

# **NEW BEDFORD HARBOR TRUSTEE COUNCIL RESTORATION PLAN ENVIRONMENTAL IMPACT STATEMENT**

## **Executive Summary**

The New Bedford Harbor Trustee Council (NBHTC or Council) has developed a plan to restore natural resources injured by releases of polychlorinated biphenyls (PCBs) to New Bedford Harbor, Massachusetts. The Council, comprised of the U.S. Departments of Commerce and Interior as well as the Commonwealth of Massachusetts, has worked with the affected communities, state and local governments, local commercial interests, academic institutions, and others to identify, develop and select restoration priorities and actions. As a result of this cooperative process, the Council has proposed a series of actions to restore a wide range of natural resources and uses injured by PCBs in the New Bedford Harbor area.

New Bedford Harbor is a small, urbanized estuary and important commercial port on western Buzzards Bay, in Southeastern Massachusetts. From the late 1940s until 1977, manufacturers in New Bedford discharged industrial wastes containing PCBs into New Bedford Harbor and nearby coastal environments, resulting in widespread, severe contamination of the sediments, water column, and biota of the Harbor estuary and parts of Buzzards Bay. Cleanup (dredging) of the contaminated sediments is underway, led by the U.S. Environmental Protection Agency (EPA), and is expected to take about ten years.

Cleanup of the contaminated sediments will reduce levels of PCBs in New Bedford Harbor and Buzzards Bay. However, natural resources have been lost or degraded by years of PCB exposure. Without restoration, recovery of the Harbor ecosystem from the effects of the contamination may take decades or longer. The purpose of the proposed action, therefore, is to restore, replace or acquire the equivalent of natural resources injured by PCB releases in New Bedford Harbor. Specifically, the proposed restoration actions are intended to: (1) restore natural resources injured by PCB releases; (2) restore the habitats of living resources and the ecological services that they provide; and (3) restore human uses of natural resources, such as fisheries and public access. Together, these actions are expected to accelerate ecological recovery, enhance environmental quality, promote economic recovery, and improve the quality of life in the New Bedford Harbor area.

The geographic scope of the Council's actions is the "New Bedford Harbor Environment," defined as the area encompassed by the Acushnet River watershed, south through the Acushnet River Estuary and New Bedford Inner and Outer Harbors, out to the Area III fishing closure line, and adjacent shoreline areas (**Figure 1.1**). The Council's focus is on the resources most injured by PCB releases--estuarine (tidal) waters and adjacent coastal areas--as well as human uses of these resources. The four municipalities within the affected environment are Acushnet, Dartmouth, Fairhaven, and New Bedford, Massachusetts.

The source of funding for the Council's actions is a \$21 million restoration fund, established as a result of settlements between the Federal Government, the Commonwealth of Massachusetts, and the companies responsible for releasing PCBs into New Bedford Harbor. A separate account will fund the Harbor cleanup. By law and under the terms of the settlement agreements, the Council must finalize a restoration plan for the New Bedford Harbor Environment before funding restoration projects, although necessary plans and studies may be funded before

completion of the plan. The purpose of this plan, therefore, is to provide a blueprint for restoring natural resources injured by PCB releases to the New Bedford Harbor Environment, while satisfying relevant legal requirements.

The Council proposed a combination of near-term, future and emergency actions, and plans and studies, as appropriate, that together would form the basis of an estuary-wide plan to restore the affected environment. This plan evaluates general restoration alternatives as well as specific restoration actions, and establishes a process for the evaluation, selection, and implementation of future restoration actions.

The NBHTC identified six restoration priorities for the New Bedford Harbor Environment: 1) marshes or wetlands; 2) recreational areas; 3) the water column; 4) habitats; 5) living resources; and 6) endangered species. In 1995, the Council issued a public "Request for Ideas," inviting all parties to submit ideas for restoring natural resources injured by PCB releases to New Bedford Harbor. As a result, 56 restoration ideas were received from citizens, non-profit organizations, municipalities, academic institutions, State and Federal agencies, and private businesses.

A 15-member Community Restoration Advisory Board (CRAB) was established to represent community interests in the restoration and to help disseminate information to the public about the restoration process. The NBHTC then evaluated the ideas received, drawing upon the input of the CRAB as well as a Technical Advisory Committee of agency staff and the Council's legal advisors. Public meetings and a public comment period ensured a full exchange of information between project proponents, citizens, representatives of the private and public sectors, and the Council throughout the evaluation process.

From among the 56 ideas, the Council selected 12 preferred alternatives for near-term implementation. These ideas, along with approximate 2-year funding levels, are as follows:

- Marshes or Wetlands:
  - Hydrologic restoration of Padanaram Salt Marsh, Dartmouth: \$16,000
  - Hydrologic restoration of Nonquitt Marsh, Dartmouth: \$186,000
- Recreational Areas
  - Recreational and habitat improvements to Fort Taber Park, New Bedford: \$2,000,000
  - Riverside/Belleville Avenue Marine Recreational Park, New Bedford: Funding level to be determined
- Water Column
  - Hurricane Barrier Box Culvert: Funding level to be determined
- Habitats
  - Eelgrass habitat restoration, New Bedford Harbor and Clarks Cove: \$400,000
  - Land acquisition, Sconticut Neck, Fairhaven: \$380,000
- Living Resources
  - Restoration and management of the New Bedford area shellfishery: \$425,000 in Year 1
  - Restoration of the Acushnet River herring run: \$600,000
- Endangered Species
  - Buzzards Bay tern restoration and habitat stabilization: \$124,000
- Plans and Studies
  - Wetlands restoration planning and implementation: \$35,000
  - New Bedford/Fairhaven Harbor Master Plan (aspects related to natural resources): \$50,000

The Council invited public comment on the draft plan. Upon review of the public comment, the Council approved 11 of the 12 preferred alternatives. The Council approved:

Hydrologic restoration of Padanaram Salt Marsh: \$16,000	Approved
Hydrologic restoration of Nonquitt Marsh (Public comment raised questions that the Council wants explored before action is taken. Results from the wetlands restoration planning survey will be considered as well)	Deferred
Recreational and habitat improvements to Taber Park: \$2,000,000	Approved
Riverside/Belleville Avenue Marine Recreational Park: \$35,000	Approved
Hurricane Barrier Box Culvert: Funding level to be determined	Approved
Eelgrass habitat restoration, New Bedford Harbor and Clarks Cove: \$120,000 for first year	Approved
Land acquisition, Sconticut Neck, Fairhaven (Purchase up to fair market value.)	Approved
Restoration and management of the New Bedford area shellfishery: \$298,000/year for 2 years	Approved
Restoration of the Acushnet River herring run: \$600,000	Approved
Buzzards Bay tern restoration and habitat stabilization: \$124,000 for two years (Council imposed a prohibition on the use of toxicants and no lethal control on predators. If non-lethal measures are unsuccessful, Council must approve lethal measures.)	Approved
Plans and Studies	
Wetlands restoration planning: \$35,000 (Council requests justification if amount is greater.)	Approved
New Bedford/Fairhaven Harbor Master Plan: \$50,000 (Aspects related to natural resources)	Approved

Total cost of the Council's commitments is estimated at approximately \$4 million of the \$21 million restoration fund. In a number of cases, other state or federal agencies are providing matching funds or in-kind services to leverage restoration dollars. Finalization of this plan allows the NBHTC to begin implementation of the approved near-term alternatives, drawing on the Council's two-year funding commitment.

Since the Harbor cleanup is ongoing, restoration actions must be coordinated with that process to maximize environmental benefits while ensuring that neither process negates or interferes with the other. As cleanup of the Harbor proceeds, more restoration options will become practicable.

The Council proposes an event-based process of idea solicitation and selection to choose future restoration actions, periodically selecting restoration actions that are practicable, effective, and appropriate in the context of the ongoing cleanup. Full public involvement in Council decisionmaking will be maintained in all aspects of the process.

On completion by EPA of the Harbor cleanup, the Council will allocate the remainder of the restoration fund toward completion of the restoration process. The NBHTC will solicit, select and fund a final round of restoration actions; following necessary oversight or implementation, the Council will disband.

## TABLE OF CONTENTS

	Page No.
Executive Summary .....	i
Table of Contents .....	v

### Chapter 1: Purpose and Need for Action

1.1 The Proposed Action: Restoration of the New Bedford Harbor Environment .....	1-2
1.2 Need for the Proposed Action: Injury to Natural Resources.....	1-3
1.2.1 Site History: Contamination of New Bedford Harbor .....	1-3
1.2.2 Superfund Site Remediation .....	1-6
1.2.3 Likelihood of Ecosystem Recovery .....	1-6
1.2.4 Injury to Natural Resources: Overview .....	1-7
1.3 Purpose of the Proposed Action: Restore Injured Natural Resources and Lost Uses .....	1-7
1.3.1 Restoration of Injured Natural Resource Populations.....	1-8
1.3.2 Restoration of Injured Habitats and Ecological Services: Acceleration of Ecological Recovery .....	1-8
1.3.3 Restoration of Lost Use .....	1-9
1.3.4 Restoration of Quality of Life .....	1-10
1.4. Coordination of Restoration with Remediation .....	1-10

### Chapter 2: the Restoration Process

2.1 Legal and Governmental Context .....	2-2
2.1.1 Natural Resources Damage Assessment and Restoration .....	2-2
2.1.1.1 Definitions .....	2-3
2.1.1.2 Statutory Authority .....	2-5
2.1.1.2.1 CERCLA .....	2-5
2.1.1.2.2 Court Case & Settlement .....	2-5
2.1.2 Trustee Council .....	2-7
2.1.2.1 Membership .....	2-7
2.1.2.2 Structure .....	2-8
2.1.2.3 Responsibility .....	2-9
2.1.3 US EPA Remediation Process .....	2-9
2.1.3.1 Hot Spot .....	2-9
2.1.3.2 Proposed Cleanup for ROD II .....	2-10
2.2 Restoration Planning .....	2-11
2.2.1 Overview of Approach .....	2-13
2.2.2 Injury Determination .....	2-13
2.2.3 Goal of Restoration .....	2-14
2.2.4 Commitments .....	2-15
2.2.5 Selection Criteria .....	2-16
2.2.6 Restoration Priorities .....	2-17
2.2.7 Scoping Process: Development of a Restoration Plan .....	2-18
2.2.7.1 Define Process .....	2-18
2.2.7.2 Workshop .....	2-19

2.2.7.3 Public Information Activities.....	2-20
2.2.7.3.1 Notice of Intent to Prepare an Environmental Impact Statement .....	2-21
2.2.7.3.2 Public Information Meetings .....	2-21
2.2.7.4 Legal Guidance .....	2-22
2.2.7.5 Request for Restoration Ideas .....	2-24
2.2.8 Determination of Baseline for Monitoring.....	2-30

### **Chapter 3: the Affected Environment**

3.1 Geography .....	3-3
3.2 Physical Environment.....	3-4
3.2.1 Geomorphology .....	3-4
3.2.1.1 Shorelines .....	3-4
3.2.1.2 Marine Sediments .....	3-5
3.2.2 Hydrology and Bathymetry .....	3-6
3.2.2.1 Acushnet River and Watershed .....	3-6
3.2.2.2 New Bedford Harbor Estuary .....	3-6
3.2.2.2.1 Bathymetry.....	3-6
3.2.2.2.2 Dynamics.....	3-7
3.2.2.3 Buzzards Bay .....	3-8
3.2.3 Climate .....	3-8
3.3 Biological Environment.....	3-9
3.3.1 Habitats .....	3-9
3.3.1.1 Fresh water and Upland habitats .....	3-9
3.3.1.2 Salt Marsh.....	3-14
3.3.1.3 Tidal flats and Soft Bottoms.....	3-18
3.3.1.4 Beaches and Rocky Shores.....	3-20
3.3.1.5 Sea grass Beds.....	3-21
3.3.1.6 Open Water Habitats.....	3-21
3.3.1.7 Interaction Among Habitats .....	3-22
3.3.2 Plankton .....	3-22
3.3.3 Coastal Plants .....	3-23
3.3.4 Marine Invertebrates .....	3-25
3.3.5 Fish .....	3-28
3.3.6 Birds .....	3-30
3.3.7 Mammals - Terrestrial and Marine.....	3-35
3.3.8 Endangered Species.....	3-35
3.4 Human Environment.....	3-35
3.4.1 Population.....	3-35
3.4.2 Historic Patterns of Natural Resource Use and Impacts .....	3-37
3.4.2.1 Settlement Period.....	3-37
3.4.2.2 19th Century.....	3-38
3.4.2.3 Early 20th Century.....	3-40
3.4.3 Current Patterns of Natural Resource Use and Impacts .....	3-46
3.4.3.1 Manufacturing .....	3-46
3.4.3.2 Tourism and Recreation .....	3-47
3.4.3.3 Offshore Fishing and Maritime Industries.....	3-48
3.4.3.4 Inshore Fishing.....	3-48
3.4.3.4.1 Commercial Fishing .....	3-48

3.4.3.4.2 Recreational Fishing .....	3-51
3.4.4 Impacts of Current Uses on Coastal Resources .....	3-51
3.4.5 Current Land Use.....	3-54
3.4.6 Baseline for Restoration: Mid-20th Century .....	3-56
3.4.7 Future Directions - New Bedford's Waterfront .....	3-58
3.5 Injury to the Environment.....	3-59
3.5.1 Contaminant distributions .....	3-59
3.5.1.1 Pre-cleanup.....	3-59
3.5.1.2 Post-cleanup .....	3-65
3.5.2 Ecological injury.....	3-65
3.5.2.1 Species .....	3-65
3.5.2.2 Habitats and Communities.....	3-67
3.5.2.3 Wider Buzzards Bay Ecosystem .....	3-68
3.5.3 Losses to the Public.....	3-69
3.5.3.1 Fisheries .....	3-69
3.5.3.2 Environmental Quality.....	3-70
3.5.3.3 Lost Recreation Use of Beaches .....	3-70
3.5.3.4 Total Quantified Losses to the Public.....	3-70

## **Chapter 4: Alternatives - Analysis and Consequences**

4.1 No-Action Alternative: No Environmental Restoration .....	4-2
4.1.1 Current Status of the Harbor Environment.....	4-2
4.1.2 Predicted Scenario under Natural Recovery Only .....	4-3
4.1.3 Lost Services/amenities .....	4-3
4.2 The Preferred Alternative: Environmental Restoration .....	4-4
4.2.1 Near-term Restoration Actions .....	4-4
4.2.2 Future Restoration Actions.....	4-5
4.2.3 Emergency Restoration Actions .....	4-5
4.2.4 the Preferred Approach: Select Projects by Restoration Priority .....	4-6
4.3 Specific Proposals/alternatives .....	4-7
4.3.1 Marshes or Wetlands .....	4-13
4.3.1.1 No-action Alternative: No Marsh or Wetland Restoration, Enhancement or Creation .....	4-13
4.3.1.2 Preferred Alternatives.....	4-14
4.3.2 Recreation Areas .....	4-19
4.3.2.1 No-action Alternative: No Recreation Area Enhancement or Development .....	4-19
4.3.2.2 Preferred Alternatives.....	4-19
4.3.2.3 Non-preferred Alternatives.....	4-25
4.3.3 Water Column.....	4-26
4.3.3.1 No-action Alternative: No Water Column Restoration.....	4-27
4.3.3.2 Preferred Alternatives.....	4-27
4.3.3.3 Non-preferred Alternatives.....	4-29
4.3.4 Habitats .....	4-36
4.3.4.1 No-action Alternative: No Habitat Restoration or Enhancement .....	4-36
4.3.4.2 Preferred Alternatives.....	4-36
4.3.4.3 Non-preferred Alternatives.....	4-43
4.3.5 Living Resources .....	4-45

4.3.5.1 No-action Alternative: No Living Resources Restoration or Enhancement .....	4-45
4.3.5.2 Preferred Alternatives.....	4-45
4.3.5.3 Non-preferred Alternatives.....	4-52
4.3.6 Endangered Species.....	4-54
4.3.6.1 No-action Alternative: No Endangered Species Restoration...	4-55
4.3.6.2 Preferred Alternative.....	4-55
4.3.7 Studies, Plans or Educational Activities.....	4-59
4.3.7.1 Preferred Studies, Plans or Educational Activities.....	4-59
4.3.7.2 Non-preferred Studies, Plans or Educational Activities.....	4-61
4.3.8 Proposals Falling Outside of the Scope of Restoration .....	4-63

## **Chapter 5: Implementation of the Restoration Plan**

5.1 Coordination of Restoration with Remediation .....	5-2
5.2 The Restoration Process.....	5-6
5.3 Timing and Milestones.....	5-9
5.4 Implementation of Restoration Actions .....	5-10
5.4.1 Plans and studies .....	5-10
5.4.1.1 Procedures.....	5-10
5.4.1.2 Timeframe.....	5-10
5.4.1.3 Budget .....	5-11
5.4.2 Near-term restoration.....	5-11
5.4.2.1 Procedures.....	5-11
5.4.2.2 Timeframe.....	5-11
5.4.2.3 Budget .....	5-12
5.4.3 Future restoration actions .....	5-12
5.4.3.1 Procedures.....	5-12
5.4.3.2 Timeframe.....	5-13
5.4.3.3 Budget .....	5-13
5.4.4 Emergency restoration .....	5-13
5.4.4.1 Procedures.....	5-14
5.4.4.2 Timeframe.....	5-14
5.4.4.3 Budget .....	5-14

## **Chapter 6: Relationship to Other Laws and Programs**

6.1 Laws .....	6-2
6.1.1 Federal Laws .....	6-2
6.1.2 State Laws .....	6-6
6.1.3 Local Laws .....	6-8
6.2 Policies .....	6-8
6.2.1 Federal Policies .....	6-8
6.2.2 State and Local Policies.....	6-9
6.3 Programs .....	6-9
6.3.1 Federal Programs .....	6-9
6.3.2 State Programs.....	6-9
6.3.3 Local Programs.....	6-10
6.4 Non-governmental Partners.....	6-11
6.5 Summary of Compliance with Potentially Applicable Laws .....	6-12



Chapter 7: Consultation and Coordination

Chapter 8: List of Agencies, Organizations, and Persons to Whom Copies of the Statement Are Sent

Chapter 9: References

Chapter 10: Comments/Responses

10.1 Comments .....	10-2
10.2 Response to Comments .....	10-95
10.2.1 General/Technical Comments .....	10-95
10.2.2 Preferred Alternatives .....	10-102
10.2.2.1 Padanaram Salt Marsh Restoration .....	10-102
10.2.2.2 Nonquitt Salt Marsh Restoration .....	10-102
10.2.2.3 Taber Park .....	10-105
10.2.2.4 Riverside Park/Belleville Avenue Recreational Park .....	10-105
10.2.2.5 Hurricane Barrier Box Culvert .....	10-106
10.2.2.6 Eelgrass Habitat Restoration .....	10-107
10.2.2.7 Land Conservation - Sconticut Neck Marshes and Coastline .....	10-108
10.2.2.8 Restoration and Management of New Bedford Area Shellfishery .....	10-109
10.2.2.9 Herring Run Restoration .....	10-110
10.2.2.10 Restoration and Management of Tern Populations .....	10-110
10.2.3 Other Alternatives .....	10-115
10.2.3.1 New Bedford Aquarium/Oceanarium .....	10-115
10.2.4 Preferred Studies, Plans, Educational Activities .....	10-116
10.2.4.1 New Bedford/Fairhaven Harbor Master Plan .....	10-116
10.2.4.2 Wetlands Restoration Planning: New Bedford Harbor Environment .....	10-116
10.2.5 New Alternatives .....	10-116

## **Appendices**

Appendix A Glossary of Terms/Acronyms Used

Appendix B Community Restoration Advisory Board

## List of Figures

Figure No.		Page No.
1-1	New Bedford Harbor Environment .....	1-4
1-2	New Bedford Harbor.....	1-5
2-1	Restoration Plan Development .....	2-12
2-2	Development of a Restoration Plan - Public Participation .....	2-20
2-3	Request for Ideas Process .....	2-27
3-1	Acushnet River Watershed Habitats and Resources .....	3-13
3-2	New Bedford Harbor and Upper Buzzards Bay Habitats and Resources .....	3-17
3-3	Existing Land Uses New Bedford Harbor and Vicinity .....	3-55
3-4	Acushnet River Estuary Total PCB Concentrations 0-12 inch Sediment Depth .....	3-61
3-5	Acushnet River Estuary Total PCB Concentrations 0-6 inch Sediment Depth .....	3-62
3-6	Acushnet River Estuary Total Metal Concentrations 0-12 inch Sediment Depth .....	3-63
3-7	Acushnet River Estuary Total PCB Concentrations 0-6 inch Sediment Depth .....	3-64
5-1	Hot Spot Location Map.....	5-4
5-2	Proposed Dredging Areas and CDFs.....	5-5
5-3	Typical CDF Cross-section.....	5-7
5-4	Building a CDF .....	5-8

## List of Tables

Table No.		Page No.
3.1	Fish using freesh water habitats in the Acushnet River.....	3-10
3.2	Dominant soft-bottom, hard-bottom and rocky intertidal communities in Buzzards Bay.....	3-19
3.3	Dominant benthic macroinvertebrates sampled from New Bedford Harbor in decreasing order of abundance .....	3-20
3.4	Coastal plants of the New Bedford Harbor Estuary .....	3-24
3.5	Marine invertebrates of the New Bedford Harbor Estuary .....	3-27
3.6	Finfish in the New Bedford Harbor Estuary .....	3-29
3.7	Dominant commercially valuable fish species in Buzzards Bay in order of abundance and preferred prey items.....	3-30
3.8	Bird observation in New bedford Harbor and Upper Buzzards Bay, 1986-95 .....	3-33
3.9	Population of the New Bedford Harbor Environment.....	3-36
3.10	1990 Economic Status for the New Bedford harbor Environment.....	3-36
3.11	Summary of land use activities and impacts, and ecological effects on the New Bedford Harbor resources .....	3-43
3.12	Commercial landing of shellfish in the New Bedford Harbor Estuary ....	3-49
3.13	Commercial lobster landings for Buzzards Bay from 1981 to 1991.....	3-50
3.14	Lobster harvest by New Bedford and Fairhaven fishermen 1991-1993 .....	3-51
4.1	Restoration alternatives.....	4-8
4.2	River herring sample results.....	4-50
6.1	Summary of compliance with potentially applicable laws .....	6-13

# CHAPTER 1: PURPOSE AND NEED FOR ACTION

## **Chapter Outline:**

1.1 The Proposed Action: Restoration of the New Bedford Harbor Environment .....	1-2
1.2 Need for the Proposed Action: Injury to Natural Resources .....	1-3
1.2.1 Site History: Contamination of New Bedford Harbor .....	1-3
1.2.2 Superfund Site Remediation .....	1-6
1.2.3 Likelihood of Ecosystem Recovery .....	1-6
1.2.4 Injury to Natural Resources: Overview .....	1-7
1.3 Purpose of the Proposed Action: Restore Injured Natural Resources and Lost Uses .....	1-7
1.3.1 Restoration of Injured Natural Resource Populations .....	1-8
1.3.2 Restoration of Injured Habitats and Ecological Services: Acceleration of Ecological Recovery .....	1-8
1.3.3 Restoration of Lost Use .....	1-9
1.3.4 Restoration of Quality of Life .....	1-10
1.4. Coordination of Restoration with Remediation .....	1-10

## CHAPTER 1: PURPOSE AND NEED FOR ACTION

### 1.1 The Proposed Action: Environmental Restoration of the New Bedford Harbor Environment

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund," 42 U.S.C. §9601 *et seq.*) provides a mechanism for addressing the Nation's hazardous waste sites, allowing states and the Federal Government to sue polluters for the clean-up and restoration of designated sites. CERCLA provides for the designation of "natural resource trustees:" Federal, state, or tribal authorities who represent the public interest in natural resources. Natural resource trustees may seek monetary damages (*i.e.*, compensation) from polluters for injury, destruction, or loss of natural resources resulting from releases of specified hazardous substances. These damages, which are distinct from clean-up costs, must be used by the trustees to "restore, replace, or acquire the equivalent of" the natural resources that have been harmed, but only after the trustees have approved a restoration plan. The trustees are required to involve the public in the development of the restoration plan (42 U.S.C. §9607(f)(1) and §9611(l); 40 C.F.R. §300.600; 43 C.F.R. §11.93).

The sediments, water column and biota of New Bedford Harbor, Massachusetts, are highly contaminated with polychlorinated biphenyls (PCBs) as a result of industrial discharges into the Harbor and nearby coastal environments in western Buzzards Bay. As a result, the U.S. Environmental Protection Agency (EPA) designated New Bedford Harbor a Superfund Site under CERCLA in 1983. In 1991 the New Bedford Harbor Trustee Council (NBHTC or Trustee Council) was formed, composed of the Commonwealth of Massachusetts, the U.S. Department of Commerce, and the U.S. Department of Interior.

