

POPLAR ISLAND ENVIRONMENTAL RESTORATION PROJECT: ENVIRONMENTAL MONITORING AND THE ROLE OF CONSENSUS BUILDING

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ABSTRACT

The Poplar Island Environmental Restoration Project (PIERP) was designed to reconstruct Poplar Island to its approximate size of 1847 using clean dredged material from Chesapeake Bay approach channels to the Port of Baltimore. Island restoration will create 460 hectares (1140 acres) of wildlife habitat through placement of approximately 32 million cubic meters (42 million cubic yards) of clean dredged material. A collaborative, multi-disciplinary team, called the Working Group, developed the monitoring framework. This group is comprised of personnel from State and Federal agencies, universities, private consultants and local government representatives. This framework details monitoring that is being performed to ensure regulatory compliance, to document the creation of beneficial habitat, to confirm the expected findings of no significant negative impacts, to provide operational input on the success of habitat creation and potential changes which will increase the habitat value and utilization, and to provide concurrent peer review of the monitoring effort. The Working Group and its associated Habitat and Monitoring Subgroups assist the Project Team with determining what, if any changes need to be made to the project and/or monitoring based on the results from the monitoring studies. Monitoring elements include: exterior sediment quality, wetland soil and vegetation monitoring, exterior water quality, construction/turbidity monitoring, discharge monitoring, benthic community and tissue monitoring, fisheries use of exterior proximal water, wetlands use by fish and wildlife, bird utilization counts, submerged aquatic vegetation monitoring, shellfish bed sedimentation, interior water quality/algae monitoring, and terrapin monitoring. A new environmental component of the project is the development of a framework to evaluate the quality of the dredged material for wetland and upland habitat restoration. The goal of the process is to gain a better understanding of how the characteristics of placed dredged material can limit or enhance the establishment of restored upland, wetland, and aquatic communities.

Keywords: Working Group, dredged material management, beneficial uses, monitoring framework, habitat development

INTRODUCTION

Poplar Island is an environmental restoration project located in Talbot County, Maryland in the upper middle Chesapeake Bay (Figure 1). Ultimately, the PIERP will provide 32 million cubic meters of dredged material capacity (42 million cubic yards) within a 460 hectares (1140 acre) island divided equally into tidal marsh and upland habitat (Figure 2). PIERP will re-establish the approximate 1847 footprint, which as of 1996 had eroded to less than 2 hectares (5 acres) due to natural hydrodynamic influences. This beneficial use reconstruction and restoration will allow for the natural and planned development of diverse aquatic, intertidal, and upland habitats for fish and wildlife.

