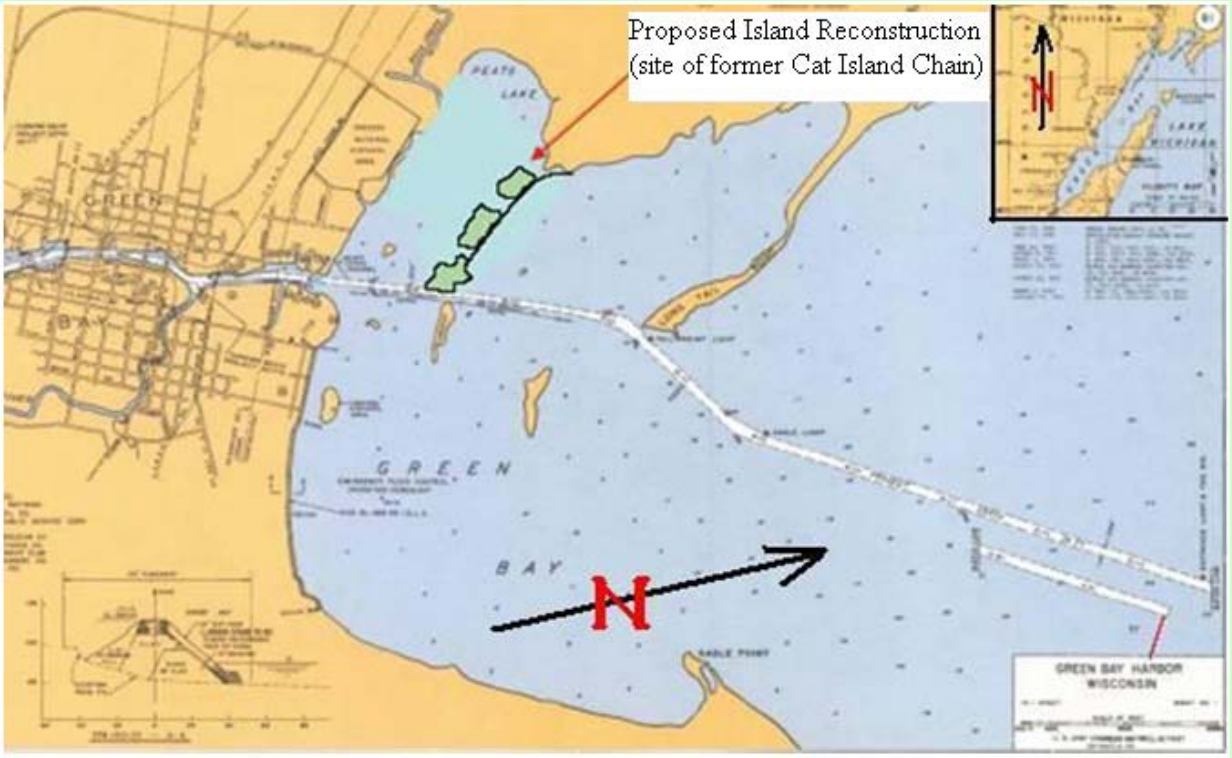
ENVIRONMENTAL ASSESSMENT

Dredged Material Management Plan
Green Bay Harbor, Wisconsin



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ENVIRONMENTAL ASSESSMENT

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ABSTRACT

The U.S. Army Corps of Engineers, Detroit District, is preparing a Dredged Material Management Plan (DMMP) to determine suitable dredged material placement options for material removed during maintenance of the Green Bay Harbor Federal navigation channels. The proposed action is to continue to use the existing Bayport Confined Disposal Facility (CDF), but only for contaminated sediment from the inner harbor (mostly the channel within the Fox River), and to reconstruct islands with the clean sediment dredged from the outer harbor in Green Bay. The island reconstruction was previously studied as an ecosystem restoration project at the site of the former Cat Islands near the head of Green Bay. The primary benefit of island reconstruction using outer harbor shoal material is lower channel maintenance costs. A secondary benefit of the island reconstruction is the beneficial use of dredged material to restore aquatic and wildlife habitat that was lost over time as the Cat Islands were destroyed by storms and high water levels. A variety of dredged material placement alternatives are considered, including continued placement of all the dredged material in the Bayport CDF, use of a lake-bottom site for the clean material, and the proposed island reconstruction. The No Action alternative sets the baseline from which to evaluate the effects of the proposed action. Expected adverse project effects of the proposed island construction are anticipated to be minor, short-term localized degradation of the aesthetic quality in the proposed work area due to increased turbidity and noise; localized and temporary air and water quality degradation from construction equipment operation; smothering of benthos (bottom-dwelling organisms) at the project site; and displacement of fish during construction activities. These effects would repeat during each dredging cycle until each island is completed. The constructed islands would restore terrestrial habitat and, by blocking wave energy, would promote the re-establishment of aquatic plant beds in the head of the Bay. This would increase habitat diversity, as well as aesthetic and recreational values in Green Bay. This Environmental Assessment has been prepared in accordance with National Environmental Policy Act (NEPA) of 1969, and incorporates earlier NEPA documentation by reference as discussed in paragraph 1.2 of this Environmental Assessment. . Based on results of this Environmental Assessment, an Environmental Impact Statement does not appear to be necessary.

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Green Bay Harbor, Wisconsin

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ENVIRONMENTAL ASSESSMENT
Dredged Material Management Plan
Green Bay Harbor, Wisconsin

1.0 INTRODUCTION

1.1 The U.S. Army Corps of Engineers (USACE), Detroit District, is preparing a Dredged Material Management Plan (DMMP) to determine suitable placement options for material removed during maintenance dredging of the Green Bay Harbor Federal navigation channels. The study is being conducted under the guidance of the National Harbors Program: Dredged Material Management Plan (DMMP), policy dated July 21, 1994, which requires preparation of a DMMP for a minimum 20-year dredged material placement capacity. A plan to accommodate, at a minimum, 20 years of dredged material placement at Green Bay Harbor would require approximately 4.3 million cubic yards capacity.

1.2 Maintenance dredging is necessary to prevent shoal build-up in the navigation channel which decreases available water depth, and could eliminate commercial navigation. Maintenance dredging of Green Bay Harbor supports the economic benefits associated with navigation (see Economic Appendix C to the DMMP report). A Base Plan for dredged material placement has been developed as part of the Green Bay Harbor DMMP, to which this EA is attached. The DMMP provides a solution that is engineeringly, economically and environmentally feasible. This EA also incorporates by reference the previous Environmental Impact Statements (1976 and 1977, see Paragraphs 1.11 through 1.13 below) for dredging at Green Bay and dredged material placement as allowed by 40 CFR 1502.21. (See Attachment 3 for availability of these EISs).

Background

1.3 Green Bay is a relatively shallow extension of Lake Michigan that is over 100 miles long, southwest to northeast, and averages about 15 miles in width (Figure 1). 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.

1.4 The Bay and the Fox River serve a variety of interests including power generation, industrial, recreational, and deep-draft navigation. The Federal Navigation Project at Green Bay extends 7 miles up the Fox River and nearly 12 miles into the bay of Green Bay (Figures 2 — 4). The upper 3 miles of navigation channel in the Fox River currently is not maintained. Currently, all shoal material from maintenance dredging of the Federal channel (both Fox River and Green Bay channels) is placed in the Bayport site, which is along the Bay shore about one mile west of the navigation channel. Since the Bayport CDF is now owned by Brown County, the Corps pays a tipping fee to place

Figure 1. Green Bay and Dredged Material Management Plan Project Vicinity.

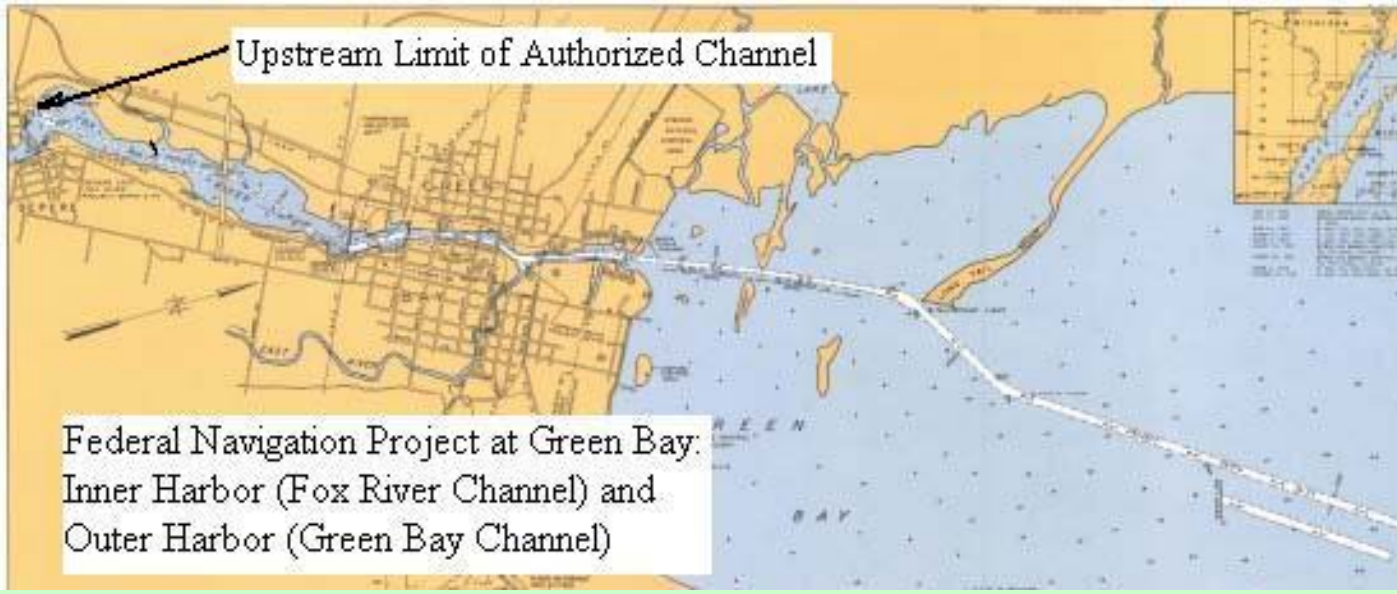

Figure 2. Overview of Federal Navigation Project at Green Bay Harbor

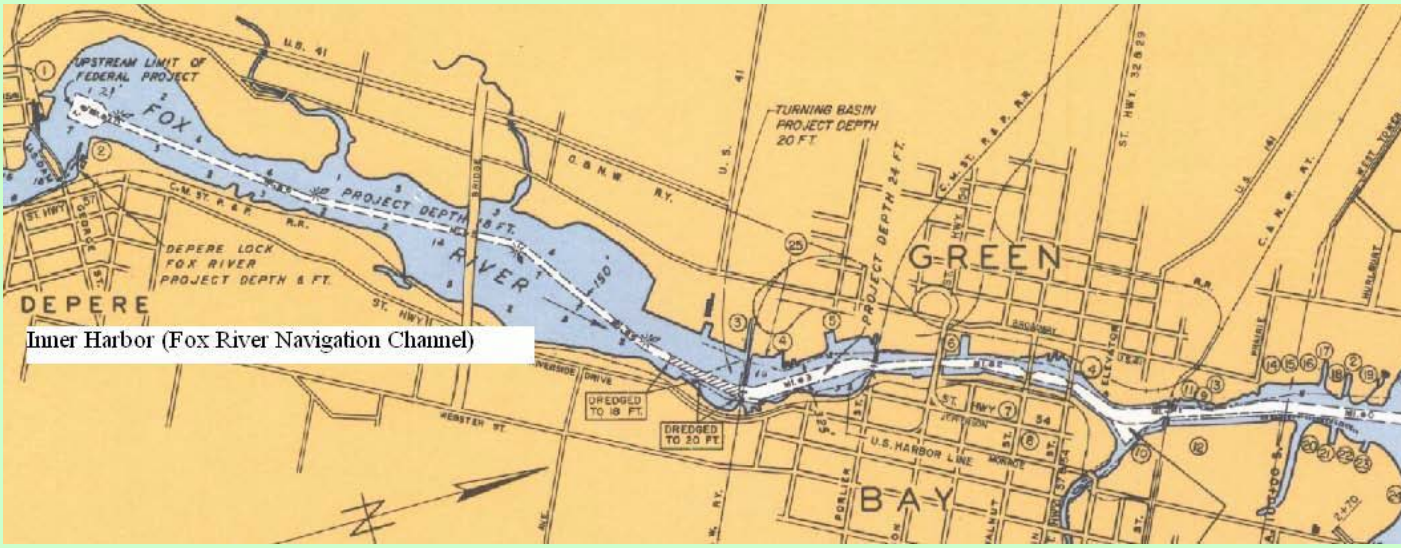

Figure 3. Inner Harbor (Fox River Navigation Channel)

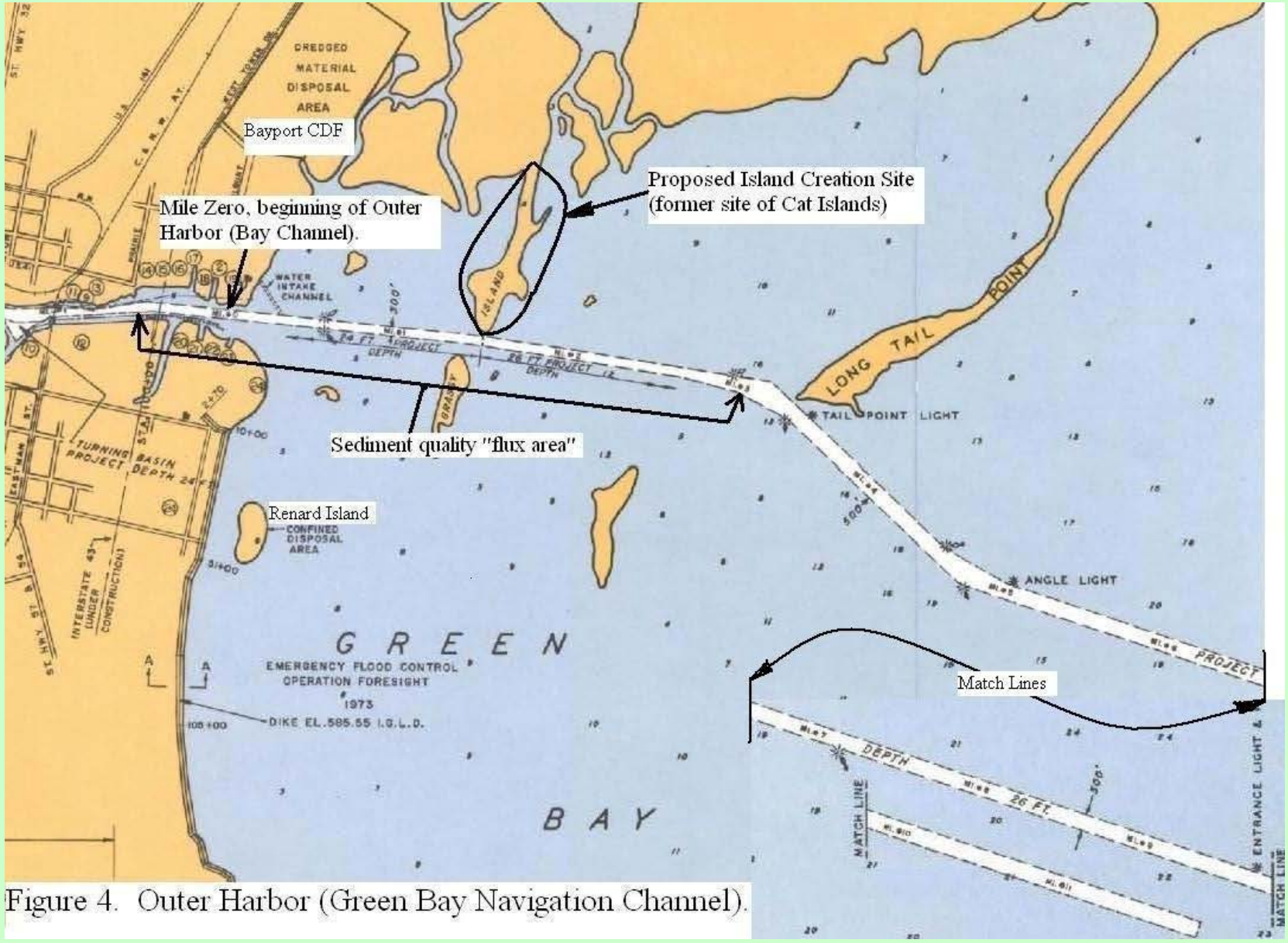

Figure 4. Outer Harbor (Green Bay Navigation Channel).

dredged material at the CDF. Other sites used in the past include the Renard Island confined disposal facility, a constructed island about one mile east of the Fox River mouth.

