estuarine-like nutrient and productivity gradients and the strong influence of the Fox River.

Historically, a chain of small islands and shoals was located in the southern end of Green Bay and extended about 2.5 miles, west to east, halfway across the bay. The islands and shoals functioned as barrier islands and protected extensive coastal (Great Lakes) wetlands from high-energy wave and storm effects, ice damage and sediment re-suspension. The lower Green Bay once contained one of the largest and most diverse wetland complexes in the Great Lakes. In addition, the west shore of Green Bay is a geographic feature known as a "leading line" that guides and concentrates migrating birds from a broad northern opening to the southern end of the bay. The shallow waters and extensive beds of submergent and emergent aquatic vegetation provided a major stopover for migrating birds including waterfowl and habitat for diverse populations of water birds, furbearers, invertebrates, and native fishes. A 1994 report by The Nature Conservancy, *The Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities*, indicated that the islands and lower Green Bay support habitat for critically imperiled species and communities.

The islands provided shoreline/upland habitat with shrubs and large cottonwood trees. Other species included silver maple, box elder, willow, alder, and green ash. Trees supported large nesting rookeries of great blue herons, black-crowned night herons, snowy egrets, and cattle egrets. Near the shore were colonial nesting gulls and terns. In recent years, nesting populations of the double-crested cormorant and American white pelican have steadily increased. Surveys of Great Lakes colonial nesting birds documented 13 species using Cat Island, the highest species diversity of any island in the Great Lakes.

Over the last three decades, most of the island and wetland habitat has been lost or degraded due to a combination of wetland filling, shoreland development, high lake levels, coastal erosion, and sedimentation. High turbidity and reduced light penetration in the water column have been implicated as the primary cause for the loss of submerged aquatic vegetation in the lower Green Bay. During extremely high water levels in the mid-1970s a series of severe storms during ice breakup resulted in catastrophic erosion and damage to the islands. Large sheets of ice propelled by gale force winds sheared off trees and whole sections of the islands. Today, sand shoals remain where the islands were located as well as a remnant of Cat Island.

Although the loss of wetland, island and gravel reef habitats has contributed to the general decline in species abundance and diversity in the lower Green Bay, the area still attracts a large number of avian species. Migrating waterfowl use remains depressed, although the number of ducks observed during migration has been increasing in recent years. The bald eagle is nesting again in the area. Approximately

16 species of fish are recorded as spawning in littoral areas in the lower part of Green Bay and 12 species are recorded as using suitable areas as nursery area. Species of importance to anglers include yellow perch, walleye, lake whitefish, and northern pike. A population of Great Lakes strain of muskellunge is expanding due to recent stocking efforts and some lake sturgeon use the lower bay during the year. Key forage fish species include gizzard shad, alewife, young white suckers, carp, and seasonally, smelt. Other forage fish include various minnow species common to Green Bay, including spottail shiner and emerald shiner.

The bay still contains about 20% of all remaining Great Lakes coastal wetlands, one of the most productive fisheries in the Great Lakes, and the greatest diversity of bird populations in Wisconsin. Although no federally-listed threatened or endangered species are currently known to be present in the project area, the endangered piping plover (Great Lakes population) historically used lower Green Bay habitat during migration. The USFWS has indicated it is conceivable that during periods when the habitat is suitable, piping plovers could attempt to nest on the islands created through a companion USACE dredged materials management plan project. A number of Wisconsin state-listed bird species, the great egret, snowy egret, Caspian tern, Forster's tern, and common tern are regular summer residents and will nest in the lower bay.

B. Construction

The GLRI Grant will be used to construct a rock spine to act as a wave barrier and provide the foundation for rebuilding the Cat Island Chain of barrier islands. The rock spine will provide immediate benefits by reducing sediment resuspension and water turbidity in a large area behind the barrier, protecting remaining wetlands and promoting emergent and submergent aquatic vegetation reestablishment. Through a companion USACE Dredged Material Maintenance Plan (DMMP) for Green Bay Harbor, the upland and shallow water areas of the islands will be constructed with clean navigational channel dredged material from ongoing Green Bay annual maintenance dredging.

The Cat Island Chain Restoration Project will reestablish the historic string of barrier islands and shoals to protect remaining wetland habitat, promote reestablishment of additional emergent and submergent aquatic vegetation and restore island habitat. Reestablished islands and wetlands will provide nesting and brood rearing habitat for waterfowl, shorebirds, and water birds. Expanded submerged aquatic plant beds and emergent wetlands will provide important feeding habitat for waterfowl and colonial nesting birds as well as feeding, spawning and nursery habitats for various fish species. Reestablished wetlands will help maintain water quality through reduction in turbidity that currently results from frequent resuspension of bottom sediments.

Plans allow the islands and adjacent wetlands to grow and retreat naturally under Great Lakes water level cycles. However, storm and wave studies for the project by the USACE and by Baird & Associates indicate that a hardened barrier is necessary on some exteriors of the islands that are subject to prevailing winds and historical storm tracks. The barrier surfaces (rock headlands and stone dikes) have been carefully designed to withstand Green Bay storms yet provide protected areas for captive gravel bays and gradually sloping sand beaches that allow safe access for wildlife and their offspring and promote a diversity of wetland, beach and upland habitat types.