The Trustee Council proposes undertaking environmental restoration in New Bedford Harbor and the surrounding environment in order to: (1) restore natural resources injured by PCB releases; (2) restore the habitats of living resources and the ecological services that the resources provide; (3) restore human uses of natural resources, such as fisheries and public access; and (4) improve aspects of the human environment of New Bedford Harbor that have been degraded by the Harbor contamination (NBHTC, 1993).

The proposed environmental restoration would incorporate public and professional opinion to develop, evaluate, and select specific and general restoration alternatives. The result would be a range of selected restoration alternatives that together would form the basis of an estuary-wide plan to restore the affected environment.

Selected alternatives would consist of near-term, future, or emergency restoration actions. Chapter 5 discusses the process of evaluation and selection of restoration alternatives. This document evaluates the restoration program as a whole, as well as specific near-term restoration actions. Emergency actions (if necessary) and future restoration actions would be evaluated through future rounds of restoration project selection, coordinated with the Superfund clean-up over the next 15 years. Selected actions would be implemented by the Trustee Council or its designees, including agency staff and advisors, the Commonwealth of

Massachusetts, local governments, or non-governmental entities. Monitoring and evaluation would be undertaken to assess the effectiveness of selected alternatives. Chapter 5 presents an estimated timetable and milestones for selection and implementation of future restoration actions as clean-up of the New Bedford Harbor Environment proceeds.

In order to satisfy the requirements of the National Environmental Policy Act (NEPA, 42 U.S.C. §4321 *et seq.*), the Trustee Council intends to combine the restoration planning process with the development of an Environmental Impact Statement (EIS). This document, therefore, constitutes a Draft Restoration Plan and EIS (RP/EIS) for New Bedford Harbor, Massachusetts, under CERCLA, 42 U.S.C. §9601 *et seq.*, and NEPA, 42 U.S.C. §4321 *et seq.*

While the contamination of New Bedford Harbor and its clean-up have important implications for human health, the primary focus of this document is on the restoration of natural resources, and resource uses, affected by the contamination of New Bedford Harbor. Cleanup decision-making is a separate process, ongoing under the leadership of the U.S. Environmental Protection Agency. Chapter 2 discusses the relationship between cleanup and restoration activities in New Bedford Harbor and provides more information on the legal framework, and required scope, of natural resource restoration in the New Bedford Harbor Environment.

## **1.2 Need for the Proposed Action: Injury to Natural Resources**

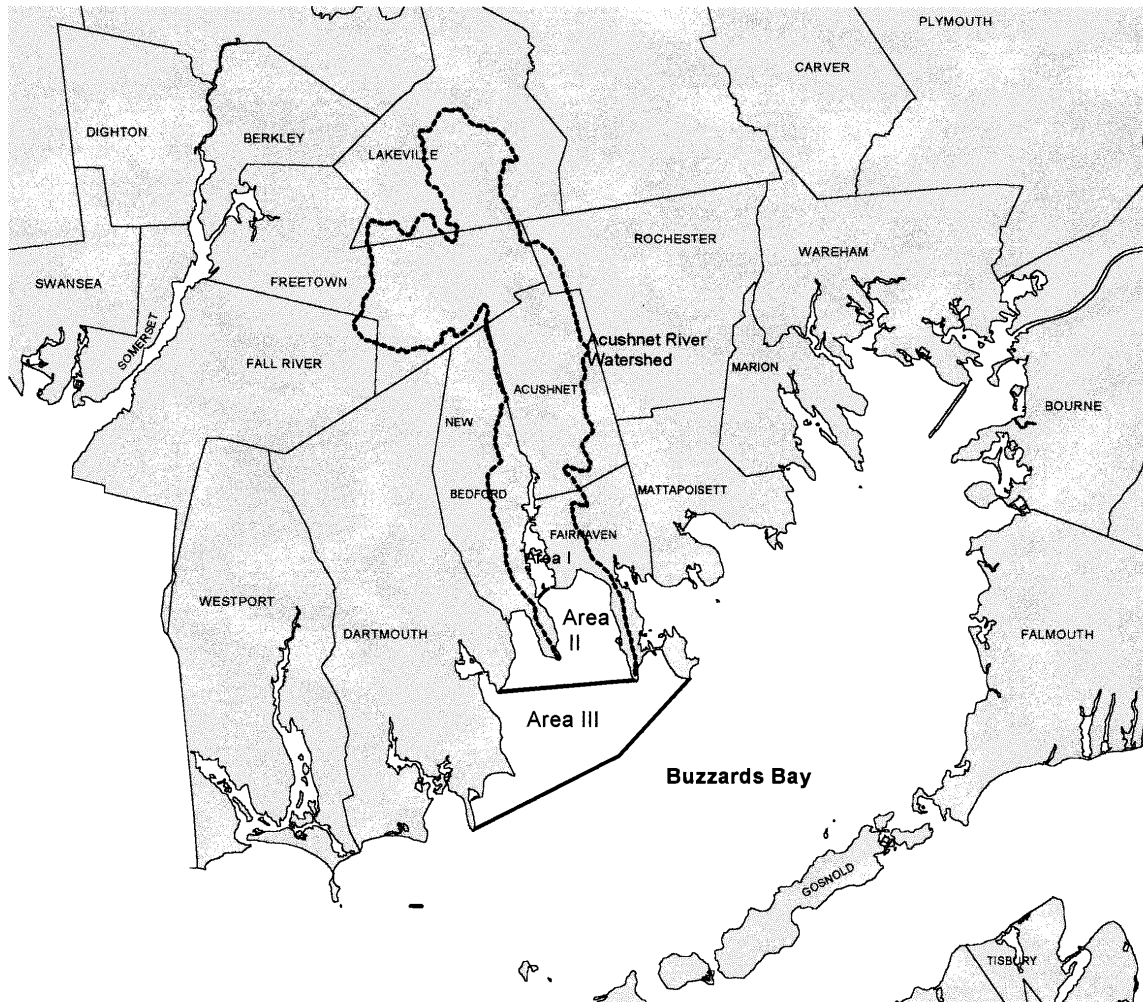
### **1.2.1 Site History: Contamination of New Bedford Harbor**

New Bedford Harbor is an urban tidal estuary on Buzzards Bay, in southeastern Massachusetts (**Figures 1.1 and 1.2**). From the late 1940s until 1977, when the use of PCBs was banned in the U.S., manufacturers of electrical parts in New Bedford discharged PCBs directly and indirectly, via the municipal wastewater treatment system, into the New Bedford Harbor Estuary. PCBs are a class of chlorinated organic compounds that are suspected human carcinogens. They have been shown to be harmful to many species, capable of causing reproductive failure, birth defects, and death. PCBs tend to “biomagnify” up the food chain, accumulating in the tissues of top predators such as gamefish, birds, and humans (60 F.R. 10836).

A series of studies conducted from 1974-1982 found high levels of PCBs and toxic metals (particularly cadmium, chromium, copper and lead) to be widespread in the water, sediments, and marine life of New Bedford Harbor. Levels of PCBs in the Harbor biota were found to exceed what was then the U.S. Food and Drug Administration (FDA) guideline of 5 parts per million (ppm) (subsequently lowered to 2 ppm). As a result, the Commonwealth closed the Inner Harbor to all fishing, and the Outer Harbor to the taking of certain species in September, 1979. Section 3.5 details these fishing closures and their effects.

In the late 1980s and early 1990s, studies further described the distribution of PCBs and toxic metals throughout the New Bedford Harbor Estuary and in parts of Buzzards Bay (Pruell et al., 1990). PCB concentrations in marine sediment in the Estuary were found to range from a few parts per million to over 200,000 ppm, while concentrations in excess of 50 ppm were found in

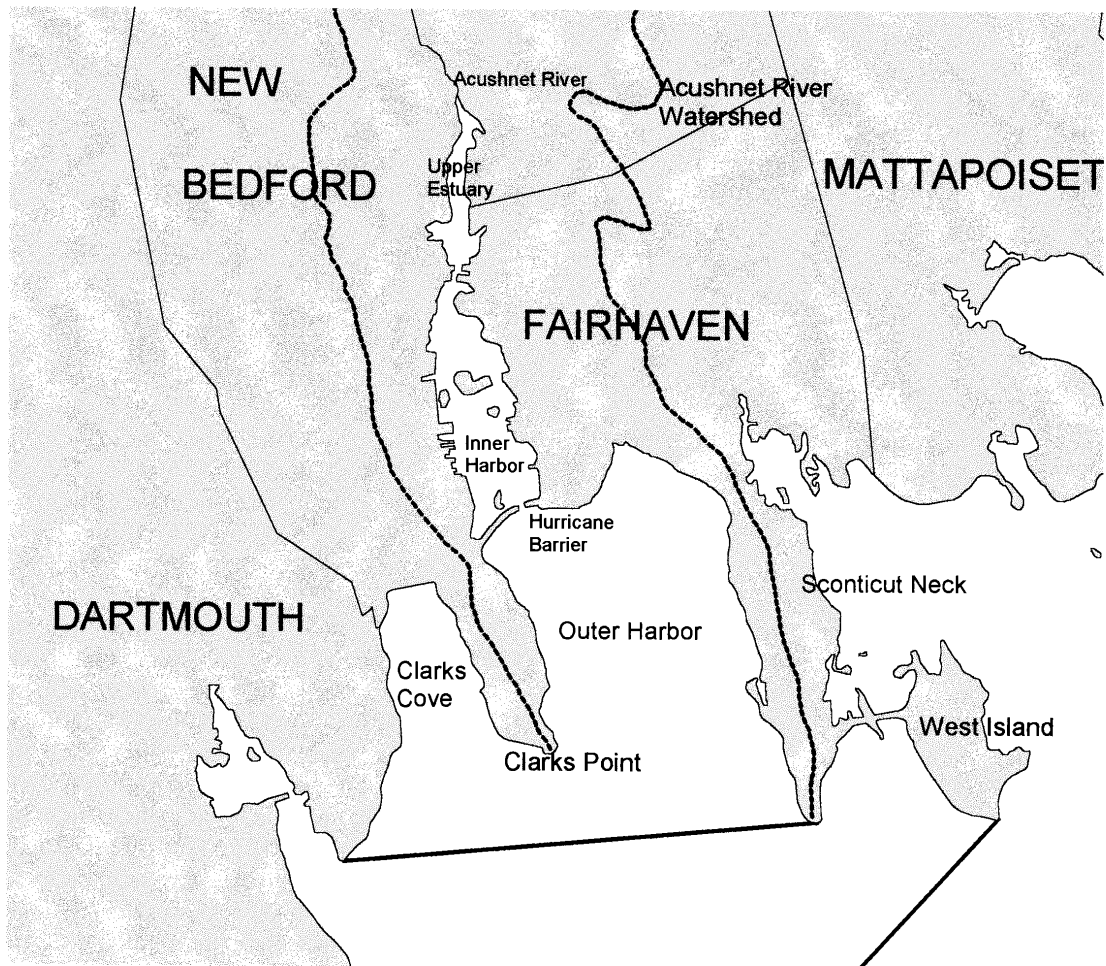
**Figure 1-1**



New Bedford Harbor Environment  
Acushnet River Watershed south to  
Area II

New Bedford Harbor Trustee Council  
RP/EIS

**Figure 1-2**



New Bedford Harbor

New Bedford Harbor Trustee Council  
RP/EIS



parts of Outer New Bedford Harbor. PCB concentrations in the water column were found to exceed Federal ambient water quality criteria (AWQC) (0.030 ppm, based on chronic impacts to marine organisms) (60 F.R. 10836). Section 3.5 describes the distribution of contaminants in the New Bedford Harbor Environment.

In 1983, New Bedford Harbor was designated a Superfund Site, eligible for Federal clean-up action, or “remediation.” In addition, Massachusetts has identified New Bedford Harbor as the Commonwealth's priority Superfund site. As a result of settlements in 1991 and 1992 with the Federal Government and the Commonwealth of Massachusetts, the manufacturers responsible for the contamination paid approximately \$100 million for remediation and restoration of New Bedford Harbor, of which approximately \$21 million must be used by the Trustee Council for restoration of natural resources. Chapter 2 describes legal and financial aspects of the proposed restoration as well as complementary efforts to address the contamination of New Bedford Harbor.

### **1.2.2. Superfund Site Remediation**

Remediation is ongoing at the New Bedford Harbor Superfund Site. Between 1994 and 1995, EPA and the U.S. Army Corps of Engineers (Corps) dredged the most contaminated sediments (“the Hot Spots”) from the Harbor, into a “confined disposal facility” or CDF near Sawyer Street, New Bedford. This Hot Spot material will be treated later. While the dredging is directed at removing PCBs, areas contaminated with the highest heavy metal concentrations will also be removed. Due to the size and difficulty of the job, the remediation process is expected to take approximately fifteen years, until about 2011. This process is described more fully in Chapters 2 and 5.

Chapter 3 discusses pre-remediation levels of PCBs in the New Bedford Harbor Environment as well as expected levels and rates of ecosystem recovery following the cleanup. Most of the Upper Acushnet River Estuary will be dredged; thus post-remediation levels of PCBs in the sediments there are expected to be less than 10 ppm. An exception is the salt marshes of this area, where PCB concentrations up to 50 ppm will remain. Inner New Bedford Harbor, between Coggeshall Street and the Hurricane Barrier, will also be dredged to an action level of 50 ppm, leaving in place sediment PCB concentrations from 0-50 ppm. Significant concentrations of toxic metals (cadmium, chromium, copper, and lead) can also be expected to remain in the Inner Harbor once clean-up is complete.

### **1.2.3 Likelihood of Ecosystem Recovery**

Superfund Site remediation in New Bedford Harbor will greatly reduce PCBs and toxic metals in the sediments, waters and biota of the New Bedford Harbor Estuary. EPA has informally estimated that it may take some years after completion of the remediation for the Harbor's water quality to meet EPA's target levels for PCBs, placing that portion of recovery squarely into the next century (Dickerson, PC, 1996). However, since PCBs and metals will remain in some portions of the Harbor sediments, and due to the exceptional persistence of these substances, it is probable that the ecosystem will not have fully recovered until some time after those target levels have been met.

The environmental persistence of the New Bedford Harbor contaminants is such that they may recirculate in the living component of the Harbor ecosystem for many decades. In Lake Michigan, reductions in sources of PCBs resulted in initial declines in environmental

concentrations, followed by a leveling-off or stabilization above AWQC, with the most toxic forms of PCBs persisting in the environment (VHB, 1996). While it is impossible to predict the amount of time it will take the New Bedford Harbor Environment to recover from environmental releases of contaminants, it may be many years after completion of remediation until PCBs in the biota of New Bedford Harbor stabilize at lower levels.

While the Superfund clean-up will reduce the environmental and human health risks associated with the Harbor contamination, the remediation is not without its own environmental impacts. One of the most important of these stems from the siting of CDFs and long-term storage of contaminated sediments along the Harbor shoreline. While the size, extent, and location of the CDFs have not been finalized, it is certain that, following the clean-up, CDFs will become a significant feature of the Harbor shoreline (**Figure 5.2**) and, where sited on areas that are currently open water, will cause a limited amount of marine habitat loss.

#### **1.2.4 Injury to Natural Resources: Overview**

Discharges of PCBs to the New Bedford Harbor Environment have caused significant ecological injury. Widespread contamination of the air, water, sediments and biota of the New Bedford Harbor Estuary has resulted in lethal effects for some species as well as widespread sub-lethal effects such as reduced biological diversity, alteration of biotic communities, and reproductive impairment of marine species.

Contamination of New Bedford Harbor by PCBs has resulted in economic losses, as well, through closure of fishing grounds, lost use of beaches, and loss of environmental quality. Injury to the ecology and economy of New Bedford Harbor from PCB releases is discussed in detail in Section 3.5.

Finally, the contamination has affected the New Bedford area in less tangible ways, eroding the quality of the human environment. The effects of the contamination on the New Bedford area's quality of life are discussed in Section 3.5.

As noted in the preceding section and in Section 3.5, the Superfund Site remediation of New Bedford Harbor will remove 85% to 90% of the PCB contamination from New Bedford Harbor. It will not, however, restore the New Bedford Harbor Environment to its pre-contamination condition. Lower, but still significant, levels of PCBs and metals will remain in the marine sediments of some Harbor areas. CDFs will occupy significant areas of shoreline alongside New Bedford Harbor.

Also present is contamination from other sources such as combined sewage overflows, wastewater treatment plant discharges, industrial wastewater discharges, and boats. The Superfund designation of this site was based primarily on the PCB releases from industrial discharges at two locations and not on these other sources. Further action is necessary to help restore the ecology and economy of the area, and to compensate public and private users of marine resources for lost use during the period of elevated contaminant levels.

#### **1.3 Purpose of the Proposed Action: Restore Injured Natural Resources and Lost Uses**

The purpose of the proposed action--natural resource restoration in New Bedford Harbor--is to restore, replace or acquire the equivalent of natural resources injured by PCB releases in New

Bedford Harbor, as required by CERCLA (42 USC §9607(f)(1)). Restoration actions would thereby accelerate and enhance recovery of the ecosystem, the ecological services provided by the ecosystem, and associated human uses.

In order to accomplish this goal, restoration of natural resources would strive to enhance the entire Harbor ecosystem by implementing a series of actions directed at a range of natural resources. The cumulative effect of these actions would be to improve the functioning and productivity (ecological and economic) of the system as a whole. The proposed restoration of New Bedford Harbor would target four broad areas of natural resource restoration: (1) restore natural resources injured by PCB releases; (2) restore the habitats of living resources and the ecological services that they provide; (3) restore human uses of natural resources, such as fisheries and public access; and (4) improve aspects of the human environment of New Bedford Harbor that have been degraded by the Harbor contamination (NBHTC, 1993).

In order to assess the potential environmental impacts of the restoration, the Trustee Council will consider the affected environment to include the lands of the Acushnet River watershed, the waters of the Acushnet River and New Bedford Harbor, and parts of Buzzards Bay, as well as uses of this environment -- ecological as well as human -- extending beyond these boundaries. However, since the injury primarily affected marine and coastal resources, the proposed restoration focuses on the resources of the New Bedford Harbor Estuary and adjacent coastal areas. **Figures 3.1 and 3.2** describe the geography of the affected environment, which is discussed more fully in Section 3.1.

Several potential approaches are available to restore the natural resources of New Bedford Harbor; these are described below. Moreover, a single restoration action could employ several of these approaches in combination.

### **1.3.1 Restoration of Injured Natural Resource Populations**

One potential approach to restoring natural resources injured by PCBs in New Bedford Harbor is restoration at the population level. An example is replenishing shellfish with hatchery-grown seed, a measure that has proven effective in reestablishing shellfish populations elsewhere in Southern New England. Such restoration could help rebuild a valuable commercial or recreational fishery that, if well-managed, could prove self-sustaining.

Populations can also be restored indirectly, through species-specific habitat restoration. An example might be restoration of anadromous fish runs by improving fish-ladders at existing dams to increase available spawning habitat for herring, alewives and shad. Resulting increases in the abundance of these species would benefit recreational, commercial, and bait fisheries directed at these species. Moreover, ecosystem-wide benefits might be expected, since these fish are important forage species for sportfish such as bluefish and striped bass, wading and diving birds, and birds of prey.

### **1.3.2 Restoration of Injured Habitats and Ecological Services: Acceleration of Ecological Recovery**

A second potential approach to restoring natural resources, as well as the ecological services they provide, is habitat restoration. Habitats of importance to the New Bedford Harbor Environment are discussed in Section 3.3; these include several types of wetlands, beaches,

tide flats, benthic (subtidal) areas, woodlands, and the water column itself. Habitat enhancement or replacement might include restoration of salt marshes, seagrasses, or other wetlands, or preservation or protection of valuable habitats, such as natural coastal areas, that might otherwise be developed.

A good example of the link between habitat restoration and the provision of ecosystem services is salt marsh restoration. Coastal salt marshes are critical to the biology of coastal ecosystems, providing habitat for a variety of life-stages of fish, shellfish, birds, and other organisms, as well as serving important chemical and physical functions in the estuarine environment (NOAA, 1991). In New England, however, the construction of roads or railways across salt marshes has often resulted in reduced tidal flushing, changes in species composition, and, ultimately, lower habitat values for birds and fish. A simple hydrologic restoration that enlarges the culverts beneath the road can restore former species distributions, with benefits for commercial and recreational fisheries as well as birdwatchers and other non-consumptive ecosystem users.

Habitat restoration can also significantly accelerate the recovery of organisms, populations, and habitats that have been harmed by the contamination of the New Bedford Harbor Estuary. PCBs in the Estuary have reduced biological diversity, impaired reproduction, and in some cases caused direct mortality of marine organisms. Habitat restoration -- whether directed at wetlands, seagrass beds, or other coastal habitats -- can increase plant and animal biodiversity.

By providing spawning and nursery habitat for fish and other fauna, habitat restoration can accelerate the reproductive recovery of species whose fecundity may have been depressed by the contamination. To the extent that these species interact with the larger ecosystem, through trophic transfer, for example, or as food sources for other animals throughout the estuary, such actions can accelerate ecological recovery of the entire ecosystem.

Species-specific restoration actions--whether habitat restoration, or restoration of injured populations--can also help accelerate ecological recovery. For example, terns have been poisoned by eating baitfish from New Bedford Harbor; restoration of these birds' nesting habitat can help recover a population directly affected by the Harbor contamination. Populations of shellfish, if sufficiently dense, have been shown to improve water quality.

By using an approach that combines restoration of injured natural resource populations and habitat restoration, and species-specific action, natural resource restoration in the New Bedford Harbor Environment can substantially improve the ecosystem health of an estuary that has been severely affected by PCB contamination.

### **1.3.3 Restoration of Lost Use**

Natural resource restoration can restore lost human use of natural resources, as well. Restoration of lost use may pertain to consumptive uses, such as fishing, shellfishing, and duckhunting, or non-consumptive uses like swimming, birdwatching, recreational walking, and aesthetic enjoyment.

Consumptive uses that might be restored include inshore fisheries. Restoration of inshore fish and shellfish species, through action at the population or habitat level, would restore an

historically important use of the Harbor Environment, providing significant economic and cultural benefits.

Non-consumptive human uses of the New Bedford Harbor Environment can be restored in a variety of ways. The improvement of coastal parks or walkways, for example, could restore public access lost because the Harbor was undesirable or inaccessible in its contaminated state. Wetlands restoration could improve the aesthetics of degraded areas. And restoration of birds, through habitat restoration or restoration of prey species, could improve the aesthetics of the Harbor Environment while restoring lost use to birdwatchers.

#### **1.3.4 Restoration of Quality of Life**

The quality of the human environment is inextricably linked to that of the natural environment (PCSD, 1996). By restoring natural resources along with their uses and values, restoration in New Bedford Harbor could have economic and non-economic benefits. The enhanced economic prosperity, recreational opportunity, and aesthetic enjoyment that could be expected to result from natural resource restoration has the potential to significantly improve the quality of the human environment in the greater New Bedford metropolitan area and related environments, such as Buzzards Bay.

#### **1.4. Coordination of Restoration with Remediation**

Restoration of the New Bedford Harbor environment will have to be coordinated with the process of remediation, since the restoration options available at a particular time would be largely dependent on the status of the Harbor environment and clean-up. Water and sediment quality, ongoing dredging and construction activities, and the location and extent of CDFs will influence the possibilities for restoration. The Trustee Council, therefore, envisions a flexible restoration planning process, based on a combination of emergency, near-term, and future restoration actions. The process would make use, over a number of years, of a series of public solicitations for restoration ideas. Since EPA's remedial action is expected to take approximately 15 years, the Trustee Council anticipates a restoration process of similar duration. As clean-up of the Harbor proceeds, more restoration options would become available. Chapter 5 discusses coordination of restoration and remediation in greater detail.

**Chapter Outline:**

NBHTC RP/EIS - Chapter 2 Final

## CHAPTER 2: THE RESTORATION PROCESS

### 2.1 Legal and governmental context

The New Bedford Harbor Trustee Council's responsibility to restore the injured natural resources of the New Bedford Harbor Environment results from legal actions brought under CERCLA. CERCLA also provides authority to the Environmental Protection (EPA) Agency to conduct cleanup activities to reduce the threat to human health and the environment. Monetary settlements with parties responsible for releasing PCBs and other hazardous materials into the Harbor Environment provide funds for use by the Trustee Council to accomplish restoration activities and the EPA for cleanup activities. The court actions, cleanup of hazardous materials and restoration of injured natural resources fall under the jurisdiction of the state and federal government. This section explains the legal and statutory requirements which guide the restoration process.

#### 2.1.1 Natural resources damage assessment and restoration

Once a "release" or contamination of the environment occurs, several steps are required before restoration of injured natural resources can be undertaken. The type and quantity of the contaminant release, geographic location, weather conditions, and response authorities' ability to respond determine the first actions taken to control, contain or clean up the release. A damage assessment is undertaken to determine the extent of damage to natural resources, the environmental effects, and the amount of money needed to: (1) respond to the incident; (2) to assess the damages; and (3) restore the natural resources. The party or parties potentially responsible may take an active role in this process and provide resources to assist the cleanup and restoration. In some cases, it is necessary to seek civil penalties in court against the responsible parties to recover funding for the damage caused.