1.5 The character of the dredged material from most of the outer harbor is classified as suitable for unrestricted uses, which includes island reconstruction. The proposed island reconstruction project site is about 6,500 feet out from the head of Green Bay, extending from near the Federal navigation channel (Figure 4) northwest about 8,000 feet to the shore of Green Bay. Formerly there was a chain of islands called the Cat Island Archipelago[1] that occupied this location, extending about 2.5 miles, west to east, halfway across the Bay. A few miles farther north in the Bay is Long Tail Point (Figure 4), which extends from the west shore about half way across the Bay. Long Tail Point has been eroding over the years and has breached in some areas.

1.6 Historically, the Cat Islands have been recognized for their significance as a bird sanctuary and fishery resource. According to a draft habitat restoration feasibility report proposal by the Wisconsin Department of Natural Resources (WDNR, 1994), the southern end of Green Bay contained one of the largest and most diverse wetland complexes in the Great Lakes. The shallow waters, submerged aquatic vegetation, Cat Island Chain, Long Tail Point, and gravel reefs provided diverse habitat for a variety of fish, waterbirds, furbearers, and invertebrates. The Cat Islands, specifically, provided habitat for shorebirds and colonial nesting birds. The WDNR report cites a 1994 Nature Conservancy report, *The Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities*, which indicated that the islands support habitat for critically imperiled species and communities.

Recommended Plan

1.7 The recommended Dredged Material Management Plan is continued use of the existing Bayport Confined Disposal Facility (CDF), but only for contaminated sediment from the inner harbor, and to construct islands with the clean outer harbor material. Environmental impacts associated with the Bayport CDF are addressed in an EIS titled *Final Environmental Impact Statement, Maintenance Dredging and Contained Disposal of Dredged Material at Green Bay Harbor, Wisconsin* (May 1976).

1.8 The proposed island construction was previously studied in 1999 as an ecosystem restoration project at the site of the former Cat Islands. An Environmental Assessment was prepared and sent to the public for review in December 1999 under the authority of Section 204 of the Water Resources Development Act of 1992, which authorizes projects that protect, restore and/or create aquatic and ecologically related habitat using dredged material from USACE navigation projects. Since 1999 the project design for the island reconstruction to restore the Cat Islands has been revised. The Corps is no longer pursuing an ecosystem restoration project at the Cat Islands, but the island reconstruction is now being considered as

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1 The former Cat Island Archipelago consisted, from west to east, of the two Bass Islands, Cat Island, and Grassy Island. This ecosystem restoration project focuses on the sites of the former Bass Islands and Cat Island. The site of Grassy Island, which lies east of the Federal navigation channel, is not a part of this project.

a dredged material placement alternative in the Green Bay Harbor Dredged Material Management Plan (DMMP).

1.9 This Environmental Assessment (EA) discusses the DMMP alternatives, the alternative selection process, potential impacts of the proposed island reconstruction on the human environment, and preliminary comments received during coordination of the DMMP. The DMMP, to which this EA is attached, contains additional information about the alternatives, alternative selection, and proposed island reconstruction, including project costs, design information, hydrology, geology, and real estate.

Project Purpose, Need, and Authority

1.10 The purpose of the DMMP study is to identify a plan for dredged material placement over a period of 20 years. Green Bay Harbor is authorized under the River and Harbor Acts of 23 Jun 1866, 13 Jul 1892, and 26 Jun 1910, which authorized the dredging of the harbor to accommodate robust commercial shipping activity. A detailed summary of the authorizations are included in the main body of the DMMP report in Table 2. This study is being conducted under the guidance of the National Harbors Program: Dredged Material Management Plan policy dated July 21, 1994.

National Environmental Policy Act Documentation

1.11 Environmental effects of maintenance dredging at Green Bay Harbor are addressed in the Environmental Impact Statement (EIS) titled *Final Environmental Impact Statement, Operation, Maintenance and Dredged Material Disposal Facility, Green Bay Harbor, Wisconsin,* (November 1977). The 1977 EIS addresses the impacts of maintenance dredging and dredged material placement. (See Attachment 3 for availability of this EIS). The conditions described in the 1977 EIS remain basically unchanged in that there are no endangered species that would be impacted and the dredged material is of the same physical and contaminant character. Area development has not impacted operations and maintenance dredging. The exact width, depth and location of the Federal channel at Green Bay Harbor have been prescribed by Congress through authorization documents.

1.12 Environmental effects of construction, operation, and maintenance of the Bayport CDF are addressed *Final Environmental Impact Statement, Maintenance Dredging and Contained Disposal of Dredged Material at Green Bay Harbor, Wisconsin* May 1976, (Attachment 3). The Bayport CDF is now a licensed landfill run by Brown County, Wisconsin.

1.13 The current Environmental Assessment addresses the additional sites proposed to complete the 20-year Dredged Material Management Plan: Construction of three islands at the site of the former Cat Islands and filling them with the clean outer harbor dredged material, and expansion of the Bayport CDF. The alternatives considered in determining this plan are described in the following section.

2.0 ALTERNATIVES AND THE PROPOSED ACTION

2.1 A number of alternatives for placement of dredged material from Green Bay Harbor have been investigated. These alternatives are presented in detail in the DMMP report and summarized below. Alternative 1 is the no action alternative. Alternatives 2 through 8 are various island reconstruction alternatives. Alternative 9 is open water placement. Alternative 10 is beach nourishment. Alternatives 11 and 12 are variations on the continued use of the existing Bayport CDF. Alternatives 13 and 14 are variations on the use of dredged material for closure of the existing Renard Island CDF. Alternatives 15 and 16 combine continued use of the Bayport CDF with other alternatives for the cleaner material.

2.2 Alternative 1 - No Action. Under the No Action alternative, no Corps action would be taken to provide for additional dredged material placement capacity at Green Bay Harbor. All dredged material, from both the inner and the outer harbor, would be placed in the Bayport CDF until it is full. This alternative is the current situation and has resulted in reduced dredging, leaving a backlog of shoaling in the channel, especially in Green Bay. The backlog will increase, channel depths will be reduced, and ultimately ships will not be able to enter the harbor. This alternative was eliminated from further consideration because it does not achieve the 20 year capacity required of a DMMP.

2.3 Island Reconstruction Alternatives (Alts. 2 through 8): Island reconstruction alternatives consider single island reconstruction scenarios (Alts 2, 3, and 8), two-island scenarios (Alts 4 and 5), and three island scenarios (Alts 6 and 7). The islands would be filled with suitable shoal material dredged from the Federal navigation channel in Green Bay. The concept plan for island reconstruction is shown in Figure 5 below. The island configuration in relation to the bay of Green Bay is shown in the cover illustration of this EA.

2.4 The dredged material placement capacity of the islands is approximately 630,000 cubic yards (cy) for the west island by the west shore of the Bay, 720,000 cy for the middle island, and approximately 1,000,000 cy for the east island, by the navigation channel. Table 1 summarizes the island areas and storage capacities. Nutrients in the channel sediments are sufficient to support vegetation, which is expected to develop quickly from existing seed bank in the sediments.

2.5 A wave barrier is required on the northeast side of each island to protect the islands from wave energy that destroyed the former Cat Islands. In some of the alternatives, the wave barrier is constructed across the entire length of the three island area (complete wave barrier) at the initiation of island construction, even if less than three islands are to be constructed. In the other alternatives, the wave barrier is only constructed for actual islands constructed and at the time of each island's construction (partial wave barrier). Since the wave barrier protects the head of the Bay on the west side of the navigation channel, initial construction of a complete wave barrier will result in a quicker restoration of the aquatic habitat.

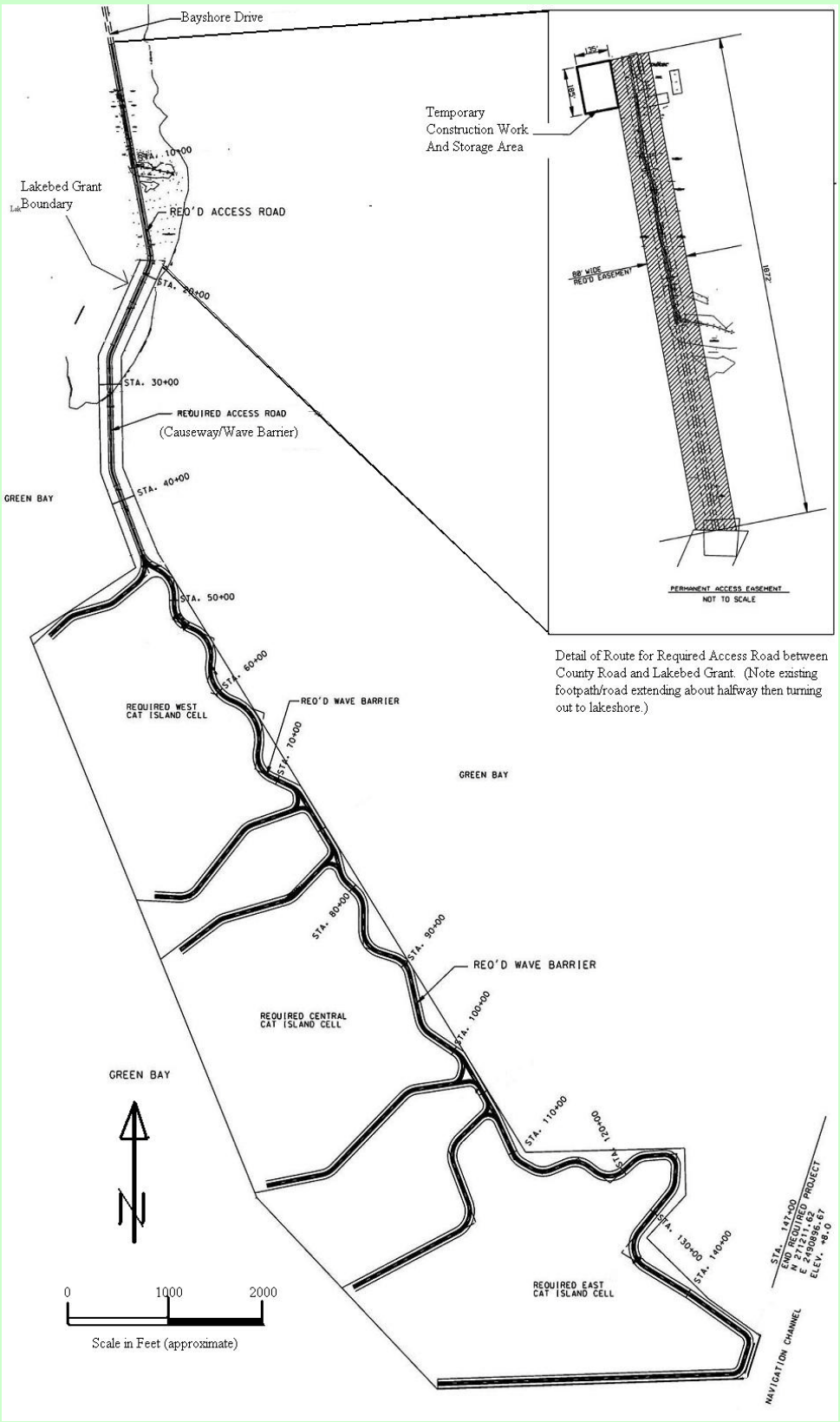


Figure 5. Island Reconstruction Concept Plan—Preliminary

Table 1 – Island Storage Capacity Summary

Island	Area (acres)	Storage Capacity (cubic yards)
West Island	74	630,000
Central Island	92	720,000
East Island	106	1,000,000

2.6 All three islands would occupy approximately 300 acres of lake bottom. An access road would be constructed from the end of Bayshore Drive approximately 1870 feet to the water's edge, occupying approximately 3 acres below the ordinary high water mark (OHWM). A causeway would extend approximately 3000 feet from the water's edge to the west island, occupying approximately 6 acres of lake bottom.

2.7 The following island construction alternatives were considered:

Alternative 2 - Construct a single island (West Island) DMDF, a partial wave barrier and an access road.

Alternative 3 - Construct a single island (West Island) DMDF, a complete wave barrier and an access road.

Alternative 4 - Construct a two island (West and Middle Islands) DMDF, a partial wave barrier, and an access road.

Alternative 5 - Construct a two island (West and Middle Islands) DMDF, a complete wave barrier, and an access road.

Alternative 6 - Construct a three island (West, Middle and East Islands) DMDF, a partial wave barrier, and an access road.

Alternative 7 - Construct a three island (West, Middle and East Islands) DMDF, a complete wave barrier, and an access road.

Alternative 8 - Construct a single island (East Island) DMDF, a complete wave barrier, and an access road.

2.8 Alternative 9 – Open Water Placement. This alternative consists of placing clean dredged material from the Bay channel on the lake bottom in an open water site. Because of the relatively shallow depth of the lower half of Green Bay and the need to have the material sheltered from significant wave energy, the open water site is located approximately 50 miles from the harbor. This alternative was eliminated from further consideration as a stand-alone alternative because the inner harbor is unsuitable for unrestricted uses, including open water placement; however, open water placement is further discussed as a combination alternative for the outer harbor material only (see Alternative 16 below).

2.9 Alternative 10 – Beach Nourishment. This alternative proposes to place dredged material on the beaches within Green Bay as a beneficial use. Beach nourishment is becoming a more utilized option where local conditions warrant. Beach nourishment is ideal in shoreline areas that are classified as "erosional", where more material is lost through natural erosion than is deposited via littoral drift. Also, beach nourishment helps to expand recreational beaches at local or state parks, if nearby. Lastly, sandy material can be placed on shorelines in preserve areas to enhance shoreline habitat. This alternative was eliminated from further consideration because the fine-grained component of the outer harbor shoal material makes it unsuitable for beach nourishment.

2.10 Bayport CDF Alternatives (Alts. 11 and 12): This alternative consists of continued use of the Bayport CDF for dredged material placement. Currently there is not 20 years of capacity for dredged material at the Bayport facility; however, the site owner (Brown County) expects in the future to expand the Bayport CDF to meet the 20-year dredged material capacity. Bayport alternatives:

> **Alternative 11 – Brown County Expanded Bayport CDF (Scenario 1—Inner Channel Only):** Only the contaminated inner harbor dredged material would be placed in the Bayport CDF under this alternative. With placement only of inner harbor dredged material, the Bayport CDF would reach current capacity by the end of 2019, at which time the County would expand the site. The expansion would consist of constructing a 36-acre diked Dredged Material Disposal Facility (DMDF) adjacent to the existing Bayport CDF containing dry cells for stock piling dry dredged material (Figure 6). The existing Bayport CDF will continue to process wet dredged material. The process will consist of temporary storage of the wet dredged material in designated cells until it is dried, then transferring it to the 36 acre expansion site. This alternative is not feasible as a stand-alone alternative but is further considered in combination with other sites (see Alternatives 15 and 16 below).

Figure 6. Future Expanded Dredged Material Placement Area at the Bayport CDF site.

Alternative 12 – Brown County Expanded Bayport CDF (Scenario 2—Inner and Outer Channels): This alternative is similar to the no action alternative (Alternative 1 above), except that under this alternative, the Bayport CDF would be expanded to meet the needed 20-year capacity. With the placement of both inner and outer harbor dredged material, the Bayport CDF would reach current capacity by the end of 2015, at which time the County would provide additional capacity. The additional capacity would consist of constructing a 36 acre Dredged Material Disposal Facility (DMDF) adjacent to the existing Bayport CDF containing dry cells for stock piling dry dredged material, and a 100 acre facility in Holland Township, approximately 20 miles from the Bayport CDF. The existing Bayport CDF will continue to process wet dredged material. The process will consist of temporary storage of the wet dredged material in designated cells until it is dried, then transferring it to the 36-acre expansion site and/or the 100-acre Holland Township site.

2.11 Renard Island CDF Alternatives (Alts. 13 and 14): This alternative consists of reshaping the interior contour of the approximately 54-acre Renard Island using dredged material as fill and for a final cover to close the Renard Island CDF. The non-Federal project sponsor (Brown County) plans to eventually convert the island to a park. This would provide a dredged material capacity of approx. 466,362 cy (includes 2.5 feet of cover). Dredged material from the inner harbor channel (approx. 288,895 cy) could be used to shape the hills, followed by dredged material from the outer harbor channel (177,467 cy) for the cover. Nutrients in channel sediments are sufficient to create vegetation quickly and act as topsoil. A perimeter swale would be included to collect surface water run-off. Geotextile fabric would be placed on the inside slope of the existing perimeter dike for seepage protection. Final island elevations vary from 5 ft to 20 ft above the dikes.

> **Alternative 13 – Modify Interior Contours within Renard Island CDF and Transport Dredged Material by Barge:** Dredged material from the Federal channel would be pumped from a barge into cells constructed on the island. Three cells (approx. 10 acres each) could be constructed to allow dredged material placement into alternate cells every three years. This would allow a two year drying time for each cell. The dried dredged material could then be moved and shaped into hills with various elevations for the park development. The cells could be constructed using onsite material to create temporary push up berms.
>
> **Alternative 14 – Modify Interior Contours within Renard Island CDF, Construct a Causeway and Transport Dredged Material by Truck:** This alternative also proposes to reshape the islands' (approx. 54 acres) interior contour using dredged material and provide a cover as discussed in alternative 13 above. The main difference from Alternative 13 above is that dry dredged material from Bayport CDF would be trucked to the Renard Island. A causeway would be constructed from the mainland to the island to provide truck access.

