

# **Poplar Island Restoration Study, Maryland**

## **Integrated Feasibility Report and Environmental Impact Statement**

### **Section 1**

#### **Introduction**

Section 204 of the Water Resources Development Act of 1992 allows the Corps of Engineers (USACE) to protect, restore, and create aquatic and ecologically related habitats in connection with dredging (construction and/or maintenance) of an authorized Federal navigation project. This report presents an investigation to determine the feasibility of using clean dredged material from the Baltimore Harbor and Channels Federal navigation project to protect, restore, and create aquatic and ecologically related habitat at Poplar Island, Maryland.

#### **1.1 Study Purpose**

In a letter dated May 3, 1994, the Maryland Department of Transportation (on behalf of the Maryland Port Administration) requested that a study be conducted under the authority of Section 204 of the Water Resources Development Act of 1992. The purpose of the study would be to determine whether uncontaminated material dredged from the approach channels to the Baltimore Harbor and Channels project could be used to restore Poplar Island to its approximate size 150 years ago. Upon receipt of the formal request, the District was advised by the Corps Headquarters (HQUSACE) in Washington, DC, and by the North Atlantic Division (CENAD) office in New York to prepare an initial appraisal report using Operations and Maintenance funds. The District was also advised to seek approval to conduct a Section 204 study with Section 204 funds. The initial appraisal was conducted and approval was received for conducting the study under Section 204.

The purposes of this study are (1) to determine the technical, economic, and environmental feasibility of protecting, restoring, and creating aquatic, intertidal wetland, and upland habitat for fish and wildlife at Poplar Island using dredged material from the Baltimore Harbor and Channels Federal navigation project and (2) to identify a sponsor to share the cost of project implementation.

This feasibility report incorporates the USACE's Environmental Impact Statement (EIS) for the proposed project pursuant to the National Environmental Policy Act (NEPA).

## 1.2 Study Authority

This study is being conducted pursuant to Section 204 of the Water Resources Development Act of 1992 (Public Law 102-580), Beneficial Use of Dredged Material, which states:

*"(a) IN GENERAL. - The Secretary is authorized to carry out projects for the protection, restoration, and creation of aquatic and ecologically related habitats, including wetlands, in connection with dredging for construction, operation, or maintenance by the Secretary of an authorized navigation project.*

*(b) SECRETARIAL FINDINGS. - Subject to subsection (c) of this section, projects for the protection, restoration, or creation of aquatic and ecologically related habitats may be undertaken in any case where the Secretary finds that -*

*(1) the environmental, economic, and social benefits of the project, both monetary and nonmonetary, justify the cost thereof; and*

*(2) the project would not result in environmental degradation.*

*(c) COOPERATIVE AGREEMENT. - Any project undertaken pursuant to this section shall be initiated only after non-Federal interests have entered into a cooperative agreement in accordance with the requirements of section 221 of the Flood Control Act of 1970 in which the non-Federal interests agree to -*

*(1) provide 25 percent of the cost associated with construction of the project for the protection, restoration, and creation of aquatic and ecologically related habitats, including provision of all lands, easements, rights-of-way, and necessary relocations; and*

*(2) pay 100 percent of the operation, maintenance, replacement, and rehabilitation costs associated with the project for the protection, restoration, and creation of aquatic and ecologically related habitats.*

*(d) DETERMINATION OF CONSTRUCTION COSTS. - Costs associated with construction of a project for the protection, restoration, and creation of aquatic and ecologically related habitats shall be limited solely to construction costs which are in excess of those costs necessary to carry out the dredging for construction, operation, or maintenance of the authorized navigation project in the most cost effective way, consistent with economic, engineering, and environmental criteria.*

*(e) AUTHORIZATION OF APPROPRIATIONS. - There is authorized to be appropriated not to exceed \$15,000,000 annually to carry out this section. Such sums shall remain available until expended. "*