The restoration phase begins with planning. Using information from the damage assessment, the affected resources are examined and there is consideration of the appropriate actions needed to correct the injury to natural resources or the services they provide. All reasonable alternatives are considered and public input is sought before decisions are made on actual restoration projects. Once implemented, restoration projects are monitored to determine their success or whether there are negative impacts caused by projects.

New Bedford Harbor was one of the first cases brought under CERCLA. The court case was initiated about 40 years after the initial release of contaminants, although the release continued to occur through most of that period. There was no immediate response. The damage assessment conducted was not an exhaustive study of the effects of contamination but rather a means of determining general injuries due to short timeframes and the procedures in effect at that time.

### 2.1.1.1 Definitions

Several key words or phrases form the basis for restoration planning and are important to understanding what is required under law. The following terms apply to natural resource damage assessment and restoration. Other commonly used terms and acronyms are found in Appendix A.

*Acquisition of the equivalent* -- the substitution for an injured resource with a resource that provides the same or substantially similar services, when such substitutions are in addition to any substitutions made or anticipated as part of response actions and when such substitutions exceed the level of response actions determined appropriate to the site pursuant to the National Contingency Plan (defined below). (43 CFR Part 11.14)

*Baseline* -- the condition or conditions that would have existed at the assessment area had the discharge of oil or release of the hazardous substance under investigation not occurred. (43 CFR §11.14(e))

*CERCLA* -- the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986.

*Consent decrees* -- legal documents filed with the Federal District Court, and entered as orders of the Court, by which the agreements between the Trustees and the responsible Parties are spelled out.

*EPA* -- the United States Environmental Protection Agency.

*Facilities* -- the manufacturing plants and associated structures and land of the Aerovox facility located at 740 and 742 Belleville Avenue, New Bedford, and the Cornell Dubilier Electronics, Inc. (CDE) facility located at 1605 East Rodney French Blvd., New Bedford, Massachusetts. (Consent decrees)

*Hazardous substance* -- a hazardous substance as defined in section 101(14) of CERCLA. (43 CFR §11.14(u))

*Injury* -- a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge of oil or release of a hazardous substance, or exposure to a product of reactions resulting from the discharge of oil or release of a hazardous substance. As used in this part, injury encompasses the phrases "injury," "destruction," and "loss." ( 43 CFR § 11.14(u)) Note: CERCLA does not include oil, natural or synthetic gas within its definition of hazardous substance. M.G.L. c.21E does include oil within its definition of hazardous substance.

*National Contingency Plan or "NCP"* -- the National Oil and Hazardous Substances Contingency Plan and revisions promulgated by EPA, pursuant to section 105 of CERCLA and codified in 40 CFR Part 300. (43 CFR §11.14(y))



*Natural resources* -- land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the exclusive economic zone), any State or local government, any foreign government, or any Indian tribe. (42 USC §9601 (16))

*Natural resource damage assessment or damage assessment* -- the process of collecting, compiling, and analyzing information, statistics, or data through prescribed methodologies to determine damages for injuries to natural resources as set forth in this part. (43 CFR §11.14 (aa))

*New Bedford Harbor Environment or Harbor Environment* -- means the area encompassed by the Acushnet River watershed which extends west into Dartmouth, east into Acushnet and Fairhaven, and from the north extending south to include the New Bedford Reservoir and the City of New Bedford into Buzzards Bay extending out to the area designated as Fishing Area III. The watershed is defined as the entire surface drainage area that contributes water to the Acushnet River. (Consent decrees)

*Remedy, remediation, remedial action or cleanup* -- are the actions taken to stop ongoing, or prevent further, degradation of the environment.

*Replacement* -- the substitution for an injured resource with a resource that provides the same or substantially similar services, when such substitutions are in addition to any substitutions made or anticipated as part of response actions and when such substitutions exceed the level of response actions determined appropriate to the site. (43 CFR §11.14(ii))

*Responsible party or parties* -- a person or persons who is the owner of a vessel or facility responsible for the release of contamination into the environment. With respect to the New Bedford Harbor Superfund Site, the responsible parties are AVX Corporation; Aerovox Incorporated; Belleville Industries Incorporated; Cornell-Dubilier Electronics Inc.; and Federal Pacific Electric Company. (43 CFR 11.14(kk) and Consent decrees)

*Restoration* -- are the actions that return injured natural resources and/or services to their baseline or comparable condition. (43 CFR §11.14(II) ) With respect to the Trustee Council, any actions including planning, implementation, administration and oversight, which serve to restore, replace, acquire the equivalent or provide substitutes for natural resources or natural resource services injured, destroyed or lost as a result of the release of hazardous substances into the New Bedford Harbor Environment. (Consent decrees)

*Services* -- the physical and biological functions performed by the resource including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource. (43 CFR §11.14(mm))

*Site* -- an area or location, for purposes of response actions under the NCP, at which oil or hazardous substances have been stored, treated, discharged, released, disposed, placed, or otherwise came to be located. (43 CFR §11.14( oo)) Note: CERCLA does not include oil, natural or synthetic gas within its definition of hazardous substance M.G.L. c.21E does include oil within its definition of hazardous substance..

*Trustee or natural resource trustee* -- any Federal natural resources management agency designated in the NCP and any State agency designated by the Governor of each State, pursuant to 42 USC §9607(f)(2)(B), that may prosecute claims for damages under section §9607(f)(1) or §9611(b); or an Indian tribe, that may commence an action under §9626(d). (43 CFR § 11.14(rr))

### **2.1.1.2 Statutory authority**

#### **2.1.1.2.1 CERCLA**

CERCLA is the principal federal statute specifying federal and state response actions to past and current releases of hazardous materials into the environment. CERCLA was enacted in 1980 with a major amendment occurring in 1986 (The Superfund Amendment and Reauthorization Act of 1986, or "SARA"). CERCLA also provides the means to compensate governments for clean up costs and damages to natural resources. CERCLA gives the President authority to act on behalf of natural resources affected by the release or contamination.

Under CERCLA, the party responsible for the release is also responsible for the clean up and restoration. When the responsible party is unwilling or unable to provide an adequate response, authority is provided to EPA (for discharges and releases in the inland zone), working with the U.S. Coast Guard (for discharges and releases in the coastal zone) and state agencies, to respond to and clean up the hazardous release. The responsible party is liable for all costs associated with the cleanup and restoration. If this is not possible, the Superfund can be used. The Superfund is a revolving trust fund resulting from tax proceeds from the sale of oil, certain chemicals, and certain imported substances, as well as recoveries from court cases.

NCP regulations implement CERCLA. The NCP designates federal and state trustees to act for the natural resources under their jurisdiction that were injured or damaged by the hazardous release. The members of the New Bedford Harbor Trustee Council are the Commonwealth of Massachusetts (represented by the Secretary of Environmental Affairs) and the two federal agencies with statutory authority over the natural resources in the New Bedford Harbor environment: 1) U.S. Department of Commerce (DOC) (represented by the National Oceanic and Atmospheric Administration (NOAA); and 2) the U.S. Department of the Interior (DOI) (represented by the U.S. Fish and Wildlife Service (USFWS)).

#### **2.1.1.2.2 Court case & settlement**

In 1976, EPA conducted a New England-wide PCB survey, which included New Bedford Harbor. EPA determined that the high levels of PCBs detected in New Bedford Harbor sediments warranted further investigation. During the next five years, field studies conducted by EPA and the Commonwealth of Massachusetts identified PCBs and heavy metals in the sediments and marine life throughout a 1,000-acre area north of the Hurricane Barrier in New Bedford Harbor, and in parts of Buzzards Bay.

In 1977, testing of edible fish tissue revealed PCB levels in excess of the U.S. Food and Drug Administration 5-ppm guideline (Note: current guideline is now 2-ppm). As a result, the

Massachusetts Department of Public Health (MDPH) issued a health warning and closed areas of New Bedford Harbor and Buzzards Bay to fishing.

In 1983, EPA added the site to the National Priorities List of hazardous waste sites eligible for action under the Superfund program. The Massachusetts Department of Environmental Protection also designated New Bedford Harbor as its priority Superfund site.

In 1983, complaints were filed in federal district court in Boston alleging causes of action under CERCLA against Aerovox Incorporated, Belleville Industries, AVX Corporation, Cornell-Dubilier Electronics (CDE) and Federal Pacific Electric Company (FPE), for injuries to natural resources that had resulted from releases of PCB that occurred during the time that they owned or operated the facilities.

The district court issued eight opinions over the course of this case, with another opinion issued by the First Circuit Court of Appeals.<sup>1</sup> In April 1992, a National Wildlife Federation (NWF) appeal of the Aerovox and Belleville settlement was dismissed by the First Circuit for lack of standing. In June 1992, the Trustees entered a settlement with the NWF, pursuant to which NWF voluntarily dismissed its pending appeal of the First Circuit decision and agreed not to challenge the settlement with FPE and CDE. Also in June 1992, the case against Aerovox and Belleville was resolved for \$13.15 million. Of this amount, \$10 million paid for response costs; \$500,000 went to NOAA for damage assessment costs; and \$2.5 million was placed in the Court Registry (maintained by the U.S. District Court) for natural resource damages and restoration.

In July 1992 the settlement with AVX, Inc. became final. The total settlement was \$66 million. Of that amount \$59 million was designated for clean-up; \$250,000 went to NOAA for past assessment costs; and \$6.7 million went into the Court Registry for past natural resource damage assessment costs.

The settlement with the two remaining defendants, FPE and CDE, was entered in October 1992. Pursuant to this decree, NOAA was reimbursed approximately \$65,000 plus accrued interest; \$10 million was placed into the Court Registry for natural resource damages and restoration; and an additional \$10 million was placed into a joint registry account with EPA, to be used for response or natural resource damages, depending upon selection of the final remedy by EPA.

The total settlement, with interest, for natural resource damages was approximately \$20.2 million. Interest earned through investment in the Court Registry Investment System, this amount has grown to \$22.8 million.

---

<sup>1</sup> In re Acushnet River & New Bedford Harbor, and are found at: 675 F. Supp. 22 (D.Mass. 1987)("Acushnet I"); 712 F. Supp. 994 (D.Mass. 1989)("Acushnet II"); 712 F. Supp. 1010 (D. Mass. 1989)("Acushnet III"); 712 F. Supp. 1019 (D. Mass. 1989)("Acushnet IV"); 716 F. Supp. 676 (D. Mass. 1989)("Acushnet V"); 722 F. Supp. 888 (D. Mass. 1989)("Acushnet VI"); 722 F. Supp. 893 (D. Mass. 1989) ("Acushnet VII"); 725 F. Supp. 1264 (D. Mass. 1989)("Acushnet VIII"); National Wildlife Federation (Appellant/Intervenor) v. United States and AVX Corp. et al., No. 91-1895 (1st Cir. April 21, 1992)

## **2.1.2 Trustee Council**

Under CERCLA section 9607(f)(1), natural resource trustees include 1) federal agencies responsible for the protection or management of natural resources and/or management of federally owned land; 2) state trustees designated by the Governor; and 3) Indian tribes. Of all possible state and federal Trustees, the three New Bedford Harbor Trustees are the subset who have jurisdiction over natural resources that were injured by PCBs.

The New Bedford Harbor Trustee Council was established by the Court as part of the settlement of the actions against the responsible parties, and specifies the three Trustees -- the Commonwealth of Massachusetts, the U.S. Department of the Interior, and the U.S. Department of Commerce.

### **2.1.2.1 Membership**

#### *Commonwealth of Massachusetts*

The Commonwealth's designated Trustee is the Secretary of Environmental Affairs, head of the Executive Office of Environmental Affairs. Assisting the Office are the Massachusetts Coastal Zone Management Office; Department of Fisheries, Wildlife, and Environmental Law Enforcement; and the Department of Environmental Protection. These offices provide assistance in the areas of environmental protection, wetlands, fisheries, wildlife, and coastal management.

A state's trust interests are defined as "natural resources, including their supporting ecosystems, within the boundary of a state or belonging to, managed by, or controlled by, or appertaining to such state..." (40 CFR §300.605)

#### *U.S. Department of the Interior*

DOI's lead agency for New Bedford Harbor is the U.S. Fish and Wildlife Service with assistance provided by DOI's Office of the Solicitor and Office of Environmental Policy and Compliance. DOI's trustee interests include:

- migratory birds
- anadromous fish
- endangered species
- marine mammals
- federally owned minerals
- federally managed water resources
- resources for which an Indian tribe would otherwise act as trustee
- federally owned or managed lands
  - national parks and monuments
  - national wildlife refuges
  - federal water projects

## *U.S. Department of Commerce*

NOAA has been designated as the Department of Commerce's lead agency responsible for damage assessment and restoration. NOAA's lead agency for restoration is the National Marine Fisheries Service (NMFS) assisted by NOAA's Office of General Counsel and the NOAA Damage Assessment and Restoration Program. NOAA's trust interests include:

- marine fishery resources and their supporting ecosystems
- anadromous fish
- endangered marine species
- marine mammals
- National Marine Sanctuaries and Estuarine Research Reserves

### **2.1.2.2 Structure**

Each trust agency designates a Trustee Representative (Trustee) to represent its trust interests. These Trustees may, in turn, appoint delegates to represent them when they cannot be present. Each Trustee is also provided legal advice through its respective agency's legal counsel.

The Trustees may appoint up to two ex-officio (non-voting) members from their respective State or federal agencies or sub-divisions. The U.S. Department of Justice and the Massachusetts Office of the Attorney General may each designate one ex-officio member. The Trustee Council may invite up to three individuals from the public or non-governmental environmental organizations to serve as ex-officio members to the Trustee Council.

Assisting the Trustees are a Technical Advisory Committee (TAC) which provides technical and scientific advice; a Financial Oversight Committee providing financial, accounting and investment advice; the Community Restoration Advisory Board (CRAB), a group of individuals chosen to provide a community perspective; and various work groups. The Trustees have appointed a Coordinator and Outreach Coordinator to support their efforts.

Trustee Council meetings are generally open to the public and time is provided for comment. To allow for formal participation and greater access, the Trustees appointed the CRAB to assist restoration planning by providing advice to the Trustees and information to the community (Appendix B). The composition of the CRAB is intended to reflect the following Harbor interests, occupation, and demographics:

- recreational fishing
- commercial fishing
- shipyards
- fish houses or seafood dealers/supply houses
- business
- environmental groups or interests
- river and harbor abutters
- historical perspective
- merchant shipping
- minority perspective

- recreational interest
- education

From a list of volunteers, individuals were selected who best represented these interests. An additional member was appointed by each of the four communities to represent the interests of that community.

### **2.1.2.3 Responsibility**

Trustee responsibilities are specified in the NCP (40 CFR §300.615). Their responsibilities include carrying out a damage assessment to quantify the effects of contamination on natural resources; developing and implementing a plan to restore, rehabilitate, replace or acquire the equivalent of injured natural resources; and requesting legal authorities (U.S. or state attorney general) to seek compensation for the damages assessed and the costs for planning. In developing a restoration plan, the Trustees must insure that the proposed actions are consistent with the intent of CERCLA and must comply with other applicable law.

### **2.1.3 U.S. Environmental Protection Agency remediation process**

Under CERCLA, natural resource trustees are not responsible for cleaning up spills or releases. This responsibility has been designated to EPA and the U.S. Coast Guard. This responsibility includes protection of human health as well as the environment. For the New Bedford Harbor Superfund Site, EPA decides on the methods and timing of clean-up, assisted by ACOE and the Massachusetts Department of Environmental Protection (MDEP). Such decisions can impact restoration activities, and the Trustee Council monitors EPA's activities.

Restoration options and activities are dependent on cleanup plans and success. Questions such as the degree of cleanup necessary, where cleanup actions will occur, what resources will be affected, and timing all play a large role in the restoration decision process. At many Superfund Sites, restoration occurs after the remedy has been completed. The New Bedford Superfund Site is large in scope with very high contamination levels. The site and remedy is complicated by other factors such as a high population density relatively close to the site, an active commercial and recreational waterfront, and the difficulty of performing large-scale toxic site cleanup underwater. This has led to delays in determining and implementing remedies for the contaminated material. The following section briefly summarizes the progress EPA has made to date.

#### **2.1.3.1 Hot Spot**

EPA selected a remedy for the most contaminated area of the harbor, known as the "Hot Spot", in a Record of Decision (ROD) in April 1990. Under this plan, roughly 10,000 cubic yards of sediment with PCB levels of 4,000 parts per million or more were to be dredged, and then "de-watered" (decanted) and incinerated on a site at the foot of Sawyer Street in New Bedford. This remediation was to begin in February 1993 and was expected to take 18 months.

Community opposition to the incineration portion of the ROD was widespread; therefore, siting work for the incinerator was stopped. A facilitated community forum (New Bedford Harbor Superfund Site Forum) was established with the purpose of developing an acceptable

alternative (if available) to incineration. The forum began meeting in December 1993. Through the efforts of the forum, EPA may decide to reopen the ROD and to begin exploring alternative technologies.

In April 1994, ACOE began Hot Spot dredging using a cutterhead dredge in the Upper Estuary portion of the site. Efforts were concentrated in a 5 acre site in the vicinity of the Aerovox plant. The dredge removed material to a depth of 1.5 to 2 feet. Once dredged, material was carried by floating pipeline and deposited in an engineered containment basin, or CDF on Sawyer Street. The material was then dewatered and stored under a floating cover. Water drawn off the sediment was treated to remove PCBs and heavy metals and returned to the harbor.

The Hot Spot phase of the dredging concluded in September 1995 after removing approximately 14,000 cubic yards of sediment. With this volume, an estimated 300 tons of PCBs were removed from the upper estuary. Another 160 million gallons of seawater collected through dredging operations was treated and returned to the harbor. The total cost, including construction, for the Hot Spot dredging was approximately \$28 million. (EPA 1995)

The Hot Spot sediments remain in the Sawyer Street CDF. The Site Forum has been reviewing alternative technologies for treating the contaminated sediments. The treatability study process began in 1994 and has resulted in a focus on three primary technologies: 1) solidification/stabilization; 2) contaminant destruction; and 3) contaminant separation and destruction. The results of the treatability studies have been published in a Hot Spot Feasibility Study Addendum. (Foster Wheeler, 1997)

#### **2.1.3.2 Proposed Cleanup for ROD II**

On January 17, 1992, EPA released a Proposed Plan to cleanup a portion of the site encompassing all of the Acushnet River Estuary and areas within the inner and outer New Bedford Harbor. The proposed remedy involved dredging roughly 118 acres of contaminated sediment from the Harbor with PCB concentrations levels exceeding 50 ppm, and 500 ppm in the marsh. Dredged sediments would be permanently stored in confined disposal facilities on the banks of the harbor. The second phase of the Harbor cleanup was expected to take approximately six years to complete.

In May 1992, in response to Trustee comments on the Proposed Plan, EPA proposed the Addendum Proposed Plan for the Upper Bay for additional Harbor clean-up in areas south of the Hurricane Barrier. This Plan proposed dredging two areas where PCB concentrations greater than 10 ppm have been found, and capping a third such area at the New Bedford Wastewater Treatment Plant outfall.

The Proposed Plan was revised to address the comments received and presented in November 1995. In the Upper Estuary, EPA proposed to dredge approximately 415,000 cubic yards of sediments containing greater than 10 ppm PCBs. A saltmarsh on the Fairhaven side would have areas containing more than 50 ppm PCBs dredged. Material from the dredging would be stored in CDFs along the shore and in a cove just north of Sawyer Street. In the Inner Harbor, material with PCB concentration greater than 50 ppm would be dredged and stored in a CDF in the North Terminal area. The two areas south of the Hurricane Barrier would also be dredged at the 50 ppm action level.

Community opposition over the proposed siting of a CDF in the cove north of Sawyer Street prompted EPA to reconsider siting options. This cove is adjacent to a residential area and playground, and long-term storage there of contaminated sediments raised concerns among local residents.

EPA issued a revised Plan in November 1996. The Plan contained many of the elements of the 1995 version but proposed alternative CDF sites to the cove. Under the Plan approximately 450,000 cubic yards of PCB-contaminated sediment would be dredged and placed in four CDFs (A-D). For the area north of Coggeshall Street, dredging would remove sediments with PCB levels above 10 ppm. Sediments with PCB levels above 50 ppm would be dredged in the saltmarshes and the area between Coggeshall Street and the Hurricane Barrier. As with previous proposals, water drained from the sediments would be treated before release in the harbor. The CDFs would be capped with an impermeable cover. (EPA 1996)

As cleanup proceeds over the next decade or so, the Trustee Council will need to periodically reexamine the New Bedford Harbor Restoration Plan, and modify or revise it as necessary.

## **2.2 Restoration planning**

Two primary Federal statutes apply to restoration planning. These are CERCLA and NEPA. Massachusetts also requires that the Massachusetts Environmental Policy Act (MEPA) be followed to the extent that restoration involves state agency action, financial assistance or, in certain instances, dispositions of state land. Consistent with these acts the Trustees must develop a restoration plan to document and guide future restoration actions and insure that decisions on restoration projects are made after consideration of all reasonable alternatives and public comment.

CERCLA requires restoration planning to take place prior to implementation of restoration projects. CERCLA states:

“Except in a situation requiring action to avoid an irreversible loss of natural resources or to prevent or reduce any continuing danger to natural resources or similar need for emergency action, funds may not be used under this Act for the restoration, rehabilitation, or replacement or acquisition of the equivalent of any resources until a plan for the use of such funds for such purchases has been adopted by affected Federal agencies, Governor or Governors of any state ... after adequate public notice and opportunity for hearing and consideration of all public comment.” (CERCLA § 96II(I))

Restoration projects may be implemented to respond to an emergency that may affect natural resources. In such an instance, the intent is to implement actions as quickly as possible to prevent or reduce imminent harm. Emergency actions do not require the development of a restoration plan. However, when there is no emergency, an approved restoration plan is required. The public must be provided the opportunity to comment and any comment received within the comment period must be considered before such a plan is approved by the Trustees.

The situation in New Bedford Harbor is not considered to be an emergency in the context of the statute. While the impacts to natural resources are alarming, the long-term duration of the

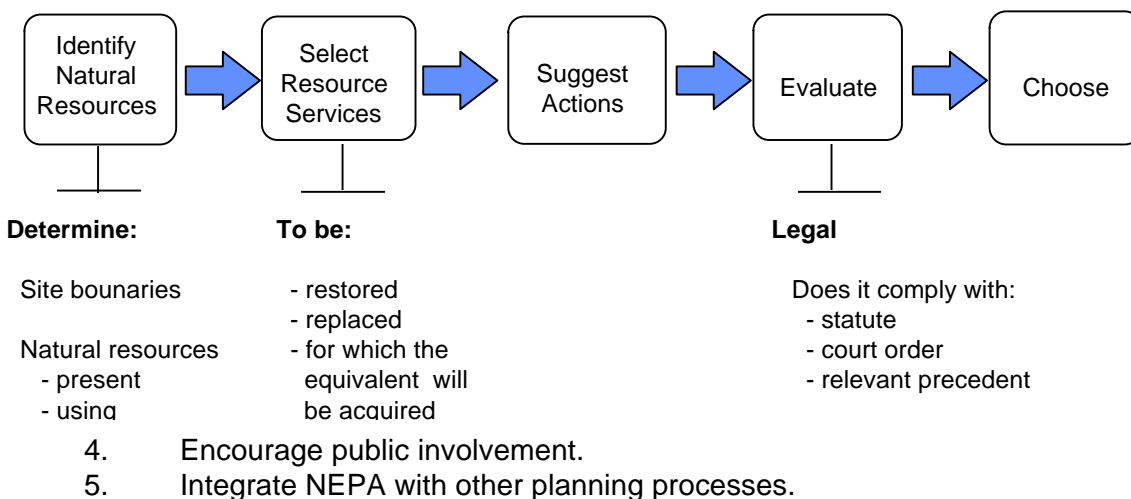


contamination precludes the need for immediate action. Quick action would benefit the natural resources, but concerted restoration planning may provide even more benefits by identifying the most urgent restoration needs and the types of projects that can best address those needs. The restoration planning process also allows the public to have a say in the types of projects under consideration.

NEPA requires that an environmental impact statement (EIS) or environmental assessment (EA) be prepared and approved before major Federal actions are undertaken. NEPA's goals are to:

1. Ensure that decisions are based on an understanding of the environmental consequences of actions.
2. Restore environmental damage.
3. Address all reasonable alternatives to minimize the impacts.

Figure 2.1  
**Restoration Plan Development**



The Massachusetts Environmental Policy Act takes a similar approach; the document used is called an environmental impact report (EIR).

In all cases, alternatives are developed and analyzed. The information is then put before the public; comments are invited; and a decision is rendered before projects are implemented. In an attempt to eliminate duplication and recognizing the common requirements of these acts, the Trustee Council has prepared one document which combines the requirements of CERCLA, NEPA, and MEPA.