Both Renard Island alternatives were eliminated from further consideration because a current project will use all the existing capacity.

2.12 Combination Alternatives (Alts. 15 and 16): These alternatives consider continued placement of dredged material at the Bayport CDF for the contaminated material in the inner harbor (Alternative 11) combined with technically and environmentally feasible alternatives for the cleaner material (Alternatives 6 and 9).

> **Alternative 15 – Combination of Alternative 7 and Alternative 11.** This alternative combines Alternative 7 (Construct a three island DMDF, a partial wave barrier, and an access road) with Alternative 11 (Brown County Expanded Bayport CDF) to address the inner and outer dredged material capacity needs.
>
> **Alternative 16 – Combination of Alternative 9 and Alternative 11.** This alternative combines Alternative 9 (Open water placement) with Alternative 11 (Brown County

Expanded Bayport CDF) to address the inner and outer dredged material capacity harbor needs. This alternative is eliminated from further consideration because the required depth for the open water site (as discussed under Alternative 9 above) results in excessive barging distance that increases costs to the degree that it is more economical to put the outer harbor material in the Bayport CDF under the expanded CDF plan (Alternative 12).

Alternative 17 – Combination of Alternative 4 and Brown County Expanded Bayport CDF (Scenario 3). Scenario 3 consists of a future expansion of the Bayport CDF (as in Alternative 11) to meet 20 year capacity for the inner harbor material, and future development of a separate 100-acre upland site, the Holland Township Site, to make up the 20 year capacity for the outer harbor since Alternative 4 consists of creating only the west and middle islands. The portion of the outer channel equivalent to the capacity of the East Island (1,000,000 cy) will be placed in the 100 acre DMDF located at Holland Twp., WI, approximately 20 miles from the Bayport CDF.

2.13 Proposed Action: A detailed discussion evaluating all the alternatives is included in the main DMMP report under Section 8, "Evaluation of Alternative Plans," and Section 9, "Trade-off Analysis." The Base Plan is the least costly plan, consistent with sound engineering, that meets all Federal environmental requirements. As such, the base plan is Alternative 15 – Combination of Alternative 7 and Alternative 11, which is to construct three islands with complete wave barrier and access road for the outer harbor and to expand the Bayport CDF for the inner harbor. The locally (non-Federal project sponsor) preferred plan is the same as the Base Plan. Therefore, the proposed action is Alternative 15.

3.0 CONSTRUCTION OF THE PROPOSED DREDGED MATERIAL PLACEMENT ISLANDS

3.1 The selected alternative for placement of dredged material from the cleaner outer harbor channel is island reconstruction in Green Bay to replace the former Cat Islands. The selected island reconstruction option is to construct three islands in sequence from west to east. In addition the non-Federal project sponsor would expand the capacity of Bayport CDF by constructing additional cells adjacent to the existing facility as shown in Figure 6. Since the Bayport Expansion is being constructed by the non-Federal project sponsor, its construction is not detailed here; additionally, the Bayport expansion would not be constructed until about 2023. The following describes the construction of the islands.

3.2 A construction access road/causeway would be built from the mainland to the west island location and between each island. The road would extend approximately 1870 feet from the end of Bayshore Drive to the water's edge occupying approximately 3 acres below the ordinary high water mark (The actual footprint of the road would be approximately 2.6 acres, whereas the real estate right of way would be approximately 3.4 acres including the road which includes an existing raised footpath/road).). The causeway would extend approximately 3000 feet from the water's edge to the west island, occupying approximately 6 acres of lake bottom.

Culverts would be constructed in the causeway to allow water circulation between the shore and the west island and between each island. The islands would occupy approximately 300 acres extending from the west shore area to near the Federal navigation channel. The construction work and storage/staging area is proposed to be located along Bayshore Drive; however, the construction contractor may choose an alternative site provided all necessary permits and approvals and National Environmental Policy Act compliance are met..

3.3 Construction could be by floating plant, but shallow water depths largely preclude this option. Dredged material would be hydraulically pumped into each island, or could be trucked to the island over the access road. A pile cluster likely would be installed at the navigation channel to serve as a tie off for vessels and barges to use while pumping out the dredged material to the islands. While some dredging may be done directly with hydraulic dredge, farther reaches of the 11-mile Bay channel would likely be done mechanically and then the material hydraulically pumped from the channel's edge to the island, or in the case of the east island, it could be mechanically off loaded. The dredging contractor will be responsible for laying any hydraulic pipeline to the island and may use a boat to pull the pipeline to the island, or if the water is too shallow, may use equipment in the lake to pull the pipeline to the island. If the contractor desires to dredge an access channel to an island, either to pull the pipeline, or to mechanically offload at the island, the contractor will need all necessary permits and approvals and ensure that the National Environmental Policy Act compliance requirements are met.

3.4 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 beach area. The final island elevation is expected to vary from +10 to +15 ft, low water datum to be compatible with the regional landscape, provide natural diversity, and provide additional storage capacity. Invasive species management during island filling could be achieved through manipulation of the fill material during each dredging/filling cycle.

3.5 Clean stone for the dikes would be obtained from a commercial quarry. Shoal material for island fill would be obtained from normal maintenance dredging of the Federal navigation channel in Green Bay.

3.6 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 is not expected to be necessary because of the sandy nature of the dredged material to be placed into the islands. Dredged material placement operations would be conducted in compliance with State water quality standards. The contractor also is required to have a contaminant prevention plan and a spill control plan in-place prior to construction.

3.7 The proposed action may require the in-water construction of one or more temporary structures—such as 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 on 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.

3.8 Because of the shallow water in the island reconstruction project vicinity, one or more channels may have to be dredged. The need for and location of such channels are dependent upon construction methods. If access channels are needed, the construction contractor would be required to obtain all necessary approvals and permits, and may be required to conduct some sediment testing. Material dredged from access channels likely would be placed at the Bayport Confined Disposal Facility, the new islands, or some other approved site.

3.9 The type and location of temporary structures, land based facilities, and access channels cannot be determined at this time, since they would be incidental to the work being performed. Additionally, some variation from the project as described may occur with respect to sequence of activities, method of operation, or design details as a result of unanticipated design improvements, site conditions, or cost-saving measures. Such variations are not expected to result in significant changes to either the overall project design or environmental impact. Any changes would be reviewed to determine whether there is need for further evaluation under the National Environmental Policy Act.

3.10 The Local Project Sponsor is responsible for maintaining the project after it is constructed. Periodic maintenance effects would be similar to those described in this document, but are expected to be of shorter duration and smaller magnitude. In general, subsequent maintenance would have short-term adverse effects on the environment. Significant cumulative adverse effects would not be expected.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES—BAYPORT CDF EXPANSION

4.1 The Bayport Expansion Site historically was marshland and open water. Dredged material was placed on the site between the 1880's and 1950's by the city. In the 1950’s the city began placing material into the adjacent location which is the current CDF and discontinued regular placement of the material onto the site. Based on observations during a March 2010 site visit, there was no evidence to indicate a past use of the area as a manufacturing or industrial facility. Currently the site is used for yard waste collection and composting. The compostable material is collected from municipal delivery as well as citizen drop off.

Hazardous and Toxic Waste

4.2 Surface soil samples were collected in March 2010 from 10 locations within the proposed Bayport CDF expansion area to characterize surface conditions. During the site visit evidence of soil discoloration, odor, unusual or unexplained excavations (such as would be consistent with the placement of an underground storage tank), or discharge to the site from an adjacent property was not observed.

4.3 The soil samples were analyzed for polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs), and metals. PCBs were not detected in any of the samples. Only one sample showed SVOCs, and that was slightly above the detection limit, but is not an environmental concern. Results for metals were consistent with background metal concentrations generally seen in the Green Bay region in eight of the samples. Two samples displayed elevated metals, but not at levels that would be a concern for using the site as a dredged material placement area.

Wetlands and Wildlife Habitat

4.4 Because of the disturbed nature of the site and the lack of significant habitat, the Bayport expansion would not adversely affect wildlife. There are no wetlands on the Bayport expansion site. There is evidence of wildlife use, particularly deer. This usage is likely in passing as the site does not provide significant habitat. The site does not include any Federally listed species.

Floodplains

4.5 The Bayport Expansion is outside of the Federally delineated 100-year floodplain. The proposed action complies with the Federal Executive Order on Flood Plain Management (E.O. 11988) because it is outside of the floodplain and would not have adverse effects on floodplains, nor would it encourage development of the floodplain.

Air Quality

4.6 The proposed Bayport facility expansion was reviewed pursuant to the Clean Air Act. Although some criteria pollutants or their precursors would be emitted by use of construction equipment, the project area is in attainment of air quality standards per the Act (40 CFR Part 81, Subpart C); therefore a specific determination of conformity with air quality standards is not required. In addition, the proposed action is exempt because it would result in no or de minimis (Latin for ‘of minimal importance’) emissions per 40 CFR 93.153(c)(2). All equipment would be required to meet emission standards and emissions are expected to be minor. The effects would be temporary and short-term, repeating each dredging cycle for an anticipated 20 year project life. Once constructed, there would be no emissions, with exception of periodic maintenance activities which would be considered exempt actions per 40 CFR 93.153(c)(2).

Recreation, Noise and Aesthetics

4.7 The site vicinity includes a cement plant, the Bayport dredged material facility, and a small nature park. The nature park is immediately on the north side of the existing Bayport facility (which wraps around two sides of the nature park). Since the Bayport expansion site is on the opposite side of the existing Bayport facility it would not increase existing noise and aesthetic effects on the nature park, nor would there be noise or aesthetic effects on any residential areas as they are separated from the Bayport site by a major expressway (Interstate 43).

4.8 Noise generating activities would primarily be caused by construction equipment and would not significantly differ from equipment noise at the existing Bayport facility. The site also is subject to noise from adjacent operations such as the cement plant. Operation of construction equipment would result in periodic, but temporary and minor noise emissions. These noise effects are not expected to be significant because of the current use of construction equipment in the area of the site and the routine nature of the construction equipment to be utilized. Additionally, the site is not located in the immediate vicinity of a commercial or residential area.

Cultural Resources

4.9 In compliance with Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593, Protection and Enhancement of the Cultural Environment, the National Register of Historic Places and the State Historic Preservation Office have been consulted. No properties that are listed on, or eligible for listing on, the National Register have been identified that would be affected by the proposed project. As described in the site history section above, the area of the Bayport expansion has been thoroughly disturbed since at least 60 years ago, and by current operations at the site. Therefore, no impacts on cultural resources are expected.

Cumulative Impacts

4.10 Cumulative impacts are those impacts “on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Construction of the Bayport CDF expansion would not result in significant cumulative or long-term adverse environmental impacts. Cumulative impacts on this site are historical. The placement of dredged material at the site would be consistent with existing site usage.

5.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES—ISLAND CONSTRUCTION

5.1 Adverse effects associated with construction of the proposed islands would be minor during construction and island filling operations, and considered short-term but repeating each dredging and/or construction cycle over the expected 20 year project life. The primary impact would be physical in nature, including smothering of the existing benthic community during placement of the rock armor stone and the repeated covering of some of the benthos during dredge material placement operations. The work would cause localized degradation of the aesthetic quality in the proposed work area due to increased turbidity from placing the dredged sands (short lived), construction noise; localized and temporary air and water quality degradation; smothering of benthos that could not migrate through the newly deposited sediment load. Any fish within the immediate construction area would be displaced during project activities. These effects would repeat during each rock placement cycle and dredging cycle until an island is constructed and filled to design capacity. The adverse project effects are minor and are outweighed by the benefits of the proposed action including the restoration of emergent and submergent wetlands, restoration of upland island habitat suitable for nesting, resting and rearing of birds and benthic colonization of the rock armor stone. No significant adverse secondary effects are expected to occur. Nor are any significant cumulative or long-term adverse environmental impacts expected to result from constructing the proposed islands.

5.2 Protected shallow water bays on the Great Lakes, such as Green Bay, generally have large areas of lakebed with gentle slopes (20H:1V horizontal:vertical) that provide suitable substrate for emergent wetlands. Emergent coastal wetlands expand lakeward with low water levels, then recede as water levels rise. When the water levels are at or above the ordinary high water mark (OHWM) the wetlands are eroded as they cannot migrate landward past the armored shorelines. Once the high water has eroded the wetlands and protecting points, bars, islands and spits, re-development of the emergent wetlands is difficult in the wave washed environment. Such is the case in lower Green Bay after the loss of the Cat Island Chain, which served as a protective barrier helping keep wetlands from erosion.

5.3 Construction of the new islands with stone and dredged material would help restore terrestrial and aquatic habitat diversity lost as the former islands were destroyed over time by storms and high water levels. Each island is expected to provide terrestrial and aquatic habitat. The island aquatic habitat includes shallow water emergent and submergent wetlands and areas of open water in the protected Bay area behind the islands. The stone dikes around the front and sides of the islands would provide benthic habitat below the water line and upland habitat above the water. Additionally, the armored islands would block wave energy from further eroding the fringe remnants of the extensive estuarine wetlands once present in the head of Green Bay off Duck Creek (as evidenced in the 1960 aerial photo Figure 7). By blocking wave energy the new islands would promote the re-establishment of emergent and submergent wetlands in the head of the bay west of the Fox River. Overall, the project benefits to fish and wildlife in lower Green Bay are also expected to increase aesthetic and recreational enjoyment.

Figure 7. Aerial Photo Showing Remnant Estuarine Wetlands in 1960.

Water and Sediment Quality

5.4 Existing Water Quality: While water quality in the vicinity of the proposed project is improving, beach closures periodically occur and public health advisories are still in effect. The Fox River is the major contaminant source for Green Bay. Effluents entering the river include agricultural run-off, soil erosion, and other non-point sources; marine repairs and refueling; wastewater treatment plants; and paper and pulp mill discharges. The water quality situation in Green Bay was characterized by Beltran (n.d.):

> "Lake Michigan's Green Bay is a large, primarily shallow freshwater estuary having many of the characteristics of a whole Great Lake. It suffers from many of the same nutrient and toxicant problems as the rest of the Great Lakes system, including eutrophication and a biotic population impaired by PCBs, pesticides, and metals. . . . The southern portion of the Bay and its largest tributary, Wisconsin's Fox River, have been acknowledged as a polluted water system, and have been designated by the United States and the International Joint Commission as a Great Lakes Area of

Concern. The Fox River Valley is heavily industrialized and contains the world's largest concentration of pulp and paper mills. The Bay nevertheless remains a major recreational resource in the region, providing excellent boating and outstanding walleye fishing, despite fish consumption advisories established by the states."

5.5 Lower Green Bay and Fox River Area of Concern: Forty-three Areas of Concern (AOCs) have been identified in the Great Lakes/St. Lawrence River Basin. Remedial Action Plans (RAPs) are being developed for each of these AOCs to address impairments to any one of 14 beneficial uses (e.g., restrictions on fish and wildlife consumption, dredging activities, or drinking water consumption) associated with these areas.

5.6 The island reconstruction project is within the Lower Green Bay and Fox River AOC, which consists of the lower 7 miles of the Fox River below DePere Dam and a 21 square mile area of southern Green Bay out to Sable Point (Point au Sauble) on the east shore of Green Bay and Long Tail Point on the west shore, north of the Cat Island site. The drainage area encompasses portions of eighteen counties in Wisconsin and 40 watersheds of the Upper Fox River, Wolf River and the Fox River Basins, including the largest inland lake in Wisconsin, Lake Winnebago and its pool lakes.

5.7 While water quality problems and public use restrictions are greatest in the AOC, water resources of the entire basin are affected by runoff pollution from urban and rural areas, municipal and industrial wastewater discharges and degraded habitats. Eleven use impairments have been documented and two are suspected. Reversing the hypereutrophic conditions in the River and Bay is a top priority for the AOC. Reconstruction of the former islands would assist in the improvement of specific uses identified as impaired being: 1. Degradation of fish and wildlife populations; 2. Degradation of benthos; 3. Degradation of phytoplankton and zooplankton populations; and 4. Loss of fish and wildlife habitats.

5.8 Federal Navigation Channel Sediment Quality: 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 (Figure 3) are not suitable for unrestricted uses and would require restricted placement. The material dredged from the outer harbor (Figure 4) is suitable for unrestricted uses, including island reconstruction. The area of the channel from approximately one-half mile upstream in the Fox River, to approximately three miles into the Bay (Figure 4) is in flux with regard to sediment quality because of varying river currents and storm load outputs. Dredged material in this "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. Future evaluations of the Federal channel sediments will be periodically conducted, consistent with the Great Lakes Testing and Evaluation Manual (USEPA/USACE 1998), to ensure that only suitable shoal material is used in the island filling.