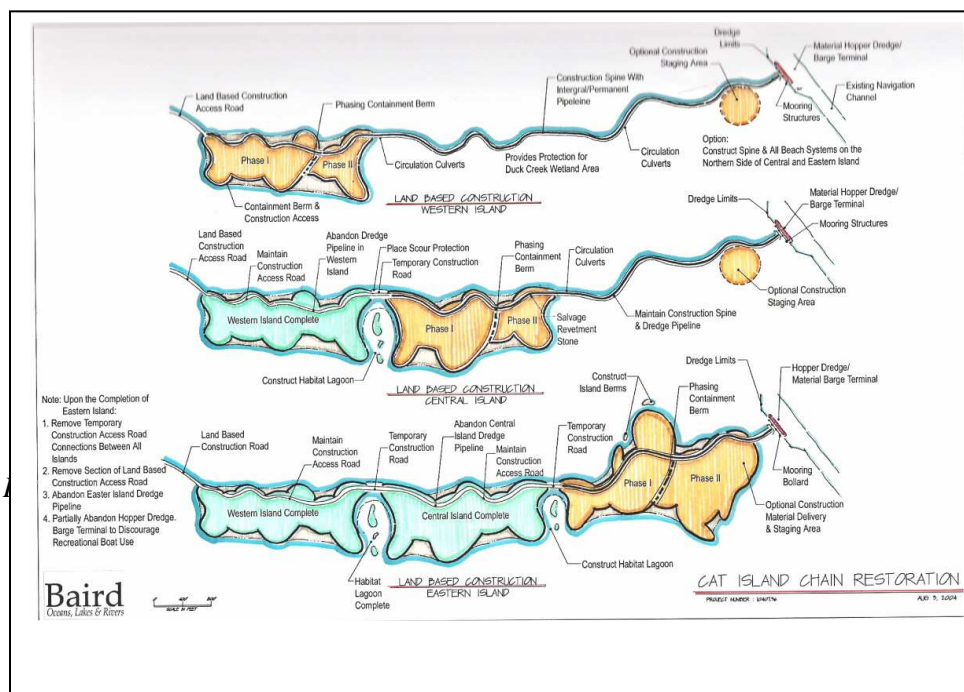


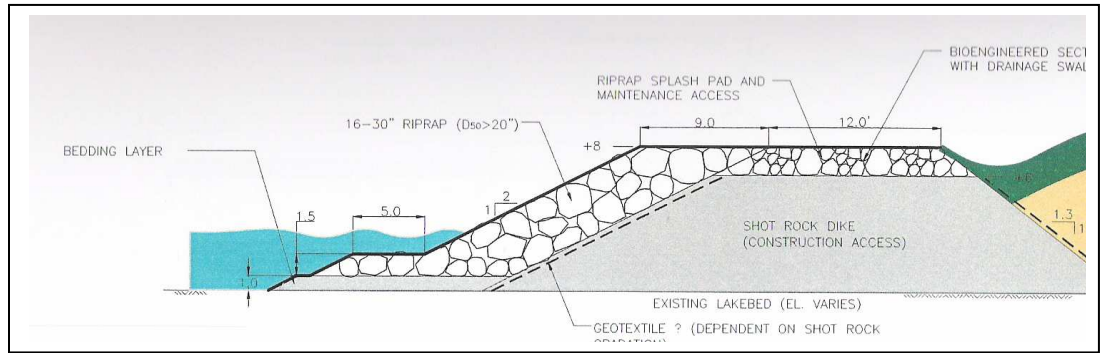
This project will be designed by the USACE and constructed by Brown County. Brown County has extensive experience in highway construction and other related work activities. In addition, Brown County will use USACE plans and specifications for the design bid, utilizing private contractors. Using USACE design, Brown County administration and use of private contractors is the most cost-effective manner in which to complete this project. The USACE cost of constructing the project is estimated at \$12M; while Brown County is confident the project can be privately constructed for \$9M saving 25%. Brown County administration and regular reporting to USEPA will minimize USEPA resources necessary for oversight and administration. In addition, the project will be able to be constructed in over a 9 to 12 month continuous period.

Restoration of the Cat Island Chain involves construction of three islands in sequence from the west shore of Green Bay eastward to the navigation channel, a distance of 2.5 miles. The islands are designed to restore the 1960s footprint of the barrier islands, but would be armored on the north side by a wave barrier to protect the islands from future storm and ice damage. The project involves two phases: Phase 1 - constructing an access road and wave barrier that forms the foundational spine for the barrier island chain and Phase 2 - dredging and dredged material placement to form the islands. The GLRI grant will be used to construct Phase 1. The USACE DMMP program will be used to complete Phase 2 over a period of years.