Figure 2.1 summarizes the methodology used to develop restoration alternatives:

### **2.2.1 Overview of approach**

As has been mentioned previously, information on the cleanup levels and location must be considered in restoration decisions. Given the types of issues confronting the cleanup and its magnitude, it is likely that many years will elapse before the cleanup is complete. Rather than wait for such an occurrence, the Trustees decided to proceed with restoration planning before cleanup is complete. This approach requires the Trustees to proceed cautiously and to review and update the restoration plan as more information becomes available or actions are completed.

The Trustee Council will implement restoration projects in stages using available information from the cleanup process. Restoration projects that would not be affected by cleanup activities could begin in the near-term. This allows restoration to begin sooner and should result in greater benefits to the Harbor Environment. Additional solicitations and funding rounds would occur when cleanup actions are achieved. Examples of opportunities for additional solicitations include the issuance of Records of Decision for Harbor cleanup, completion of cleanup in specific areas, and when the entire cleanup is completed.

To assist this process, the Trustees have chosen to develop a programmatic environmental impact statement. The approach is to document the Trustee Council's goals, objectives and general project areas, and then work within an initial scope defined by what can be done now. Possible future actions can be identified but an analysis may not be possible given various unknowns. Rather, a generalized analysis will be performed with the specifics to be provided in environmental assessments on a project by project basis.

### **2.2.2 Injury Determination**

Restoration decisions are driven by the extent of injury to the natural resources and their users and the financial settlement that was based on those injuries. The original legal complaints filed by the Commonwealth of Massachusetts and the United States in federal district court identified injured resources and related economic impacts to area industry and residents.

Data has been collected to document the extent of injury. PCB contamination in waters, sediments, and living resources has diminished ecosystem biodiversity, reduced reproductive capabilities, and increased mortality in resident species of finfish and shellfish. PCBs have also accumulated or biomagnified across trophic levels, with impacts to birds and other predators.

EPA has documented injury to marine sediment, the water column, fish and shellfish, surface water, aquatic biota including 28 species in the Harbor, lobster and winter flounder (EBASCO, 1990). Massachusetts Division of Marine Fisheries documents injury to lobsters, shellfish (soft-shell clam and oysters), bottom dwelling and bottom feeding fish (eels, winter flounder, windowpane flounder). (Kolek and Cuervals, 1981)

The Trustees have identified the following injuries which can be best addressed through remediation and restoration activities:

- Reduced health of lobster, shellfish, finfish, and other organisms in New Bedford Harbor and adjacent areas;
- Diminished fishing opportunities in an area known for commercial and sport fishing;
- Reduced natural resource services because of impacts to public health from consuming seafood and participating in water or beach-contact recreation; and
- Development options in the New Bedford Harbor Environment are limited because of dredging and disposing of contaminated materials.

### Affected User Groups

Affected users include all groups associated with injured resources or their services within the New Bedford Harbor Environment. Human uses of the Harbor that have been affected by the injury to natural resources include commercial fishing, recreational fishing, water-based activities (boating, swimming, wading, and sunbathing), walking, viewing, picnicking, bird watching, transportation, and existence value, the value of knowing the Harbor is usable for recreation, walks and vistas.

On behalf of the Trustees and the public NOAA conducted three damage assessment studies of impacts to the lobster fishery, real estate market, and recreational bathing. The original complaints, the three NOAA studies, and the court record document the extent of injury to user groups. The record confirms that harvestable resources, their prey, their habitat, and associated human users have been affected by PCB contamination.

Diminished biological productivity and closed commercial and sport fishing and shellfishing can be translated into a direct economic loss for the local community. Contaminated sediment has delayed necessary navigational and port dredging, rebuilding local infrastructure (bridges), and removing debris like derelict vessels from harbor waters. Elevated contaminants limit recreational opportunities in the estuary and harbor.

More complete information on the extent of contamination, the injured natural resources, impacted uses or services, and the economic losses sustained can be found in Section 3.5.

### **2.2.3 Goal of restoration**

The main goal of restoration of the New Bedford Harbor Environment is to restore the natural resources which have been injured, destroyed or lost by release of hazardous substances into the New Bedford Harbor Environment.

Consistent with the requirements of CERCLA, the focus of the goal is the injured natural resources. The injured marine life, wildlife, birds, plants, and their supporting ecosystem are to be restored to their baseline levels. Given that the contamination occurred over many years, the determination of absolute baseline may be difficult to attain.

In an effort to reach this goal, the Trustee Council will seek opportunities to:

- Improve the health of living resources (such as finfish, shellfish, birds, and their prey);

- Restore degraded habitats essential to those living resources (such as vegetated wetlands, mudflats, waters, harbor sediments);
- Replace human uses compromised by contamination (fishing, recreation, and others); and
- Reestablish community confidence and pride through outreach programs, improved physical access, reopened fishing areas, enhanced aesthetics, and other components of the harbor fabric.

The object of restoration is to compress the timeframe of natural recovery. An August 1992 TAC meeting considered how concerted restoration might supplement natural recovery from storms, sedimentation, and chemical cycling. Several scientists estimated that it might take about 100 years for the Harbor Environment to reach some level of cleanliness acceptable to contact and consumptive uses. However, a well-orchestrated restoration program should compress that schedule into several decades.

#### **2.2.4 Commitments**

As a secondary goal of restoration, the Trustee Council is committed to use restoration activities to develop public awareness of the ecological and economic state of the Harbor Environment, how the deterioration and pollution of the environment affects citizens' everyday life, and how the Harbor Environment can be further enhanced through community involvement after the New Bedford Harbor Trustee Council's actions are complete.

The Trustee Council recognizes the importance of community involvement and the role the community can play in a successful restoration. In order to have an informed community, there must be a process of education. The Trustee Council will strive to provide information and access to restoration planning and activities and include the public whenever possible.

Restoration of injured natural resources will bring about public opportunities as the services provided by the natural resources are restored. With restoration will come economic benefits. As public confidence is restored in the Harbor as a clean and safe environment, greater use of the Harbor should result in economic rewards.

In support of its goals and commitments, the Trustee Council will do the following:

- 1) Select a suite of restoration projects in a logical, methodical and defensible manner. These projects will be developed with special attention to the needs, concerns, questions and comments of individuals in the communities of the New Bedford Harbor Environment.
- 2) Rigorously monitor and document project selection, development and execution to ensure that restoration proceeds in a timely and effective fashion.
- 3) Work with the community to receive advice on restoration options and to offer advice on ways for outside organizations to act with the Trustee Council for the benefit of the New Bedford Harbor Environment.

Success would be measured through a vigorous monitoring program beginning before remediation and continuing until after the last restoration action. Ideally the monitoring program should separate recovery into natural and enhanced components enabling the Trustees to document the effects of the restoration efforts.

### **2.2.5 Selection criteria**

In order to select the most appropriate projects for inclusion in the restoration plan, the Trustee Council established the following selection criteria.

1. Projects must restore the injured natural resources and associated activities of the area.

Projects will be evaluated on whether they restore, replace or acquire the equivalent natural resources that were injured as a result of the release of hazardous materials, including PCBs, in the New Bedford Harbor Environment. This is the specific guidance from CERCLA and all projects must meet this criteria before consideration of the remaining criteria. Restoration projects must address a natural resource injury whether through direct restoration of the resource or through restoration of the service that resource provided.

2. Priority will be given to projects within the New Bedford Harbor Environment, however, projects within the affected marine ecosystem that will have a direct, positive impact on the Harbor Environment will be considered.

Project ideas that are outside of the New Bedford Harbor Environment will be considered, provided that they restore injured natural resources within the New Bedford Harbor Environment. This can occur for species that feed or spend a life stage within (i.e., egg, larvae, fry or spawning), or seasonally enter the Harbor Environment but move out into Buzzards Bay or the Atlantic Ocean. Examples include bird populations, herring, alewives, eels, and crustaceans such as lobster.

3. Projects should ultimately enhance the public's ability to use, enjoy, or benefit from the Harbor Environment.

In addition to a project's potential for restoring natural resources, it will be evaluated on the basis of its potential to enhance the public's ability to utilize the Harbor Environment.

4. Priority will be given to those projects that give the largest ecological and economic benefit to the greatest area or greatest number of people affected by the injury.

Projects should provide the greatest good, and will be evaluated on the basis of whether they provide positive benefits to a more comprehensive area or population. Project ideas that benefit a particular individual rather than a group of individuals would be ranked lower under this criterion.

5. Projects should enhance the aesthetic surroundings of the Harbor Environment to the greatest extent possible, while acknowledging the ongoing industrial uses of the harbor.

The extent that a project recognizes the multiple uses of the Harbor and its impacts on those uses will be evaluated as well as its ability to enhance the overall beauty of the Harbor Environment. The harbor is an urban, mixed-use area which includes residential, commercial, recreational, shipping and industrial interests. Projects must recognize these harbor uses but also use available opportunities to improve the overall Harbor Environment for both natural resources and the public.

6. Ecological or economic effects of the selected projects should be identifiable and/or measurable, so changes to the New Bedford Harbor Environment can be documented.

Projects will be evaluated with respect to discrete, quantifiable results, so that success or failure can be determined. All projects will be monitored to determine whether expected results are being achieved or whether unexpected impacts are being caused.

7. Preferred projects are those that employ proven technologies with high probability of success.

Projects will be evaluated on their likelihood of success based upon the method being proposed. Factors to be considered include whether the proposed technique or action is applicable to the project, whether it has been used before, and whether it was successful.

8. Projects should be cost effective.

Preferred projects are those which have a high benefit to cost ration; in some cases, projects may simply be too expensive for the Trustee Council to undertake.

9. Projects should provide an opportunity for community involvement that can continue even after the Trustee Council's actions have ended.

Projects will be evaluated on whether the public can continue to be involved after the Trustee Council has concluded its part of the work. The Trustee Council has no permanent funding; once the settlement monies have been expended, the Trustee Council will cease operations.

### **2.2.6 Restoration priorities**

Before specifying restoration projects, the Trustee Council identified priority areas based on the damage assessment and other documentation of injury. Priorities were based on the resource types injured, as follows:

- 1) marshes or wetlands

Wetlands are an important habitat component which provide food, shelter, and nursery areas to a variety of animals and sea life. A functioning wetland can filter waste material improving water quality in the surrounding area. High levels of PCBs are present in wetlands on the Fairhaven side of the river, with potential effects on the flora and fauna of these wetlands, as well as other species that depend on them.

- 2) recreation areas

Through the release of contaminants, recreational opportunities were lost. This included, but was not limited to, beaches and parkland. Access to the Harbor was curtailed because of the possible harmful affects of being in or near the water, or by eating affected seafood.

### 3) water column

Though the majority of PCBs reside in the sediment, PCBs are still introduced to and present in the water column through chemical and mechanical exchange between the waters and sediments, as well as PCB residue remaining in the New Bedford sewage system.

### 4) habitats

Habitat is the complex of geographic features, hydrologic conditions, and living organisms within an ecosystem that provide food, nesting and resting areas, and shelter for fish and wildlife. Habitat was negatively impacted through the release of PCBs into the Harbor Environment. Restoration, enhancement, or replacement of habitat has the potential to substantially improve the abundance and health of a wide variety of living resources in the NBH Environment

### 5) living resources

Numerous species, including shellfish, marine fish, anadromous fish, and birds have been directly affected by PCBs. Species-specific restoration actions will focus on the affected resources.

### 6) endangered species

The primary endangered species of concern is the roseate tern, a sea bird present in the affected environment. PCBs have affected the reproductive and development functions of this species as well as of the common tern. These species reside in Buzzards Bay and spend time in the New Bedford Harbor Environment when they feed, and as a consequence, ingest PCBs leading to death and other effects.

By identifying restoration priorities, the Trustee Council was able to focus attention on the specific groups natural resources needing restoration. These priorities focus on the trust interests of the trustee agencies.

## **2.2.7 Scoping process: Development of a restoration plan**

The following sections document the development of the restoration plan, including the efforts of the Trustee Council to develop alternatives, how the alternatives were analyzed, and how decisions are made. The types of issues that shaped this process and their outcome are identified.

### **2.2.7.1 Define process**

Ideally, restoration planning would occur soon after a hazardous spill or contaminant release. Cleanup and restoration could then follow in turn. In the case of New Bedford Harbor, neither of these events occurred soon after the release. The case was one of the first brought under

CERCLA and was settled before a full damage assessment with restoration option development occurred. Cleanup options have not been finalized adding to uncertainty over what the potential cleanup will entail, possible impacts on restoration projects, and because of this, whether, and to what extent restoration should proceed at this time.

Keeping these concerns in mind, the Trustee Council embarked on a concerted approach to develop alternatives with public involvement. The alternatives would be included in the restoration plan/EIS. What follows is a description of the process by which alternatives were developed for the initial round of restoration activities. It is anticipated that future rounds will occur under the process defined in Section 5.4.

#### **2.2.7.2 Workshop**

The Trustee Council hosted a restoration workshop in Fairhaven, Massachusetts in June 1993. The purpose of the workshop was to bring together the Trustee agencies and local officials to discuss and develop a range of restoration alternatives. During the course of the workshop, the group discussed restoration plan goals which included maximizing environmental values with the money available, the importance of having an overall goal, and the consideration of economic and social factors. Alternative strategies for approaching restoration were developed; these included historic habitat restoration, maximization of habitat diversity, or taking a specialized approach appropriate to the area.

Background discussions focused on 1) site history; 2) the physical environment of the Harbor; 3) determination of injury and damages; 4) what is known about the contaminants and the effects; 5) legal context; 6) geographic scope; 7) EPA cleanup actions; and 8) natural resources present and their extent of injury. The purpose was to develop a common understanding of the political and legal history of the site, understand the technical data for the area, and attempt to reach a consensus as to where restoration planning should go.

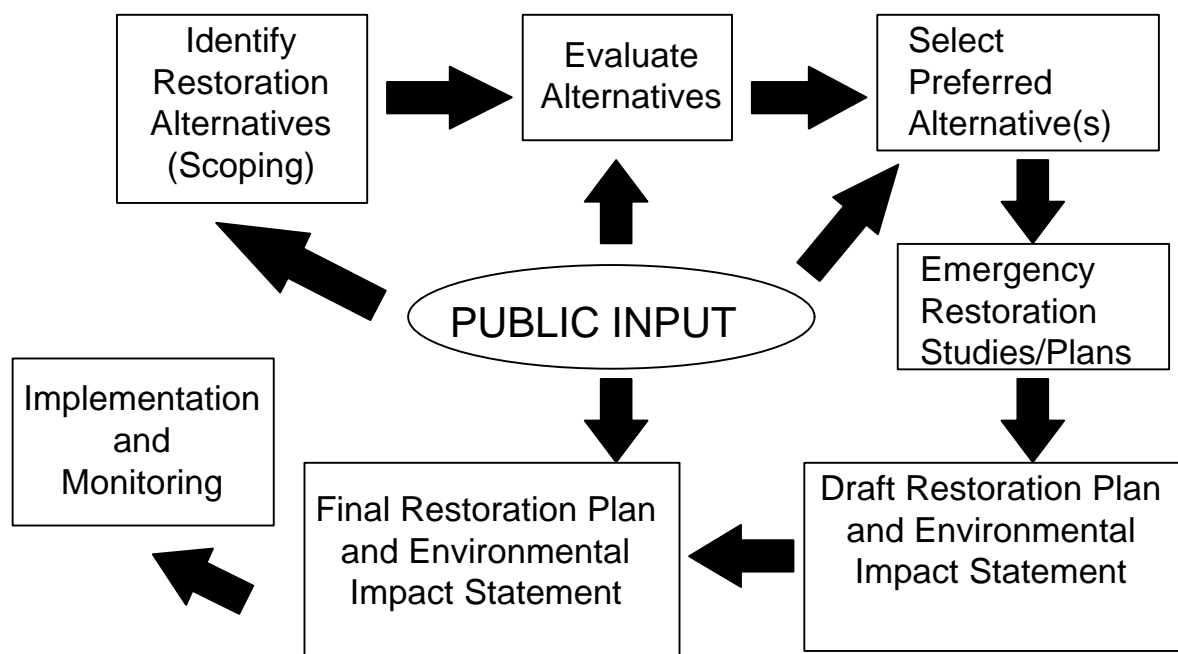
The workshop discussed restoration alternatives for shellfish, lobsters, marine fish, and wetlands. Specific alternatives included:

- 1) Creating artificial reefs to increase utilization of finfish. Included in discussions were the use of clean derelict vessels which could be placed in deeper water areas. There were concerns about attracting PCB laden fish out of the Harbor thus spreading the contamination.
- 2) Dredging to increase utilization of the Harbor.
- 3) Increasing public use of the harbor through the construction of boat ramps.
- 4) Repairing or building fish runs around dams on the Acushnet River to allow anadromous fish such as alewives and blueback herring to return to historic areas.
- 5) Replanting or seeding submerged aquatic vegetation beds such as eelgrass to provide nursery habitat and stabilize the sediment.

There was an overall consensus that the alternatives must fit within the needs of the community as well.



Figure 2.2  
Development of a Restoration Plan - Public Participation



The workshop also discussed whether restoration planning could proceed without cleanup decisions in place. The participants entertained the idea that restoration could occur in phases to allow some projects to move forward. A need was identified to educate and include the public in restoration planning; therefore, the workshop participants decided that public outreach should begin immediately.

### 2.2.7.3 Public information activities

CERCLA requires public notice, public hearing and consideration of comment before a restoration plan can be approved (CERCLA §9611(l)). The Trustee Council recognizes and encourages full public participation in the restoration planning and implementation process. Contamination impacts result in direct injury to the natural resources but also in injury to the public through the loss of economic revenue and enjoyment of the resource.

As can be seen in Figure 2.2, there are several opportunities for formal public involvement.

The public is encouraged to suggest restoration alternatives or ideas. The local community has the best knowledge of the needs of the area. When these are applied within the constraints of CERCLA, restoration alternatives result. The public can assist in evaluation of alternatives either directly as an advisor to the Trustee Council or by providing comment in writing or at public hearing. Once preferred alternatives are chosen and the RP/EIS drafted, the public is provided an opportunity under the National Environmental Policy Act and CERCLA to comment. Involvement does not end there.

The public can assist in implementing projects and volunteer opportunities will be available. Moreover, many projects will require monitoring after completion to see if the work was

effective and whether the expected results are being achieved. The public can play a key role and may even take over the maintenance and operation of specific projects. It is the hope of the Trustee Council that once the Council's work is finished, the public will take responsibility for continuing the work which has been implemented.

#### **2.2.7.3.1 Notice of Intent to Prepare and Environmental Impact Statement**

On February 28, 1995, the Trustee Council published in the *Federal Register* (60 FR 10835) (Appendix B) a "Notice of Intent to Prepare an Environmental Impact Statement" for the restoration of the New Bedford Harbor Environment. The notice initiated the formal public scoping process for the RP/EIS. Given the complexity of the restoration and the comparatively large geographic scope, the Trustee Council determined that an EIS was the proper means to determine impacts to the environment. This also provided the public with greater opportunity for participation through suggesting various restoration alternatives. The notice announced a series of public scoping meetings and requested comments. The next section summarizes the results of those meetings.

#### **2.2.7.3.2 Public information meetings**

An informed public can contribute a great deal to restoration planning. The public needs to understand restoration concepts, legal requirements (ie: use of settlement funds), and the roles of the various groups.

In February/March of 1995, the Trustee Council held public information (scoping) meetings to introduce the public to restoration concepts and requirements. An informational meeting was held in each of the four affected communities (Acushnet, Dartmouth, Fairhaven and New Bedford) surrounding the harbor, and separate briefings were conducted for the Superfund Site Forum, the Harbor Development Commission, the New Bedford Seafood Industry Coalition, municipal officials, and the media. Material presented at the meetings included information on the Trustee Council, the court case against responsible parties and the resulting settlement, restoration concepts, statutory requirements, and National Environmental Policy Act requirements. The following is a summary of each.

##### New Bedford

Approximately 50 people were present at the New Bedford meeting, including city and town officials. Support was expressed for using restoration monies to assist in the construction of the secondary wastewater treatment plant which completed and operating in August 1996. EPA suggested that a trust fund be established to fund short term projects, that a park be constructed adjacent to the wastewater treatment plant, and offered support for other short term projects such as repairing herring runs, shellfish transfers, wetland restoration and shoreline clean-up. Other suggestions included clearing derelict vessels and constructing a soccer field to replace a field on Sawyer Street; written suggestions encompassed planting trees on public lands, establishing a harbor patrol unit to assist monitoring and enforcement, and funding modifications to the Fairhaven wastewater treatment plant.

##### Dartmouth

The Dartmouth meeting was attended by 2 individuals. Suggestions were received to modify the Hurricane Barrier by creating additional openings to increase tidal flow, to extend the Fairhaven outfall through one of the openings, to eliminate or modify combined sewerage overflows, and to install a bubble curtain just north of the Hurricane Barrier to contain hazardous releases, aerate the harbor, and prevent ice formation.

#### Acushnet

Approximately 20-25 people attended the Acushnet meeting; the discussion focused on repairing fish ladders at the three dams on the Acushnet River, north of Wood Street.

#### Fairhaven

The Fairhaven meeting was attended by approximately 35 people. As in Acushnet, there was support for repairing the fishways, establishing shellfish relays, enhancing tidal flow to a marsh in Fairhaven, as well as monitoring after projects are completed.

A common theme of the meetings was the public desire to use restoration funds as soon as possible to bring benefits to the area now rather than later.

#### **2.2.7.4 Legal guidance**

The restoration planning process is prescribed by law. Funding comes from settlement monies under the control of the U.S. District Court, District of Massachusetts. To request funding, the Trustee Council must seek approval from the Court and provide justification for the funding. First, however, the request must be approved by the U.S. Department of Justice (DOJ) and the Massachusetts Office of the Attorney General (Massachusetts AG). In deciding whether to fund a particular project, the Trustee Council, DOJ, Massachusetts AG, and the Court look to the guidance provided by CERCLA, the consent decrees for the settled cases, and case law or opinions from other CERCLA cases.

The Trustee Council is responsible for making the first-level determination on whether a particular restoration idea or project is allowed under CERCLA and the Consent Decrees. CERCLA and the Consent Decrees require that restoration activities restore, replace or acquire the equivalent of the resources that were injured, and define the area where this may take place, but remain silent on which restoration projects are allowed. When it is unclear whether particular restoration projects are legally allowed, the Trustees seek legal guidance from their counsel, who in turn can seek guidance from DOJ and/or Massachusetts AG.

A result of the public information/scoping meetings, and other Trustee Council discussions, were a series of legal questions for which guidance was required before restoration planning could proceed.

#### Restoration before Cleanup

The Trustees had been asked to consider implementing short-term restoration projects before cleanup decisions were made. Restoration planning efforts are more difficult when there are no cleanup decisions in place and CERCLA does not speak directly to this issue. Realizing this and in response to inquiries, the Trustees sought guidance from DOJ.

The advice received, and applied by the Trustee Council, is as follows:

- 1) Projects must be consistent with the restoration plan being developed.

While the actual restoration plan had not been written, the expected scope of the plan was being developed through the Restoration Workshop, work by the Trustee Council and its committees, and by the comments received at the public information meetings. Restoration goals, geographic scope, selection criteria and proposed project areas were adopted.

- 2) Projects must not be undone or negatively impacted by EPA's remediation work, either now or in the future.

EPA's prior and current remediation plans give an indication of the general areas where cleanup activities will occur. EPA has completed cleanup of the Hot Spot and has presented proposals for the Harbor. The proposals defined areas being considered for cleanup and proposed locations of confined disposal facilities (CDF). For the next phase of the cleanup, areas to be remediated will be dredged, and the material will be deposited in CDFs along the shore. These locations are obvious areas to avoid for restoration activities at this time. Discussion of navigational dredging is occurring and the Trustees will avoid these areas as well.

Areas for restoration that are not likely to be directly affected by the cleanup include the Outer Harbor (except for isolated areas of contamination), Clark's Cove, the Acushnet River north of Saw Mill Pond, shoreline areas on the eastern side of the Harbor south of Coggeshall Street, and other areas within Buzzards Bay.

- 3) Sufficient funds must be retained to accomplish meaningful and necessary restoration work after EPA's cleanup is finished.

The Trustee Council received a recommendation from the TAC to set a funding limit for short-term restoration projects. The TAC suggested that 10-15% (\$2.1 - 3.15 million) of the natural resource damages restoration fund be used for short-term restoration. If this total were disbursed, and no other major disbursements occurred, this amount would be replenished within 2-3 years at the current rate of interest.

The suggested amount will allow several projects to be funded but at the same time allow the majority of the money to be retained for post-cleanup work. If long-term restoration was delayed, the full amount could be available through the addition of interest payments.

The Trustee Council decided to wait before setting a limit on the amount of money for short-term projects. This allows the Trustees to select projects on merit rather than exclude projects that exceed the spending limit.