5.9 In addition to the Great Lakes Testing and Evaluation Manual evaluations noted above, sampling and bulk contaminants analysis (no biological testing) were completed in 1999 for the Fox River channel, 2006 for the Bay channel, and 2010 for both the River and Bay channels. The 1999 Fox River samples showed primarily fine material, but included a mixture of fines and sand. The material had detectable levels of PCBs, some metals above background levels; semi-volatile compounds were not detected in the material. The 2006 samples, which were collected in the Bay beginning approximately 3 miles out from the Fox River mouth, showed primarily sand, with some mix of fine material; the material had low levels of metals, within background levels, and PCBs were not detected. The 2010 sampling showed results similar to 2006 for the Bay channel samples, but for the Fox River and the first three miles of Bay channel (flux area as described in the previous paragraph) the material was predominantly fines, with some metals above background levels, and with detectable levels of PCBs and polynuclear aromatic (PNA) compounds. All these results support the previously stated conclusions of suitability of the Bay channel shoal material for island construction and of the Fox River shoal material for the Bayport CDF.

5.10 Hazardous and Toxic Wastes: The proposed island reconstruction site has been looked at with respect to the potential for the presence of hazardous and toxic waste (HTW). The project site, formerly uninhabited islands, is now an open-water area. There are no known sources of any HTW in that area. Sediment samples were taken from the site and show no HTW material, nor do sediment samples of the shoal material to be used for island development.

5.11 Project Effects on Water Quality: An evaluation, pursuant to Section 404(b)(1) of the Clean Water Act, has been prepared addressing the effects of the discharge of fill material into waters of the U.S. for the island reconstruction alternative (Attachment 1). The evaluation concludes with the determination that "the proposed action is in compliance with Section 404 of the Clean Water Act." Water quality effects associated with construction and filling of the islands would be localized and of short duration, with periodic repetitions over many years as the islands are constructed and filled. While the reconstruction of the islands would remove an area of lakebed that has been open water since the loss of the original Cat Islands, the islands will protect the inner Bay waters for wetland re-establishment and provide bird and mammal habitat, thus meeting at least two of the AOC use impairments.

5.12 Project activities for island construction and filling would result in minor, temporary elevation of turbidity and an increase in the concentration of suspended solids due to disturbance of sediments existing at the site and from the shoal material being placed into the islands. Disturbed bottom material in the immediate construction site is primarily sand and would resettle quickly since sands have a relatively fast settling time—measured in minutes—which limits turbidity to the immediate area of disturbance. Because the island wave barriers will provide containment on three sides, no special measures are anticipated to control turbidity generated from placement of shoal material within the island perimeters. The sandy nature of the dredged material indicates that silt curtains or other means of sediment containment would not be necessary during hydraulic placement of the dredged material.

Temporary turbidity generated by project activities would be insignificant in comparison to turbidity generated by wave action in open areas during storm events.

5.13 Construction equipment has the potential for introducing petrochemical products into the water in localized areas. Contractor(s) would be required to comply with U.S. Coast Guard and Wisconsin Department of Transportation regulations as applicable to marine work, construction activities, and truck transport. Spill kits to contain and/or neutralize accidental minor discharges would be required on-site. These safeguards would minimize the chance of significant impacts.

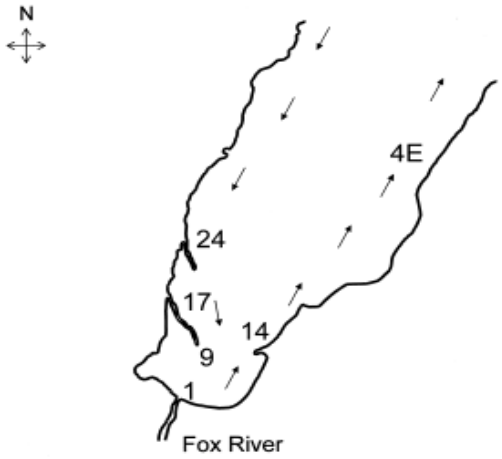
5.14 The presence of reconstructed islands in the western part of the Bay would not be expected to have a significant adverse effect on water quality in Green Bay. Water circulation through the lower Green Bay generally is southwest along the west side of the Bay and northeast along the east side of the Bay. The northeasterly circulation in the east side of the Bay, including the Fox River outflow, would move material away from the project site in the west side of the Bay.

5.15 The presence of the islands may have a positive effect on water quality in the area behind the islands. Total suspended solids (TSS) were modeled for the proposed Cat Island restoration project (Baird, W.F. and Associates, Ltd 2005). The modeling results suggested that the islands "can tremendously reduce TSS level associated with wave and current induced sediment re-suspension in the lee of the islands during windstorms," which will result in water clarity improvements that will promote the re-establishment of aquatic vegetation.

Aquatic Habitat and Fisheries

5.16 Populations of benthic (bottom dwelling) organisms in the sandy, wave washed lakebed typically contain sparse populations of midges and oligochaetes (Exhibit 1, below). Where the lakebed contains hard structure or wetland vegetation, the number of taxa increase to include amphipods, crayfish, native and invasive mussels, and if the water quality is suitable, mayflies and other intolerant invertebrate species. Surrounding areas that have a siltier, more organic sediment, may offer better benthic invertebrate habitat for burrowers and sprawlers, though the habitat may be degraded from contaminants.

Exhibit 1. Recent Invertebrate Data for Lower Green Bay



Source: This Exhibit is from "Refugia and Local Controls: Benthic Invertebrate Dynamics in Lower Green Bay, Lake Michigan following Zebra Mussel Invasion." Tara Reed, Sarah J. Wielgus, Alyssa K. Barnes, Jeremiah J. Schiefelbein, and Amy L. Fettes. Journal of Great Lakes Research 30(3):390-396. International Association for Great Lakes Research. 2004.

FIG. 1. Map of sampling sites on lower Green Bay.

TABLE 1. Environmental variables and non-zebra mussel invertebrate densities and taxa richness for several sites in Green Bay.

Site	Dissolved Oxygen (mg/L)	Secchi (m)	Turbidity (NTU)	Substrate	Density of non zebra mussel invertebrate per cm³ druse	Density of non zebra mussel invertebrates per 1 cm³ sediment	Taxa richness druse samples	Taxa richness sediment samples
West shore								
24 (1 m)	11.5	2	2.23	Sand	2.333	0.009	10	2
24 (3 m)	10.7	2	2.23	Sand	1.543	0.261	11	7
17 (1 m)	10.6	2	1.86	Sand	1.923	0.034	9	2
17 (3 m)	9.2	2	1.86	Sand	0.433	0.010	8	3
Fox inlet								
1 (1 m)	12.3	0.5	15.1	Silt	0.227	0.085	4	3
9 (1 m)	10.2	0.5	9.75	Silt	3.137	0.003	4	1
East shore								
14 (3 m)	10.2	0.5	14.53	Silt	2.171	0.044	11	3
4E (1 m)	8.8	3	0.97	Silt	0.124	0.025	8	3
4E (3 m)	11.2	3	0.97	Silt	0.509	0.018	7	3

TABLE 3. Percent non-zebra mussel invertebrate taxa composition of sediment core samples taken from Green Bay.

Site	Oligochaete	Chironomid	Amphipod	Nematode	Leech	Hydra	Isopod
West shore							
24 (1 m)	50.0	50.0	0.0	0.0	0.0	0.0	0.0
24 (3 m)	52.8	4.5	10.1	1.7	1.1	28.7	1.1
17 (1 m)	47.8	52.2	0.0	0.0	0.0	0.0	0.0
17 (3 m)	71.4	14.3	0.0	14.3	0.0	0.0	0.0
Fox inlet							
1 (1 m)	96.6	1.7	1.7	0.0	0.0	0.0	0.0
9 (1 m)	0.0	100	0.0	0.0	0.0	0.0	0.0
East shore							
14 (3 m)	80.0	10.0	10.0	0.0	0.0	0.0	0.0
4E (1 m)	41.1	47.1	11.8	0.0	0.0	0.0	0.0
4E (3 m)	5.0	90.0	5.0	0.0	0.0	0.0	0.0

5.17 Fish species common in Lake Michigan and its tributaries include smallmouth bass, yellow perch, walleye, lake whitefish, lake sturgeon, lake trout, and introduced brown trout and Pacific salmon. The Fox River and southern Green Bay support spawning populations of gizzard shad, rainbow smelt, alewife, lake herring, freshwater drum, rainbow trout, white bass, northern pike, carp, sucker, channel catfish, the aforementioned yellow perch, lake sturgeon, brown trout, lake whitefish, lake trout, Pacific salmon, and walleye (Goodyear, et. al. 1982). Walleye find good spawning habitat in the gravel beds along the east shore of Green Bay, which is formed by a high rocky escarpment. The Wisconsin Department of Natural Resources (WDNR) stocks select game fish in support of local sport fisheries.

5.18 According to the WDNR (electronic mail, September 1, 2010), the primary predator fish species in lower Green Bay (the area south of Long Tail Point and Point au Sable) are walleye, smallmouth bass, and northern pike. These species feed on a variety of fish, such as gizzard shad, alewife, young white suckers and carp, and seasonally, smelt.

5.19 Yellow perch is the major pan fish people pursue in lower Green Bay. A variety of species use the Dead Horse Bay (north of the Cat Island site) as a nursery area. With wetlands re-established the lower Bay has the potential for species such as northern pike, yellow perch, musky, bluegill, black crappie, and large-mouth bass, which currently are limited by a lack of aquatic vegetation. The re-establishment of submerged wetlands would be expected to result in suitable nursery habitat for musky, northern pike and yellow perch.

5.20 The Wisconsin Department of Natural Resources staff conducted fisheries trawl sampling in Green Bay since 1980. The trawls were conducted in early to mid August of each year targeting young of the year (YOY) yellow perch. The catch per unit effort (CPE) consolidated trawl data for the years 2008-2010 are displayed in Table 2 for the sampling locations off Long Tail Point, the data site closest to the proposed island reconstruction. The percentage of each fish species of the total catch by year is also identified in the table. Four fish species, yellow perch, white perch, gizzard shad, and trout perch, comprised 68%-95% of the fish collected in 2008-2010. It is important to recognized that other fish species would be in the area in different seasons of the year (Personal communications, WNDR, Tammie Paoli, Senior Fisheries Biologist).

5.21 Fish and aquatic mammals would tend to avoid the work area during construction and filling of the islands, finding new foraging and resting habitats in the general project vicinity. Fish and other mobile organisms are expected to return between island filling cycles and after construction and operation activities cease. Some aquatic plant growth may occur within the island perimeter between dredging/island filling cycles and would be subject to disruption by the next filling cycle. No significant loss of productivity or decrease in species diversity would be expected from the proposed project. Species present are considered prolific enough to re-colonize the area soon after construction activities are complete.

Table 2. WDNR Trawl Data for Long Tail Point 2008 through 2010.

Fish Species	Annual Index Trawl CPE's					
	Long Tail Point					
	2008	% of Total	2009	% of Total	2010	% of Total
PERCH (YELLOW)*		10%		22%		33%
YOY	70		926		1932	
ADULT	26		31		22	
PERCH (WHITE)*		20%		2%		8%
YOY	120		65		497	
ADULT	72		31		0	
SMELT		0%		0%		0%
YOY	0		0		0	
ADULT	0		2		0	
ALEWIFE		0%		1%		0%
YOY	0		2		0	
ADULT	0		31		0	
CARP		2%		1%		0%
YOY	0		0		0	
ADULT	22		22		2	
WALLEYE		7%		0%		0%
YOY	67		10		2	
ADULT	2		5		0	
CARP SUCKER	0	0%	0	0%	0	0%
CHANNEL CATFISH	0	0%	0	0%	0	0%
COMMON SUCKER	0	0%	34	1%	10	0%
E. SHINER	0	0%	0	0%	2	0%
GIZZARD SHAD*	158	17%	1697	39%	718	12%
NORTHERN PIKE	0	0%	2	0%	2	0%
OTHER	0	0%	0	0%	0	0%
SAUGER	0	0%	0	0%	0	0%
SHEEPSHEAD	50	5%	691	16%	46	1%
SPOTTAIL SHINER	0	0%	0	0%	14	0%
TROUT PERCH*	194	21%	749	17%	2465	42%
WHITE BASS	158	17%	0	0%		3%
YOY					163	
ADULT					0	
ROUND GOBY	2	0%	14	0%	0	0%
Total	941	100%	4312	100%	5875	100%

* = Species with the highest % of the total catch

5.22 The open waters behind the islands (to the south) would provide protected shallow water areas for the natural development of a wetland habitat (up to approximately 1225 acres of emergent and submergent wetlands) that would benefit the aquatic ecosystem of Green Bay providing spawning and nursery habitat for a variety of fish species, resting, nesting and feeding habitat for birds and some mammal species. The stone dikes around the front and sides of the islands would restore prime habitat for fish, benthos and birds, which would be expected to colonize the site from adjacent habitats. Significant populations of spawning carp are found in the area in May and June. However, after the carp spawn and return to deeper waters, the submergent vegetation would be expected to flourish in the protected waters during the remainder of the growing season.

Exotic/Nuisance Species

5.23 A variety of invasive exotic species have entered the Great Lakes. According to the USFWS (Planning Aid Letter, Attachment 2), "A number of invasive exotic plant species have become well established in the Green Bay area, in some cases displacing native plant species and resulting in diminished wildlife habitat values. Some of the more aggressive invasives include giant reed grass [Phragmites], reed canary grass, purple loosestrife, Eurasian milfoil, and glossy buckthorn." They also note that rocky shorelines provide favorable habitat for the invasive exotic zebra and quagga mussels, and the round goby, all of which are present in Green Bay.

5.24 Exotic species are likely to be present in the new habitat areas that will result from the dredged material placement island reconstruction project. Zebra mussel, quagga mussel, and round goby may use the stone wave barrier and side dikes of the islands for habitat. Similar Corps stone structures on the western side of Lake Michigan have not shown any readily visible signs of significant zebra mussels or green algae infestation. A similar in-water dredged material facility (Renard Island) already exists in Green Bay as well, and again, staff have not noted any significant presence on the stone armored dikes. The Corps floating plant has undertaken work on stone breakwater structures on the western side of Lake Michigan. Staff observations reflect a minimal presence of invasives on the individual armor stones that have been removed from the bottom and replaced. To the extent exotic species colonize the rock, they are not likely to result in significant negative impacts to the Green Bay ecosystem.

5.25 Some shoreline areas in Green Bay have developed extensive stands of Phragmites (an invasive grass) but with the higher water levels in the last two years, the inundated stands have receded. The inundated shoreline lakebed should establish emergent wetlands consisting of bulrush and cattails. The presence of submergent wetlands in the protected Bay area would provide significant and substantial fishery, wildlife and water quality benefits. To the degree that exotics make up the plant species assemblage in the shoreline areas, these benefits would be diminished.

5.26 The double-crested cormorant is the only cormorant species widely distributed in the interior of the continent. Once on the verge of extinction in the Great Lakes region, the population has rebounded from a few nests in 1977 to over 30,000 in 2001 in response to

environmental changes in chemical and biological conditions, human disturbances, and changes in fish population food base. The increased number of predatory cormorants has raised concerns with impacts to the forage base and young game fish, other colonial water birds and island resources. The population appears to have leveled off but is of concern to commercial and recreational fishermen and the commercial aquaculture interests (such as trout farming, minnow production facilities, etc.). Cormorants have targeted captive fish stocks and occasionally decimated the crop.

5.27 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.

5.28 Habitat benefits from the island construction can be enhanced by management actions during and post construction. While the Corps of Engineers has limited options for habitat management (largely manipulation of dredged material during island filling), there are opportunities for conservation groups or local agencies to help limit and or reduce the presence of exotic species. The Corps will help with this effort to the extent possible.

Terrestrial Habitat, Wetlands, Birds and Wildlife

5.29 Vegetation in low areas along the lake shore are influenced by erosion and lake level fluctuations as described in Exhibit 2, below, which also lists species present in the Point au Sable wetland across the Bay from Long Tail Point (about 5 miles east-northeast from the proposed Cat Islands). Vegetation along the shores Green Bay in the project vicinity is typical of a flood-plain forest, interrupted by grasslands, rivers, and wetlands. Common tree species include silver maple, box elder, eastern cottonwood, willow, tag alder, and green ash. Typical mammals include various small rodents, fox, eastern cottontail rabbit, raccoon, and white-tailed deer. Birds are likely to be the most common class of animals in the vicinity of the proposed project. Common avian species are shorebirds, gulls, terns, various passerine birds, raptors, and waterfowl.

5.30 The historic Cat Islands provided shoreline/upland habitat with shrubs and large cottonwood trees. Large nesting rookeries of great blue herons, black-crowned night herons, snowy egrets, and cattle egrets were found on the trees (personal communication, USFWS, October 6, 1999). Near the shore were colonial nesting gulls and terns. Over time, as the islands were destroyed by erosion and inundation, the habitat changed. An island remnant (at the location of the east island) with mostly dead trees was observed in August 1996 by Corps of Engineers personnel who reported the following birds: double-crested cormorant, American white pelican, herring gull, ring-billed gull, and black-crowned night heron. None of the dead trees are now standing (U.S. Fish and Wildlife Service) and of the tree nesters only the cormorants remain (nesting on the ground).

Exhibit 2. Plant Community Changes and List of Plants at Point au Sauble, Green Bay.