### **1.3 Existing Federal Navigation Project**

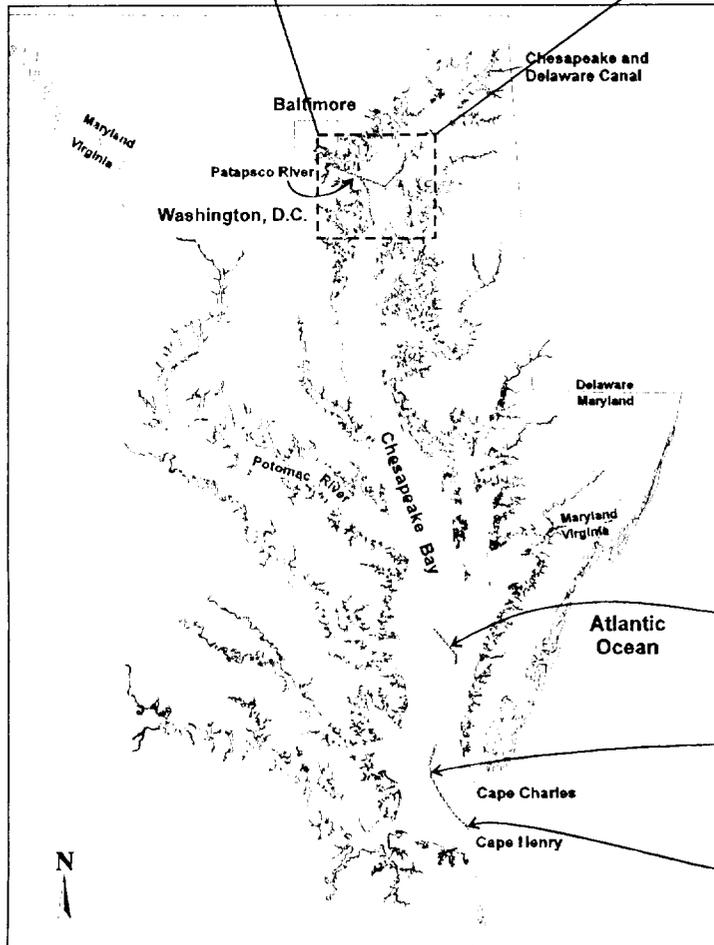
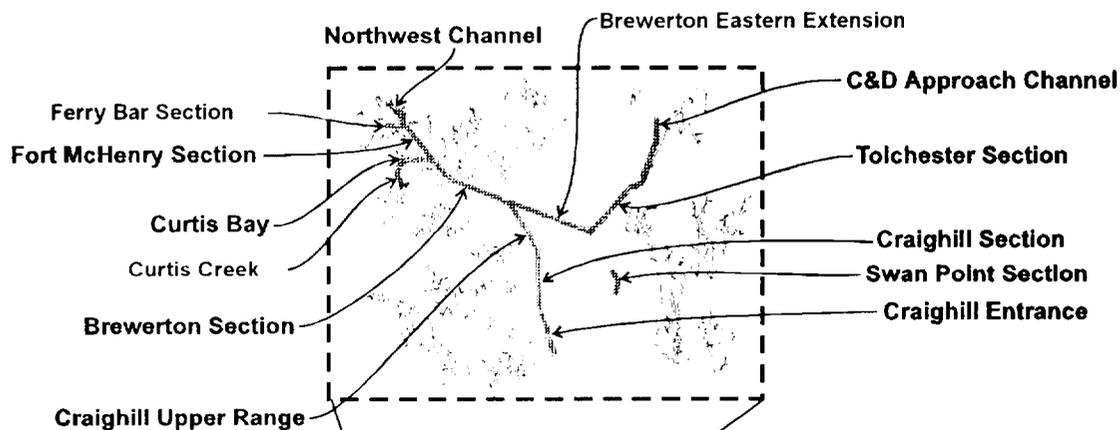
The Baltimore Harbor and Channels Federal navigation project was adopted by the River and Harbor Act of August 8, 1917, and modified by the River and Harbor Acts of January 21, 1927; July 3, 1930; October 7, 1940; March 2, 1945; July 3, 1958; and December 31, 1970. The existing navigation project is shown in Figure 1-1.