### Sewer Related Work

Another area where the Trustee Council sought legal advice with respect to potential restoration projects was whether restoration settlement funds could be used for sewer related

work. While the initial request sought funding to help construct the New Bedford wastewater treatment plant, subsequent request were also made by Dartmouth and Fairhaven. The Trustee Council recognized the worth of the project in terms of benefits to natural resources and the community through an improvement in water quality, but questioned whether settlement funds could or should be spent on a cleanup required under a separate statute, the Clean Water Act. The legal guidance received was that restoration settlement funds may not be used to fund projects that were required by a separate consent decree, court order, statute or regulation. The use of other settlement monies to pay for an independent prior obligation is not proper. The Trustee Council adopted this guidance as policy. The guidance and subsequent policy was and is not restricted to any particular project, but certainly applies to, and restricts funding for, sewer related projects.

#### **2.2.7.5 Request for Restoration Ideas**

Responding to public requests for a process to submit ideas, and continuing the scoping process to develop alternatives, the Trustee Council issued a "Request for Restoration Ideas" (RFI) in the *Federal Register* (60 FR 52164, October 5, 1995) and the *Massachusetts Environmental Monitor* (October 23, 1995). Groups (agencies, communities, academia, etc.) or individuals who had ideas for restoring the injured natural resources were requested to formally submit their ideas for consideration. Individuals who had previously submitted unsolicited ideas were requested to resubmit them under the RFI. Unlike a request for proposals, the applicants were not submitting requests for funding to implement a specific project, however, it was explained that after review and acceptance by the Trustee Council, the ideas could lead to a request for proposals or other procurement action. Applicants were advised that ideas would become public and that proprietary information should not be provided.

In submitting ideas, applicants were provided forms on which they could provide brief descriptions of their idea, its methodology and merits. The applicants provided explanations of how their idea would meet the selection criteria (Section 2.2.4). Budget information was requested, but was not required.

A total of 56 ideas were submitted. The following provides information on the source, cost, and focus of the ideas submitted:

Submitted by:

City/town government	18
State/federal agencies	13
Groups/individuals	25

Number of ideas received from:

Acushnet/Dartmouth/Fairhaven/New Bedford	36
Other areas	20

Total cost if implemented: \$76,232,564

The specific ideas received, follow:

## Marshes/Wetlands

1. Restoration of Padanaram Salt Marsh, Dartmouth, MA
2. Restoration of Nonquit Salt Marsh, Dartmouth, MA

## Recreational Areas

1. Rogers Street boat ramp
2. Taber park
3. Riverside Park Belleville Avenue recreational marine park
4. Boat ramp, fishing pier, parking area (Dartmouth)
5. Sportfishing piers (Dartmouth, Fairhaven, New Bedford)
6. Acushnet River recreation/preservation district

## Water Column

1. A living machine for water purification and habitat restoration in New Bedford Harbor
2. Bayview sewer project
3. Sol-E-Mar area sewer project
4. Rogers Street/Clarks Cove storm drain
5. East Clark's Point pumping station
6. Cove Road pumping station
7. Removal & disposal of PCB contaminated grit from main interceptor (from Pearl Street to Cove Street)
8. Eliminating toxic chlorine discharge from Fairhaven wastewater treatment plant
9. New Bedford hurricane barrier eastern box culvert
10. Relocation of Fairhaven sewerage outfall: hurricane barrier modification
11. Bubble curtain installation: New Bedford barrier gate opening
12. Pumpout vessel for marine sanitary devices

## Habitats

1. Constructed reefs for lobster and fish habitat enhancement
2. Artificial reef creation using abandoned fishing vessels
3. Eelgrass habitat restoration
4. Artificial reef

## Living Resources

1. Fisheries restoration for Dartmouth Areas II and III
2. Upper Sconticut Neck/Priest's Cove shellfish restoration and sewer work
3. Restoration and management of the New Bedford area shellfishery
4. Massive seeding of large juvenile bay scallops in New Bedford harbor area
5. Hatchery startup assistance with Taylor Seafood
6. Acushnet aquafarm development
7. Shellfish restoration Town of Acushnet
8. Restoration of the Acushnet River herring run (2 ideas)
9. Anadromous fish restoration on the Weweantic River

## Endangered Species

1. Restoration and management of tern populations.
2. Buzzards Bay tern restoration and stabilization project
3. Tern restoration - Penikese Island

#### Other

1. Removal of Native American artifacts
2. Padanaram Harbor dredging
3. New Bedford Police Department Harbor Unit
4. Land conservation - Sconticut Neck marshes and coastline
5. Build a dam at the I-195 bridge with possible dewatering pump
6. Design and development of the New Bedford Aquarium complex
7. Amos Pratt - House 1810
8. Wood Street - North
9. Herman Melville Shipyard cleanup

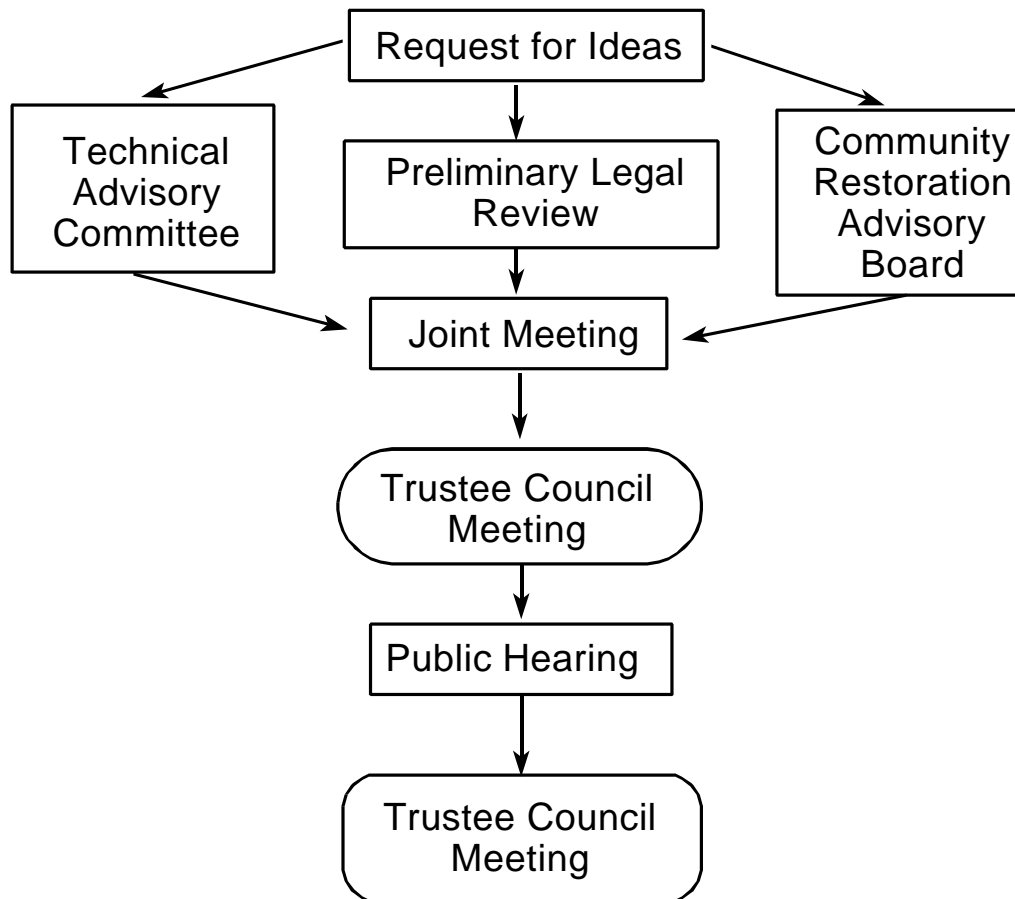
#### Studies/Plans

1. Wetlands restoration planning and implementation: New Bedford Harbor Environment
2. Salt marsh restoration
3. Planning for nitrogen removal from the Fairhaven wastewater treatment plant
4. Long-term monitoring and restoration of shellfish habitats
5. Terrestrial ecological restoration habitat inventory, categorization and mapping project
6. Stock assessment of shellfish and predators in New Bedford, Fairhaven and Dartmouth, and market research for the products
7. New Bedford Harbor avian monitoring and restoration project
8. New Bedford/Fairhaven harbor master plan
9. Restoration management/visualization model of New Bedford harbor ecosystem
10. City of New Bedford - from brownwaters to green

#### Evaluation

Figure 2.3 shows the process by which ideas were evaluated, comments received and decisions made.

Figure 2.3  
Request for Ideas Process



The ideas underwent three concurrent reviews, legal, technical and public.

The legal review was conducted by the Trustee Council's legal counsel to determine whether the ideas were acceptable under CERCLA and the consent decrees resulting from the settled cases against the responsible parties. All 56 ideas were reviewed, but this review did not judge the technical merit of an idea, nor did it rank the ideas. Those judged unacceptable were not eliminated from consideration by the technical or public review. Studies were judged separately since they might not directly restore a resource, but instead, might provide further information needed for restoration planning.

The TAC, assisted by other technical staff within the trustee agencies, reviewed the ideas. The 56 ideas were categorized by restoration priority (marshes/wetlands, recreation areas, etc.). Rather than have each reviewer evaluate all 56 ideas, ideas were assigned to reviewers based upon the reviewer's area of expertise. Reviewers did not review their own submissions. Weighted point scores were assigned using the selection criteria and total points tallied.



Comments were provided and suggestions made as to whether the idea could be implemented earlier rather than later or whether further information or action was needed. The top scoring ideas for each restoration priority were then determined.

The CRAB evaluated all 56 ideas. CRAB members did not review their own ideas or the ideas submitted by the organization or community they represented. In reviewing the ideas, the CRAB considered whether the idea could be implemented earlier, before the cleanup occurred. Majority votes were used to select the preferred ideas.

At the end of the evaluation process, the three groups met to develop recommendations to the Trustee Council on which ideas should be pursued. It was the first time each group shared its results with the others. The results were compared and discussions held on the ideas for which there was disagreement. At the conclusion, it was decided that a joint recommendation would be made for those ideas for which there was agreement as well as separate recommendation by both the CRAB and TAC for ideas which either group favored.

The recommendations were as follows:

#### Marshes/Wetlands

- Restoration of Padanaram Salt Marsh, Dartmouth, MA (CRAB/TAC)
- Restoration of Nonquit Salt Marsh, Dartmouth, MA (TAC)
- Wetlands restoration planning and implementation: New Bedford Harbor Environment (TAC)

#### Recreational Areas

- Riverside Park Belleville Avenue recreational marine park (CRAB/TAC)
- Taber Park (CRAB)
- Sportfishing piers (Dartmouth, Fairhaven, New Bedford) (TAC)

#### Water Column

- Hurricane barrier eastern box culvert (CRAB/TAC)
- Bubble curtain installation: New Bedford barrier gate opening (CRAB)

#### Habitats

- Eelgrass habitat restoration (TAC)

#### Living Resources

- Restoration/management of the New Bedford area shellfishery (CRAB/TAC)
- Restoration of the Acushnet River herring run (CRAB/TAC)

#### Endangered Species

- Buzzards Bay tern restoration and stabilization project (TAC)

#### Other

- Land conservation - Sconticut Neck marshes and coastline (CRAB/TAC)
- New Bedford/Fairhaven harbor master plan (CRAB)
- Design and development of the New Bedford Aquarium complex (CRAB)

#### Public presentations/review

A Trustee Council meeting was held on April 9, 1996, to receive the recommendation of the Council's advisory groups and to hear presentations from individuals and organizations that had submitted ideas. The advisory group recommendations were made public and explanation was provided on why specific ideas were favored. The meeting also provided an opportunity for the applicants to explain their ideas and for the Trustees and their advisors to ask questions. Fifteen ideas were presented at this meeting.

This meeting initiated a 30-day public comment period, from April 9, 1996 to May 9, 1996, during which the public was invited to review the ideas and provide written comment. During the comment period an opportunity was provided for idea authors to meet with the Trustee Council's legal counsel to discuss questions regarding the legal determination of whether or not settlement funds could be used to fund their ideas.

A public hearing on April 30, 1996, attended by approximately 100 people, was held to provide an opportunity for the public to comment on individual ideas. Comments were presented on several of the ideas. The two ideas receiving the most support were a feasibility study for an aquarium complex in New Bedford, and a park in the vicinity of Belleville Avenue and Riverside Park. Other ideas receiving favorable comment included shellfish restoration and management, salt marsh restoration, construction of Taber Park, funding for a harbor master plan, funding for wastewater pump stations, tern restoration, funding for archeological work on Native American artifacts, restoration of fish runs on the Acushnet River, construction of sportfishing piers, and a modeling study of the New Bedford Harbor ecosystem.

#### Trustee Council preferred alternatives

After evaluating the ideas received, considering the recommendations of its advisors, and reviewing the public comment received, the Trustee Council met on May 14, 1996 to decide on which of the 56 ideas to pursue for possible implementation. This also concluded the initial scoping process for the first round of ideas. The Trustees recognized that further technical or legal analysis needed to be done along with discussions with project proponents which could lead to changes in the scope or the idea or determine that the idea was not feasible. After discussion, the Trustees agreed unanimously agreed to pursue the following ideas:

1. Padanaram Salt Marsh Restoration
2. Nonquitt Salt Marsh Restoration
3. Restoration & Management of Tern Populations
4. Taber Park
5. Restoration and Management of New Bedford Area Shellfishery
6. New Bedford/Fairhaven Harbor Master Plan
7. Land Conservation - Sconticut Neck Marshes and Coastline
8. Wetlands Restoration Planning and Implementation: New Bedford Harbor Environment
9. Herring Run Restoration
10. Hurricane Barrier Box Culvert
11. Riverside Park Belleville Avenue Recreational Marine Park
12. Eelgrass Habitat Restoration

The Trustees also addressed the issue of how much money should be spent on early projects. For multi-year project ideas, the Trustees expressed their desire to fund only the first two years, monitor their success and then make a later determination to continue funding once more information is available on EPA's cleanup plans.

These project ideas are considered to be the preferred alternatives. An analysis of these ideas can be found in Chapter 4.

### **2.2.8 Determination of baseline for monitoring**

PCB contamination of New Bedford Harbor has occurred since the 1940's. The Harbor is an industrialized, mixed-use area with other sources of contamination. As will be described in Chapter 3, it is likely that there were pollution sources going back to the earliest time of settlement. The Trustee Council acknowledges that the cleanup and restoration efforts cannot address all of the impacts on the harbor. The focus must be on the impacts caused by the release of PCBs and other hazardous materials from the facilities. In order to better understand the state of the Harbor Environment, the Trustees issued a contract to determine the historical natural resources and uses of the harbor as well as the existing natural resources. This information has been incorporated into Chapter 3. This will assist the Trustees in determining where restoration should occur, how extensive it should be, and when it will be achieved.

To determine current status and health of the harbor shellfish resources, the Trustee Council has funded the Massachusetts Division of Marine Fisheries to conduct a shellfish assessment and sanitary survey. This work will provide information on the abundance of the shellfish resource within the inner harbor, its range, variety and the degree of PCB or other contamination present. The results, could lead to increased utilization and restoration of other areas.

Where existing information on the natural resources of New Bedford Harbor is available, it has been incorporated into Chapter 3 of this document. Where necessary information is lacking, the Trustee Council may fund additional studies.

## CHAPTER 3: THE AFFECTED ENVIRONMENT

<b><u>Chapter Outline:</u></b>	<b>Page</b>
3.1 Geography .....	3-3
3.2 Physical Environment.....	3-4
3.2.1 Geomorphology .....	3-4
3.2.1.1 Shorelines .....	3-4
3.2.1.2 Marine Sediments.....	3-5
3.2.2 Hydrology and Bathymetry.....	3-6
3.2.2.1 Acushnet River and Watershed.....	3-6
3.2.2.2 New Bedford Harbor Estuary.....	3-6
3.2.2.2.1 Bathymetry.....	3-6
3.2.2.2.2 Dynamics .....	3-7
3.2.2.3 Buzzards Bay .....	3-8
3.2.3 Climate .....	3-8
3.3 Biological Environment.....	3-9
3.3.1 Habitats.....	3-9
3.3.1.1 Fresh water and Upland habitats.....	3-9
3.3.1.2 Salt Marsh .....	3-14
3.3.1.3 Tidal flats and Soft Bottoms .....	3-18
3.3.1.4 Beaches and Rocky Shores .....	3-20
3.3.1.5 Sea grass Beds .....	3-21
3.3.1.6 Open Water Habitats.....	3-21
3.3.1.7 Interaction Among Habitats .....	3-22
3.3.2 Plankton.....	3-22
3.3.3 Coastal Plants.....	3-23
3.3.4 Marine Invertebrates .....	3-25
3.3.5 Fish .....	3-28
3.3.6 Birds .....	3-30
3.3.7 Mammals - Terrestrial and Marine.....	3-35
3.3.8 Endangered Species .....	3-35
3.4 Human Environment.....	3-35
3.4.1 Population.....	3-35
3.4.2 Historic Patterns of Natural Resource Use and Impacts .....	3-37
3.4.2.1 Settlement Period.....	3-37
3.4.2.2 19th Century.....	3-38
3.4.2.3 Early 20th Century.....	3-40
3.4.3 Current Patterns of Natural Resource Use and Impacts .....	3-46
3.4.3.1 Manufacturing.....	3-46
3.4.3.2 Tourism and Recreation .....	3-47
3.4.3.3 Offshore Fishing and Maritime Industries .....	3-48
3.4.3.4 Inshore Fishing.....	3-48

3.4.3.4.1 Commercial Fishing .....	3-48
3.4.3.4.2 Recreational Fishing .....	3-51
3.4.4 Impacts of Current Uses on Coastal Resources .....	3-51
3.4.5 Current Land Use.....	3-54
3.4.6 Baseline for Restoration: Mid-20th Century .....	3-56
3.4.7 Future Directions - New Bedford's Waterfront .....	3-58
3.5 Injury to the Environment.....	3-59
3.5.1 Contaminant distributions .....	3-59
3.5.1.1 Pre-cleanup .....	3-59
3.5.1.2 Post-cleanup .....	3-65
3.5.2 Ecological injury .....	3-65
3.5.2.1 Species .....	3-65
3.5.2.2 Habitats and Communities .....	3-67
3.5.2.3 Wider Buzzards Bay Ecosystem .....	3-68
3.5.3 Losses to the Public.....	3-69
3.5.3.1 Fisheries.....	3-69
3.5.3.2 Environmental Quality .....	3-70
3.5.3.3 Lost Recreation Use of Beaches.....	3-70
3.5.3.4 Total Quantified Losses to the Public.....	3-70

## CHAPTER 3: THE AFFECTED ENVIRONMENT

New Bedford Harbor is an estuary--a place where fresh and salt water mix in a dynamic coastal environment--within a larger estuary, Buzzards Bay. The unique characteristics of New Bedford Harbor and Buzzards Bay are a result of this dynamism: interactions among the waves and tides of the sea, the winds of the atmosphere, the flow of rivers and wetlands. Temperatures and salinities change; sediments are deposited or scoured; creatures in the water, land and air eat and are eaten, transferring energy and materials into, out of, and throughout the ecosystem.

These estuarine environments are home to about 150,000 people as well, living and working in the four communities on the banks of the New Bedford Harbor Estuary. This human environment is at least as complex as the physical environment, and at least as significant an aspect of the affected environment. Particularly relevant to natural resource restoration issues are human uses of the environment, whether commercial, recreational, or simply aesthetic.

In order to assess the potential impacts of natural resource restoration on the New Bedford Harbor Environment, both human and natural aspects of the environment must be considered, as well as interactions between the two: human uses of the environment. An examination of the effects of PCB contamination on the environment and the economy of New Bedford Harbor is an essential component of this assessment.

### 3.1 Geography

New Bedford Harbor is an urbanized tidal estuary on the western shore of Buzzards Bay, in southeastern Massachusetts. The City of New Bedford and the Town of Dartmouth are situated on the west bank of the Harbor, while the Towns of Fairhaven and Acushnet occupy the east bank. The Acushnet River flows north to south into the New Bedford Harbor Estuary.

For restoration purposes, the New Bedford Harbor Trustee Council (NBHTC) has defined the New Bedford Harbor Environment (the affected environment) as the Acushnet River and its watershed from the New Bedford Reservoir south through New Bedford Harbor, to the outermost fishing closure line (**Figure 1.1**). However, emphasis for restoration will be placed on the part of the site most affected by PCB contamination of New Bedford Harbor: estuarine and marine areas in which fishing closures have been implemented as a result of the Harbor contamination, along with their natural resources and adjacent shorelines. These saltwater portions of the New Bedford Harbor Environment will be referred to as the New Bedford Harbor Estuary, bounded in the North by Wood Street and in the South by the Area III closure line (**Figure 3.2**). The Estuary may be further subdivided into the Upper Acushnet River Estuary, from Wood Street to the Route 195 bridge; Inner New Bedford Harbor, from Route 195 to the Hurricane Barrier; and Outer New Bedford Harbor, from the Barrier to the Area III closure line, including Clarks Cove. The boundaries established by the US Environmental Protection Agency (EPA) for the New Bedford Harbor Superfund Site conform roughly to those of the New Bedford Harbor Estuary.

New Bedford, Fairhaven, Dartmouth and Acushnet, the communities adjoining the New Bedford Harbor Estuary, are those which have been most affected by the contamination of the Harbor. The human environment of the New Bedford area is discussed more fully in Section 3.4, but it is important to note here that the area's economic, cultural, and historical links to the marine environment are strong. In the 19th Century, the New Bedford whaling fleet was the largest in the world; today, New Bedford Harbor is a major East Coast fishing port, a regional center for marine transportation, and a gateway to marine recreation on Buzzards Bay and beyond.

## **3.2 Physical Environment**

### **3.2.1 Geomorphology**

Buzzards Bay was formed as a result of the Pleistocene glaciation; the subsequent retreat of the Laurentide ice sheet, beginning about 16,000 years ago; and the rise in sea level which accompanied the retreat of the glaciers. The bedrock beneath the estuary is granitic gneiss, overlain with 8-9 ft (2.4-2.7 m) of glacial till or 6-9 ft (1.8-2.7 m) of gravelly sediments. Sands and silts also cover these materials; in some areas, such as New Bedford Harbor, marine sediments are 60 ft (18.2 m) thick (VHB 1996; Summerhayes et al., 1977). The Elizabeth Islands, southeast of New Bedford, are remnants of the glacier's terminal moraine--materials deposited at the furthest extent of glaciation.

#### **3.2.1.1 Shorelines**

The upper reaches of the New Bedford Harbor Estuary are low-energy areas. Shorelines in these places are composed of fine-grained sediments. Wetlands and tidal flats are the predominant natural shoreline types, although much of the natural shoreline has been altered.

Manufacturing facilities and residential neighborhoods occupy the shores of the Upper Acushnet River Estuary. While most of the western shore of the Upper Estuary has been altered by land-filling, bulkheading, and other shoreline modifications, there are fringing marshes and tide flats in the vicinity of the cove by Coffin Ave. By contrast, the eastern shore of the Upper Estuary is largely natural or semi-natural, with fairly extensive salt marshes.

The shores of Inner New Bedford Harbor are heavily developed. Wharves for the fishing fleet and other commercial uses are the dominant feature of the New Bedford shoreline, while boatyards dominate the Fairhaven shore. Fuel docks, fish processing operations, and other support services for the commercial and recreation fleet are prominent on both sides of the Inner Harbor, as well. Considerable land-filling has taken place, particularly on the New Bedford side, and relatively little unmodified shoreline remains between Route 6 and the Hurricane Barrier.

By contrast with the developed shorelines of the Upper Estuary and Inner Harbor, the shoreline of Outer New Bedford Harbor is largely natural or semi-natural, although modifications such as bulkheads and groins are evident in some areas. Since the shores of the Outer Harbor area are more exposed than those of the Inner Harbor and Upper Estuary,

shorelines outside the Hurricane Barrier tend toward ledge or beach rather than wetlands. Exceptions include the large salt marsh in the Pope Beach area of Fairhaven, the salt marshes behind Winsegansett Pond on Sconticut Neck, Fairhaven, and the salt marshes of Padanaram and Nonquitt in Dartmouth.

### **3.2.1.2 Marine Sediments and Sedimentation Processes**

Tidal and wind-driven currents are the primary mechanisms of sediment transport and sorting in Buzzards Bay. Like many estuaries around the world, Buzzards Bay as a whole is a net depositional area -- that is, sediments tend to accumulate there over time. Within Buzzards Bay and within the Harbor Estuary, patterns of sediment transport are more complex. Tidal currents carry silts and clays landward from Buzzards Bay, depositing them in the Upper Estuary and Inner Harbor, while sediments tend to move from the Outer Harbor back out into Buzzards Bay. As a result, the Upper Estuary and Inner Harbor are net depositional areas, accumulating sediment, while the Outer Harbor is not. Fine-textured sediments such as muds accumulate in Harbor Estuary's low-energy environments: the Inner Harbor, Upper Estuary, and deeper parts of the Outer Harbor. Coarser sediments -- sand and gravel -- are present in higher-energy areas: the shoals, channels and beaches of the Outer Harbor (VHB, 1996).