Changes in plant communities of Great Lakes wetlands are driven by fluctuations in water levels. Daily, seasonal, and annual lake-level changes are important, but decadal changes play the major role in shaping Great Lakes wetland plant communities (Wilcox 2004). Wetland plant communities are not only adapted to these fluctuations, but this natural cycle is beneficial to plant biodiversity and essential to maintaining wetland condition (Keddy and Reznicek 1986).

As water level increases, emergent communities are reduced in area or eliminated and the open-water complex develops (Wilcox 2004). Deeper water is often associated with a decrease in emergent cover, as plants intolerant of flooding are killed by insufficient root aeration. For example, Gathman *et al.* (2005) documented the quick response of wetland plant species to a three-year (1996-1998) water level change in coastal Lake Huron wetlands. In their study, stem density, per-plot species richness, and Shannon diversity in the wet meadow and transition zones decreased as water depth increased from 1996 to 1997. An increase in these same measures was noted in 1998 with the decrease in water level (Gathman *et al.* 2005).

Periods of extremely low water expose unvegetated lagoon bottoms as mud flats, providing a substrate for new plant colonization. Annuals and other opportunistic species such as *Schoenoplectus tabernamontani* rapidly increase in abundance, and are typically replaced by cattail as the plant community matures (Harris *et al.* 1977, Bosley 1978).

TABLE 3. Species present at Point au Sauble wetland in 2001 and 2004 and their C-values (Bernthal 2003).

Scientific name	C-value	Cover in 2001	Cover in 2004
Bidens cernua L.	4	23.9	—
Calamagrostis canadensis (Michx.) Beauv.	5	—	1.4
Carex bebbii Olney ex Fern.	4	—	< 0.1
Carex hystericina Muhl. ex Willd.	3	—	< 0.1
Carex lacustris Willd.	6	—	< 0.1
Cirsium arvense (L.) Scop.	*	—	0.3
Calystegia sepium ssp. *sepium* (L.) R. Br	2	—	< 0.1
Cynoglossum officinale L.	*	—	3.4
Eleocharis erythropoda Steud.	3	0.2	< 0.1
Epilobium ciliatum Raf.	3	0.2	—
Eupatorium perfoliatum L.	6	< 0.1	< 0.1
Impatiens capensis Meerb.	2	13.7	1.4
Juncus balticus Willd.	5	—	< 0.1
Leersia oryzoides (L.) Sw.	3	0.3	0.3
Lemna minor L.	4	4.8	—
Lycopus americanus Muhl. ex W. Bart	4	—	< 0.1
Lysimachia thyrsiflora L.	7	—	4.8
Lythrum salicaria L.	*	< 0.1	—
Phalaris arundinacea L.	*	0.3	1.4
Phragmites australis (Cav.) Trin. ex Steud.	*	0.3	35.5
Ranunculus sp.		1.6	—
Ricciocarpus natans L.		—	16.0
Sagittaria latifolia Willd.	3	24.5	4.6
Schoenoplectus fluviatilis (Torr.) M.T. Strong	6	—	1.4
Schoenoplectus tabernaemontani (K.C. Gmel.) Palla	4	10.2	1.7
Solanum dulcamara L.	*	—	< 0.1
Sparganium eurycarpum Engelm. ex Gray	5	—	< 0.1
Taraxacum officinale G.H. Weber ex Wiggers	*	—	< 0.1
Typha latifolia L.	1	0.8	—
Invasive *Typha*	*	2.7	45.7
Urtica dioica L.	1	—	3.4
Verbena hastata L.	3	—	1.4
Veronica anagallis-aquatica L.	4	—	< 0.1

* indicates an introduced species that was not assigned a C-value; species identified at genus level were not assigned any C-values.

Source: This Exhibit is from "Rapid Invasion of a Great Lakes Coastal Wetland by Non-native Phragmites australis and Typha." Mirela G. Tulbure, Carol A. Johnston, and Donald L. Auger. Journal of Great Lakes Research 33(Special Issue 3):269-279. International Association for Great Lakes Research. 2007.

5.31 Project effects on terrestrial habitat are expected to be minimal since the island remnant currently offers little attractive habitat. 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.

5.32 The former Cat Island chain blocked wave energy and protected an estuarine wetland in the western half of the head of Green Bay. Erosion, sedimentation, and turbidity have reduced the estuarine wetland to a fringe remnant along the Bay shore and largely prevented their re-expansion into their former area. The proposed islands would help protect this fringe from further erosion by blocking wave energy. Over time most of the shallow open water area in the head of the Bay would be located behind the constructed islands and is expected to develop into emergent or submergent wetlands as previously existed.

5.33 According to the Wisconsin Department of Natural Resources, coastal wetlands assessment (WDNR, 2002), "Peats Lake & Duck Creek (also called Atkinson Marsh Complex) is located near the southern end of Green Bay, west of the mouth of the Fox River and on either side of the mouth of Duck Creek (the Cat Island area). These wetlands are situated in shallow water in lower Green Bay and are characterized by stands of emergent aquatic macrophytes. The exotic common reed grass (Phragmites) has formed large monotypic clones here and dominates much of the area. Condition of this marsh is variable and many portions of it have been extensively diked and filled, degrading the site and reducing its acreage and functions. … Over 250 bird species have been recorded here, and this marsh continues to receive heavy use as a resting and staging area during migration. However, the simplification of the vegetative composition of the marsh has reduced the habitat diversity available thus reducing the numbers of birds of the using the area for breeding and foraging."

5.34 An access road would be constructed from the end of Bayshore Drive, to the shoreline to connect with the construction causeway, which extends across the water to the wave barrier. This road would extend approximately 1870 linear feet through a vegetated area below the ordinary high water mark (that includes wetlands and an existing raised footpath/road) . The access road footprint would widen and extend the existing footpath/road, covering approximately 3 acres (about 3.4 acres real estate right of way, but approximately 2.6 acres for actual road footprint), but this is a small amount compared to the vast area of wetland/aquatic habitat that will be created in the southern end of the Bay as a result of the island construction (up to approximately 1225 acres). The area that would be protected by the Cat Islands and the causeway is Peter's Marsh. Vegetative changes in the Peter's Marsh area over the past 50 years are shown in Figure 8.

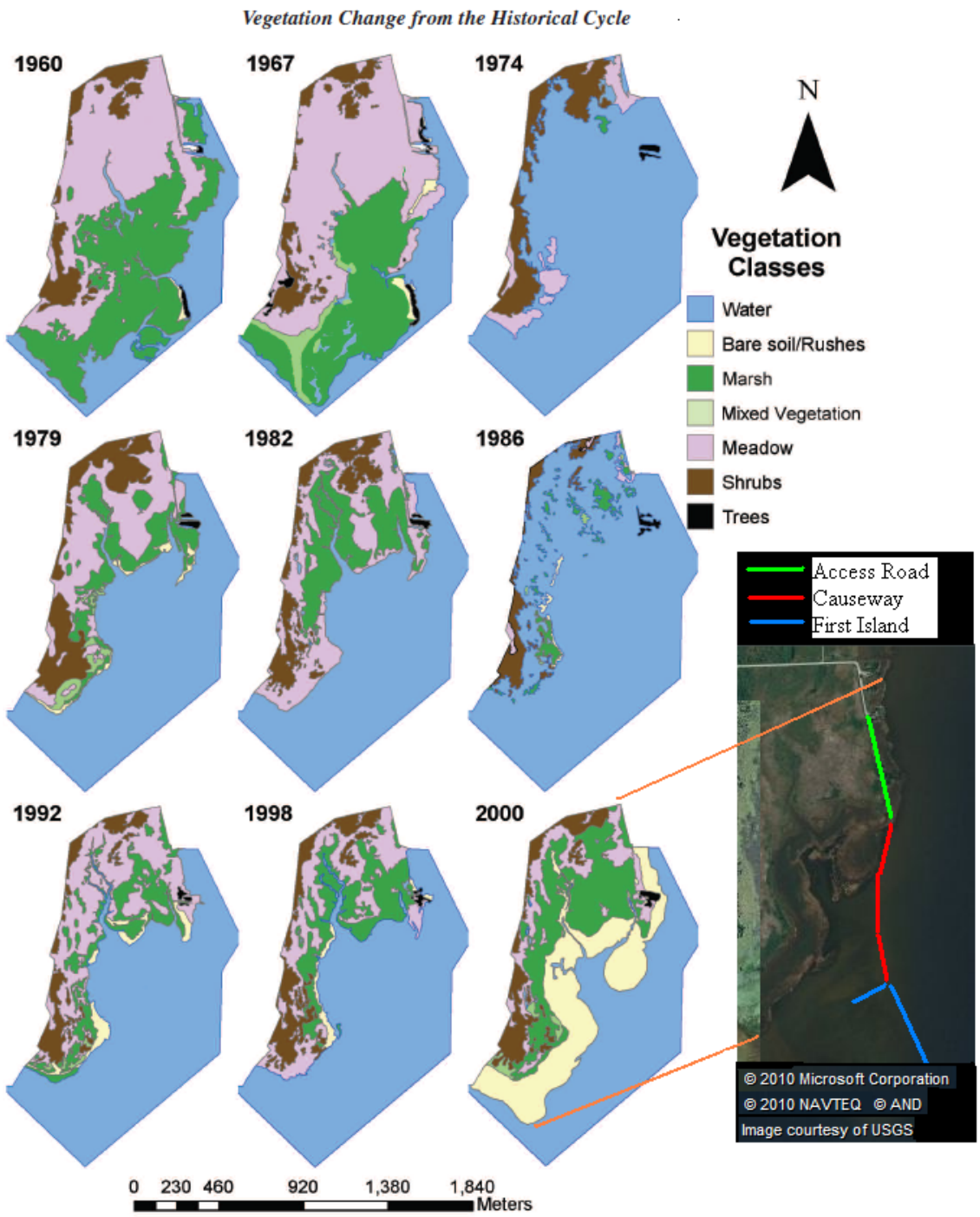


FIG. 4. Image interpretation maps showing changes in habitat areas between 1960 and 2000 in Peter's Marsh. Similar patterns occurred in Atkinson and Long Tail marshes.

Source: This figure (except for the inset aerial depicting the proposed construction access route) is from "Vegetation Change in Great Lakes Coastal Wetlands: Deviation from the Historical Cycle," Christin B. Frieswyk and Joy B. Zedler. Journal of Great Lakes Research 33:366-380. International Association for Great Lakes Research. 2007.

Figure 8. Vegetative Changes in the Peter's Marsh Area and Layout of Construction Access.

5.35 Adverse effects associated with construction of the access road would largely be minor and short-term, including localized degradation of the aesthetic quality in the proposed work area due to increased turbidity and noise; localized and temporary air and water quality degradation; smothering of benthos (bottom-dwelling organisms); and displacement of fish during construction activities. Birds in the immediate project vicinity are expected to temporarily avoid project activities. Species accustomed to humans, such as the ring-billed gull, may remain nearby during construction; others are expected to forage and loaf elsewhere. Since the east island site would encompass the remnant island, construction of the east island would be coordinated with the USFWS, as necessary, to ensure avoidance of significant impacts on any migratory birds. The access road will provide longer term benefits of protecting the habitat at Peter's Marsh. The adverse project effects are minor and are outweighed by the benefits of the proposed action. No significant adverse secondary effects are expected to occur. Nor are any significant cumulative or long-term adverse environmental impacts expected to result from constructing the proposed islands. The only identified adverse impact that is secondary and/ or long term is that predatory mammals, such as raccoon and fox, may access the islands and prey upon birds using the islands. If this becomes a problem, some control measures such as fencing and/or predator removal could be implemented by local agencies or groups.

5.36 The constructed islands would restore colonial nesting bird habitat lost when the islands finally succumbed to erosive forces. Collectively all three islands would provide approximately 300 acres of upland habitat. Initially the islands would be occupied by such colonial ground nesting birds as herring gulls, ring-billed gulls, common terns, Caspian Terns and Forster's terns. Islands, because they are fairly well isolated from terrestrial predators, provide excellent habitat for such birds. Such protected island habitat is a limiting factor for colonial nesting birds in Green Bay and the Great Lakes (Scharf, 1978). The Renard Island confined disposal facility which is a man-made island nearby, has its perimeter covered by nesting ring-billed gulls, herring gulls, common terns, Caspian terns and Forster's terns. There were an estimated 10,000 nests of ring-billed gulls alone (F&WS). The new island would initially be most attractive to the gulls and terns. The Wisconsin DNR has been interested in promoting habitat for the common and Caspian terns as they are on Wisconsin's endangered species list.

5.37 Over time, as vegetation is allowed to develop naturally, habitat conducive to the colonial tree nesting birds (herons, egrets, and cormorants) would return. However, because of annual disturbance from island filling operations, active management to establish a desired vegetation community would not be effective until the island filling is complete. This gives time for interested parties, such as Federal or State agencies, representatives of Brown County, and/or local natural resource interest groups, to develop specific management plans for vegetation and wildlife communities of the created islands. Upon completion of the islands and their being turned over to the non-Federal project sponsor (Brown County), interested parties could work with the County to develop specific habitats on the islands, including management of invasive species. Invasive species management during island filling could be achieved through manipulation of the fill material during each dredging/filling cycle. Even without specific habitat management, the islands likely would be used by various

colonial nesters within the area. Species covered by existing Wisconsin DNR management plans (such as the double crested cormorant) could be handled under those plans. In addition, restored aquatic macrophyte beds, which existed in this area before the former Cat Island chain was destroyed, would provide additional wildlife benefits.

5.38 The constructed dredged material islands would be expected to provide a more diverse habitat for birds and other wildlife than the former islands. The stone dikes would harbor benthic organisms and fish as an additional food source for water birds. Likewise, the proposed lagoon areas to be created along the protected back sides of the islands 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.

Federally Listed Species

5.39 Only the dwarf lake iris is Federally listed ("threatened") in Brown County under the Endangered Species Act. The dwarf lake iris is found in partially shaded sandy-gravelly soils on lakeshores. This type of habitat does not exist in the island reconstruction site, and likely would not exist during the island construction, but may occur after the islands are completed, if vegetational succession is allowed to continue. This effect is not certain, is well outside the scope of review for potential effects, and if it ever occurs, would be considered beneficial. Therefore, the Corps of Engineers, Detroit District, has determined that the project would have no effect on Federally listed species and/or critical habitat.

Floodplains

5.40 The project is within the 100-year floodplain (which includes all lake surface areas). The proposed action complies with the Federal Executive Order on Flood Plain Management (E.O. 11988) because there is no practicable alternative to construction of the islands within the floodplain, the islands would not promote floodplain development, and because the islands are in the open waters of Green Bay, they would not result in increased flood elevations.

Air Quality

5.41 The proposed Cat Island reconstruction was reviewed pursuant to the Clean Air Act. Although some criteria pollutants or their precursors would be emitted by use of construction equipment, the project area is in attainment of air quality standards per the Act (40 CFR Part 81, Subpart C); therefore a specific determination of conformity with air quality standards is not required. All equipment would be required to meet emission standards and emissions are expected to be minor. Construction of the proposed project would be temporary and short term, repeating each dredging cycle for an anticipated 20 year project life. Once constructed, there would be no emissions, with exception of periodic, maintenance activities which would be considered exempt because it would result in no or de minimis (Latin for 'of minimal importance') emissions per 40 CFR 93.153(c)(2).

Recreation, Noise and Aesthetics

5.42 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. Before the high waters in the 1970's eliminated the submergent wetlands, the area received heavy waterfowl hunting pressure for diving ducks from layout hunters in the submerged wetlands and for puddle ducks in the emergent wetland areas along the shoreline. There is limited walleye trolling in the spring, and some ice fisherman use the Duck Creek estuary area (the Cat Island area) to fish for panfish and pike . Historically, when this was deep water marsh, it was important for spawning and nursery habitat. This area is listed as one of the few documented spawning locations of muskellunge in Green Bay before they were extirpated in the 1930s. Restoration of the protected submergent wetland complex is one of the goals of the island reconstruction (WDNR personal communications, 2010).

5.43 Adverse recreational effects due to project construction include localized disruption of fishing and localized aesthetic impacts from construction equipment and barges operating in the project vicinity. These impacts are expected to be minor because of the immense size of Green Bay, the small area affected by the project, and the general remoteness of the project site from areas of heavy population.

5.44 The island reconstruction alternative would provide improved recreation and aesthetics through the habitat improvements, which would benefit fishing, bird watching, and other fish and wildlife related recreational activities. Direct recreational use of the islands is not expected. However, 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.

5.45 Noise generating activities during the proposed island reconstruction project will primarily be caused by construction equipment. Operation of construction equipment would result in periodic, but temporary and minor noise emissions. These noise effects are not expected to be significant because of the routine nature of the construction equipment to be utilized. Additionally, the site is not located in the immediate vicinity of a commercial or residential area. There are some houses along Bayshore Drive, which will have increased noise of trucks passing through during construction of the island frames, but houses along the road would already be accustomed to traffic noise. The increased frequency due to project construction would be temporary.