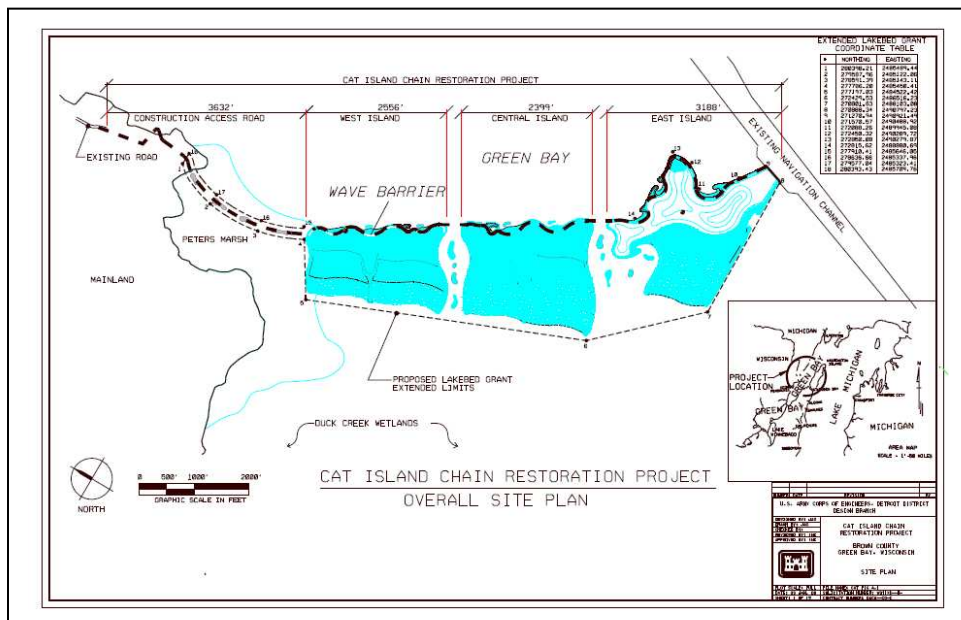
A variety of invasive exotic species have entered the Great Lakes. To minimize the potential for introduction of exotic species during construction, the contractor would be required to clean equipment, including watercraft, to prevent the spread of seeds, eggs, larvae, or other dispersal vectors between Green Bay and other harbors and lakes. Habitat benefits from the project can be enhanced by management actions during and post construction.

PHASE 1: A construction access road would be built from the mainland to the farthest extent of the east island location, as indicated in the figure below. The access road would be placed in the location and configuration of the wave barrier. Culverts would be constructed in the road to promote water circulation between the shore and the west island and between each island. The access road would be in place until all three island wave barriers and upland portions of the islands are built. When the access road is removed, some of the material may remain to retain wave barrier protection and small island habitat between islands. Open space will be left between these small islands for water circulation and fish passage. Clean stone for the dikes would be obtained from a commercial quarry.





Cross-section diagram illustrates the proposed design of the wave barrier spine with interface to dredged material placed for island development



View of the overall site plan combining the access road and rock spine wave barrier with general placement of the three islands

PHASE 2: Per the approved USACE DMMP, any additional rock structure needed for island side foundation dikes would be constructed to tie into the rock spine wave barrier constructed through the GLRI grant. Design specifications would be consistent with the dike function and those developed for the wave barrier spine. Dredged material would be hydraulically pumped into each island, or it could be trucked to the island using the access road. A geotextile filter fabric or a finer gradation of stone would be placed over the inner slope of the wave barrier and stone dikes as necessary to minimize the potential for sediment erosion through the dikes. The shoal material would be mounded behind the wave barrier, sloping to the back of the islands in the protected area of the bay to create a 1:100 sloped beach area. The final island elevation is expected to vary from +10 feet to +15 feet, Low Water Datum (LWD) to be compatible with the regional landscape and provide natural habitat diversity.

Shoal material for island fill would be obtained from normal maintenance dredging of the Federal navigation channel in Green Bay. Siltation control measures, such as the use of a silt curtain or some other type of temporary barrier across the open side of an island, if necessary, would be considered to prevent excess turbidity from entering the bay during filling of the islands with dredged material. Such

measures would apply mainly to island filling by hydraulic pipeline, and may not be needed for a mechanical dredging and placement operation. The contractor will be required to have a contaminant prevention plan and a spill control plan in-place prior to construction

The project may require the in-water construction of one or more structures such as the mooring facilities or dolphins to assist in construction and filling of the islands. These structures would be at USACE-approved locations, outside of any wetlands, areas containing Federal or state-protected species or their critical habitat, or properties listed, or eligible for listing, on the National Register of Historic Places or state-listed properties. Any temporary construction material placed on the lake bottom would not be expected to cover an area larger than approximately 0.5 acre. These construction aids would be within project boundaries or rights-of-way and would be removed when no longer needed. Structures associated with filling an island may remain in place for the duration of island filling. Temporary sites would be restored upon project completion. Any land based facilities related to the construction project would be the responsibility of the construction contractor and would be subject to applicable permitting requirements.

C. Implementation Plan

This section documents action undertaken and completed since development of the Lower Fox River/Green Bay RAP and efforts were initiated in 1994 to restore the Cat Island Chain of barrier islands and shoals. A timeline also is included indicating actions to be taken to complete the combined wave barrier and island restoration project upon receipt of the GLRI grant.

1994	1988 Green Bay RAP, and Identification of Cat Island Chain Restoration Project as #1 habitat restoration priority in AOC (<i>completed</i>)
1999	USACE, Detroit District, Draft Ecosystem Restoration Report & Draft Environmental Assessment (<i>completed</i>)
Oct 2002	Baird & Associates, Initial Design Development and Concept Evaluation (<i>completed</i>)
Apr 2005	Baird & Associates, Design Development Report (<i>completed</i>)
2006	State of Wisconsin, Legislative Lakebed Grant of Real Estate (<i>completed</i>)
2007	USACE, Detroit District, Value Engineering (<i>completed</i>)
2009	USACE, Detroit District, DMMP (<i>completed</i>)
May 2010	USACE, Detroit District, Environmental Assessment
May 2010	Great Lakes Restoration Initiative Grant Award
July 2010	Brown County, Request for Qualifications for Engineering Firm
Oct. 2010	Brown County, Request of Bids using USACE Plans and Specifications
Nov. 2010	Brown County, Contract Award and Start Construction
Dec. 2010	Submit Semi-Annual Report to USEPA
July 2011	Submit Semi-Annual Report to USEPA
Dec. 2011	Brown County Complete Construction of Islands' Wave Barrier
Dec. 2011	Submit Final Report to USEPA
2011-2021	Placement of Dredged Material on islands wave barrier by USACE