Marine sediments on the seabed of the New Bedford Harbor Estuary are thinnest over the topographic highs and thickest in the drowned channels. The shallower deposits typically consist of 8-9 ft (2.4-2.7 m) of glacial till or 6-9 ft (1.8-2.7 m) of gravelly outwash over bedrock, sometimes with a thin (less than 3 ft (1 m)) layer of marine sands or silts capping the underlying deposits. In the Inner Harbor, unconsolidated sediments are as deep as 60 ft (18 m). Sediment clay to mud (silt + clay) ratios are 0.34 in central Buzzards Bay; 0.28 in the Outer Harbor and 0.18 in New Bedford Harbor (Summerhayes et al., 1985).

The deepest sediments in the Estuary consist of silt and sandy silt, above which are sandy sediments of gravel and silt. The uppermost layer is as much as 10-15 ft (3-5 m) thick and consists of organic enriched silts. While organic carbon content in the upper 4 in (10 cm) of sediment in most of Buzzards Bay is 1-2%, the Inner Harbor contains surface sediments with an organic carbon content of 4-7%, and the area near the Clarks Point sewage treatment plant outfall has sediments with 3.2% organic carbon. These elevated levels of organic carbon have been attributed to urban sewage discharges, organic wastes, and oil residuals from shipping (Summerhayes et al. 1985). The sediment-water interface beneath New Bedford Harbor is dominated by a thin, soupy layer of clay-rich sediments in suspension. This turbid layer is not unusual in estuaries, and is referred to as "fluff" in the scientific literature. Levels of organic materials and metals in the sediments are high, particularly in the Inner Harbor (VHB, 1996; Summerhayes et al., 1977).

Rates of sedimentation in Buzzards Bay are, on average, 0.04-0.12 in (1-3 mm) per year. Sedimentation rates are highest in deeper and more protected waters, and less around shoals and channels. Historically, the rate of sedimentation in the deeper parts of Inner New Bedford Harbor was about 0.08 in (2 mm) per year. However, construction of the Hurricane Barrier across the Harbor mouth in 1966 increased sedimentation rates nearly tenfold, to approximately 0.7 in (17 mm) per year. Sedimentation rates are also high near the Clarks Point waste treatment plant outfall: 1.2 in (30 mm) per year directly beneath the sewer outfall,



and 0.12 in (3 mm) per year at a distance of 0.3 miles (0.5 km) from the point of discharge (Summerhayes et al., 1977).

### **3.2.2 Hydrology and Bathymetry**

#### **3.2.2.1 Acushnet River and Watershed**

The Acushnet River is a small fresh water stream of approximately 2.5 miles in length, flowing north to south from the New Bedford Reservoir in Acushnet into the New Bedford Harbor Estuary. The River is dammed at three points, all within the Town of Acushnet: at the south end of the New Bedford Reservoir; at the Hamlin Road crossing; and at the Acushnet Sawmill, off Mill Road on the New Bedford/Acushnet town line. Discharges of fresh water from the Acushnet River to the New Bedford Harbor Estuary are small, ranging during the year from a low of 0.55 cubic feet per second (cf/s) (0.02 cubic meters per second (cm/s)) to a high of 26 cf/s (0.73 cm/s) (Malcolm Pirnie Inc., 1982). Estimates of mean annual discharge rate and 100-year storm flow are 30 cf/s (0.85 cm/s) and 1,350 cf/s (38.2 cm/s), respectively (NUS, 1984). The small flow rates of the Acushnet River explain the relatively high salinities of the Upper Estuary and Inner New Bedford Harbor described below.

The watershed of the Acushnet River is about 18.5 square miles (48 sq. km) in extent, including land within the borders of Lakeville, Rochester, Freetown, New Bedford, Acushnet and Fairhaven, MA. Approximately 59% of the Acushnet River watershed is forested, including both upland and wetland forest (VHB, 1996; EPA, 1991). Approximately 21% of the watershed is non-forested wetlands, tidal as well as non-tidal; 12% is pasture or cropland; and approximately 7% is open land and woody perennial. In 1984, residential, commercial, and industrial development comprised 14.3%, 0.1%, and 0.02% of the watershed, respectively. These figures suggest that the Acushnet River watershed remains relatively undeveloped; however, land-use mapping clearly reveals intensive development in the lower watershed, particularly within New Bedford and Fairhaven, and in coastal areas adjoining the Upper Estuary and Inner Harbor. Land use in the New Bedford Environment is discussed in more detail in Section 3.4.

#### **3.2.2.2 New Bedford Harbor Estuary**

##### **3.2.2.2.1 Bathymetry**

The New Bedford Harbor Estuary is a shallow embayment consisting of approximately 18 sq. mi. (47 sq. km) of open water, rocky shores, beaches, salt marshes, tidal creeks, and other coastal habitats. A well-defined, narrow channel extends from the Upper Acushnet River Estuary, south-southeast to Outer New Bedford Harbor, approximately one and one-quarter mile. The channel has been widened and deepened to 30 ft (9 m) at mean low water (mlw) by occasional dredging activities since 1839, although no dredging has occurred for more than 30 years, and channel depths are now generally less (VHB, 1996).

Depths in the Upper Estuary north of the Coggeshall Street Bridge are generally less than 6 ft (1.8 m) mlw, although there is a natural channel of about 15 ft depth (5 m) beneath the bridge. South of Coggeshall Street, the dredged channel runs along the west side of the Harbor and through the 150 ft (45 m) wide Hurricane Barrier entrance. With the exception of

areas along the piers of New Bedford and Fairhaven that have been dredged to accommodate shipping, the Inner Harbor and Upper Acushnet River Estuary are quite shallow; shoals and intertidal flats are present throughout. South of the Hurricane Barrier, Outer New Bedford Harbor is also relatively shallow, with depths ranging to about 40ft along the Area III closure line (VHB, 1996; NOAA, 1995).

#### **3.2.2.2.2 Dynamics**

The New Bedford Harbor Estuary is classed as a weakly stratified, low-energy microtidal estuary. Tides are semidiurnal, tidal currents are generally weak, and wave energy is low. The Upper Estuary and Inner Harbor are poorly flushed, and have been made more so by human modification, intensifying problems caused by discharge of pollutants within the Upper Acushnet River Estuary and Inner New Bedford Harbor.

Fresh water flows into the New Bedford Harbor Estuary from the Acushnet River, smaller streams on the east bank of the Upper Estuary, as stormwater runoff, and as wastewater from combined sewer overflows (CSOs). Taken together, these inputs are relatively small and the Harbor Estuary is relatively saline. Salinities in the Upper Estuary have been measured at 7-31 parts per thousand (ppt); at the Coggeshall Street Bridge, salinities range from 10-33 ppt (ACOE, 1990; Bellmer, 1988). Salinity in Buzzards Bay is generally 31-33 ppt (Summerhayes et al. 1977). Vertical salinity gradients vary; gradients up to 18 ppt have been measured at the Coggeshall Street Bridge (Battelle Memorial Institute, 1990) while vertical salinity gradients in the Inner Harbor range from 1-3 ppt (VHB 1996). The average horizontal salinity gradient in the Inner Harbor is approximately 4 ppt over a 3.1 mile (5,000m) distance (Bellmer, 1988).

Water temperatures in New Bedford Harbor range from 33 F (0.5 C) in winter to 66 F (19 C) in summer. Higher temperatures during the summer reduce dissolved oxygen levels while increasing biological activity and biological oxygen demand (BOD) levels; at times, such conditions stress marine organisms, causing fish kills in poorly-flushed areas (VHB, 1996).

Tidal currents are the principal force of circulation in the New Bedford Harbor Estuary. Tidal flushing of the Upper Acushnet River Estuary is estimated to occur every 1.6 tidal cycles (18.2 hours), but appears to vary throughout the year. The Upper Estuary flushes less frequently in summer, suggesting that suspended materials such as pollutants may remain in the Upper Estuary for longer periods during the summer than during other times of the year (VHB, 1996; SES, 1988).

Tidal velocities in the New Bedford Harbor are generally weak. Velocities are higher on the flood tide than on the ebb (Summerhayes et al., 1977), and maximum currents occur approximately 3 hours before the turn of each tide (Battelle Memorial Institute, 1990). Currents in the Upper Estuary are relatively low: 0.3 knots (0.15 m/s) on average, and generally less than 0.6 knots (0.3 m/s) (ACOE, 1988). In the Inner Harbor, current velocities are generally less than 0.4 knots (0.18 m/s); bottom friction results in small-scale eddies that create a vertically well-mixed boundary layer in the deeper waters, thereby causing sediments and other materials to remain suspended in the water column, giving rise to the turbid layer of "fluff" described above (VHB, 1996; Summerhayes et al., 1977). Maximum tidal velocities in the Outer Harbor are generally comparable to those of the Inner Harbor, at

0.4 knots (0.18 m/s) or so, running generally north and south, into and out of the Inner Harbor (Eldridge Tide and Pilot Book, 1994).

The dynamics of the Estuary have been significantly altered by human modification. The Coggeshall Street Bridge and the Hurricane Barrier have constricted tidal flow in the Inner Harbor and Upper Estuary, forcing local accelerations of tidal currents and altering flow patterns. The flood tide enters the Inner Harbor in a jet-like stream, moving through the 150 ft (45 m) wide Hurricane Barrier entrance at 2.4 k (122 cm/sec). This jet, with secondary eddies on either side, dominates Inner Harbor mixing patterns. The Coggeshall Street Bridge is thought to cause similar flow patterns as the tides force water to move between the Inner Harbor and Upper Estuary. (EBASCO, 1990; SES, 1988; Summerhayes et al., 1977). Tidal currents at Coggeshall Street have been measured as high as 3.5 k (1.8 m/s) during the ebb (Battelle Memorial Institute, 1990). Construction of the Hurricane Barrier also appears to have altered tidal range within the Inner Harbor and Upper Estuary--average tidal range in the Inner Harbor is 3.7 ft (1.1 m) with a spring tidal range of 4.6 ft (1.4 m), while outside the Barrier, average tidal range is 4.65 ft (1.42 m) with a spring range of 5.05 ft (1.54 m) (VHB, 1996; ACOE, 1990).

Winds also affect currents within the Outer Harbor. Moderate southwesterly winds in summer and strong northwesterlies in the winter cause distinct seasonal current effects. A fetch of more than 8.7 miles (14 km) is present to the Southwest, and waves at times may reach 6.5 ft (2 m) (Battelle Memorial Institute, 1990). While the Inner Harbor is generally well protected from waves by the Hurricane Barrier, waves as high as 3 ft (0.92 m) have been observed north of Coggeshall Street during storms (Battelle Memorial Institute, 1990). In waters less than 20 ft (6 m) deep, wind-driven waves may be the most important factor in generating currents at the bottom, particularly during storms (VHB, 1996).

### **3.2.2.3 Buzzards Bay**

Like New Bedford Harbor, Buzzards Bay is classed as a low-energy microtidal estuary. The Bay is 28 miles (45 km) long with an average width of 8 miles (12 km); total area is 228 square miles (590 square km). It is generally shallow, with an average depth of 36 ft (11 m) and a maximum depth of roughly 75 ft (23 m). The Bay has a drainage area of 425 square miles (1,104 square km), which is small for an estuary of its size. The land:water ratio of Buzzards Bay is less than 2:1, far less than the 14:1 land:water ratio of Chesapeake Bay. Nearly 250,000 people live in the drainage basin, in 17 municipalities (Buzzards Bay Project, 1991).

The Bay's southwestern shoreline--formed by the terminal moraine--is physically regular, while the northern and northwestern shores are characterized by the irregular topography of drowned river valleys and embayments such as the New Bedford Harbor Estuary. Seven major rivers drain the western shore of the Bay, including the Acushnet; but along the eastern shore, groundwater is the most important source of fresh water to the Bay. At the head of the Bay is the Cape Cod Canal, providing a passage for vessels--and a tidal connection--to Massachusetts Bay. Buzzards Bay has a shoreline of more than 280 miles (470 km), including 11 miles of public beaches and a variety of important coastal habitats: salt marshes; tide creeks; sea grass beds; tidal flats; and barrier beaches (Buzzards Bay Project, 1991).

### **3.2.3 Climate**

Wind, precipitation, and temperature have a significant influence on the flow of the Acushnet River, the circulation of the New Bedford Harbor Estuary, and ecological processes in the New Bedford Harbor Environment. Ocean winds moderate summer and winter temperatures; mean annual air temperature is 50 F (10 C), while average monthly temperatures range from 30 F (-1 C) in January to 72 F (22 C) in July (Battelle Memorial Institute, 1990). Average annual precipitation is 46 in (114 cm), uniformly distributed throughout the year (approximately 4 in (10 cm) per month).

During the winter, strong northwest winds prevail, while gentle southwest winds are more frequent during the summer. Brief but severe thunderstorms with high winds occur in the area, generally from May through August. Hurricanes sometimes pass through during the summer and fall, while northeasters, coastal storms which can also produce severe erosional effects, occur from late fall through spring. Storm winds as high as 78 knots (90 mph, 40.3 m/s) have been recorded; related storm surges may drive tides 1 to 3 ft (0.3 to 0.9 m) above normal (Battelle Memorial Institute, 1990).

### **3.3 Biological Environment**

#### **3.3.1 Habitats**

Habitat is the complex of geographic features, hydrologic conditions, and living organisms within an ecosystem that provides food, nesting and resting areas, and shelter for fish and wildlife. Broadly speaking, the habitats of the New Bedford Harbor Environment include fresh water and upland habitats, salt marsh, tidal flat and soft-bottom habitats, beaches and rocky intertidal habitats, sea grass beds, and open water habitats.

In spite of human modification of much of the shoreline, significant coastal habitats of all these types remain in and around the New Bedford Harbor Estuary, supporting a wide range of plants, animals, fish, and shellfish. Moreover, these habitat types function together in the New Bedford Harbor Environment and beyond, since many of the most important organisms in New Bedford Harbor--fish and birds in particular--are dependent on a number of habitat types. Therefore, while it is useful to consider each of these habitat types individually, the New Bedford Harbor Environment should also be seen as a single, multifaceted habitat which is, in turn, part of larger marine and terrestrial systems--Buzzards Bay and the New England coastal plain.

##### **3.3.1.1 Fresh water and Upland Habitats**

A range of fresh water and upland habitats is present in the New Bedford Harbor Environment. There are riverine habitats; fresh water wetlands of several types; natural and man-made lakes and ponds; and upland forests and meadows throughout the watershed. Some of these systems are quite extensive and many have significant natural value, though in many cases their ecology has been adversely affected by land clearing, development, ditching or diversion for residential use, roads and utilities, sand and gravel operations, agriculture, industrial purposes, or urbanization.

Upstream of tidal influence, the Acushnet River and other water courses are characterized as riverine habitat. The Acushnet is the largest of these, yet it is relatively small, less than 30 ft

(10 m) in width and less than 18 in (0.45 m) deep during average flow conditions. It originates at the south end of the New Bedford Reservoir and widens in two impoundment locations: above the Hamlin Street Dam in Acushnet, and at the Acushnet Sawmill Dam off Mill Street in Acushnet. Much of the substrate is sand, gravel, and cobble, as high flows in the spring and during storm events create erosive conditions that transport sediments and detritus downstream. Behind the dams and in other areas where flow velocities are low, organic-rich mud and fine sand sediments are deposited. While there are small streams throughout the less developed parts of the Acushnet River watershed, few surficial fresh water flows remain in the more urbanized parts of New Bedford and Fairhaven, having been diverted into the stormwater system. **Table 3.1** provides a list of the fresh water fish inhabiting the Acushnet River.

**Table 3.1:** Fish using fresh water habitats in the Acushnet River (Hurley, 1996).

common name	scientific name
American eel	<i>Anguilla rostrata</i>
Blueback herring	<i>Alosa aestivalis</i>
Alewife	<i>Alosa pseudoharengus</i>
Brook trout	<i>Salvelinus fontinalis</i>
Rainbow smelt	<i>Osmerus mordax</i>
Redfin pickerel	<i>Esox americanus</i>
Chain pickerel	<i>Esox niger</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Bridled shiner	<i>Notropis bifrenatus</i>
White sucker	<i>Catostomus commersoni</i>
Creek chubsucker	<i>Erimyzon oblongus</i>
Brown bullhead	<i>Ameiurus nebulosus</i>
White Perch	<i>Morone americana</i>
Striped Bass	<i>Morone saxatilis</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Bluegill	<i>Lepomis macrochirus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Tassellated darter	<i>Etheostoma olmsted</i>
Yellow perch	<i>Perca flavescens</i>

There are forested wetlands throughout less developed parts of the Acushnet River watershed; these systems may be dominated by either deciduous (broad-leaved) or

coniferous (evergreen) trees. Red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*) are dominant tree species in many of the broad-leaved deciduous wetlands, which may be seasonally-flooded or saturated. A detailed ecological description of these wetlands is provided by Golet et al. (1993). White pine (*Pinus strobus*) and Atlantic white cedar (*Chamaecyparis thyoides*) are coniferous tree species that are common in the forested wetlands in the watershed. Often, white pine is a sub-dominant or co-dominant canopy species in red maple swamps in the Acushnet River watershed. Atlantic white cedar sometimes occurs as a dominant species, particularly in semi-permanently flooded and permanently saturated sites underlain by thick organic mucks. Laderman (1989) presents a detailed overview of the Atlantic white cedar wetlands found in southeastern New England.

A large forested swamp along the southwestern shore of Long Pond (east of Route 140), dominated by red maple and white pine along its perimeter and Atlantic white cedar in the interior, is a classic example of the forested wetlands found in the watershed. Other, similar wetlands include the Fall Brook drainage in the western portion of the Acushnet watershed; an 1,100 acre (445 ha) floodplain swamp along the Acushnet River south of New Bedford Reservoir; the 600 acre (245 ha) Bolton Swamp (between Route 140 and Country Road in Freetown); and the 350 acre (140 ha) Hathaway Swamp, southeast of the Peckham Road-Acushnet Avenue intersection in Acushnet. The Acushnet Swamp, which is actually in the Paskamanset River watershed to the west of the Acushnet River watershed, is an expansive Atlantic white cedar-dominated wetland.

Scrub-shrub wetlands are prevalent in areas where the forest canopy has been cleared, and in semi-permanently and shallow permanently flooded areas where the hydrology inhibits tree establishment or growth. Scrub-shrub wetlands in the Acushnet River watershed are generally dominated by alders (*Alnus* spp.), highbush blueberry (*Vaccinium corymbosum*), buttonbush (*Cephalanthus occidentalis*), red maple saplings, and willows (*Salix* spp.). Examples of scrub-shrub wetlands in the watershed include a large buttonbush and willow-dominated swamp at the north end of Long Pond adjacent to Assawompset Pond in Lakeville, and a red maple sapling swamp near the impoundment above Hamlin Street in Acushnet.

Palustrine emergent wetlands are fresh water marshes dominated by non-woody plants, and include seasonally saturated meadows, the fringes of ponds and lakes, and semi-permanently flooded areas lacking woody species cover. Cattail (*Typha* spp.) and wetland grasses commonly dominate the emergent wetlands within the Acushnet River watershed; duck potato (*Sagittaria* spp.) and pickerelweed (*Pontederia cordata*) are typical non-persistent species. Examples of emergent wetlands occur as fringes along the impoundments off Mill Street and Hamlin Street in Acushnet.

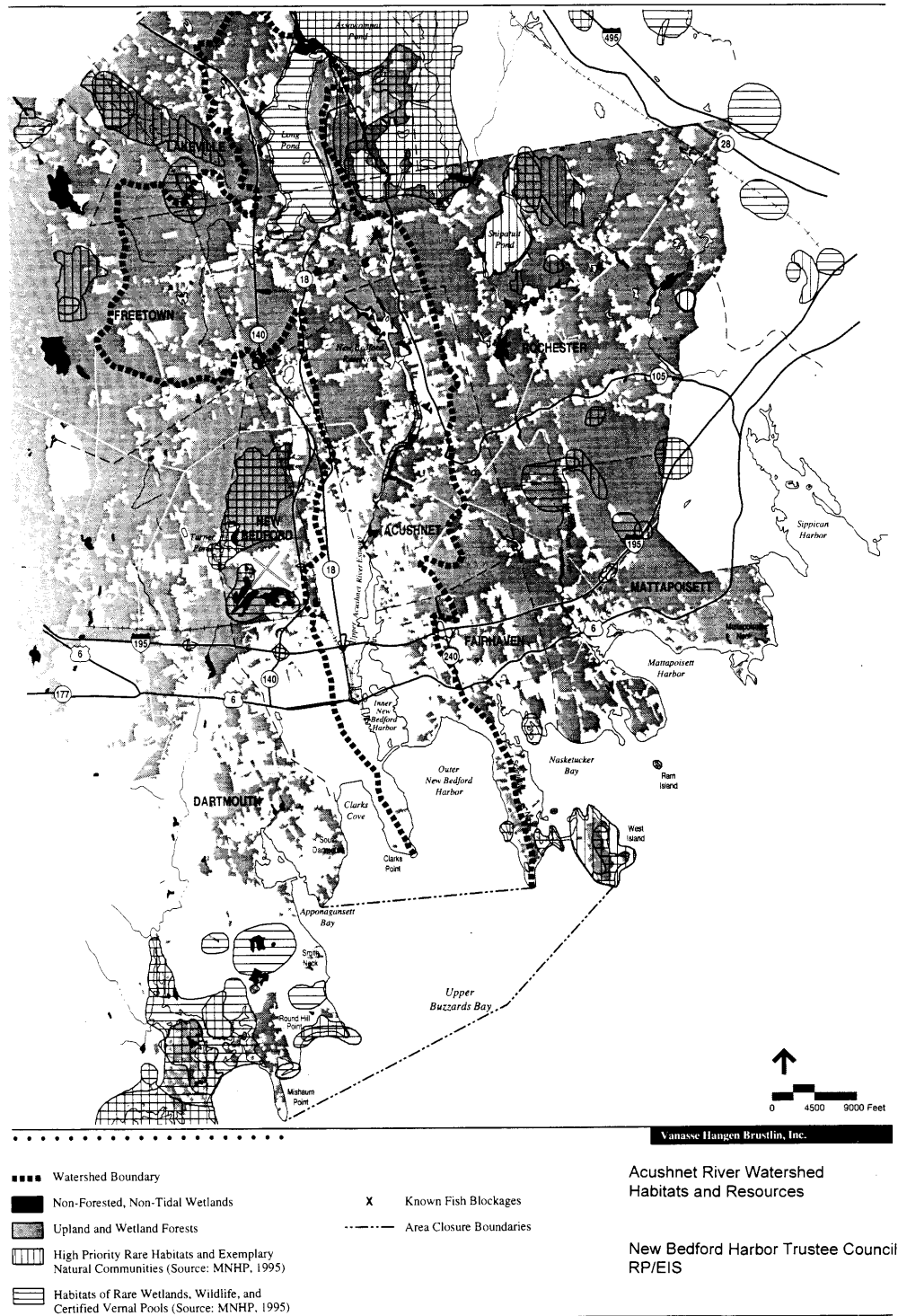
Small, shallow bodies of open fresh water lacking significant emergent vegetative cover are classified as palustrine open water. This habitat type is present throughout the Acushnet River watershed, and includes small natural ponds with mud or mucky substrates, as well as man-made basins created for cranberry production, stormwater management, or resulting from sand and gravel mining. Examples of this habitat type include the small impoundment north of the Hamlin Street Dam in Acushnet and the

numerous cranberry production and quarry ponds off Braley Road and Route 18 in the northern portion of Acushnet.

Larger, deeper bodies of open water are classified as lacustrine habitat. Long Pond and New Bedford Reservoir are examples of lacustrine wetlands in the watershed.

**Figure 3.1** shows upland and fresh water habitats of the New Bedford Harbor Environment.

Figure 3-1



70602AHR



### 3.3.1.2 Salt marsh

From an ecological perspective, salt marshes are among the most important shoreline types in Buzzards Bay. There are nearly 400 acres (160 ha) of salt marsh along New Bedford Harbor, mostly along the east bank of the Upper Acushnet River Estuary and by Pope Beach, on the Outer Harbor in Fairhaven. Elsewhere in the New Bedford Harbor Estuary there are fairly large salt marshes in Nonquitt, Dartmouth (60 acre (24 ha)); in Padanaram, Dartmouth, on Apponagansett Bay (6.5 acres (2.6 ha)); and in the Winsegansett Pond area of Sconticut Neck, Fairhaven. These wetland areas are rich in the flora and fauna that typifies New England salt marsh.

The ecology and composition of salt marsh plant and animal communities depends on their elevation and corresponding frequency of tidal inundation. The high marsh is the area between mean high water and the highest spring tides; because of its elevation it is irregularly flooded by the tide. Dominant plant cover in the high marshes of the New Bedford Harbor Estuary is salt hay (*Spartina patens*), but dozens of other plant species are present. Spikegrass (*Distichlis spicata*) and blackgrass (*Juncus gerardi*) are sometimes co-dominants with the salt hay. Common forbs include sea lavender (*Limonium carolinianum*), sea orach (*Atriplex patula*), seaside goldenrod (*Solidago sempervirens*), and slender-leaved aster (*Aster tenuifolius*). Stunted salt-marsh cordgrass (*Spartina alterniflora*) and glasswort (*Salicornia spp.*) are present in areas where soil salinity is exceptionally high, such as in depressions on the marsh surface (VHB, 1996; SES, 1988).