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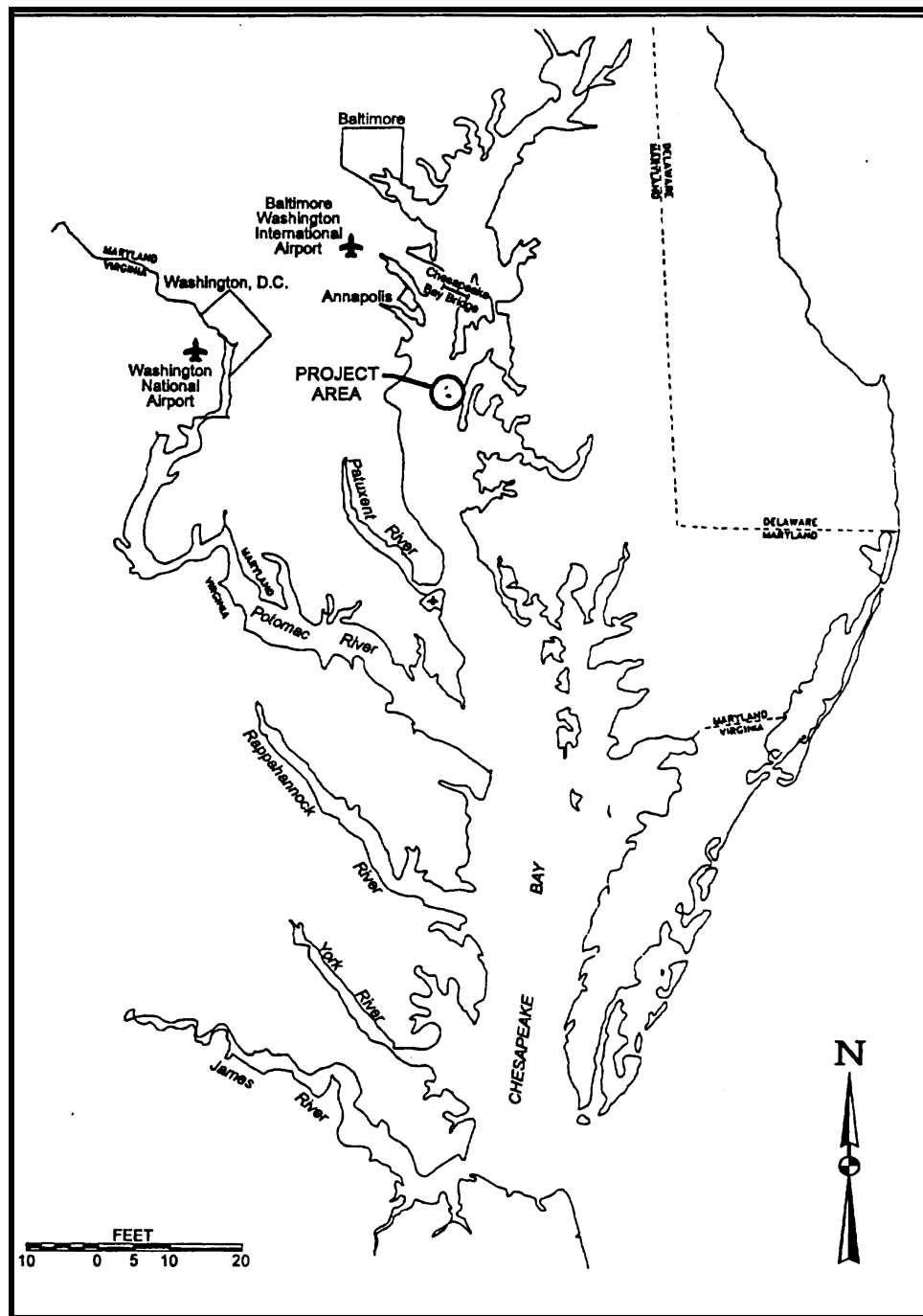


Figure 1. Poplar Island environmental restoration project vicinity map.



Figure 2. Poplar Island environmental restoration project (July 2006).

In 1993, the Baltimore District of the U.S. Army Corps of Engineers (Corps) and the Maryland Port Administration (MPA), along with federal and state agencies as well as private stakeholders began meeting to identify additional monitoring data that was needed to complete the Integrated Feasibility Report and Environmental Impact Statement (EIS) for the project (USACE/MPA, 1996). As a team, the agencies and stakeholders developed the foundation of the PIERP monitoring plan that would eventually develop into a comprehensive long-term monitoring framework. The EIS lists the following habitat restoration objectives for the PIERP: create bare or sparsely vegetated islands as nesting habitat to benefit ground nesting colonial waterbirds such as terns; create vegetated islands to benefit colonial nesting wading birds such as egrets and herons; create tidal marsh to provide habitat to benefit fish and wildlife and to provide food web support to the Chesapeake Bay ecosystem; create a diverse upland habitat to benefit a wide range of birds and wildlife; create quiescent conditions in Poplar Harbor for SAV recovery; and minimize and offset loss to benthic habitat. The PIERP was approved by the Assistant Secretary of the Army (Civil Works) in September 1996 and the monitoring elements performed to support the EIS became the baseline monitoring data for the project.