D. Permits & Approvals

Brown County has received an approved Legislative Lakebed Grant for the project from the State of Wisconsin in 2005 through Assembly Bill 868. Evaluation under Section 404(b)(1) of the Clean Water Act (CWA) addressing the effects of the discharge of fill material into waters of the United States for the island restoration was completed by the USACE in 2008 and the project was determined to be in compliance. Evaluation of Green Bay Harbor channel sediments was completed in 1998 and 2004 in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual USEPA/USACE, 1998. The Manual presents guidance on testing and evaluation for proposed discharges of dredged material into U.S. waters of the Great Lakes Basin. In summary, the physical, chemical and biological testing conducted indicated that the sediments in the inner harbor are not suitable for unrestricted uses and

would require restricted placement. The material dredged from the outer harbor is suitable for unrestricted uses, including island creation. The area of the channel from approximately one-half mile upstream in the Fox River to approximately three miles into the bay is in flux with regard to sediment quality because of varying river currents and storm load outputs. Dredged material in the “flux” area may be suitable for use in the island construction, depending upon conditions at the time of dredging. Therefore, sediments in the flux area would not be placed into the island construction unless recent testing shows it to be suitable.

Efforts are underway to obtain Section 401 CWA certification for the Cat Island Chain restoration from the State of Wisconsin in mid-2010. The WDNR has been an active and supportive partner in the island/wetland restoration planning and is coordinating with Brown County regarding the certification.

The Cat Island Chain restoration project proposed in the USACE DMMP includes review of the proposed rock spine wave barrier pursuant to the following Acts and Executive Orders, as amended: Fish and Wildlife Act of 1956; Fish and Wildlife Coordination Act of 1958; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Clean Air Act of 1970; Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 1971; Coastal Zone Management Act of 1972; Endangered Species Act of 1973; Clean Water Act of 1977, Executive Order 11988, Flood Plain Management, May 1977; and Executive Order 11990, Wetland Protection May 1977. The proposed project has been found to be in compliance with the aforementioned Acts and Executive Orders for this phase of the study.

E. Outreach & Education

The Biota & Habitat Work Group of the Lower Fox River Basin Partner Team has already involved the public in the overall Cat Island Chain restoration project and will continue to do so. Members of the Work Group have given presentations on the proposed project to many stakeholder groups and at several professional conferences and agency/interagency meetings. In 2007, a UW-Green Bay graduate class was enlisted to devise a vegetation plan for the islands. UW-Green Bay faculty and students will be engaged in future habitat planning and post-project monitoring. The successful evolution of the islands and associated ecological recovery provide ideal study topics for university students. Local conservation groups will be recruited to assist with managing potential invasive species and planting desired native vegetation. Much of the long-term public involvement and studies will occur beyond the life of the proposed wave barrier project. The Work Group is assisting Brown County and the USACE in organizing a spring 2010 public informational meeting on the Green Bay Harbor DMMP and the island construction upon completion of the barrier island spine. Brown County has retained the public relations firm of Leonard & Finco for other matters and will contract with them to develop educational materials related to the project and coordinate project outreach. Brown County holds public meetings at which the progress and result of the project will be reported monthly. This information will also be made available on the Brown County (www.co.brown.wi.us) and Port of Green Bay (www.portofgreenbay.com) websites. In addition, the local media has taken great interest in the project and can be expected to cover the project as it progresses.

F. Relevance to Great Lakes Needs & Priorities

Restoration of the Cat Island Chain addresses many of the Great Lakes’ needs and priorities established federally by the President of the United States, USEPA, NOAA, USACE, State of Wisconsin, Wisconsin’s Governor and WDNR, as well as locally by the Port of Green Bay, Brown County and the RAP. The project clearly meets the needs and priorities of many federal, state and regional agencies and organizations. Relevance to the Great Lakes’ needs and priorities is covered in greater detail under “Section 10 Collaboration and Partnerships”.

9. OUTCOMES, OUTPUTS AND EXPECTED RESULTS

This project is engineeringly feasible, technically sound, and safe and will provide historic ecological benefits along with navigational benefits. This project has been extensively studied and engineered to ensure project goals and objectives are met. Project performance will be measure by UW-Green Bay and

made public.

A. Environmental Outcomes, Outputs & Expected Results

A wave barrier extending approximately 2.5 miles from the west shore of Green Bay toward the remaining exposed segment of Cat Island will be constructed of rock and protect 1,225 acres of shallow water and wetland habitat. Three islands totaling about 272 acres will be constructed through a USACE companion project. Terrestrial island habitat will be restored and, by blocking wave energy, reestablishment of aquatic plant beds in 1,600 acres of the lower bay will be promoted.

Habitat destruction and degradation due to fluctuating lake levels have negatively impacted habitat and wildlife in this AOC. This destruction has led to altered food webs, a loss of biodiversity, and a poorly functioning ecosystem. Restoring the Cat Island Chain is an opportunity for the protection and restoration of the largest and most critical habitat in the Great Lakes.

The project would provide beneficial use for clean dredged material and would help restore terrestrial and aquatic habitat diversity lost over time as the former islands were destroyed by storms and high water levels. Each island would provide terrestrial and aquatic habitat. The island aquatic habitat includes proposed lagoons along the back of the islands and stone dikes around the front and sides. The proposed lagoon areas would offer benthos and fish for feeding and quiet pond areas for resting. Turtles, salamanders and frogs, are expected to become established around the lagoons.