Cultural Resources

5.46 In compliance with Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593, Protection and Enhancement of the Cultural Environment, the National Register of Historic Places and the State Historic Preservation Office have been consulted. No properties that are listed on, or eligible for listing on, the National Register have been identified that would be affected by the proposed project. Also, according to

available shipwreck maps, no shipwrecks are known to exist in the project area. Therefore, no effects on cultural resources are expected.

5.47 Impacts upon any unidentified cultural resources that may exist in the project area would be minimized. Contract specifications will designate that, if during construction the contractor observes unusual items that might have historical, archeological, or cultural value, the contractor shall protect those items and immediately report the find to the contracting officer so that the State Historic Preservation Office may be notified.

Traffic, Safety and Navigation

5.48 Construction equipment operators would be required to obey all applicable Federal, State of Wisconsin, and local driving laws, construction ordinances, and city-imposed hauling/unloading time restrictions and obtain the appropriate permit(s). Therefore, trucking operations, would not be expected to significantly interfere with residential areas, local traffic, or emergency vehicles.

5.49 The project area is a water of the United States subject to navigational servitude (Section 10 of the Rivers and Harbors Act of 1899). The proposed island construction would not result in significant impacts on navigation. The project site formerly had uplands until the natural islands were lost to erosion. Navigational right-of-way would be maintained in the Federal channel. The dredging contractor would be required to comply with U.S. Coast Guard regulations applicable to marine work. Disruptions to traffic in the Federal channel are not anticipated during island construction or filling because the east island is set back approximately 75 feet from the navigation channel; therefore, barges offloading dredged material to fill the islands would be moored off-channel.

5.50 The area where the islands are to be constructed is shallow with water depths varying from 0-7 feet. Vessels using the area operate at a slow, no wake speed because of the sand bars and snags. Recreational vessels launch from the main navigation channel, Duck Creek and Long Tail Point. The NOAA navigation chart depicts water depths within the area from 2 to 4 feet with numerous wetland symbols and bars. Operation of deeper draft vessels in the area or at a higher speed would not be considered prudent. The area is suited for smaller fishing vessels and canoes or rowboats. With the re-establishment of the wetlands, vessel use may increase as the opportunity for fishing, hunting and bird watching are restored to previous levels.

Coastal Zone Management

5.51 The proposed project is within the coastal zone (as defined by the Wisconsin Coastal Management Program), but would have no adverse effects on the waters of Green Bay because the project consists of restoration of former habitat using clean stone and clean shoal material. Therefore, since the project would have no adverse effect on the coastal zone, it would be “consistent to the maximum extent practicable” (as defined in 16 U.S.C. 1456, Coastal Zone Management Act) with the Wisconsin Coastal Management Program.

Cumulative Impacts

5.52 Cumulative impacts are those impacts "on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR ~ 1508.7).

5.53 A superfund cleanup of PCB contaminated material is taking place at the Fox River and Green Bay Harbor under Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The Fox River has had a large number of paper mills located along the river. Some of the mills operated de-inking facilities in connection with the recycling of paper and others manufactured carbonless copy paper. In both the de-inking operations and the manufacturing of carbonless copy paper, these mills handled polychlorinated byphenyls (PCBs), which were used in the emulsion that coated carbonless copy paper. In the de-inking process and in the manufacturing process, PCBs were released from the mills to the river directly or after passing through the water treatment works. PCBs adhere to sediment and have caused extensive contamination in the river. The remedial actions includes dredging at several locations along the Fox River, the use of natural recovery processes in Green Bay, and a long term monitoring program to determine the effectiveness of the remedy.

5.54 The remediation dredging that is taking place is generally located outside the Federal navigation channel. The material is being removed based on an action level of 1 ppm for this cleanup effort. Any sediment that has a concentration of over 1 ppm of PCBs will be removed. The goal of the project is to reach a surface weighted average of about 0.25 ppm after dredging is completed. The surface weighted averages vary per operation unit, however, are all less than 1.0 ppm. It is anticipated that the final surface weighted average will be well below the 1.0 PCB action level. Consequently, once the remediation dredging is complete in the Fox River, the material in the River will have greatly reduced levels of PCBs. It is anticipated that as the remediation dredging takes place, the material that is depositing into the Federal navigation channel will be much cleaner and future sampling in the Federal navigation channel will likely show that PCBs are non-detectable. Therefore, the cumulative impacts of remediation will be positive for future maintenance dredging activities.

5.55 Dredged material island reconstruction and the resultant emergent and submergent wetlands re-establishment at the site of the former Cat Island chain would not result in significant cumulative or long-term adverse environmental impacts. Reconstruction of the former islands and associated habitat development in the shallow waters at the head of the Bay would assist in the improvement of specific uses identified as impaired in the Remedial Action Plan for the Green Bay Area of Concern: 1. Degradation of fish and wildlife populations; 2. Degradation of benthos; 3. Degradation of phytoplankton and zooplankton populations; and 4. Loss of fish and wildlife habitats.

5.56 There are no new adverse cumulative impacts. Dredging would continue and harbor usage would continue. Placement of the dredged material has been and remains a concern. With this action, however, dredged material will be used beneficially to restore the Cat Island chain which previously functioned as a protective wetland barrier and bird habitat. The cumulative restoration impacts are considered positive.

5.57 Future possible projects, such as making the Cat Island area into a recreational park or other such usage would require coordination by the County. However, no such plans are currently envisioned.

Other Resources

5.58 The project would not have a significant adverse impact on community cohesion, desirable community growth, tax revenues, property values, public facilities, public services, regional growth, employment or the labor force, business and industrial activity, farmland, or man-made resources, nor would the project cause displacement of people.

6.O COORDINATION OF THE PROPOSED ACTION

6.1 The U.S. Army Corps of Engineers (USACE), Detroit District, coordinated an ecosystem restoration project proposal for the Cat Islands in April 1998 with the U.S. Fish and Wildlife Service (USFWS), the U.S. Environmental Protection Agency (USEPA), the Wisconsin Department of Natural Resources (WDNR), the State Historical Society of Wisconsin (SHSW), and Native American Indian interests (Bureau of Indian Affairs and various Native American Indian tribes and groups).

6.2 A Draft Ecosystem Restoration Report and Draft Environmental Assessment for the project was provided for public and agency review in 1999. The USACE Detroit District re-coordinated a revised island design in 2005 and 2008. In 2008, the project was changed from a proposal under the Beneficial Use of Dredged Material authority (Section 204) to an alternative of a Dredged Material Management Plan (DMMP) study under general Operations and Maintenance authority. The USFWS, the WDNR, the Stockbridge-Munsee Tribal Historic Preservation Office, and the SHSW responded to the 2005/2008 coordination. Their responses are included as Attachment 2 of this Environmental Assessment and are discussed below.

U.S. Fish and Wildlife Service Comments:

6.3 The U.S. Fish and Wildlife Service, Green Bay Ecological Services Field Office, prepared a Planning Aid Letter (PAL) addressing the proposed island reconstruction at the site of the former Cat Islands. The PAL includes a brief, informative discussion of the fish and wildlife resources of the project area. It is included as Attachment 2 of this Environmental Assessment for those interested in reading the text. The latter part of the PAL, titled "RESOURCE ISSUES AND RECOMMENDED MITIGATION MEASURES" (page 3) is

quoted in its entirety below as numbered comments with Corps responses following each comment.

6.4 The Planning Aid Letter comments on this topic were oriented to ecosystem restoration under the former Section 204 project authority. The USFWS was contacted and understands the Corps' is no longer pursuing an ecosystem restoration and therefore has limited options for habitat management and monitoring, but that the Corps will do what they can in that regard (phone conversation August 26, 2008).

6.5 Comment 0: "The Service has identified the following issues related to resources of concern to the Service that should be considered in the course of project implementation."

Invasive Species

6.6 Comment 1: "A number of invasive exotic plant species have become well established in the Green Bay area, in some cases displacing native plant species and resulting in diminished wildlife habitat values. Some of the more aggressive invasives include giant reed grass, reed canary grass, purple loosestrife, Eurasian milfoil, and glossy buckthorn. These species and others are likely to invade freshly placed dredge spoils and should be considered during project implementation, to limit their spread and possible adverse effects on wildlife habitats. We recommend formulating plans to minimize establishment of invasive plant species on dredge spoils, and monitoring to ensure success in minimizing their adverse effects."

6.7 Response 1: Habitat management could be achieved during island filling operations by strategic placement of the freshly dredged shoal material. 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.

6.8 Comment 2: "The dikes and rock structures proposed for construction of the exterior of the islands will represent a habitat that is greatly different from adjacent habitats within the project area. These rocky shorelines will provide favorable habitat for the invasive exotic zebra and quagga mussels and round goby. To minimize the numbers of these species in the project area, we recommend that you consider ways to create a more natural shoreline along the edges of the islands as they are completed, such as deposition of dredge spoils along the exterior margins of the islands to create a gently sloping shoreline."

6.9 Response 2: Wave energy against the island perimeters may limit the habitat suitability of the wave barrier, thereby restricting colonization by exotics (as well as by desirable species). In event exotic mussels were to colonize an area of the dikes, or the goby uses a portion of the dikes for nesting and/or foraging, clean sandy dredged material could be placed over the affected area to eliminate the exotic species activity. However, because this area would be subject to wave energy and erosive forces, this may not be feasible. Such a solution would have to be further evaluated if it becomes necessary.

Habitat Management and Monitoring (see Paragraph 6.3.1 above)

6.10 Comment 3: "The islands created as a result of this project will ultimately be colonized by an assortment of plant species and will function as habitat for numerous wildlife species. To achieve the maximum benefit for wildlife, it will be desirable to formulate and implement a vegetation management plan to guide the development of habitat on the newly created islands. This plan should include a vision for desired future habitat conditions, an implementation schedule, and monitoring to document plant succession."

6.11 Response 3: As noted in the Response 1, above, apart from strategic placement of dredged material during filling of the islands, vegetation management and habitat development plans could be pursued by interested parties. It is expected that vegetation would become established naturally.

6.12 Comment 4: "The construction of the wave barrier and island complex is expected to create conditions conducive to re-establishment of aquatic beds in the Peat's Lake area. However, given the profound changes experienced in Green Bay over the past century, and considering the mix of exotic plant and animal species now present, the prospect for recovery to conditions similar to that historically present is uncertain. A plan should also be formulated to monitor the progress of aquatic vegetation recovery in the Peat's Lake area, to include the gathering of baseline data to document the existing conditions in this area, and periodic monitoring to determine success of habitat recovery."

6.13 Response 4: As noted, habitat conditions for the recreation of aquatic beds would be established. It is expected that a Cat Island recovery volunteer group would be formed to watch the recovery and to monitor if necessary. See next comment, below.

6.14 Comment 5: "The Service recommends establishment of an advisory group to guide development of this plan and monitoring efforts, to include the Service, the Wisconsin Department of Natural Resources (DNR), representatives of Brown County, and other local natural resource interest groups."

6.15 Response 5: Concur. This would help ensure local desires are considered in any habitat management efforts.

Colonial Nesting Birds

6.16 Comment 6: "Green Bay is well known for the many species of colonial-nesting birds that breed on islands in and near the project area. Cat Island currently hosts a large nesting colony of double-crested cormorants and American white pelicans, and other colonial nesting species present on islands in this area include herring gull, ring-billed gull, black-crowned night heron, and great egret. Some other species which have nested in the past and could be expected to occur in the future include cattle egret, snowy egret, common tern, Forster's tern, and Caspian tern.

6.17 “Construction activities occurring during the nesting season have the potential for disturbing nesting birds on Cat Island, which could lead to the death of eggs and/or chicks. In addition, the islands created by this project are likely to become suitable habitat, and will probably be utilized for nesting when they become available. Under the Migratory Bird Treaty Act of 1918, as amended, it is unlawful to take, capture, kill, or possess migratory birds, their nests, eggs, and young. To avoid take of birds, nests or eggs, for those project activities that may occur within areas used for nesting, there may be a need for timing restrictions to avoid disturbance during the nesting period. We recommend that project activities be designed to avoid adverse effects to nesting birds during this period, which is approximately late April through July. Dependent upon where and when nesting birds are present in any given year, the dates presented above may need to be extended, or may not be necessary in some years.”

6.18 Response 6: Dredging operations can be scheduled to avoid island filling during migratory bird nesting. The initial island construction (wave barrier, side dikes, and first dredged material placement) should not be affected since nesting would not occur at the site until a nesting substrate is established.

6.19 Comment 7: “The access road which will be created as part of this project will also allow for potential access to the islands by various mammalian predators that could reach them from the mainland. Colonial nesting bird species choose island nesting sites to avoid predators, and predator access could compromise their value as nesting areas. We recommend you consider how to restrict predator access to the islands while they remain connected to the mainland.”

6.20 Response 7: Fencing and a gate will be considered if this becomes a problem; however, it is likely that additional management for predators may be needed, such as trapping. This would involve the local environmental advisory group(s).

6.21 Comment 8: “In addition to predators, the construction access road could also facilitate human access to these sites, which could have adverse effects on colonial nesting birds. The islands and associated fish and wildlife habitats may eventually become a desirable destination for fisherman, birders and other nature enthusiasts. Allowing human access may be appropriate at some future date, provided it is controlled to avoid adverse impacts to colonial nesting birds and other wildlife.”

6.22 Response 8: Posting the site with signs and other controls could be investigated should this become a problem.

6.23 Comment 9: “The presence of nesting colonies of some bird species, particularly cormorants, could also affect the development of plant communities on the islands and should be considered when developing the vegetation management plan referenced above. Consideration should also be given to the potential for adverse effects that cormorants and ring-billed gulls could have on other bird species.”

6.24 Response 9: Strategic placement of dredged material as the islands are filled can help guide habitat development, but management targeted to specific bird species likely would require more intensive efforts, which can best be implemented at the local level by interested parties.

Wisconsin Department of Natural Resources

6.25 A June 30, 2008, letter from the WDNR (Attachment 5) notes the WDNR prefers to comment when more detailed information is available and desires to be involved in the design process. This EA and DMMP report provide detailed information on the proposed action and alternatives for the WDNR and other reviewers. The WDNR also will be involved in the detailed design process for the selected alternative.

Stockbridge-Munsee Tribal Historic Preservation Office

6.26 The Tribal Historic Preservation Office indicated "the proposed ground disturbing activity of this project does not appear to be in a region of archaeological interest to the Stockbridge-Munsee Tribe."

State Historical Society of Wisconsin

6.27 SHPO provided a review of the proposed project and concurred with the Corps finding that no historic properties will be affected.

7.0 CONCLUSIONS

7.1 This Environmental Assessment concludes that the adverse environmental effects of the proposed dredged material management plan project are minor and local in scope; the benefits of the proposed action outweigh the minor effects that would result from the proposed action; and the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment.

7.2 Environmental review of the proposed action indicates that no significant cumulative or long-term adverse environmental effects would be expected to result from a 20 year dredged material management plan utilizing the proposed Cat Island and the expanded Bayport CDF. The adverse project effects include localized and temporary degradation of the aesthetic quality in the proposed work area due to increased turbidity and noise; localized and temporary air and water quality degradation; smothering of benthos (bottom-dwelling organisms); and displacement of fish during construction activities. These effects would repeat during each dredging cycle until an island is completed.

7.3 Construction of the islands would provide beneficial use for clean dredged material and would help restore terrestrial and aquatic habitat diversity that were 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. Additionally, the islands would help block wave energy from further eroding the fringe remnants of the estuarine wetlands once present in the head of Green Bay, and 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.

7.4 The proposed action has been reviewed pursuant to the following Acts and Executive Orders, as amended (Table 3): Bald Eagle Act of 1972; Clean Air Act of 1972; Clean Water Act of 1977; Coastal Zone Management Act of 1973; Endangered Species Act of 1973; Fish and Wildlife Coordination Act of 1958; Migratory Bird Treaty Act of 1918; National Environmental Policy Act of 1969; National Historic Preservation Act of 1966; Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 1971; 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 these Acts and Executive Orders for this phase of the project.

Table 3. List of Relevant Acts and Executive Orders

PUBLIC LAWS, as amended	**US CODE**	**DATE**	**COMPLIANCE**
Bald Eagle Act	16 USC 668	1972	FULL
Clean Air Act	42 USC 7401 et seq.	1972	FULL
Clean Water Act	33 USC 1251 et seq.	1972	PARTIAL*
Coastal Zone Management Act	16 USC 1451 et seq.	1973	FULL
Endangered Species Act	16 USC 1531	1973	FULL
Fish and Wildlife Coordination Act	16 USC 661	1958	FULL
Migratory Bird Treaty Act	16 USC 703	1918	FULL
National Environmental Policy Act	42 USC 4321 et seq.	1969	PARTIAL*
National Historic Preservation Act	16 USC 470	1966	FULL
EXECUTIVE ORDERS			
Executive Order 11593, Protection and Enhancement of the Cultural Environment	36 FR 8921	1971	FULL
Executive Order 11988, Flood Plain Management	42 FR 26951	1977	FULL
Executive Order 11990, Wetland Protection	42 FR 26961	1977	FULL

* Clean Water Act and National Environmental Policy Act are listed as partial because the Section 401 water quality certification will be issued later, and a Finding of No Significant Impact has not yet been signed.