The existing project includes a main channel, 50 feet deep, between Cape Henry, Virginia, and Fort McHenry at Baltimore. The authorized dimensions of the channels are as follows:

1. Cape Henry Channel: 50 feet deep and 1,000 feet wide from the 50-foot depth curve in the Atlantic Ocean to that depth in the Chesapeake Bay, a distance of 3 miles.
2. York Spit Channel: 50 feet deep and 1,000 feet wide connecting the 50-foot depth curves in the Chesapeake Bay opposite the York River near York Spit, a distance of 18.4 miles.
3. Rappahannock Shoal Channel: 50 feet deep and 1,000 feet wide connecting the 50-foot depth curves in the Chesapeake Bay opposite the Rappahannock River, a distance of 10.3 miles.
4. Craighill Approach Channel to Fort McHenry: 50 feet deep and generally 800 feet wide, widened at the entrance and bends, from the 50-foot depth curve in the Chesapeake Bay opposite the mouth of the Magothy River to Fort McHenry on the Patapsco River, a distance of 20.7 miles.

The existing project also authorizes a series of branch channels that provide access to the various public and private terminals serving the Port of Baltimore and that connect the main channel with the Chesapeake Bay & Delaware (C&D) Canal. The dimensions of the branch channels are as follows:

1. Connecting Channel to C&D Canal Approach Channel: 35 feet deep, 600 feet wide, and 15.6 miles long from the Cutoff Angle in the main channel to the 35-foot depth curves in the natural channel on the east side of the Chesapeake Bay, which is part of the inland waterway from the Delaware River to the Chesapeake Bay. The channel includes the Brewerton Channel Eastern Extension, and the Swan Point and Tolchester Channels.



**Figure 1-1**  
**Baltimore Harbor and Channels**

2. Curtis Bay Channel: 50 feet deep, 600 feet wide, and 2.2 miles long from the main channel to and including a 1,275-foot-wide turning basin at the head of Curtis Bay.

3. Curtis Creek:

a. A channel 35 feet deep and 200 feet wide from the 50-foot channel in Curtis Bay to 750 feet downstream of the Pennington Avenue Bridge, a distance of 0.9 mile.

b. A channel 22 feet deep and 200 feet wide from the 35-foot channel to and along the marginal wharf of the Curtis Bay Ordnance Depot.

c. An irregularly shaped basin 18 feet deep and 320 feet wide, adjacent to the head of the 22-foot channel, a distance of 600 feet.

d. A basin 15 feet deep and 450 feet wide, from the end of the 22-foot channel to the end of the marginal wharf, a distance of 0.2 mile.

e. A channel 22 feet deep and 200 feet wide, from the 22-foot channel of the CSX Rail Transport bridge to the vicinity of Arundel Cove, a distance of 2,800 feet, then 100 feet wide in Arundel Cove for a distance of 2,100 feet, with an anchorage basin 700 feet square adjacent to the channel and southwest of the wharf of the Coast Guard Depot at Curtis Bay.

4. Middle Branch (Ferry Bar East Section): A channel 42 feet deep and 600 feet wide, from the main channel at Fort McHenry to Ferry Bar, a distance of 1.4 miles.

NOTE: The West Ferry Bar and Spring Garden Sections of the existing project were deauthorized by Section 1001 of the Water Resources Development Act of 1986, PL 99-662.

5. Northwest Branch:

a. East Channel: 600 feet wide and 49 feet deep for 1.3 miles, with a 950-foot-wide turning basin at the head of the channel.

b. West Channel: 600 feet wide and 40 feet deep for 1.3 miles, with a 1,050-foot-wide turning basin at the head of the channel.

#### **1.4 Scope of Study**

The approach channels to the Port of Baltimore provide shipping access to and from the Ports of Norfolk, Philadelphia, New York, and the rest of the world. The channels in the upper

Chesapeake Bay must be dredged and maintained to navigable depths to maintain Port commerce. Approximately 100 million cubic yards of material are expected to be dredged from the Baltimore Harbor and Channels project, the approaches to the C&D Canal, and the C&D Canal itself over the next 20 years. This volume exceeds the capacity of the existing dredged material placement sites.