Additionally, the islands would help block wave energy from further eroding the fringe remnants of the estuarine wetlands which were once present in the head of Green Bay. The islands would promote the re-establishment of aquatic plant beds in the head of the bay. Overall, project benefits to fish and wildlife in lower Green Bay also would be expected to increase aesthetic and recreational enjoyment. Affects of the wave barrier and islands, in conjunction with other ongoing actions and initiatives in the Wolf River/Fox River watershed, are expected to contribute to the improvement in water quality and clarity in Green Bay over time. Increased emergent aquatic plant growth will help stabilize bottom sediments and reduce resuspension as well as contribute to dampening of erosive wave energy.

Vegetation should quickly become established within the constructed islands from existing seed bank in the sediments, which also have sufficient nutrients to support the vegetation. Until the island construction is complete, vegetation within the island dikes will be subject to disturbances, including burial, from subsequent filling operations, but the newly-placed dredged material will quickly re-vegetate.

Long-term monitoring opportunities exist for our partners. UW-Green Bay has utilized graduate students to quantify and document current submergent and emergent vegetation in the area behind the islands. This information will be used as the baseline for future graduate students to measure the ecological outcomes of constructing the islands. Existing grant opportunities exist for Brown County, WDNR, UW-Green Bay and UW-Sea Grant to measure benthos, invasive species management and outcomes.

The Green Bay Metropolitan Sewerage District (GBMSD) currently has an Ambient Water Quality monitoring program since 1986 for water of Bay of Green Bay. GBMSD has committed to this long-term monitoring program to better understanding the quality of its receiving waters and to provide data to other institutions and agencies working on water quality issues in the area.



The Lower Green Bay and Fox River have been deemed an AOC by the International Joint Commission (IJC) and the WDNR. The area has been designated an AOC because many of the beneficial uses are restricted or impaired due to the degradation of habitat and the persistence of pollutants. The proposed wave barrier and island restoration project are within the AOC which is comprised of the section of the Fox River below the De Pere dam extending 7 miles to the mouth of the river and a 21 square mile area of southern Green Bay from the mouth of the Fox River north to Long Tail Point and Point au Sable.

Many of the beneficial use restrictions listed for Green Bay and the Fox River are due to hypereutrophic conditions. Hypereutrophic conditions result from excess runoff of nutrients and sediment which are characterized by frequent and severe nuisance algal blooms and low water clarity. Hypereutrophic waters typically have a transparency of less than 3 feet in depth, chlorophyll *a* concentrations greater than 40 ug/L, and total phosphorus concentrations greater than 0.1 mg/L. Also, excessive algae blooms can significantly reduce oxygen levels in the water column and impact the growth of submerged aquatic vegetation.

In 1988, a RAP was developed for the lower Bay of Green Bay and the Fox River. The RAP made specific recommendations on how to restore beneficial uses to the AOC. In order to restore beneficial uses and possible reverse degradation, the RAP set specific target concentrations for phosphorus, total suspended solids and chlorophyll *a*. The objective was to achieve sufficient water clarity to meet the state swimming standard of 1.3 meters. It was also determined that if water clarity could improve to at least .7 meters, populations of submerged aquatic vegetation could survive in the AOC. Unfortunately at this time, the AOC is not meeting any of the RAP targets.

AOC Impairment	Cause
Fish consumption advisories	Toxic substances, PCBs
Degradation of fish and wildlife populations	Excess phosphorus and suspended sediments
Bird and animal deformities	Toxic substances, PCBs
Degradation of sediment	Toxic substances, PCBs, excess phosphorus, & suspended sediments
Restriction on dredging	Toxic substances, PCBs
Eutrophication	Excess phosphorus and suspended sediments
Drinking water restrictions due to taste and odor problems	Toxic substances
Beach closings	Bacteria
Degradation of phytoplankton and zooplankton populations	Phosphorus and toxic substances
Loss of fish and wildlife habitat	Excess phosphorus and suspended sediments

The RAP recommended that nesting islands be restored and/or stabilized, submerged aquatic vegetation be reestablished, and native fish spawning habitat be enhanced, where feasible. In conjunction with the RAP process, an environmental risk assessment for lower Green Bay identified wetland losses and near-shore habitat destruction as posing the greatest long-term risks to the health of the lower Green Bay ecosystem. In 1994, as part of RAP implementation, a habitat restoration workshop was held, where over 40 Green Bay area and Great Lakes resource managers and scientists identified the top priorities for habitat restoration and rehabilitation in lower Green Bay. Restoration of the Cat Island Chain was

identified as the top priority, followed by reestablishment of submerged aquatic vegetation and enhancement of fish spawning habitats. Construction of the proposed rock wave barrier along with the USACE companion project for island restoration would contribute greatly toward achieving these RAP objectives and restoring associated beneficial uses in the AOC.

B. Economic Outcomes, Outputs & Expected Results

The 13 port businesses that currently ship more than 2.5M tons of cargo via 200+ ships annually will continue viability. The three islands are anticipated to provide disposal capacity of 20 years for clean dredged material from the outer harbor in Green Bay (mile 3 to 11). Maintenance dredging of the Green Bay Harbor is the foundation of the economic vitality of the Port of Green Bay. In 2008, the Port of Green Bay had an annual economic impact in Northeastern Wisconsin of over \$75M in Northeastern Wisconsin. The Port handles cargo such as coal, limestone, cement, forest products and other commodities that are the raw materials for Northeast Wisconsin's agricultural, construction, papermaking and manufacturing industries. The Port cargo is valued at over \$315M each year. In order to keep commerce moving, dredging and placement locations for dredged material are necessary. Without sufficient dredging and opportunities like the Cat Island Chain Restoration Project, the port vitality is jeopardizing 13 port businesses. These businesses have \$829M in property and capital as well as \$715M in annual operating budgets, employing over 4,000 people. These businesses are dependent upon the Port to provide low-cost transportation of raw materials and a competitive advantage.