7.5 The proposed island reconstruction site is located within the 100-year flood plain; however, the project would not encourage flood-plain development, nor would it impact flood stages. The proposed action complies with the Federal Executive Order on Flood Plain Management (E.O. 11988) because there is no practicable alternative to construction in the flood plain.

7.6 The project is expected to have minimal effect on the coastal zone of Wisconsin. Development would not occur in areas that 1) pose natural hazards, 2) are sensitive to alteration or disturbance, 3) fulfill recreational or cultural needs, 4) impact natural economic potential, or 5) contain intensive or conflicting resource utilization. The proposed project complies with Wisconsin's Coastal Zone Management Act to the maximum extent possible.

7.7 Pursuant to the Clean Water Act (CWA), a Section 404(b)(1) evaluation of the environmental effects of the discharge of fill material into waters of the U.S. has been prepared (Attachment 3). The Section 404(b)(1) Evaluation concludes with the determination that "the proposed action is in compliance with Section 404 of the Clean Water Act." A Section 401 (CWA) water quality certification, or waiver thereof, would be obtained from the state prior to signing a Finding of No Significant Impact.

7.8 This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508); and the Corps of Engineers, *Policy and Procedure for Implementing NEPA* (33 CFR Part 230).

7.9 This Environmental Assessment concludes that 1) there are no significant cumulative or long-term adverse environmental impacts associated with the proposed island reconstruction project; 2) project benefits outweigh the minor, temporary impacts that may result; and 3) it does not constitute a major Federal action significantly affecting the quality of the human environment.

8.0 PUBLIC REVIEW AND FINAL DETERMINATION

8.1 This Environmental Assessment will be made available to the public for a 30-day review period. Following this period and a review of the comments received, a final determination will be made by the District Engineer regarding the necessity of preparing an Environmental Impact Statement (EIS) for the proposed dredged material management plan for the proposed island reconstruction alternative.

8.2 Based on the conclusions of this Environmental Assessment, it appears that preparation of an EIS will not be required. Therefore, a Preliminary Finding of No Significant Impact (FONSI) is included in the next section of this EA. If the District Engineer determines that an EIS is not necessary, the Preliminary FONSI would be finalized.

9.0 PRELIMINARY FINDING OF NO SIGNIFICANT IMPACT

9.1 In accordance with the National Environmental Policy Act of 1969, the Detroit District U.S. Army Corps of Engineers, has assessed the environmental impacts of reconstructing the Cat Islands and expanding the Bayport CDF for Green Bay, Brown County, Wisconsin under a Dredged Material Management Plan. Three islands would be constructed to provide for dredged material placement capacity of 20 years for clean dredged material from the outer harbor in Green Bay. The islands would help restore aquatic and terrestrial habitat.

9.2 An Environmental Assessment (EA) for the proposed island reconstruction and Bayport expansion has been completed. The EA indicates that adverse effects of these actions would be minor and short-term, including localized noise and air emissions from construction equipment, and at the island site, localized turbidity; smothering of benthos; and displacement of fish during construction activities. These effects would repeat during every dredging cycle until each island is completed. Adverse project effects are minor and are outweighed by the benefits of re-creating the Cat Island chain. No significant adverse secondary effects are expected to occur, nor are any significant cumulative or long-term adverse environmental impacts expected to result from the island reconstruction and Bayport expansion.

9.3 The proposed island reconstruction and Bayport expansion complies with the Federal Executive Order on Flood Plain Management (E.O. 11988); the project is within the coastal zone and would be "consistent to the maximum extent practicable" with the Wisconsin Coastal Management Program.

9.4 An evaluation pursuant to Section 404(b)(1) of the Clean Water Act (CWA), on the effects of the discharge of fill material into waters of the United States for island construction has been prepared and determined to be in compliance. The State of Wisconsin has granted[2] water quality certification pursuant to Section 401 of the CWA.

9.5 Review of the proposed dredged material management plan alternative of reconstructing the Cat Islands and expanding the Bayport CDF, and review of the comments received during public review of the EA, indicate that reconstruction of the Cat Islands and expanding the Bayport CDF does not constitute a major Federal action significantly affecting the quality of the human environment; therefore, an Environmental Impact Statement will not be prepared.

_____
Date

LTC Michael C. Derosier
Lieutenant Colonel, U.S. Army
District Engineer

2 Note. Water Quality Certification has not yet been received, but is anticipated.

10.0 REFERENCES

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ENVIRONMENTAL ASSESSMENT

Dredged Material Management Plan
Green Bay Harbor, Wisconsin

ATTACHMENT 1

CLEAN WATER ACT SECTION 404(b)(1) EVALUATION

U.S. Army Engineer District, Detroit
Corps of Engineers, CELRE-PL-E
P.O. Box 1027
Detroit, Michigan 48231-1027
313-226-6752

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION
Of the Effects of Placing Fill Material Into the Waters of the United States

Dredged Material Management Plan
Green Bay Harbor, Wisconsin

I. PROJECT DESCRIPTION

A. Location and Description. The proposed project to construct islands from shoal material, with stone dike perimeters, at the location of the former Cat Islands in Green Bay, Wisconsin, including a construction access road and causeway from shore and connecting between islands. See Section 2.0 of Environmental Assessment for detailed project description.

B. Authority and Purpose. The purpose of the Dredged Material Management Plan (DMMP) study is to provide dredged material placement needs for a 20 year capacity for clean shoal material dredged from the Federal navigation channel in Green Bay. (The contaminated shoal material in the Fox River Federal navigation channel would continue to be placed in the existing Bayport Confined Disposal Facility.) The River and Harbor Acts of 23 Jun 1866, 13 Jul 1892, and 26 Jun 1910, authorized the dredging of the harbor to accommodate robust commercial shipping activity. This DMMP study is being conducted under the guidance of the National Harbors Program: Dredged Material Management Plan policy dated July 21, 1994.

C. Proposed Fill Material. Stone and suitable construction fill for an access road, stone for dikes and a causeway, and shoal material dredged from the federal navigation channel for island fill. See *Final Design and Construction* in Section 5.0 of the Environmental Assessment for material quantity and fill source information. See *Sediment Quality* in Section 6.0 of the Environmental Assessment for discussion of sediment quality and suitability for island construction.

D. Fill Site.

(1) Location and Size. The islands would occupy approximately 300 acres of shallow sandy lake bottom about 6,500 feet out from the head of Green Bay, extending from the west shore area to near the Federal navigation channel, a distance of about 8000 feet. A construction access road/causeway would be built from the mainland to the west island location and between each island. The road would extend approximately 1870 feet from the end of Bayshore Drive to the water's edge occupying approximately 3 acres below the ordinary high water mark (OHWM). The actual footprint of the road would be approximately 2.6 acres, whereas the real estate right of way would be approximately 3.4 acres (including the road). The causeway would extend approximately 3000 feet from the water's edge to the west island, occupying approximately 6 acres of lake bottom. Culverts would be constructed in the causeway to allow water circulation between the shore and the west island and between each island.

(2) Habitat Type. Benthic populations likely are sparse in this area because of periodic high wave energy and erosion, typically represented by sparse populations of midges

and oligochates (see Exhibit 1 of Environmental Assessment). The immediate project site is a sandy eroding shallow water area, typically less than three feet deep, with some rocks, stones, and scattered vegetation. The access road will have a footprint affecting approximately 3 vegetated acres below the OHWM, and includes some wetland. The vast majority of the project, the causeway and islands (approximately 300 acres), are in a shallow, sandy open water area.

(3) Timing and Duration of Discharge. For each island there would be an initial construction of the perimeter dikes, which would normally be completed in a single construction season. Filling of each island would occur over several years, depending upon quantities dredged. The smaller central and west islands are expected to take about 3 years each to complete, whereas the large east island could take 6 to 8 years to fill.

(4) Description of Placement Methods.

i. Construction of the island perimeter stone dikes is expected to occur by land based equipment accessing the island sites by an access road and causeway built from the Bay shore. Island perimeter dikes could also be built from floating plant depending on the construction contractor and associated costs. Construction of the access road from the County road to the water's edge would include some excavation in the higher areas in order to place the road base. The causeway and island perimeters would be constructed by placing stone directly on the lake bottom, with minimal sand disturbance.

ii. The dredged material fill for the islands would likely be transported to the island sites by hydraulic pipeline, but also could be brought with dump scows or other means. (Filling of the islands by truck via the causeway is an option but is not likely because of higher costs to transport the dredged material by truck.) Additionally, the contractor may have to cut access channels in the shallow Bay bottom to provide clearance for barges carrying stone and cranes to construct the dikes. Such access channels location is subject to the contractor and cannot be described at this time. If access channels are desired by a contractor, applicable permits would be required (including State and Corps Regulatory) prior to cutting of such channels.

II. FACTUAL DETERMINATIONS. The following determinations are based on the analysis presented in the Environmental Assessment.

A. Physical Substrate Determinations. No significant adverse effects. An eroded shallow water (former Cat Islands) site would be restored to approximately 300 acres of island habitat. The access road to the water's edge would occupy approximately 3 vegetated acres below the OHWM , including some wetlands. The construction causeway from the water's edge to the islands would occupy approximately 6 acres of lake bottom.

B. Water Circulation, Fluctuation, and Salinity Determinations. No significant adverse effects anticipated. Culverts will be included in the construction/access causeway between the shore and the islands and between each island.

C. Suspended Particulate/Turbidity Determinations. No significant adverse effects are expected.

i. As discussed in the EA, the area is sandy lakebottom which does not generate significant turbidity and when disturbed has a quick settling time. During island filling, the stone barriers will help limit turbidity. Silt curtains or other means of turbidity control is not expected to be needed because of the sandy nature of the dredged material and its quick settling time.

ii. The presence of the islands may have a positive effect on water quality in the area behind the islands. Total suspended solids (TSS) were modeled for the proposed cat island restoration project (Baird, W.F. and Associates, Ltd. 2005). The modeling results suggested that the islands "can tremendously reduce TSS level associated with wave and current induced sediment re-suspension in the lee of the islands during windstorms" and will result in water clarity improvements that will promote the re-establishment of aquatic vegetation..

D. Contaminant Determinations. No significant adverse effects are expected. The site of the islands was tested and does not contain significant contaminants. Likewise the dredged material was tested and found to be suitable for island construction. See discussion of water and sediment quality in Section 5.0 of Environmental Assessment.

E. Aquatic Ecosystem and Organism Determinations. No significant adverse effects are expected. See discussion under *Wetlands, Aquatic Habitat and Fisheries, Terrestrial Habitat, Birds and Wildlife, Birds, and Federally Listed Species* in Section 5.0 of Environmental Assessment. No significant adverse impacts are expected to occur on special aquatic sites, such as sanctuaries, refuges, wetlands, mud flats, or vegetated shallows. Island remnants at the site would become part of the constructed islands. Approximately 3 vegetated acres below the OHWM would be impacted (including some wetlands) to construct an access road to the water's edge. This is a minor impact, especially in light of the extensive area (up to 1225 acres) of aquatic macrophyte beds that would develop behind the islands.

F. Proposed Disposal Site Determination. No significant adverse turbidity impacts are expected. The mixing zone would be limited to the immediate vicinity of the islands. No significant adverse effects are expected on research sites, municipal or private water supplies, recreational or commercial fisheries, recreation, or aesthetics.

G. Determination of Cumulative Effects on the Aquatic Ecosystem. No adverse cumulative effects on the aquatic ecosystem are expected. Project would promote regeneration of aquatic plants in shallow protected waters behind the island for fish and wildlife habitat. The aquatic plants and protection from storm energy would result in reductions in total suspended solids and improved water clarity in this area.

H. Determination of Secondary Effects on the Aquatic Ecosystem. No significant adverse secondary effects on the aquatic ecosystem are expected.

III. FINDINGS OF COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE.

No significant adaptations of the guidelines were made relative to this Evaluation.

Alternatives to island reconstruction at the former Cat Island Archipelago includes continuing to use of the Bayport CDF for both inner harbor and the outer harbor material, developing a new upland site for the outer harbor material, or placing the outer harbor material in an open water site. All of these alternatives would leave the island remnants and the fringe wetlands along the Bay head shore open to further erosion and destruction from wave action.

This project is being coordinated with the State of Wisconsin to assure that applicable water quality standards would not be violated, and would be operated to meet those water quality standards at the edge of the mixing zone. The shoal material to be used in island construction would not violate the Toxic Effluent Standards of Section 307 of the CWA.

No species Federally listed as “threatened” or “endangered,” or critical habitat for such species, have been identified that would be affected by the project.

The proposed project would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Life stages of aquatic or other wildlife species would not be adversely affected. Significant adverse effects to the aquatic ecosystem in the areas of diversity, productivity, stability, recreation, aesthetic, and economic values would not occur. Appropriate steps taken to minimize the adverse effects on the aquatic ecosystem at the proposed site include the use of clean dredge material and project coordination with the State of Wisconsin, U.S. Environmental Protection Agency, and the USFWS regarding fish and wildlife resources.

On the basis of the "Guidelines for Specification of Disposal Sites for Dredged or Fill Material" (40 CFR part 230), it has been determined that the proposed fill activity is in compliance with Section 404 of the 1977 Clean Water Act.

ENVIRONMENTAL ASSESSMENT

Dredged Material Management Plan
Green Bay Harbor, Wisconsin

ATTACHMENT 2

AGENCY / TRIBAL COMMENT LETTERS

U.S. Army Engineer District, Detroit
Corps of Engineers, CELRE-PL-E
P.O. Box 1027
Detroit, Michigan 48231-1027
313-226-6752

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Green Bay ES Field Office
2661 Scott Tower Drive
New Franken, Wisconsin 54229-9565
Telephone 920/866-1717
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August 27, 2008

Mr. Les E. Weigum
Army Corps of Engineers, Detroit District
Environmental Analysis Branch
Box 1027
Detroit, Michigan 48231-1037

re: Planning Aid Letter
Cat Islands Restoration Project
Brown County, Wisconsin

Dear Mr. Weigum:

This constitutes a Fish and Wildlife Coordination Act (FWCA) Planning Aid Letter addressing the proposed Cat Islands Restoration with Dredged Material project in lower Green Bay, Lake Michigan, Brown County, Wisconsin, under the authority of Section 206 of the Water Resources Development Act (WRDA) of 1996, Public Law 104-303.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and are consistent with the intent of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the U.S. Fish and Wildlife Service's (FWS) Mitigation Policy.

Project Description

The subject project involves the beneficial use of dredged material to construct a series of three islands in the same general location as the historical Cat Island Chain in lower Green Bay, Lake Michigan. The original islands were destroyed by storms and high water levels during the persistent high water period of the early 1970's. Construction of these islands will utilize dredged material generated by routine navigation channel maintenance, and is expected to result in the restoration of aquatic habitat that was formerly present in the lee of the original island chain. This area, known locally as Peat's Lake, was historically typified by extensive stands of emergent and submergent vegetation which were populated by a diverse assemblage of fish and wildlife species.

Resource Values and Issues

Green Bay is an important area for numerous fish and wildlife species. Recreational fishing values are high, supported primarily by abundant populations of yellow perch, walleye, and northern pike, and commercial fisheries for both yellow perch and lake whitefish exist. An expanding population of Great Lakes strain muskellunge has become established through recent stocking efforts. A limited number of lake sturgeon spawn below the De Pere dam in the Fox River, and reside in Green Bay for most of the year. Other common native fish species found in

Green Bay include smallmouth bass, channel catfish, white and other sucker species, and a diverse assemblage of forage species. A number of non-native fish that have been introduced and are considered desirable for recreational fishing include chinook and coho salmon, rainbow and brown trout, splake and rainbow smelt. Green Bay has also been plagued for many years with an increasing number of non-native aquatic species that have adversely affected native fish populations, including carp, alewife, white perch, zebra mussel, rusty crayfish, sea lamprey, and more recently the round goby and quagga mussel.

The existing islands and emergent wetlands adjacent to Green Bay support numerous bird species, including several state threatened and endangered species such as great egret, snowy egret, and Forster's tern. The existing Cat Island has large nesting colonies of American white pelican and double-crested cormorant, and the ring-billed gull has sometimes nested in large numbers at various locations in the lower Bay, including the Renard Island Confined Disposal Facility (CDF).

The emergent marshes on the west shore of Green Bay were formerly much more extensive, and supported diverse avian communities typical of these habitats. Historically, Green Bay was an important stopover location for migrating waterfowl and was well-known as a duck hunting destination, in large part due to the extensive beds of wild celery and other aquatic habitat in lower Green Bay. Diminished water quality due to industrial and municipal pollution and excess turbidity resulted in the loss of these submergent beds, with a resultant decline in waterfowl using the area during migration. The area has seen an increase in duck numbers during migration periods in recent years, in part due to the advent of zebra mussels as a new food source for diving ducks. Muskrats were formerly common in this area, but have been at low levels for several decades since the loss of extensive areas of emergent marsh habitat during the 1970's.