Construction of the project began in the spring of 1998 and the Corps and MPA reconvened members of the original multi-disciplinary team to begin developing the long-term monitoring plans and schedules for the project. The purpose of the monitoring was to ensure regulatory compliance, document the creation of beneficial habitat, confirm the expected findings of no negative impacts, and provide operational input on the success of habitat creation and potential changes which will increase the habitat value and utilization. This assemblage of regulatory and resource agencies and private organizations became the PIERP Working Group.

PIERP WORKING GROUP

The Corps, representing the Federal Government, and the MPA, representing the State of Maryland, are the PIERP project partners and co-chairs of the multi-disciplinary Working Group. Members of the Working Group utilize their technical expertise and experience to advise the project partners on the overall management of the project, specifically focusing on habitat development and achievement of the EIS goals. Other members of the Working Group include:

- National Oceanic and Atmospheric Administration (NOAA)
- Maryland Department of the Environment (MDE)
- Maryland Department of Natural Resources (MDNR)
- University of Maryland Center for Environmental Studies/Horn Point Lab (UMCES HPL)
- Maryland Watermen's Association
- U.S. Geological Survey Biological Resources Division (USGS BRD)
- Maryland Geological Survey (MGS)
- U.S. Fish and Wildlife Service (USFWS)
- National Marine Fisheries Service (NMFS)
- Environmental Protection Agency (EPA)
- U.S. Department of Agricultural Animal and Plant Health Inspection Services (APHIS)
- Coastal Conservation Association (CCA)
- Talbot County Government

The Working Group also includes engineering, monitoring and planning contractors as well as representatives of the Maryland Environmental Service (MES) who operate the PIERP on behalf of the Corps and MPA. The Working Group meets a minimum of twice a year to share monitoring results, discuss habitat development plans and provide technical support and advice to the project partners.

Two smaller subgroups, the Habitat and Monitoring Subgroups, also meet regularly throughout the year to concentrate on specific, focused discussions. Recent topics of discussion for the Monitoring Subgroup related to modifications of the frequencies, parameters and monitoring protocols as well as a discussion of data trends. The Monitoring Subgroup does not meet as frequently as the Habitat Subgroup, which generally also meets twice a year.

Participants in the Habitat Subgroup include those stakeholders with an interest in the avian or aquatic habitat plans at PIERP and their discussions relate to the design, construction and success of functional habitat, in addition to issues such as predator control. Since the two niches are sometimes in competition with respect to habitat needs, the Subgroup's discussions at times become a compromise with the purpose of developing a well-balanced system.

MONITORING AND CONSENSUS BUILDING

The Working Group abides by the strategies set forth in the Monitoring Framework (MES, 2006) and follows the hypothesis developed for each monitoring element to evaluate the project's success in meeting its goals. The Monitoring Framework has consistently been updated from its original inception during the EIS development, and this continues to be a dynamic process with monitoring elements evolving to fit changing conditions and findings. The initial comprehensive, collaborative monitoring framework was completed in 1996 after it received signatory concurrence from the participating resource and regulatory agencies, and it was then included in the EIS to document this concurrence. As the project progresses, the Framework is updated and monitoring elements are added or replaced to meet the regulatory requirements and demands of the developing habitat and changing site conditions.

As the Framework continually evolves, the Working Group is responsible for implementing the monitoring elements in accordance with the associated Framework Schedule (Table 1). Monitoring results are then shared with the Working Group for peer review to ensure the restoration project goals and regulatory requirements are met, while costs to the project partners are contained. The Working Group uses the monitoring results to advise the Ecosystem Restoration Project Coordination Team, which includes the Site Development Team, Site Operations Team and Adaptive Management Team. These results are also used to round out the information loop and feedback into the dynamic Monitoring Framework.

Example Monitoring Framework Element

Each monitoring element in the Framework includes a purpose, hypothesis and brief description. The Working Group Member/Principal Investigator for the monitoring element draws on this information to expound their monitoring plans and procedures. An example monitoring element (Bird Utilization) from the Framework is presented as follows:

Purpose: To monitor and evaluate bird utilization on and around Poplar Island.

Hypothesis: Bird utilization on and around Poplar Island will increase as the habitat restoration goals are completed.