The Green Bay Harbor has a congressionally-authorized outer channel width of 500 feet. In several locations, the width is currently less than 100 feet. Ships are refusing to enter Green Bay, or are light loading cargo, for fear of grounding. For example, Sanimax Corporation has ceased exporting 5 to 7 ships of tallow (animal fat) per year to North Africa. Another company that has been affected is KK Integrated Logistics (KK). KK employs 200 people and provides warehousing and trucking services and has a local economic impact of more than \$1M annually. KK imports foreign forest products for use in construction and papermaking. Because of the lack of maintenance dredging, 23 international vessels had to off-load a large portion of their cargos 60 miles away in Menominee, Michigan. The remaining cargo was trucked to Green Bay, at an increased cost of more than \$100,000 annually. According to the USACE, the loss of one and two feet of channel depth in Green Bay results in an increased transportation cost of between \$452,000 and \$1.2M annually. The channel condition has contributed to other lost business development opportunities such as importing wind turbine generation equipment, plate and coiled steel, gypsum, fertilizer and kalonite clay. A backlog of dredged material exists in the navigational channel in excess of 1M cubic yards. This material is suitable for construction of the islands and the islands have the capacity to hold all the material. The bay and the Fox River also serve a variety of commercial interests including power generation, industry, and deep-draft navigation as well as recreation. The Federal Green Bay Harbor navigation project extends 7 miles up the Fox River and nearly 12 miles into the bay of Green Bay. The character of the dredged material from most of the outer harbor is classified as suitable for unrestricted uses, which includes island creation. The proposed island creation project site is about 6,500 feet out from the southern shore of Green Bay, extending from near the Federal navigation channel about midway across the bay, northwest about 8,000 feet to the shore of Green Bay.

Recreation and aesthetics would be enhanced through the combined habitat improvement projects to restore the Cat Island Chain and associated wetlands. Recreational activities such as fishing, boating, bird watching, and hunting are important to the local economy. Various private and public docking facilities, bait shops, sporting goods stores, and service industries cater to these resource uses. Water recreation and related service industries are vital during the spring and summer months. Increased fishing, bird watching, and other fish and wildlife related recreational activities in the lower bay are anticipated as well as increased revenues associated with those activities. Waterfowl hunting is anticipated in the vicinity of the islands as habitat conditions improve and waterfowl use of the area increases during the fall migration. Direct recreational use of the islands will not be encouraged in order to minimize disturbance to birds using the reestablished islands and wetlands during nesting and brood rearing periods.

10. COLLABORATION, PARTNERSHIPS AND OVERARCHING PLANS

A. Collaboration & Partnerships

Since 1998 the project has been the focus of a partnership including the USACE, Brown County, Wisconsin Department of Transportation (WDOT), WDNR, University of Wisconsin-Sea Grant, UW-Green Bay, USFWS, and the Fox River Group of paper mills. In addition to the various ecological benefits, when restored the islands will provide the USACE, Brown County, and 13 port businesses a safe and beneficial place to deposit clean navigational sediments. This project is an excellent example of providing environmental benefits while promoting economic initiatives.

Representatives of the above-mentioned parties participate in a Biota & Habitat Work Group which is part of the Science & Technical Advisory Committee to the Lower Fox River Basin Partner Team. Among other interests, the team is dedicated to implementing recommendations of the Lower Green Bay/Fox River RAP. The work group will provide ongoing input in carrying out restoration implementation using an adaptive management approach and will conduct public outreach and post-construction monitoring. Baseline information on existing submerged aquatic vegetation, coastal wetlands, colonial nesting water birds, waterfowl use, benthic macro invertebrates, and water quality has been documented through studies by participating agencies.

The proposed island construction was previously studied by the USACE in 1999 as an ecosystem restoration project at the site of the former Cat Islands near the head of Green Bay. An environmental assessment was prepared and sent to the public for review in December 1999 under Section 204 of the Water Resources Development Act of 1992, which authorizes projects that protect, restore and/or create an aquatic and ecological related habitat using dredged material from USACE navigation projects. Since 1999, project design development was done in 2002, a subsequent design development report in 2005, and value engineering in 2007 for the Cat Island Chain Restoration Project. The USACE is no longer pursuing the project under Section 204, WRDA 1992 due to changes to the program. The island restoration project is now being pursued under a dredged material placement alternative in the Green Bay Harbor DMMP completed in 2009 along with an environmental assessment in 2009.

In addition, Brown County has received numerous other federal and state grants and has the qualifications and administrative experience necessary to administer all aspects of the project, including request of bids, request for qualifications, contracting, reporting, construction management, and administrative oversight. Brown County will write a competitive request for proposals and hire engineering consulting firms and construction contractors that have the expertise, manpower and equipment necessary to successfully complete the Cat Island Restoration Project.

In each of these agencies, high level administrators and field personnel have continued to work to see this project to fusion. Letters of support and resumes of key personnel are attached as supplemental information. The following list the names and titles of key individuals associated with this project.