Toward the inland edges of the marsh and on high spots, marsh elder (*Iva frutescens*) is common. At their landward edges, or where human alteration has reduced the frequency of tidal inundation, the salt marshes of the New Bedford Harbor Estuary often show a transition from salt-tolerant vegetation to vegetation more characteristic of fresh- or brackish-water wetlands, such as red maple (*Acer rubrum*), cattail (*Typha angustifolia*), and common reed (*Phragmites australis*) (VHB, 1996; Lloyd Center, 1989; SES, 1988). The reed, in particular, is an invasive species which tends to quickly colonize recently-disturbed wetland soils of moderate salinity to form dense, monotypical stands of limited wildlife habitat value (VHB, 1996; Odum et al. 1984). **Table 3.4** provides a complete list of plants observed on the salt marshes of the New Bedford Harbor Estuary.

A 1988 study of the marshes of the Upper Acushnet River Estuary and Pope Beach area found several invertebrates to be “ubiquitous” throughout these areas: the coffee bean snail (*Melampus bidentatus*) and two groups of small crustaceans: amphipods (*Orchestia spp.*) and isopods (Isopoda) (SES, 1988). Reptiles that have been observed on the Nonquitt marsh are the black racer snake (*Coluber constrictor*) and snapping turtle (*Chelydra serpentina*), while a variety of amphibians, such as the spring peeper (*Hyla crucifer*) are present in less-saline wetland areas at the inland edges of the marsh (Lloyd Center, 1989).

Small mammals observed on the high marshes of the Upper Estuary include the white-footed mouse (*Peromyscus leucopus*); eastern chipmunk (*Tamias striatus*); gray squirrel (*Sciurus carolinensis*); opossum (*Didelphis virginiana*); rabbit (*Sylvilagus floridanus*) and skunk (*Mephitis mephitis*) (SES, 1988). White-tailed deer

(*Odocoileus virginianus*) and raccoon (*Procyon lotor*) have been observed in the Nonquitt marsh (Lloyd Center, 1989). Muskrat (*Ondatra zibethica*) are common generally in Southern New England high marsh and may live in some of the New Bedford Harbor Estuary salt marshes, but their presence has not been documented.

A variety of insects is present in the marshes of the Harbor Estuary, including katydids (Tettigoniidae), casebearers (*Coleophora spp.*), mantids (*Tenodera aridifolia*) and mirids (Miridae). (SES, 1988). Mosquitos (*Aedes spp.*) are also present. The insects of the salt marshes and their larvae are important sources of food for birds and, in some cases, fish as well.

Low marsh is the regularly-flooded portion of the salt marsh, lying between mean high water and mean low water and inundated by the tides twice daily. In the New Bedford Harbor Estuary, low marsh is dominated by the tall form of smooth cordgrass (*Spartina alterniflora*). While plant diversity is low in this part of the marsh, primary productivity--the production of plant material--is high, as is faunal diversity (SES, 1988; Teal, 1984). The faunal community present in this habitat is, generally, that characteristic of low marshes in Southern New England. Some of the more common invertebrates are fiddler crabs (*Uca spp.*), ribbed mussel (*Geukensia demissus*), and periwinkle (*Littorina spp.*). Large numbers of silversides (*Menidia spp.*), mummichogs, and killifish (*Fundulus spp.*) move into the low marsh with the tide, using the cordgrass zone as habitat; these small fish are a major food source for larger fishes of direct importance to humans as well as the wading birds of the Estuary.

**Tables 3.5 and 3.6** list vertebrate and invertebrate marine species in the New Bedford Harbor Estuary, including those which use salt marsh habitat. Some of the estuarine fish and shellfish most closely associated with the salt marshes of the Estuary are winter flounder (*Pleuronectes americanus*); bluefish (*Pomatomus saltatrix*); menhaden (*Brevoortia tyrannus*); American eel (*Anguilla rostrata*); and Eastern oyster (*Crassostrea virginica*).

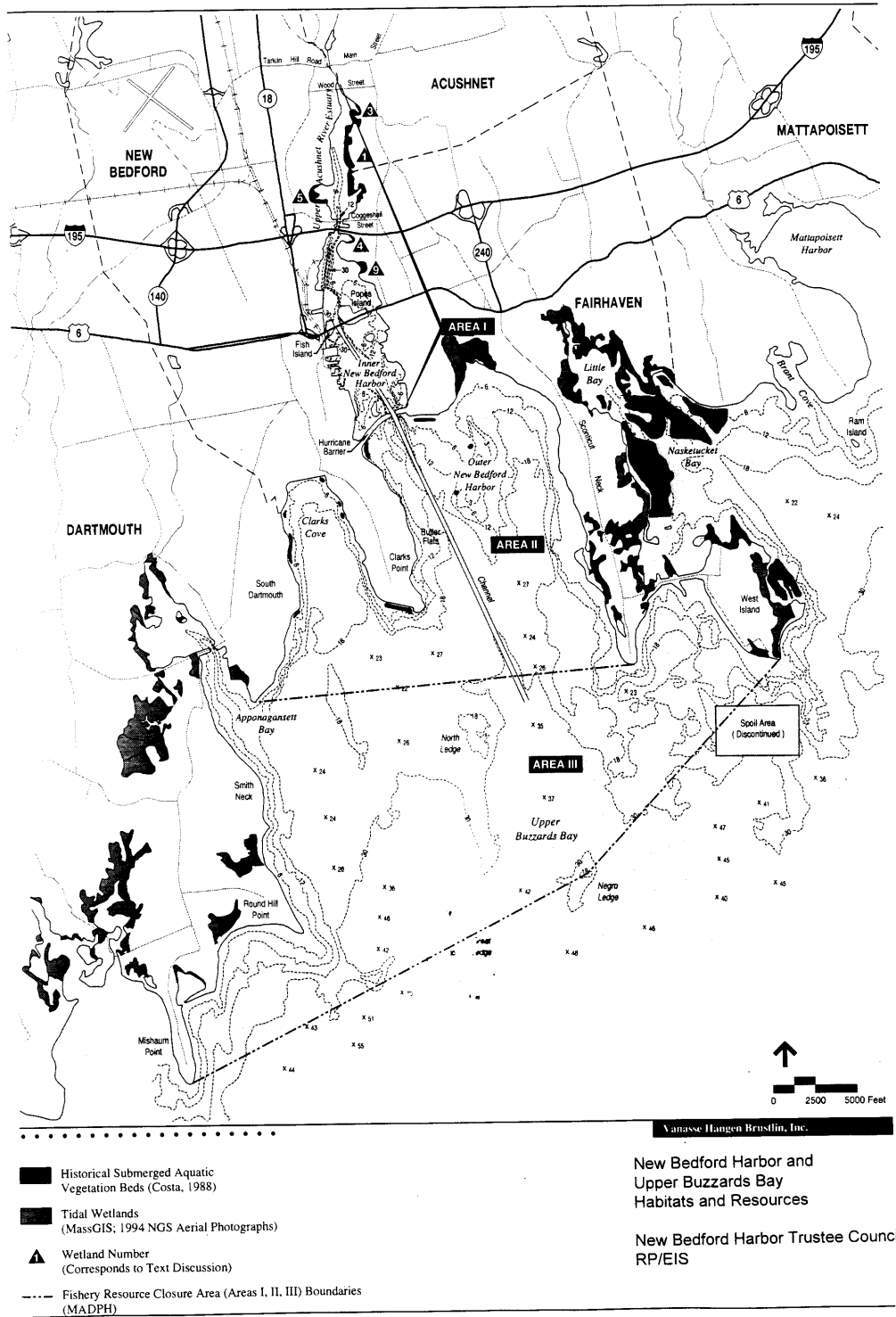
Both high and low salt marsh in the New Bedford Harbor Estuary are important bird habitat. The 1988 study of the marshes of the Upper Estuary and Pope Beach documented roughly eighty species of birds using the marshes and their upland edges (SES, 1988) while over seventy species have been observed in the Nonquitt marsh (Lloyd Center, 1989). Bird species that regularly use the marshes of the Estuary include large and small wading birds, such as herons, egrets, and bitterns; hawks, ospreys, vultures and other birds of prey; a variety of ducks, geese, and other waterfowl; and a wide range of songbirds. **Table 3.8** lists bird species associated with the estuarine environments of the New Bedford Harbor area, but does not include songbirds and other primarily terrestrial species which use the marsh occasionally.

The importance of salt marshes to the ecosystem of the New Bedford Harbor Estuary cannot be underestimated. Salt marshes are among the most biologically productive of ecosystems, providing habitat to hundreds of organisms and of particular importance to the lower trophic levels, that is, the base of the estuarine food pyramid which supports such top predators as sportfish, birds of prey, and humans. In addition, salt marshes play critical physical and chemical roles within the estuarine

environment, trapping sediments, filtering pollutants, and buffering the effect of floods.

**Figure 3.2** shows the salt marshes of the New Bedford Harbor Environment.

Figure 3-2



### 3.3.1.3 Tidal flats and Soft Bottoms

Soft (unconsolidated) sediments underlay most of the New Bedford Harbor Estuary. In low-energy areas such as the Upper Estuary and Inner Harbor, these are organic-rich silts, fine-textured muds, and sandy muds. Sands and gravelly sands are prevalent on shoals and where current velocities are greater, while sands, gravels, and muds are present in deeper areas of the Outer Harbor, interspersed with rocky reefs.

Tidal flats--intertidal areas of soft sediments, irregularly exposed by the tide--form the transition between salt marsh and subtidal habitats in much of the New Bedford Harbor Estuary. In unaltered salt marshes, tidal flats may lie seaward of the marsh or may take the form of shallow creeks running into the marsh and periodically emptied by the tide. In some marshes, drainage ditches dug for mosquito control may function as tidal flats; in other areas, the shoreline has been bulkheaded or filled, but the tidal flat remains seaward of the bulkhead. There are about 50 acres (20 ha) of tidal flats in the Upper Estuary and New Bedford Harbor (VHB, 1996).

Tidal flats and soft bottoms are habitat to dozens of species and of great ecological importance to the Estuary. They also have the highest concentrations of PCBs and metals in New Bedford Harbor and, particularly in the Upper Estuary, are probably the habitat type most affected by the contamination of the Harbor.

Bottom composition in these shallow-water and intertidal habitats is silt, clay, and peat; common plant species include sea lettuce (*Ulva lactuca*), filamentous algae, and rockweed (*Fucus spp.*) (SES, 1988). Perhaps the most important infauna--animals which live within the soft sediments--of the New Bedford Harbor Estuary are two species of clams: quahogs (*Mercenaria mercenaria*) and soft-shelled clams (*Mya arenaria*). But the tidal flats and soft bottoms of the Harbor Estuary are characterized by diverse invertebrate communities which are important sources of food for fish and shorebirds. Benthic worms (polychaetes and oligochaetes) are common in the tidal flats and soft bottoms of the Harbor Estuary, as are amphipods (small crustaceans), at least ten species of molluscs, and 13 other shellfish species (VHB, 1996). These invertebrate communities support populations of bottom-feeding fish such as flounder, scup and tautog, as well as diverse shorebirds, like oystercatchers, sandpipers, plovers, herons, egrets, and some waterfowl (Whitlatch, 1982). **Table 3.2** lists the dominant organisms in the soft-bottom intertidal habitats of Buzzards Bay. The fish, shellfish, and birds of the New Bedford Harbor Estuary, including those which live on or in tidal flats and soft bottoms, are discussed more fully in subsequent sections of this chapter.

**Table 3.2**  
**DOMINANT SOFT-BOTTOM, HARD-BOTTOM AND ROCKY INTERTIDAL**  
**COMMUNITIES IN BUZZARDS BAY<sup>1</sup>**

Substrate Type	Scientific Name	Common Name	Class or Phylum <sup>2</sup>
Soft Bottom	<i>Nucula proxima</i>	Nut clam	Bivalvia
	<i>Nephtys incisa</i>	Red-lined worm	Polychaeta
	<i>Ninoe nigripes</i>	Lumbrinerid worm	Polychaeta
	<i>Cylichna orzya</i>	Minute bubbleshell	Gastropoda
	<i>Callocardia morrhuana</i>		Crustacea
	<i>Hutchinsoniella macracantha</i>	Cephalocarid	Crustacea
	<i>Lumbrineris tenuis</i>	Lumbrinerid thread worm	Polychaeta
	<i>Turbonilla</i> sp.	Turbonillid pyramid shell	Gastropoda
	<i>Spio filicornis</i>	Spionid mud worm	Polychaeta
	<i>Retusa canaliculata</i>	Channeled bubbleshell	Gastropoda
	<i>Stauronereis caecus</i>	Burrowing worm	Polychaeta
Hard Bottom	<i>Ampelisca spinipes</i>	Four-eyed amphipod	Crustacea
	<i>Byblis serrata</i>	Four-eyed amphipod	Crustacea
	<i>Cerastoderma nulatun</i> <sup>3</sup>	Little cockle	Bivalvia
	<i>Ampelisca macrocephala</i>	Four-eyed amphipod	Crustacea
	<i>Glycera americana</i>	Bloodworm	Polychaeta
	<i>Nephtys buccera</i>	Red-lined worm sp.	Polychaeta
	<i>Tellina agilis</i>	Fragile wedge clam	Bivalvia
	<i>Ninoe nigripes</i>	Lumbrinerid tread worm	Polychaeta
	<i>Lumbrineris tenuis</i>	Lumbrinerid tread worm	Polychaeta
	<i>Nephtys incisa</i>	Red-lined worm	Polychaeta
	<i>Molgula complanata</i>	Sea grape	Tunicata
	<i>Unicola irrorata</i>	Tube-dwelling amphipod	Crustacea
Rocky Intertidal	<i>Semibalanus balanoides</i>	Acorn barnacle	Crustacea
	<i>Balanus balanus</i>	Large rock barnacle	Crustacea
	<i>Carcinus maenas</i>	Little green crab	Crustacea
	<i>Cancer irroratus</i>	Rock crab	Crustacea
	<i>Pagurus longicarpus</i>	Long-clawed hermit	Crustacea
	<i>Littorina littorea</i>	Common periwinkle	Gastropoda
	<i>Littorina obtusata</i>	Round (Obtuse) periwinkle	Gastropoda
	<i>Littorina saxatilis</i>	Rough periwinkle	Gastropoda
	<i>Mytilus edulis</i>	Blue mussel	Bivalvia
	<i>Modiolus modiolus</i>	Horse mussel	Bivalvia
	<i>Crepidula fornicata</i>	Slipper shell	Gastropoda
	<i>Nereis virens</i>	Clam worm	Polychaeta
	<i>Ascophyllum nodosum</i>	Knotted wrack	Phaeophyta
	<i>Fucus vesiculosus</i>	Rockweed	Phaeophyta
	<i>Chondrus crispus</i>	Irish moss	Rhodophyta

<sup>1</sup> Adapted from Howes and Geohringer (In Press).

<sup>2</sup> Phyla are listed for seaweeds, classes for other species.

<sup>3</sup> Because *Cerastoderma* populations are highly seasonal, it is not considered to be a good characterizing species for this community.

The most complete published study of tidal flat and soft bottom habitats in the New Bedford Harbor Estuary is the 1988 study of the salt marshes of the Upper Acushnet River Estuary and the Pope Beach area (Bellmer, 1988; SES, 1988). This work documented a variety of invertebrates living in the tidal creeks of New Bedford Harbor's salt marshes, but found markedly higher biodiversity and higher abundance of benthic invertebrates in the tidal creeks of the Pope Beach marsh, probably because of the high levels of contaminants present in the Upper Estuary as well as other factors. Thirty benthic species were observed in the mud banks of the Upper Estuary wetlands, while over sixty were found at Pope Beach (SES, 1988); the most common of these are listed in **Table 3.3**. Section 3.5 discusses the reduction of benthic biodiversity caused by the contamination of New Bedford Harbor.

**TABLE 3.3.**  
DOMINANT BENTHIC MACROINVERTEBRATES SAMPLED FROM  
NEW BEDFORD HARBOR IN DECREASING ORDER OF ABUNDANCE<sup>1</sup>

Scientific Name	Common Name
<i>Streblospio benedicti</i>	Bar-gilled mud worm
<i>Eteone heteropoda</i>	Freckled paddle worm
<i>Nassarius obsoletus</i>	Eroded basketshell snail
<i>Podarke obscura</i>	Swift-footed worm
<i>Tharyx acutus</i>	Ceratulid worm
<i>Polydora ligni</i>	Whip mud worm
<i>Mercenaria mercenaria</i>	Hard clam or quahog
<i>Mulinia lateralis</i>	Dwarf surf clam
<i>Mediomastus ambiseta</i>	Thread worm
<i>Tubificoides</i> sp.	Annelid worms
<i>Weteromastus filiformis</i>	
<i>Pectimaria gouldii</i>	Trumpet worm
<i>Lumbrinerus tenis</i>	Lumbrinarid thread worm
<i>Nereis succinea</i>	Common clamworm
<i>Odostomia seminuda</i>	Odostone pyramid shell
<i>Tellina agilis</i>	Fragile wedgeclam
<i>Brania welfleectensis</i>	Sylid worm
<i>Capitella capitata</i>	Capitellid thread worm
<i>Eobrolgus spinosus</i>	

<sup>1</sup> Adapted from Bellmer, 1988

#### 3.3.1.4 Beaches and Rocky Shores

Habitat aspects of the beaches and rocky shores of the New Bedford Harbor Estuary are not particularly well documented. Beaches of major recreational value within the New Bedford Harbor Environment are discussed in Sections 3.4 and 3.5; however, there are several smaller, more natural barrier beach systems, notably at Nonquitt in Dartmouth and at Winsegansett Pond, on Sconticut Neck in Fairhaven. Barrier beaches are naturally mobile coastal systems; plant species common to this shoreline type include beach grass (*Ammophila breviligulata*), beach pea (*Lathyrus maritimus*)

and beach rose (*Rosa rugosa*). Rocky intertidal areas are inhabited by several species of barnacle, crabs, and a variety of molluscs. **Table 3.2** lists the dominant organisms along rocky intertidal shores in Buzzards Bay, generally; however, the mussel species listed here are uncommon in the New Bedford Harbor Estuary.

#### **3.3.1.5 Sea Grass Beds**

Eelgrass (*Zostera marina*) is the dominant species of submerged aquatic vegetation in Buzzards Bay, found in shallow water at various salinities and on different types of substrate. It is an important source of food for herbivores, such as Canada geese, and detritivores, such as polychaete worms. Eelgrass beds also serve as important cover and nursery habitat for shellfish, particularly bay scallops, and finfish such as winter flounder (Thayer et al., 1985).

During the 1930s, eelgrass virtually disappeared from Buzzards Bay due to “wasting disease,” caused by a parasitic protozoan (*Labarynthula* spp.). Aerial photographs from the 1940s show few eelgrass beds in the New Bedford Harbor Estuary, attributable to the wasting disease as well as urbanization of the Harbor, which inhibited recovery of the beds following the disease (Buzzards Bay Project, 1991; Costa 1988).

Eelgrass subsequently recovered in some areas of Buzzards Bay, including parts of Outer New Bedford Harbor, although not in the Inner Harbor. This is probably the result of poor water quality and clarity in the Inner Harbor, caused by PCBs, heavy metals, sewage and other pollutants from industrial and urban sources, ship traffic, and the effects of the Hurricane Barrier (Costello, PC, 1996; Costa, 1988).

Currently, eelgrass beds are scattered along nearshore areas of New Bedford Outer Harbor, particularly on the west shore of Clarks Point and the west shore of Sconticut Neck. **Figure 3.2** shows the sea grass beds of the New Bedford Harbor Environment based on a 1988 study; more current information will be available in 1997, when the Massachusetts Wetlands Conservancy Program completes an inventory of sea grass beds in State waters.

#### **3.3.1.6 Open Water Habitats**

The habitats of Outer New Bedford Harbor are somewhat different from those in the upper reaches of the New Bedford Harbor Estuary, though both are estuarine environments and many of the same species are present. The Outer Harbor is the deepest part of the New Bedford Harbor Estuary, generally 10-30 ft, so water temperatures tend to be more moderate. Wind and wave energy are higher, so the waters of the Outer Harbor have more dissolved oxygen; shoreline and bottom sediments are sandier; and salt marshes exist only in locally sheltered areas--behind barrier beaches, for example. Since the Outer Harbor is open to Buzzards Bay, it is well-flushed in comparison to the Inner Harbor and Upper Acushnet River Estuary, and therefore its waters tend to be cleaner and more saline, and the species present tend to be those representative of Buzzards Bay, generally. **Table 3.7** lists more than 50 species of finfish that have been observed in Buzzards Bay, most of which undoubtedly make use of Outer New Bedford Harbor at least seasonally. There are



several important shellfish species in the Outer Harbor as well. More complete information on the fish and shellfish of the New Bedford Harbor Estuary is provided in subsequent sections of this chapter.

### **3.3.1.7 Interaction Among Habitats**

The biology of the New Bedford Harbor Estuary is not easily separable from the fresh water and upland habitats of the New Bedford Harbor Environment, nor from the waters of Buzzards Bay. Indeed, an estuarine ecosystem is defined by physical and biological interactions between fresh water and saltwater, waters and wetlands, wetlands and uplands (NOAA, 1990).

As noted above, habitat types in the watershed include woodlands, lakes, streams, pasture land, and inland wetlands. Important, if fragmented, habitats are also tucked in among mixed-used residential areas, urban and industrial areas. The salt marshes, tidal flats, and subtidal areas of the New Bedford Harbor Estuary are a continuum of nearshore environments, distinguished from one another by elevation and frequency of tidal inundation. And the Harbor Estuary itself is home to a range of habitats, from open water to rocky reef.

Ecologically, there is a great deal of interaction between all these habitats. Tidal creeks, for example, are used by estuarine fish, like winter flounder, at high tide and by marsh invertebrates, such as fiddler crabs, when the tide is out. Songbirds and mammals often nest in upland forests, but feed on the salt marsh. Herring and alewives run up the Acushnet river to spawn, while eels move into saltwater for the same purpose. Mummichogs feed on the salt marsh and are in turn fed on by striped bass, bluefish and other estuarine species. Indeed, there are few species that do not depend on a variety of habitats; like any ecosystem, the New Bedford Harbor Environment is not defined by any single habitat type, but rather by the basin-wide interaction among species and habitats.

The New Bedford Harbor Environment is, in turn, part of the larger environments of the Massachusetts coastal plain, Buzzards Bay, and beyond. New Bedford's terns and herons winter on the Gulf of Mexico, while winter waterfowl summer in Canada or Alaska. Winter flounder move offshore toward Georges Bank in summer, and bluefish and striped bass migrate south toward Florida in winter.

### **3.3.2 Plankton**

Plankton are microscopic or nearly microscopic marine plants (phytoplankton) and animals (zooplankton) that form the basis of marine food chains. Phytoplankton are primary producers, converting sunlight to plant material usable as food by other species, such as menhaden. Phytoplankton are also eaten by zooplankton, which are eaten in turn by macroinvertebrates, larval fishes, and planktivores such as bay anchovy. There are over 100 species of plankton in the New Bedford Harbor Estuary. Dominant phytoplankton species include *Cyclotella michiganiana*, *Skeletonema costatum*, *Chaetocerus* spp., *Leptocylindrum minimus*, *Rhizosolenia* spp., and

flagellates. Zooplankton is dominated by copepods (*Acartia* spp.), followed by *Paracalanus crassirostris*.

“Blooms”--periods of rapid growth of phytoplankton--occur naturally in the early spring and fall in temperate estuaries. However, anthropogenic pollutants, particularly nutrients from sewage, can further stimulate plankton growth, causing reduced water clarity and low-oxygen conditions when the bloom decomposes. These factors, in turn, can result in loss of sea grass beds, fish kills, changes in species composition, and other impacts on coastal ecosystems. In the 1980s, discharges from the New Bedford wastewater treatment facility were linked to seasonal phytoplankton blooms; however, the improvements to the City’s treatment system discussed in Section 3.4 are expected to mitigate these effects.

### **3.3.3 Coastal Plants**

A description of all the upland and fresh water plants of the New Bedford Harbor Environment would be outside the scope of this document. However, as discussed in the sections on habitats, above, coastal wetland plants function as an important part of the estuarine ecosystem. Therefore, **Table 3.4** lists coastal plants of the affected environment--salt marsh species as well as fresh water or upland species which grow on the upland edge of the marsh, and are therefore associated with salt marsh communities in the New Bedford Harbor Estuary. The information is based on studies of the wetlands of the Upper Acushnet River Estuary and the Nonquitt Salt Marsh.