Brief Description: Bird identification and activity within the cells and offshore of Poplar Island will be monitored and recorded throughout the year, concentrating on those periods when utilization is highest. During regular site visits, the avian investigator will observe bird activity in each cell and inventory the type and quantity of each species present. Similar documentation will be made for bird species observed offshore in the vicinity of Poplar Island.

Reporting and Communication

The Working Group member/Principal Investigator responsible for each monitoring element prepares an annual report of findings at the end of each monitoring year. Each report is consolidated into an annual comprehensive monitoring report and distributed to the Working Group for information. During the regularly scheduled meetings, the Working Group discusses the monitoring results and deliberates on modifications to site operation and habitat development plans. The project partners, through the Project Coordination Team, use the Working Group's recommendations not only for the PIERP, but also in planning future dredged material environmental restoration projects.

In the early phases of the project, meetings focused on construction progress, construction water quality results, landowner issues, inflow schedules, site operation plans, and initial discharge water quality results. Now that PIERP has been in operation for over five years, discussions generally concentrate on topics related to monitoring results, predator control, avian disease concerns, wildlife management, and wetland development. The group regularly discusses specific habitat types and develops plans to improve the created habitats for the target species listed in the EIS as well as species that have appeared at PIERP that were not originally anticipated. Examples of this include the addition of mudflats to the wetland areas, changes to the tern island-nesting habitat, creation of nesting structures for egrets, herons, and black ducks and protective fencing for nesting terrapins.

In addition to the regularly scheduled meetings, the Working Group remains in close communication year long via monthly newsletter-type updates. Consistently changing conditions on site necessitates frequent coordination between the project partners and varying members of the Group virtually each week. As challenges arise and Working Group members are called upon to provide guidance, the entire Group is continuously kept updated via email on decisions being made in order to maintain the multi-disciplinary approach that has been applied to the adaptively managed project.

Table 1. Monitoring framework schedule.[illegible]

EXAMPLE WORKING GROUP MONITORING RECOMMENDATION

During discussions of the design and value of habitat at PIERP, some members of the Working Group requested that sediments being placed at the PIERP be evaluated for their suitability as a restoration substrate. Stakeholders in the Working Group recommended that an exposure-based process be developed to evaluate potential effects of low-level chemicals (i.e., metals and organic compounds) in the dredged material on the plants, fish, and wildlife using PIERP now and in the future. With a general consensus from the Working Group, a sediment evaluation process was developed and implemented to identify the physical and chemical conditions that yield material most suitable for restoration initiatives.

A framework for the sediment evaluation was developed by a consultant on the Working Group to establish a conceptual model that linked chemicals in sediment to their fate in environmental media at the restoration site and to exposures for plants, invertebrates, fish, and wildlife. Because the goals for restoration at the PIERP are divided between upland, wetland, and aquatic habitats, the conceptual model preserved these distinctions and used the goals set forth by the Working Group in the Adaptive Management Plan (EA, 2006) to identify important plants and animals for consideration. The framework summarized the potential sources of information concerning important physical and chemical characteristics of dredged material used in restoration, as well as existing guidance for sediment evaluation. The framework established a process combining methods from traditional sediment evaluation guidance with tools from ecological risk assessment and agronomy.

The results of this sampling effort will be presented to the Working Group and discussions will be held to assess whether low-level metals and organic compounds in sediments could impact aquatic and benthic organisms, plants, and wildlife. The Group will use this information to direct the project partners and the Ecosystem Restoration Project Coordination Team in continuing to adaptively manage the restoration efforts.

CONCLUSIONS

PIERP is a beneficial use project that is creating much-needed wetland and upland habitat in the Chesapeake Bay using clean dredged material. Due to the commitment of the multi-disciplinary PIERP Working Group, the PIERP is meeting the EIS restorations goals. This is verified by the extensive monitoring that is conducted annually by members of the Working Group. Project successes and concerns/issues are communicated to the group at semi-annual meetings and through monthly newsletters and emails, and changes are performed using adaptive management strategies.

REFERENCES

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