Brown County

Dean Haen, Port Manager
Brian Lamers, Highway Commissioner
Chuck Larscheid, Port and Solid Waste Director
Neil McKloskey, Harbor Commission President

USACE, Detroit District

Dave Bowman, Project Manager
Terry Long, Planning Director
Wayne Schloop, Navigation Section Chief

WDNR

Jon Brand, Water Management Specialist
David Rowe, Fisheries Biologist
George Boronow, Lower Fox River Supervisor
Richard Stoll, Green Bay Basin Supervisor
John Huff, Wildlife Biologist

UW-Sea Grant

Vicki Harris, Water Quality Specialist
Phillip Moy, Fisheries Specialist
Gene Clark, Coastal Engineering Specialist

USFWS

UW-Green Bay

Louise Clemency, Field Supervisor
Gary Van Vreede, Wildlife Biologist

Bud Harris, Professor
Tara Reid, Professor

RAP Biota and Habitat Work Group/Science & Technical Advisory Committee
o the Lower Fox River Basin Partner Team
Janet Smith (retired USFWS Field Supervisor)

B. Project Application to Overarching plans for Protection of the Great Lakes

Restoration of the Cat Island Chain addresses many of the Great Lakes needs and priorities established federally by the President of the United States, USEPA, NOAA, USACE, by the State of Wisconsin, Governor and WDNR and locally by the Port of Green Bay, Brown County and the RAP. The project clearly meets the needs and priorities of many federal, state and regional agencies and organizations results. The following is a summary of the relevance to Great Lakes Needs and Priorities:

- President's goal set in 2004 to restore, improve and protect 3 million acres of wetlands

Council of Great Lakes Governor's Priorities

<http://www.cglg.org/projects/priorities/index.asp>

- Enhance fish and wildlife by restoring and protecting coastal wetlands, fish and wildlife habitats.
- Restore to environmental health the Areas of Concern identified by the International Joint Commission as needing remediation.
- Adopt sustainable use practices that protect environmental resources and may enhance the recreational and commercial value of our Great Lakes.

2009 USEPA 2009-2014 Strategic Plan Change Document

http://epa.gov/ocfo/plan/pdfs/strategic_plan_change_document_9-30-08.pdf

- Objectives 4.3 Restore and Protect Critical Ecosystems
- By 2011 achieve net increase of 100,000 acres of wetlands/year with focus on additional measures and assessment
- By 2011 in partnership with USACE, states and tribes achieve "no net loss" of wetlands under Section 404 of the Clean Water Act.
- Delist all 31 of the remaining AOC by 2025

2009 Wisconsin's Great Lakes Strategy

http://dnr.wi.gov/org/water/greatlakes/wistrategy/GLStrategy2009_final_wcover.pdf

- Support coastal wetlands and shoreline protection and restoration efforts to restore regional hydrology and adjacent habitats and to manage and/or emulate hydrology in wetlands and adjacent habitats. Shorelines include those along lakes, streams and wetlands.
- Lower Fox River/Green Bay is a priority area for tributary restoration and protection
- Set priorities for funding and implementation of remedial action plans to meet AOC-specific BUI delisting goals for Fox River/Lower Green Bay AOC.
- Use the strategy to support resource requests for AOC clean up and habitat restoration

2009 Great Lakes Multi-Year Restoration Action Plan Outline

<http://www.epa.gov/greatlakes/glri/glmyrapo.pdf>

- Toxic Substances and AOC's
 - AOC's are cleaned up, restoring areas and removing beneficial reuse impairments
 - By 2010 target of 16 AOC beneficial use impairments removed through strategic actions identified in RAP to restore individual beneficial uses.
- Habitat and Wildlife Protection and Restoration

- Protection and restoration of Great Lakes aquatic and terrestrial habitats, including physical, chemical, and biological processes and ecosystem functions, maintains, or improves conditions of native fish and wildlife. By 2014, 75,000 acres of wetlands, wetlands-associated uplands, and high priority coastal, upland, and island habitat will be protected, restored or enhanced. By 2014, 30% of habitat-related beneficial use impairments will be delisted across 27 AOC.
 - Improve aquatic Ecosystem Resiliency
 - Maintain or improve populations status of threatened, endangered, rare and migratory species
 - Enhance wetlands, wetlands-associated uplands, and high priority coastal, upland and island habitats
 - Identify, inventory, and track progress on Great Lakes habitats, including coastal wetlands restoration
 - Restore habitat functioning in AOC

The Cat Island Chain Restoration Project will address several focus areas identified in the GLRI Actions plan including:

ID #116	Beneficial Reuse of Dredged Material
ID #123	Regional Sediment Management
ID #223	Strategic and Environmental Dredging
ID #201	Coastal Projects to Benefit Waterways & Habitats
ID #204	Restoring Aquatic Ecosystems
ID #205	Restoring Great Lakes AOC
ID #220	Habitat Enhancement at AOC
ID #146	Coordinated implementation of RAP programs

2005 Great Lakes Regional Collaboration Strategy goal to restore and protect the Great Lakes
http://glrc.us/documents/strategy/GLRC_Strategy.pdf