This submission examines the possibility of utilizing clean dredged material from the approach channels that serve the Port of Baltimore to create environmental habitat at Poplar Island. These channels, including the Craighill Entrance, Channel, Angle, and Upper Range, the Cutoff Angle, Swan Point Channel, and the Brewerton Channel Eastern Extension, have a capacity need of 40 million cubic yards over the next 20 years. The evaluations are based on site-specific technical information collected as part of the feasibility study. This information includes new bathymetric surveys and environmental, hydraulic, and geotechnical evaluations. Alternatives considered include open water placement and upland placement, as well as island restoration and creation. Assessments are presented for geotechnical, cultural, environmental, and engineering investigations. These important study elements were fully incorporated into evaluations for this report.

### **1.5 Poplar Island Study Area**

The group of islands known as Poplar Island is located in the upper middle Chesapeake Bay at latitude 38° 46' N, and longitude 76° 23' W, approximately 34 nautical miles southeast of the Port of Baltimore and 1 mile northwest of Tilghman Island, Talbot County, Maryland (Figures 1-2 and 1-3). The closest point of mainland is Green Marsh Point (GMPT) on the eastern shore of Maryland just north of Tilghman Island, approximately 2 miles east of the site. The islands, which are situated on the main stem of the Bay near the confluence of the Chesapeake and Eastern Bays, are subject to severe erosional forces. From a size probably exceeding 1,100 acres in the 1800's, the island has eroded and split into four separate islands (North Point Island, Middle Poplar Island, South Central Poplar Island, and South Poplar Island) collectively referred to as Poplar Island. These islands together total only 5 acres today. The two larger parcels in the group are Coaches Island, which in 1847 was part of Poplar Island, and Jefferson Island, which by 1847 was already separate (Figure 1-4).

### **1.6 Study Process**

A significant amount of work had been completed in identifying a restoration project at Poplar Island. Section 2 details the effort by Federal and state agencies to develop and screen placement opportunities. Options have been investigated for open water, shallow water, upland placement, island creation/restoration, and even non-structural solutions such as rehandling/re-use and recycling. For a variety of reasons, ranging from cost effectiveness to environmental or cultural concerns, the long list of potential options has been narrowed to only a few opportunities. The most promising alternative for the clean dredged material from the Chesapeake Bay channels is the restoration of Poplar Island.