Endangered Species Issues

No federally-listed threatened or endangered species are currently known to be present in the project area. Occasional individuals of the Great Lakes population of the endangered piping plover visit the lower Green Bay area during migration, and the species has recently increased in numbers and is expanding its range. Piping plovers have been observed on Green Bay at Seagull Bar in Marinette County each of the past two years, and in 2008 attempted to nest. The deposition of dredge spoils in the proposed islands will at least temporarily create habitat that may be suitable for piping plovers, and the species is likely to visit the site during migration periods.

Piping plovers are known to prefer wide sandy beaches along the Great Lakes for nesting, and conditions within the project islands may be temporarily similar to this type of habitat during some stages of the project. Further, it is conceivable that piping plovers could attempt to nest on the created island habitats during periods when the habitat is suitable. The nesting season for piping plovers in Wisconsin extends from approximately mid-May through July. In the event that a pair of piping plovers is present at the beginning of the breeding period, construction activities may need to be delayed in the vicinity of the breeding area until after the end of the nesting season.

Although no federally-listed species are currently present, a number of State-listed bird species are regular summer residents, and all have nested in the lower Bay in the recent past. These include great egret, snowy egret, Caspian tern, Forster's tern, and common tern. Habitats which

will be created or expected to develop on the islands as a result of this project will be suitable for occupation by all of these species. Some other State-listed species which could be expected to occur in the project area include peregrine falcon, wood turtle and seaside crowfoot. State Special Concern species known from the area and also inhabiting marsh and shore habitats include bald eagle, common moorhen, black-crowned night heron, cattle egret, American white pelican, bullfrog, broad-winged skipper and mulberry wing.

Alternatives Considered in DMMP

In previous correspondence to this office dated June 11, 2008, you identified a wide range of alternatives that were being considered as part your Dredged Material Management Plan (DMMP) study. These alternatives included use of the existing Bayport CDF, modifying the contours of the existing Renard Island CDF, open water placement, beach nourishment, and multiple combinations of various designs of island creation. The alternatives of beach nourishment, open water disposal and modification of contours of the Renard Island CDF were all eliminated from further consideration due to cost, feasibility, or limited capacity. The Service recommends that any of the Alternatives that utilize the complete wave barrier and island creation would be preferable as they would maximize the potential for fish and wildlife habitat restoration through reestablishment of aquatic vegetation in the lower Bay. Further, we advocate the construction of the complete wave barrier at the onset of the project, as it would immediately begin the process of reestablishment of aquatic vegetation.

RESOURCE ISSUES AND RECOMMENDED MITIGATION MEASURES

The Service has identified the following issues related to resources of concern to the Service that should be considered in the course of project implementation.

Invasive Species

A number of invasive exotic plant species have become well established in the Green Bay area, in some cases displacing native plant species and resulting in diminished wildlife habitat values. Some of the more aggressive invasives include giant reed grass, reed canary grass, purple loosestrife, Eurasian milfoil, and glossy buckthorn. These species and others are likely to invade freshly placed dredge spoils and should be considered during project implementation, to limit their spread and possible adverse effects on wildlife habitats. We recommend formulating plans to minimize establishment of invasive plant species on dredge spoils, and monitoring to ensure success in minimizing their adverse effects.

The dikes and rock structures proposed for construction of the exterior of the islands will represent a habitat that is greatly different from adjacent habitats within the project area. These rocky shorelines will provide favorable habitat for the invasive exotic zebra and quagga mussels and round goby. To minimize the numbers of these species in the project area, we recommend that you consider ways to create a more natural shoreline along the edges of the islands as they are completed, such as deposition of dredge spoils along the exterior margins of the islands to create a gently sloping shoreline.

Habitat Management and Monitoring

The islands created as a result of this project will ultimately be colonized by an assortment of plant species and will function as habitat for numerous wildlife species. To achieve the maximum benefit for wildlife, it will be desirable to formulate and implement a vegetation

management plan to guide the development of habitat on the newly created islands. This plan should include a vision for desired future habitat conditions, an implementation schedule, and monitoring to document plant succession.

The construction of the wave barrier and island complex is expected to create conditions conducive to re-establishment of aquatic beds in the Peat's Lake area. However, given the profound changes experienced in Green Bay over the past century, and considering the mix of exotic plant and animal species now present, the prospect for recovery to conditions similar to that historically present is uncertain. A plan should also be formulated to monitor the progress of aquatic vegetation recovery in the Peat's Lake area, to include the gathering of baseline data to document the existing conditions in this area, and periodic monitoring to determine success of habitat recovery.

The Service recommends establishment of an advisory group to guide development of this plan and monitoring efforts, to include the Service, the Wisconsin Department of Natural Resources (DNR), representatives of Brown County, and other local natural resource interest groups.

Colonial Nesting Birds

Green Bay is well known for the many species of colonial-nesting birds that breed on islands in and near the project area. Cat Island currently hosts a large nesting colony of double-crested cormorants and American white pelicans, and other colonial nesting species present on islands in this area include herring gull, ring-billed gull, black-crowned night heron, and great egret. Some other species which have nested in the past and could be expected to occur in the future include cattle egret, snowy egret, common tern, Forster's tern, and Caspian tern.

Construction activities occurring during the nesting season have the potential for disturbing nesting birds on Cat Island, which could lead to the death of eggs and/or chicks. In addition, the islands created by this project are likely to become suitable habitat, and will probably be utilized for nesting when they become available. Under the Migratory Bird Treaty Act of 1918, as amended, it is unlawful to take, capture, kill, or possess migratory birds, their nests, eggs, and young. To avoid take of birds, nests or eggs, for those project activities that may occur within areas used for nesting, there may be a need for timing restrictions to avoid disturbance during the nesting period. We recommend that project activities be designed to avoid adverse effects to nesting birds during this period, which is approximately late April through July. Dependant upon where and when nesting birds are present in any given year, the dates presented above may need to be extended, or may not be necessary in some years.

The access road which will be created as part of this project will also allow for potential access to the islands by various mammalian predators that could reach them from the mainland. Colonial nesting bird species choose island nesting sites to avoid predators, and predator access could compromise their value as nesting areas. We recommend you consider how to restrict predator access to the islands while they remain connected to the mainland.

In addition to predators, the construction access road could also facilitate human access to these sites, which could have adverse effects on colonial nesting birds. The islands and associated fish and wildlife habitats may eventually become a desirable destination for fisherman, birders and other nature enthusiasts. Allowing human access may be appropriate at some future date, provided it is controlled to avoid adverse impacts to colonial nesting birds and other wildlife.

The presence of nesting colonies of some bird species, particularly cormorants, could also affect the development of plant communities on the islands and should be considered when developing the vegetation management plan referenced above. Consideration should also be given to the potential for adverse effects that cormorants and ring-billed gulls could have on other bird species.

We appreciate the opportunity to respond, and look forward to working with you to address the issues we have identified as the project proceeds. Questions pertaining to these comments can be directed to Mr. Joel Trick at 920-866-1737.

Sincerely,

Louise Clemency

Louise Clemency
Field Supervisor

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Ronald W. Kazmierczak, Regional Director

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Green Bay, Wisconsin 54307-0448
Telephone 920-662-5100
FAX 920-662-5413
TTY Access via relay - 711

June 30, 2008

1600 BROWN

Les E. Weigum
Chief, Environmental Analysis Branch, Planning Division
Detroit District, Corps of Engineers
Box 1027
Detroit, MI 48231-1027

Subject: Dredged Material Management Plan
Green Bay Harbor, Brown County, WI

Dear Mr. Weigum:

Thank you for the recent letter of June 11, 2008 regarding the Corps' intent to begin study of sixteen (16) alternatives to satisfy future dredged material disposal needs for the Green Bay Harbor. As you begin examining each alternative in more detail, please contact Al Stranz, (920-662-5118) of my staff so we can provide program and resource specific input to your agency. We cannot provide more specific comments at this time given the general nature of the documents provided.

Involving our staff early in the planning process results in a more constructive process by identifying; concerns with the proposed alternatives; permitting issues; design considerations; and public/local governmental interests.

My staff and I look forward to working closely with your office as your dredged material management plan begins to unfold.

Sincerely,

Ronald Kazmierczak
Regional Director

CC: Todd Ambs AD/8
Bruce Baker AD/8
Greg Hill WT/3
Charlie Verhoeven NER
Len Polczinski NER
Al Stranz NER

Stockbridge-Munsee Tribal Historic Preservation Office

Sherry White - Tribal Historic Preservation Officer
N8510 MohHeConNuck Road
P.O. Box 70
Bowler, WI 54416

July 20, 2005

Dr. Karen Krepps
District Archeologist
Dept. of the Army
Detroit Area Office
P.O. Box 09258
Detroit, MI 48209-0258

RE: Cat Islands Ecosystem Restoration Project
Brown County, Wisconsin

Dear Dr. Krepps:

Thank you for contacting the Stockbridge-Munsee Tribe regarding the above referenced project. The Tribe is committed to protecting archaeological sites that are important to tribal heritage, culture and religion. Furthermore, the Tribe is particularly concerned with archaeological sites that may contain human burial remains and associated funerary objects.

As described in your correspondence, the proposed ground disturbing activity of this project does not appear to be in a region of archaeological interest to the Stockbridge-Munsee Tribe.

We appreciate your cooperation in contacting the Historic Preservation Office. Should you have any questions, feel free to contact me.

Sincerely,

Sherry White

Sherry White,
Tribal Historical Preservation Officer

(715) 793-3970

Email: sherry.white@mohican-nsn.gov

or SHPO Use Only. Case # _____

REQUEST FOR SHPO COMMENT AND CONSULTATION ON A FEDERAL UNDERTAKING

Submit one copy with each undertaking for which our comment is requested. Please print or type. Return to:
Wisconsin Historical Society, Division of Historic Preservation, Office of Preservation Planning, 816 State Street, Madison, WI 53706
Please Check All Boxes and Include All of the Following Information, as Applicable. Incomplete Submittals Will Be Returned.

RECEIVED
JUN 05 2008
DIV HIST PRES

I. GENERAL INFORMATION

☐ **This is a new submittal.**
☒ **This is supplemental information relating to Case #:** #05-0575 (formerly #98-0406/BR and 99-1473/BR) and title:
☐ **This project is being undertaken pursuant to the terms and conditions of a programmatic or other interagency agreement. The title of the agreement is** _____

a. Federal Agency Jurisdiction (Agency providing funds, assistance, license, permit): USACOE, Detroit District

b. Federal Agency Contact Person: Les Weigum, Chief, Environmental Analysis Branch Phone: 313-226-6752

c. Project Contact Person : Karen Krepps, District Archeologist Phone: 313-226-6238

d. Return Address: PO Box 1027, Detroit, MI Zip: 48231-1027

e. Email Address: Karen.l.krepps@lre02.usace.army.mil

f. Project Name: Cat Island Chain, Ecosystem Restoration, Brown County, Wisconsin

g. Project Street Address (physical location): Project in the bay of Green Bay (Enclosure 1)

h. County: Brown County City: Green Bay Zip Code: _____

i. Project Location: Township 24N , Range 20E , E/W (circle one), Sections: 1, 6, 7, 12, 13, 18

j. Project Narrative Description — The project site is in the head of Green Bay (Enclosures 1 and 2). The proposed project (Enclosures 3 and 3a) includes the construction of a wave barrier and 3 islands filled with shoal material dredged from the existing Federal navigation channel in Green Bay. Construction will occur in the same location as the original islands which were heavily disturbed during a storm event which occurred in the 1970s. The small habitat islands shown in Enclosure 3a may vary in location but they will be interspersed among the three main islands. The wave barrier could be used for construction access with connecting causeways between each island and to the shore for land-based construction. Both land-based and water-based construction would be allowed to give the construction contractor flexibility that could result in construction cost savings. The islands likely would be filled by pumping shoal material through a hydraulic pipeline, although mechanical placement would remain an option.

k. Area of Potential Effect (APE). Attach Copy of U.S.G.S. 7.5 Minute Topographic Quadrangle showing APE (Enclosure 4).

II. IDENTIFICATION OF HISTORIC PROPERTIES

☐ Historic Properties are located within the project APE per 36 CFR 800.4. Attach supporting materials.

☒ Historic Properties are not located within the project APE per 36 CFR 800.4. Attach supporting materials. The National Register of Historic Places has been reviewed. There are no properties listed on, or eligible for listing on, the National Register identified that would be affected by the proposed project. According to available shipwreck maps and information from the GIS/Shape files provided to the Corps by your office, no shipwrecks are known to exist in the project area. Previous correspondence (April 30, 1998) from your office indicates that there are no known archeological sites or National Register structures in the area of the proposed undertaking; nor were any shipwrecks known to be present in the immediate project area. Therefore, no impacts on cultural resources are expected. Construction material would be placed on the lake bottom in the area of the former Cat Island chain.

III. FINDINGS

☒ No historic properties will be affected (i.e., none is present or there are historic properties present but the project will have no effect upon them). Attach necessary documentation, as described at 36 CFR 800.11. Since the project site is highly disturbed from storm

action that in the 1970s caused severe erosion and destroyed the original Cat Island chain, the presence of unidentified cultural resources is not anticipated. There are no known historic properties within the project area. Potential impacts upon any unidentified cultural resources that might be discovered in the project area would be minimized by special precautions in the construction contract. Contract specifications will designate that, if during construction the contractor observes unusual items that might have historical, archeological, or cultural value, the contractor shall protect those items and immediately report the find to the contracting officer so that the State Historic Preservation Office may be notified. Therefore it is our determination that no historic properties will be affected by the proposed project.

☐ The proposed undertaking will have no adverse effect on one or more historic properties located within the project APE under 36 CFR 800.5. Attach supporting documentation as described at 36 CFR 800.11.

☐ The proposed undertaking will result in an adverse effect to one or more historic properties and the applicant, or other federally authorized representative, will consult with the SHPO and other consulting parties to resolve the adverse effect per 36 CFR 800.6. Attach supporting documentation as described at 36 CFR 800.11 with a proposed plan to resolve adverse effect(s).

Authorized Signature: _____ Date: 3 June 08

Type or print name: Les E. Weigum, Chief, Environmental Analysis Branch

IV. STATE HISTORIC PRESERVATION OFFICE COMMENTS

☒ Agree with the finding in section III above.

☐ Object to the finding for reasons indicated in attached letter.

☐ Cannot review until information is sent as follows: _____

Authorized Signature: _____ Date: 6/11/08

Enclosures

ENVIRONMENTAL ASSESSMENT

Dredged Material Management Plan
Green Bay Harbor, Wisconsin

ATTACHMENT 3

COVER PAGES FOR 1976 and 1977 ENVIRONMENTAL IMPACT STATEMENTS

U.S. Army Engineer District, Detroit
Corps of Engineers, CELRE-PL-E
P.O. Box 1027
Detroit, Michigan 48231-1027
313-226-6752

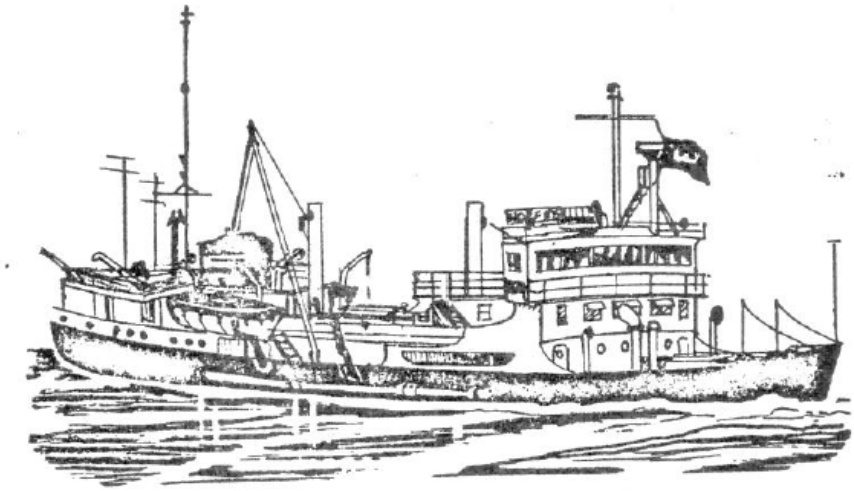
FINAL ENVIRONMENTAL IMPACT STATEMENT

relating to

OPERATION, MAINTENANCE, AND
DREDGED MATERIAL DISPOSAL
at

GREEN BAY HARBOR

WISCONSIN



prepared by

Department of the Army
Chicago District, Corps of Engineers
219 South Dearborn Street
Chicago, Illinois 60604

NOVEMBER 1977

NOTE: This EIS is available at
www.lre.usace.army.mil/who/environmentalservices/public_notices_and_documents

FINAL

ENVIRONMENTAL IMPACT STATEMENT

MAINTENANCE DREDGING AND CONTAINED DISPOSAL OF DREDGED MATERIALS AT GREEN BAY HARBOR, WISCONSIN

(BAYPORT)

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
219 SOUTH DEARBORN STREET
CHICAGO, ILLINOIS 60604

MAY 1976

NOTE: This EIS is available at
www.lre.usace.army.mil/who/environmentalservices/public_notices_and_documents