- The need for significantly more habitat conservation and species management with a focus on coastal shore and upland habitats
- Restore AOC
- Wetlands restoration for non-point sources of pollution contributing to problems in AOC
- The long-term goal for Open/Nearshore Waters is to increase reproducing native fish species, especially lake herring, ciscos, lake trout, yellow perch, walleye, whitefish, brook trout, sturgeon, eel and salmon as a significant component
 - The goals for Wetlands are:
 - Long--term goals
 - Wetland conditions should be sufficient to provide a full range of ecosystem services including hydrologic retention, nutrient and sediment trapping, spawning, nesting, and nursery habitats and other habitat needs of fish and wildlife
 - Fish, wildlife, and plant communities and their habitats are protected and conserved
 - Wetlands in hydrologically modified environments are maintained and improved.
 - Non-native plant and animal species are managed or prevented
 - Protect or restore one million acres of high quality wetlands in the basin
 - Self-sustaining non-endangered population levels for all currently listed wetland wildlife species, as determined by the WDNR
 - Short-term goals
 - Restore or protect 550,000 acres of wetlands and associated uplands (1.1M acres)
 - Achieve at least 1.54 million breeding pairs of waterfowl (annual breeding population under average environmental conditions)
 - Update inventory and mapping of wetland habitat types in the Great Lakes basin
 - Acknowledge, develop and enhance federal and state regulations and enforcement

for coastal and inland wetland protection that also facilitate and accelerate wetland restoration

- The goals for Coastal and Upland Habitats are:

Long-term goals

- Coastal shore habitats and natural processes that sustain them—such as sediment transport, lake-level fluctuation, and wetland migration—are protected, restored and/or managed
- Coastal and upland habitats sustain long-term diverse and abundant populations of native resident and migratory fish and wildlife species, especially those that are threatened and endangered
- Sufficiently large and connected inland habitats are protected and restored, contributing to ecosystem health and biodiversity, and providing migration corridors for species

Short-term goals

- Protect or restore 10,000 acres of high priority coastal and upland habitats/year
- Promote development of environmentally-sound sediment treatment and destruction technologies, beneficial reuse of sediments and best available disposal options

2005 Port of Green Bay Strategic Plan

http://www.portofgreenbay.com/uploadedFiles/Home_Page/Website_Contents/Strategic_Plan/StrategicPlan05.pdf

- Beneficially reuse clean dredge material to reconstruct the Cat Island Chain for environmental benefit.

1988 Lower Green Bay Remedial Action Plan

http://www.seagrant.wisc.edu/WaterQuality/Portals/9/Lower%20Green%20Bay%201988%20RAP%20Complete_2.pdf

- 6.10 Consider stabilizing Cat Island for habitat restoration and enhancement.

11. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

Brown County, a municipal government is involved in human services, public safety, port, airport, highway and many other areas that routinely deal with federal assistance through block grants and specialized grant programs. Brown County has successfully completed numerous projects involving project cooperative agreements, project administration and oversight, payments, reimbursement requests and fulfilling reporting requirements such as percent completion and confirmation of the project items completed within budget.

Construction of the Cat Island Chain wave barrier will be closely related to highway construction. Brown County has constructed numerous highway projects using federal, state and local dollars. Recent projects include 2009 construction of 1.27 miles of Shawano Ave at a cost of \$2.4M; 2008 construction of 1.4 miles of Waube Avenue at a cost of \$1.3M; and 2007 construction of seven lanes on Lombardi Avenue at a cost of \$3.35M. Over the past 15 years, the Brown County Port & Solid Waste Department has received over \$12M in of WDOT Harbor Assistance Program grants. Most recently in 2006, Brown County constructed a \$5M dockwall/dredging project at Georgia-Pacific.

This project has addressed many difficult aspects of the project including numerous studies of design concepts, simulations, value engineering and others. The development of plans and specifications, issuing a construction bid and administering the construction, although challenging, are well within the capabilities of Brown County. Brown County has the organizational and personnel experience to successfully construct the Cat Island Chain Restoration project on time and within budget. Brown County currently has the organizational and personnel experience in constructing highways, airport runways, port-related construction and other construction related projects. Brown County will fully utilize existing or additional in-house engineers and project managers while retaining specialized engineering consultants to assist in the construction of this project.

12. BUDGET

Item	Quantity	Unit	Unit Price	Total
Shot Rock	231,200	Tons	\$25.00	\$ 5,780,000
Coarse Gravel	34,100	Tons	\$18.50	\$ 630,850
Bedding Stone	4,850	Tons	\$35.00	\$ 169,750
Armor Stone	34,075	Tons	\$52.00	\$ 1,771,900
Geotextile	13,600	SY	\$ 3.50	\$ 47,600
Culverts	2,500	LF	\$25.00	\$ 62,500
Mob/Demob				\$ 200,000
Construction Subtotal				\$ 8,662,600
Engineering & Design				\$ 600,000
Supervision & Administration				\$ 600,000
Eng. & Design during Construction				\$ 250,000
Project Mgt/Contract				\$ 100,000
As-Builts				\$ 10,000
Water Certification Permit				\$ 150,000
Non-Construction Total				\$ 1,710,000
Total Project Costs				\$ 10,372,600

Project Budget by Budget Object Classes	
Personnel/Salaries	\$ 300,000
Fringe Benefits	\$ 150,000
Travel	\$ 10,000
Equipment	\$ 10,000
Supplies	\$ 2,500
Contract Costs	\$ 8,662,600
Other Costs	\$ 0
Total Direct Charges	\$ 9,135,100
Indirect Charges	\$ 1,237,500
Total Cost	\$ 10,372,600

Funding Source	Contribution
GLRI Grant	\$ 1,500,000
WDOT Harbor Assistance Program	\$ 7,141,835
Natural Resource Damage Assessment	\$ 800,000
Brown County	\$ 780,765
Brown County In-Kind Contribution	\$ 150,000

13. ACORN STATEMENT

Brown County affirmatively indicates that the Association of Community Organizations for Reform Now (ACORN) will not be involved in this project and no funds for this project will be awarded to ACORN.

14. ATTACHMENTS

15. LETTERS OF SUPPORT