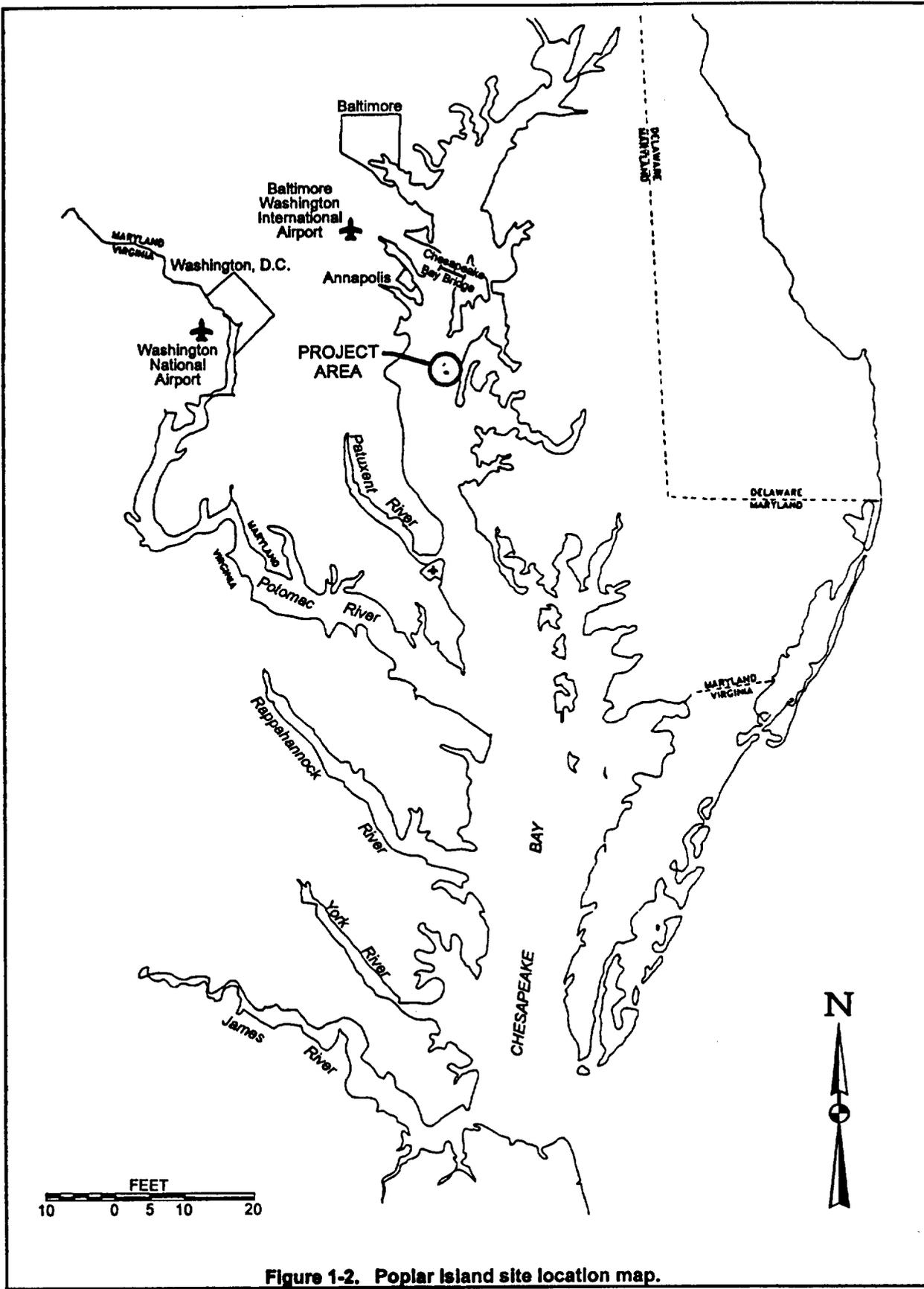
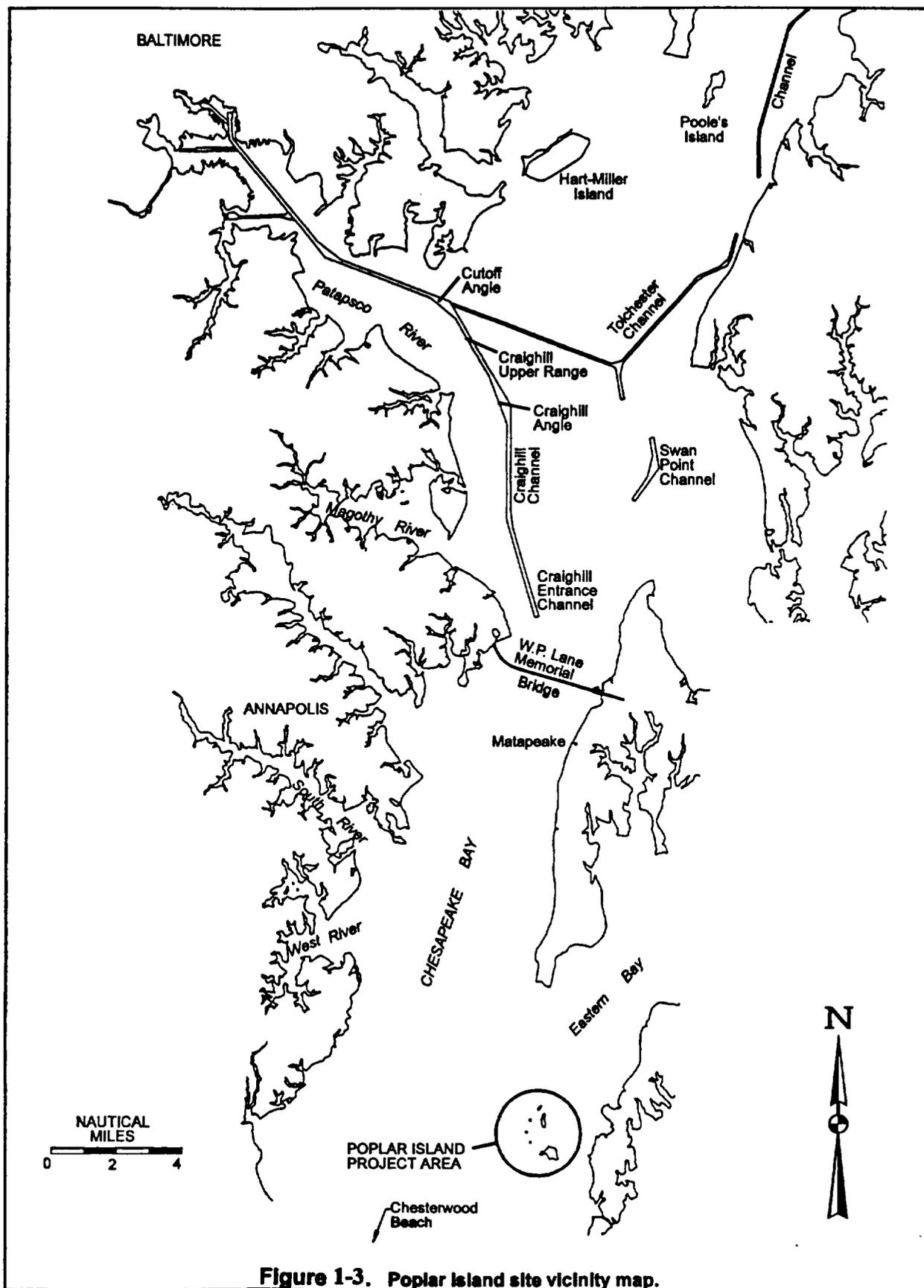
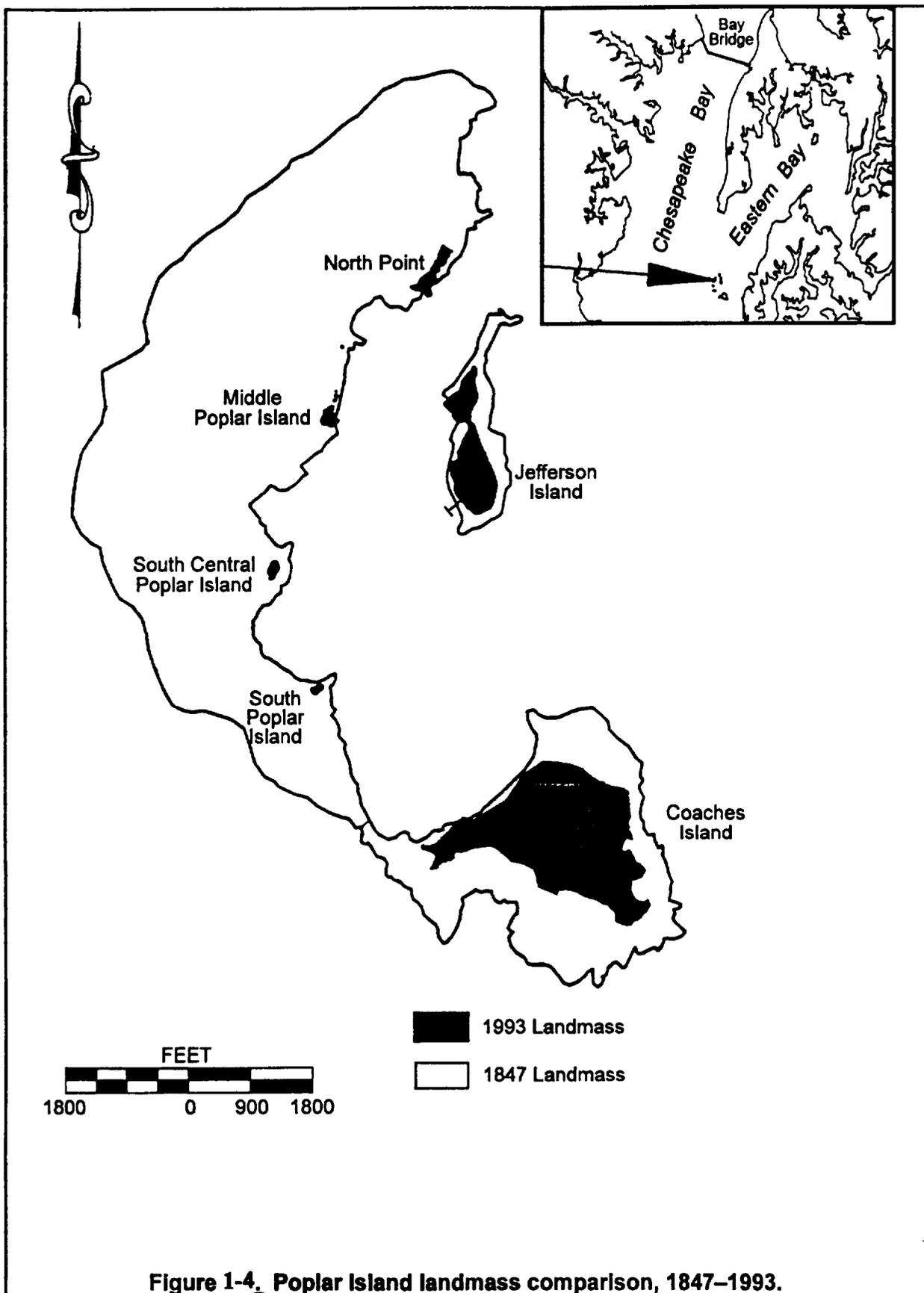


Figure 1-2. Poplar Island site location map.



**Figure 1-3. Poplar Island site vicinity map.**



**Figure 1-4. Poplar Island landmass comparison, 1847–1993.**

Due to the critical shortage of dredged material placement sites in the upper Chesapeake Bay, and the intense interest of the various natural resource management agencies and publics on the subject of dredged material placement, the process used to accomplish this study was considered carefully. At the inception of the study, it became obvious that in order to identify a dredged material placement site that would be supported by the natural resource management community and the public, extensive coordination would be required. The process used to accomplish the feasibility study is discussed in detail in the following sections.

### **1.6.1 Study Team**

Due to the limited remaining capacity at the current dredged material placement sites being utilized to accommodate material from the Baltimore Harbor and Channels Project, the Baltimore District of USACE and the Maryland Port Administration (MPA) formed a partnership to expedite the completion of the feasibility study. This partnership resulted in the establishment of a study team, which was comprised of an interdisciplinary professional staff from the technical disciplines necessary to accomplish the study. These individuals included civil engineers, hydraulic engineers, geotechnical engineers, cost engineers, biologists, environmental scientists, archaeologists, public involvement specialists, real estate specialists, lawyers, and technicians.

USACE team members were drawn from the staff of the Baltimore District, and were supplemented as needed by USACE personnel at the Waterways Experiment Station. MPA team members were drawn from the staffs of the Harbor Development Branch of the MPA and the Maryland Environmental Service (MES), which was under contract to the MPA to provide environmental and project management expertise. In addition, the MPA hired a contractor to assist with the technical studies required for the project. This contractor was a Joint Venture (JV) of Gahagan & Bryant Associates, Inc. (GBA) and Moffatt & Nichol Engineers, Inc. (M&N), both of Baltimore, Maryland. For this project, Gahagan & Bryant's primary areas of engineering and technical expertise were dredging, civil engineering, and project management, while Moffatt & Nichol's were coastal engineering, civil engineering, and wetland hydrodynamics. In addition to the principal firms of the JV, there were several subconsultant firms. These firms included EA Engineering, Science & Technology, which performed environmental analysis including socio-economic analysis; STV Group, which performed quality assistance/quality control duties and prepared the construction documents; Earth Engineering & Sciences (E2SI), which performed the geotechnical investigation and analysis; Environmental Concern Inc. (ECI), which performed the wetland/terrestrial habitat design; and R. Christopher Goodwin and Associates, which performed the marine and terrestrial archeological surveys.

The State of Maryland is undertaking a major program to restore the environmental quality of the Chesapeake Bay while providing feasible solutions to the management of sediments from the federally authorized shipping channels. This initiative, referred to as the Dredging Needs and Placement Options Program (DNPOP), was developed in response to the need to utilize dredged materials as a resource material. The program also calls for creative partnerships

among all parties concerned with the Bay environment and maritime activities. In order to foster these creative partnerships, several Working Groups, a Management Committee, and an Executive Committee have been established to provide advice, guidance, and direction for the DNPOP.

In an effort to optimize the environmental restoration alternatives developed through this study and to ensure the final plan recommended would be supported by the other resource agencies, a multi-agency approach was developed to complete the formation of the study team. Multi-agency staffing was essential to facilitate the flow of needed information among agencies, and, more importantly, to achieve buy-in and ownership by the key public agencies. The Poplar Island Working Group formed as part of the DNPOP provided this multi-agency coordination. This group, which was directed by MES for the MPA, included personnel from other agencies such as Alliance for the Chesapeake Bay, Chesapeake Bay Charterboat Association, Chesapeake Bay Critical Areas Commission, Chesapeake Bay Foundation, Maryland Department of the Environment (MDE), Maryland Department of Natural Resources (DNR), Maryland Department of Transportation, Maryland Environmental Service, Maryland Port Administration, National Biological Survey, National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Talbot County Department of Public Works, USACE, U.S. Environmental Protection Agency - Region III (EPA), U.S. Environmental Protection Agency - Chesapeake Bay Program (CBP) and U.S. Fish and Wildlife Service (USFWS). The participants from these agencies/organizations were funded by their respective agencies/organizations.

In addition to the Poplar Island Working Group, the DNPOP Management and Executive Committees were kept apprised of the study team's progress. While the Poplar Island Working Group was comprised of staff level personnel, the Management and Executive Committees were comprised of middle level and senior level managers from the same agencies. The District Engineer was a member of the Executive Committee as were the Secretaries of the Department of Natural Resources, Department of the Environment, and the Department of Transportation. These additional groups were included to ensure that the recommendations and decisions made by the staff level personnel were supported at all levels within the various resource agencies.

### **1.6.2 Study Tasks**

Prior to the initiation of the feasibility study, the MPA had directed the MES to conduct a prefeasibility study. This study was somewhat similar to a USACE reconnaissance study. The purpose of the prefeasibility study was to determine whether it would be feasible to utilize dredged material to develop environmental habitat at Poplar Island. The prefeasibility study concluded that it would be feasible and recommended that further archeological, geotechnical, hydrodynamic, and environmental studies be conducted. This prefeasibility study, the Request for Proposal prepared by the MPA, the technical proposal submitted by the JV, and the USACE Planning Guidance Notebook (ER 1105-2-10) provided a framework for the study

activities conducted as part of the feasibility effort. The feasibility study process involved these major tasks:

- **Problem Identification.** As part of this task, public concerns were identified, analyses were conducted to investigate the public and scientific concerns, and planning objectives and constraints were developed.
- **Formulation of Alternative Plans.** Using the planning objectives and constraints as a guide, a number of components were developed and from those, a range of alternative plans was developed to solve the problems that had been identified.
- **Evaluation of Alternative Plans.** This task involved the analyses needed to estimate the costs, outputs (benefits), and impacts of the alternative plans. Through these analyses, the plans were screened to identify the most viable components.
- **Recommendations.** The evaluation process identified the recommended plan and detailed the steps necessary to implement the plan.

### **1.6.3 Review of Study Products**

During the study process, working drafts of study products were developed by the JV. These working drafts were provided to selected study team members for review and comment. All of the working drafts were provided to the appropriate study team members on the USACE and MPA study teams. In addition, working drafts of study products related to environmental issues were provided to the Poplar Island Working Group for their review and comment. In addition to the monthly design team meetings held between the USACE and MPA study teams, semi-monthly meetings were held with the Poplar Island Working Group. At these meetings the study progress and results were discussed, affording agencies the opportunity to comment on the alternative plans and recommendations as they were being formulated. Additional subgroups consisting of members from the Poplar Island Working Group were established for habitat development and monitoring.