**Table 3.4**  
**Coastal Plants of the New Bedford Harbor Estuary**  
**(from Lloyd Center, 1989; SES, 1988).**

common name	scientific name
Red Maple	<i>Acer rubrum</i>
Seaside Gerardia	<i>Agalinus maritima</i>
Bent Grass	<i>Agrostis spp.</i>
Little Blue Stem	<i>Andropogon scoparius</i>
Slender-leaved Aster	<i>Aster tenuifolius</i>
Sea Orach	<i>Astriplex patula</i>
Sedge	<i>Carex spp.</i>
Twig Rush	<i>Cladium mariscoides</i>
Sweet Pepperbush	<i>Clethra alnifolia</i>
Umbrella Sedge	<i>Cyperus spp.</i>
Spatulate-leaved Sundew	<i>Drosera intermedia</i>
Massachusetts Fern	<i>Dryopteris simulata</i>
Marsh Fern	<i>Dryopteris thelypteris</i>
Spike Grass	<i>Distichlis spicata</i>
Dwarf Spike-Rush	<i>Eleocharis parvula</i>
Beaked Spike-Rush	<i>Eleocharis rostellata</i>
Dye Bedstraw	<i>Galium tinctorium</i>
Grass spp.	<i>Gramineae spp.</i>
Marsh St. John's-wort	<i>Hypericum virginicum</i>
Rose mallow	<i>Hibiscus palustris</i>
Jewelweed	<i>Impatiens capensis</i>
Marsh Elder	<i>Iva frutescens</i>
Canadian Rush	<i>Juncus canadensis</i>
Blackgrass	<i>Juncus gerardi</i>
Red Cedar	<i>Juniperus Virginiana</i>
Sea Lavender	<i>Limonium spp.</i>
Water Horehound	<i>Lycopus virginicus</i>
Purple Loosestrife	<i>Lythrum salicaria</i>
Sweet Gale	<i>Myrica gale</i>
Bayberry	<i>Myrica pensylvanica</i>

Sensitive Fern	<i>Onoclea sensibilis</i>
Switch Grass	<i>Panicum virgatum</i>
Common Reed	<i>Phragmites communis</i>
Salt Marsh Fleabane	<i>Pluchea purpurascens</i>
Black Cherry	<i>Prunus serotina</i>
Mock Bishop's Weed	<i>Ptilimnium capillaceum</i>
Oaks	<i>Quercus spp.</i>
Winged Sumac	<i>Rhus copallina</i>
Swamp rose	<i>Rosa palustris</i>
Annual Glasswort	<i>Salicornia europaea</i>
Perennial Glasswort	<i>Salicornia virginica</i>
Chairmaker's Rush	<i>Scirpus americanus</i>
Bayonet Grass	<i>Scirpus paludosus</i>
Salt Marsh Bulrush	<i>Scirpus robustus</i>
Greenbriar	<i>Smilax rotundifolia</i>
Sea-side Goldenrod	<i>Solidago sempervirens</i>
Slender-leaved Goldenrod	<i>Solidago tenuifolia</i>
Sow Thistle	<i>Sonchus arvensis</i>
Salt Marsh Cordgrass	<i>Spartina alterniflora</i>
Salt Hay	<i>Spartina patens</i>
Fresh Water Cordgrass	<i>Spartina pectinada</i>
Sand-Spurrey	<i>Spergularia marina</i>
Sphagnum Moss	<i>Sphagnum spp.</i>
Sea-Blite	<i>Suaeda spp.</i>
Poison Ivy	<i>Toxicodendron radicans</i>
Arrow Grass	<i>Triglochin maritima</i>
Cattail	<i>Typha angustifolia</i>
Large Cranberry	<i>Vaccinium macrocarpon</i>
Arrow-wood	<i>Viburnum recognitum</i>
Grape	<i>Vitis spp.</i>

### 3.3.4 Marine Invertebrates

The salt marshes, tide flats, and waters of the Upper Estuary are home to a wide variety of marine invertebrates. Several species of polychaete worms are present in

the tide flats; these organisms are an important source of food for inshore fish such as winter flounder, as well as for many shorebirds. Mollusks that live in the marshes and tide flats include soft-shell clam, quahog, oyster, and ribbed mussel. Bay scallop have also been observed in some numbers in the Inner Harbor and Upper Estuary. Numerous crustacean species use the salt marshes, including fiddler, mud, and marsh crabs; these are an important source of food for wading birds such as herons. Lobster and blue crab are also common in the Inner Harbor and Upper Estuary, at least in winter (SES, 1988; Hoff et al., 1973).

A number of commercially important species of shellfish are present in Outer New Bedford Harbor, although because of contamination or lack of abundance, only a few presently support fisheries in the Harbor Estuary. Lobster are abundant; the Outer Harbor supported a commercial fishery for this species until the 1979 fishing closure was enacted due to the discovery of elevated levels of PCBs in lobsters (McConnell and Morrison, 1986). Quahogs support both commercial and recreational fisheries in Clarks Cove and other areas of the Outer Harbor. Bay scallop, soft-shell clam, whelk, and limpet are present; of these, only whelk supports a commercial fishery, while limpets are taken in an informal, unregulated fishery. Blue mussel are present in the Outer Harbor, but are not abundant enough to support a fishery (Whittaker, PC, 1996). **Table 3.5** lists invertebrates known to be present in the New Bedford Harbor Estuary.

**Table 3.5**  
**Marine invertebrates of the New Bedford Harbor Estuary**  
**(from Whittaker, PC, 1996; SES, 1988; Hoff et al., 1973)**

common name	scientific name
Crustaceans	
American Lobster	<i>Homarus americanus</i>
Blue Crab	<i>Callinectes sapidus</i>
Fiddler Crab	<i>Uca pugnax</i>
Mud Crab	<i>Neopanope texana</i>
Marsh Crab	<i>Sesarma reticulatum</i>
Green Crab	<i>Carcinus maenas</i>
Rock Crab	<i>Cancer irroratus</i>
Spider Crab	<i>Libinia emarginata</i>
Lady Crab	<i>Ovalipes ocellatus</i>
Hermit Crab	<i>Pagurus longicarpus</i>
Horseshoe Crab	<i>Limulus Polyphemus</i>
Sand Shrimp	<i>Crangon septemspinosus</i>
Grass Shrimp	<i>Palaemonetes vulgaris</i>
Mantis Shrimp	<i>Squilla empusa</i>
Barnacles	<i>Balanus spp.</i>
Isopods	<i>Isopoda spp.</i>
Mollusks	
Quahog	<i>Mercenaria mercenaria</i>
Soft-shell Clam	<i>Mya arenaria</i>
Macoma Clam	<i>Macoma balthica</i>
Eastern Oyster	<i>Crassostrea virginica</i>
Bay Scallop	<i>Argopecten irradians</i>
Blue Mussel	<i>Mytilus edulis</i>
Ribbed Mussel	<i>Geukensia demissus</i>
Channeled Whelk	<i>Busycon canaliculatum</i>
Knobbed Whelk	<i>Busycon carica</i>

Mudsnail	<i>Ilyanassa obsoleta</i>
Common Periwinkle	<i>Littorina littorea</i>
Coffee Bean Snail	<i>Melampus bidentatus</i>
Arks	<i>Anadara spp.</i>
Limpet	<i>Crepidula fornicata</i>
Jingle	<i>Anomia simplex</i>
Minute hydrobid	<i>Hydrobia totenti</i>
	<i>Cepea hortensis</i>
	<i>Discus spp.</i>
Other Invertebrates	
Common Starfish	<i>Asterias forbesi</i>
Sea Anemone	<i>Metridium dianthus</i>
Shipworm	<i>Toredo navalis</i>
Nereid Polychaete	<i>Nereis succinea</i>
Trumpet Worm	<i>Pectinaria gouldii</i>
Serpulid Tube Worm	<i>Filograna implexa</i>
Serpulid Tube Worm	<i>Spirobus spirillum</i>
Boring Piddock	<i>Zirfaea crispata</i>

### 3.3.5 Fish

The finfish of the New Bedford Harbor Estuary have not been adequately studied. Nevertheless, it is clear that a number of important species spend part or all of their lives in the Upper Acushnet River Estuary and Inner New Bedford Harbor. A trawl survey conducted in 1972-1973 found 14 fish species in the vicinity of the Hurricane Barrier, including striped bass, bluefish, winter and windowpane flounder, and tautog. Other species known to frequent the Inner Harbor and Upper Acushnet River Estuary include scup and summer flounder. Many more marine species are probably present in larval or juvenile stages. The salt marshes and waters of the Upper Acushnet support significant populations of important baitfish, such as mummichog, Atlantic silverside, menhaden, and eel. Anadromous fish that run up the Acushnet River to spawn include blueback herring and alewife (VHB, 1996; SES, 1988; Kolek & Ceurvals, 1981; Hoff et al., 1973).

Information is also lacking on fish species in the waters of Outer New Bedford Harbor. In addition to the fish listed above, black sea bass, butterfish, fourspot flounder, tomcod, silver and red hake, and cunner have been sampled in these waters (VHB,

1996; Kolek & Ceurvals, 1981; Hoff et al., 1973). However, this list is surely incomplete. Nearly 50 species of finfish are known to use the waters of Buzzards Bay (NOAA 1994), many or most of which are undoubtedly present in Outer New Bedford Harbor for at least part of the year. **Table 3.6** lists finfish species known to use the New Bedford Harbor Estuary, while **Table 3.7** lists commercially important species in Buzzards Bay.

**Table 3.6**  
**Finfish in the New Bedford Harbor Estuary**  
**(from VHB, 1996; Kolek & Ceurvals, 1981; Hoff et al., 1973).**

common name	scientific name
Striped Bass	<i>Morone saxatilis</i>
Bluefish	<i>Pomatomus saltatrix</i>
Tautog	<i>Tautoga onitis</i>
Scup	<i>Stenotomus chrysops</i>
Black Sea Bass	<i>Centropristis striata</i>
Atlantic Tomcod	<i>Microgadus tomcod</i>
Butterfish	<i>Peprilus triacanthus</i>
White Perch	<i>Morone americanus</i>
Winter Flounder	<i>Pleuronectes americanus</i>
Summer Flounder	<i>Paralichthys dentatus</i>
Fourspot Flounder	<i>Paralichthys oblongus</i>
Windowpane Flounder	<i>Scopthalmus aquosa</i>
Alewife	<i>Alosa pseudoharengus</i>
Blueback Herring	<i>Alosa aestivalis</i>
Menhaden	<i>Brevoortia tyrannus</i>
American Eel	<i>Anguilla rostrata</i>
Smelt	<i>Osmerus mordax</i>
Atlantic Silverside	<i>Menidia menidia</i>
Silver hake	<i>Merluccius bilinearis</i>
Red hake	<i>Urophycis chuss</i>
Cunner	<i>Tautoglabrus adspersus</i>
Goby	<i>Gobiosoma Ginsburgi</i>



**Table 3.7**  
**DOMINANT COMMERCIALY VALUABLE FISH SPECIES**  
**IN BUZZARDS BAY IN ORDER OF ABUNDANCE AND PREFERRED PREY**  
**ITEMS<sup>1</sup>**

Common Name	Scientific Name	Preferred Prey Items
Scup (porgy)	<i>Stenotomus chrysops</i>	Assorted benthos, occasionally small fish
Butterfish	<i>Peprilus triacanthus</i>	Copepods, small fish, jellyfish, worms
Winter flounder	<i>Pleuronectes americanus</i>	Worms, gastropods, bivalves
Alewife	<i>Alosa pseudoharengus</i>	Copepods, shrimp, eggs, and larvae
Blueback herring	<i>Alosa aestivalis</i>	Copepods, shrimp, eggs, and larvae
Atlantic menhaden	<i>Brevoortia tyrannus</i>	Phytoplankton
Black sea bass	<i>Centropristis striata</i>	Mysids and other benthic organisms
Tautog (blackfish)	<i>Tautoga onitis</i>	Mollusks, crabs, worms, lobster
Bluefish	<i>Pomatomus saltatrix</i>	Fish, worms, shrimp, lobster, squid, crab
Striped bass	<i>Morone saxatilis</i>	Fish, worms, shrimp, lobster, squid, crab

<sup>1</sup> Adopted from Howes and Geohringer (In Press)

### Anadromous Fish

In the past, significant anadromous fish populations utilized the Acushnet River as spawning and nursery habitat, as evidenced by the 1790 establishment of the Herring Committee mentioned in Section 3.4. More recently, anadromous species have been severely reduced by overfishing, pollution, and loss of spawning habitat caused by dam construction. Alewives and blueback herring are known to spawn in the river; adults enter the river during April or May and young-of-the-year migrate from the river during the following fall. Population levels of alewives and herring are unknown; it is also unknown whether American shad (*Alosa sapidissima*) still spawn in the Acushnet.

As mentioned in Section 3.2., three structures on the Acushnet River interfere with upstream migration by anadromous species. The first is the Acushnet Sawmill Dam off Mill Street in Acushnet, where a fishway built in 1970 is impassable during low water periods. A second blockage is a dam at the Hamlin Street crossing, also known as the White's Dairy impoundment. This dam was reconstructed in 1920 and consists of two stone culverts, each with a flash board system. Local residents have been known to adjust these flashboards to facilitate passage by the migrating alewives. Further upstream, a 10 ft (3 m) high dam forming the New Bedford Reservoir also serves as an impediment to migrating fish.

### 3.3.6 Birds

The waters, shores and wetlands of the New Bedford Harbor Environment support many species of waterfowl, shorebirds, and other avifauna, including several species which are endangered or of special concern. Many of these avian species are associated with salt marshes and other wetland environments in the New Bedford Harbor Estuary; as mentioned above, a 1988 study counted about 80 species of birds

in the marshes of the Upper Estuary and Pope Beach (SES, 1988) while over 70 species are known to use the Nonquitt marsh (Lloyd Center, 1989). **Table 3.8** lists bird species known to use estuarine environments of the New Bedford Harbor area, but does not include songbirds and other primarily terrestrial species which use the marsh occasionally.

Common avian species using open-water areas near the Upper Estuary and Pope Beach salt marshes include herring gull (*Larus argentatus*), double-crested cormorant (*Phalacrocorax auritus*), mallard duck (*Anas platyrhynchos*), great black-backed gull (*Larus marinus*), and rock dove (*Columba livia*). The gulls commonly feed on fish and shellfish, while the mallards frequently feed on macroinvertebrates, such as amphipods and polychaetes, found in shallow intertidal habitats. Through these feeding patterns, contaminants such as PCBs can be transferred from the Harbor sediments to higher organisms, including humans.

Other bird species which utilize open-water areas near these marshes are least tern (*Sterna albifrons*), designated by the Commonwealth as a "Species of Special Concern," which feeds on Atlantic silversides (*Menidia menidia*) in the Upper Acushnet River Estuary. Osprey (*Pandion haliaetus*) and common tern (*Sterna hirundo*), also state-listed Species of Special Concern, have been observed using open-water habitat by the Pope Beach marsh. Peregrine falcon (*Falco peregrinus*), which is on the federal Endangered Species List, has been observed by the marshes of the Upper Acushnet River Estuary, though it is rare in the New Bedford Harbor Environment. The nearest known nesting site of this bird is the Braga Bridge in Fall River, about 11 miles west of New Bedford Harbor.

Waterfowl use the salt marshes of the Upper Estuary and Pope Beach as breeding habitat: mallard at Pope Beach and black duck (*Anas rubripes*) in the northernmost salt marsh in the Upper Estuary, just south of Wood Street. Many more avian species undoubtedly use the open water habitat of the Upper Estuary and Pope Beach area during the fall migration, feeding on macroinvertebrates in the shallow intertidal waters.

Shorebirds and wading birds observed in the marshes of the Upper Estuary and Pope Beach include killdeer (*Charadrius vociferus*) and spotted sandpiper (*Actitis macularia*). At the time of the 1988 study, snowy egret (*Egretta thula*) was the most common wading species throughout these wetlands, while least bittern (*Ixobrychus exilis*), a state-listed "Threatened Species," was observed foraging along a common reed stand at the north end of the Upper Estuary.

Other bird species using this area are mourning dove (*Zenaida macroura*) and insectivores such as chimney swift (*Chaetura pelagica*), barn swallow (*Hirundo rustica*), tree swallow (*Tachycineta bicolor*) and sharp-tailed sparrow (*Ammodramus candacutus*), which nests in salt marsh. Diversity of species is particularly high at the upland edges of the marsh, where common species include red-winged blackbird (*Agelaius phoeniceus*), European starling (*Sturnus vulgaris*), northern mockingbird (*Mimus polyglottos*), song sparrow (*Melospiza melodia*), American robin (*Turdus migratorius*), and common yellowthroat (*Geothlypis trichas*).

Roseate tern (*Sterna dougalli*), another species on the federal Endangered Species List, are known to feed in New Bedford Harbor. Bird Island, located approximately 11 miles (18 km) east/northeast of New Bedford Harbor in the town of Marion, MA, is the largest known nesting colony of roseate tern in the Western Hemisphere, consisting of approximately 1,500 breeding pairs of roseate tern as well as a greater number of breeding pairs of common tern. Ram Island, 3 miles (4.9 km) northeast of New Bedford Harbor in Mattapoisett, also is inhabited by a nesting colony of approximately 300 pairs of roseate tern and 1,000 pairs of common tern. Roseate tern inhabiting these nesting islands feed primarily on sand lance, while common tern in the area feed on sand lance, menhaden, and alewives.

The ingestion and biomagnification of contaminants by bird species in the New Bedford Harbor Environment is a function of diet, feeding habits, and the amount of time spent in the affected environment. The avian species found in the New Bedford Harbor Estuary represent seven feeding guilds: molluscivores, piscivores, carnivores, granivores, omnivores, herbivores, and insectivores. Diving ducks and oystercatchers are molluscivores; molluscs comprise more than 60 percent of the food volume of winter sea ducks (Terres, 1980). Loons, grebes, and cormorants are piscivores, feeding on Atlantic silverside, sand lance, bay anchovy and other small fishes. Osprey are both piscivorous and carnivorous, feeding on larger fish such as menhaden, dabbling ducks such as black duck, and small mammals such as muskrat. Dabbling ducks, pigeons, and doves are granivores, while gulls and crows are omnivores. Canada geese are primarily herbivorous; their diet may include marsh grasses, eelgrass, and other coastal plants. Many of the other species using the intertidal habitats are insectivores; for example, tree swallows feed on mosquitoes. The diversity of feeding patterns of birds in the New Bedford Harbor Environment, and the exceptional mobility of these animals, provide a myriad of potential pathways of ingestion, biomagnification, and transport--within and beyond the Harbor Environment--of contaminants present in the marine sediments of the New Bedford Harbor Estuary.

**Table 3.8**  
**BIRD OBSERVATIONS IN NEW BEDFORD HARBOR**  
**AND UPPER BUZZARDS BAY, 1986-1995**

SPECIES NAME		AREA				SEASON**	ABUNDANCE
COMMON NAME	SCIENTIFIC NAME	A	B	C	D		***
Red-throated Loon	<i>Gavia stellata</i>				X	W	U
Common Loon	<i>Gavia immer</i>			X	X	W	C
Horned Grebe	<i>Podiceps auritus</i>	X	X	X	X	W	C
Red-necked Grebe	<i>Podiceps grisegena</i>	X				W	U
Great Cormorant	<i>Phalacrocorax carbo</i>	X	X	X	X	W	A
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	X	X	X	X	S	A
Great Blue Heron	<i>Ardea herodias</i>	X	X	X	X	W, S	C
Great Egret	<i>Casmerodius albus</i>	X	X	X	X	S	C
Snowy Egret	<i>Egretta thula</i>	X	X	X	X	S	C
Green-backed Heron	<i>Butorides striatus</i>	X				S	C
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	X		X	X	S	C
Mute Swan	<i>Cygnus olor</i>	X	X	X	X	W, S	A
Great White-fronted Goose	<i>Anser albifrons</i>	X				W	R
Snow Goose	<i>Chen caerulescens</i>	X				W	R
Brant	<i>Branta bernicla</i>			X	X	W	C
Canada Goose	<i>Branta canadensis</i>	X	X	X	X	W, S	A
Wood Duck	<i>Aix sponsa</i>	X				S	R
Green-winged Teal	<i>Anas crecca</i>	X				W, S	U
American Black Duck	<i>Anas rubripes</i>	X	X	X	X	W, S	A
Mallard	<i>Anas platyrhynchos</i>	X	X	X	X	W, S	A
Northern Pintail	<i>Anas acuta</i>	X				W	U
Blue-winged Teal	<i>Anas discors</i>	X				S	U
Northern Shoveler	<i>Anas clypeata</i>	X				W	U
Gadwall	<i>Anas strepera</i>	X				W, S	U
Eurasian Wigeon	<i>Anas penelope</i>	X				W	R
American Wigeon	<i>Anas americana</i>	X	X			W	C
Canvasback	<i>Aythya valisineria</i>	X				W	U
Redhead	<i>Aythya americana</i>	X				W	R
Ring-necked Duck	<i>Aythya collaris</i>	X				W	U
Greater Scaup	<i>Aythya marila</i>	X	X	X	X	W	C
Lesser Scaup	<i>Aythya affinis</i>	X	X	X	X	W	C
Common Eider	<i>Somateria mollissima</i>				X	W	C
Oldsquaw	<i>Clangula hyemalis</i>			X	X	W	C
Black Scoter	<i>Melanitta nigra</i>				X	W	U
Surf Scoter	<i>Melanitta perspicillata</i>				X	W	C
White-winged Scoter	<i>Melanitta deglandi</i>				X	W	C
Common Goldeneye	<i>Bucephala clangula</i>	X	X	X	X	W	C
Barrow's Goldeneye	<i>Bucephala islandica</i>	X			X	W	R
Bufflehead	<i>Bucephala albeola</i>	X	X	X	X	W	C
Hooded Merganser	<i>Lophodytes cucullatus</i>	X			X	W	U
Common Merganser	<i>Mergus merganser</i>	X				W	U
Red-breasted Merganser	<i>Mergus serrator</i>	X	X	X	X	W	C
Turkey Vulture	<i>Cathartes aura</i>	X				S	U
Osprey	<i>Pandion haliaetus</i>	X			X	S	C

**Table 3.8**  
**BIRD OBSERVATIONS IN NEW BEDFORD HARBOR**  
**AND UPPER BUZZARDS BAY, 1986-1995**

COMMON NAME	SPECIES NAME SCIENTIFIC NAME	AREA*				SEASON**	ABUNDANCE
		A	B	C	D		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	X	X			W	R
Northern Harrier	<i>Circus cyaneus</i>				X	W	U
Sharp-shinned Hawk	<i>Accipiter striatus</i>	X				W	U
Cooper's Hawk	<i>Accipiter cooperii</i>	X				W	U
Red-tailed Hawk	<i>Buteo jamaicensis</i>	X	X			W, S	C
American Kestrel	<i>Falco sparverius</i>	X				W, S	U
Peregrine Falcon	<i>Falco peregrinus</i>	X		X		W	R
Clapper Rail	<i>Rallus longirostris</i>	X				S	U
Virginia Rail	<i>Rallus limicola</i>				X	S	U
American Coot	<i>Fulica americana</i>	X		X		W	C
Black-bellied Plover	<i>Pluvialis squatarola</i>				X	S	C
Semipalmated Plover	<i>Charadrius semipalmatus</i>				X	S	C
Killdeer	<i>Charadrius vociferus</i>	X			X	S	C
American Oystercatcher	<i>Haemotopus palliatus</i>			X	X	S	C
Greater Yellowlegs	<i>Tringa melanoleuca</i>				X	W, S	C
Lesser Yellowlegs	<i>Tringa flavipes</i>				X	S	C
Willet	<i>Catoptrophorus semipalmatus</i>				X	S	C
Spotted Sandpiper	<i>Actitis macularia</i>				X	S	C
Ruddy Turnstone	<i>Arenaria interpres</i>				X	S	C
Sanderling	<i>Calidris alba</i>				X	W	U
Semipalmated Sandpiper	<i>Calidris pusilla</i>				X	S	C
Least Sandpiper	<i>Calidris minutilla</i>				X	S	C
Purple Sandpiper	<i>Calidris maritima</i>				X	W	U
Dunlin	<i>Calidris alpina</i>				X	W, S	C/U
Laughing Gull	<i>Larus atricilla</i>	X	X	X	X	W, S	C
Common Black-headed Gull	<i>Larus ridibundus</i>	X				W	R
Bonaparte's Gull	<i>Larus philadelphia</i>	X	X	X	X	W	C
Ring-billed Gull	<i>Larus delawarensis</i>	X	X	X	X	W, S	A
Herring Gull	<i>Larus argentatus</i>	X	X	X	X	W, S	A
Iceland Gull	<i>Larus glaucoides</i>	X		X		W	R
Lesser Black-backed Gull	<i>Larus fuscus</i>	X				W	R
Glaucous Gull	<i>Larus hyperboreus</i>	X				W	R
Great Black-backed Gull	<i>Larus marinus</i>	X	X	X	X	W, S	A
Roseate Tern	<i>Sterna dougalli</i>				X	S	C
Common Tern	<i>Sterna hirundo</i>	X	X	X	X	S	C
Forster's Tern	<i>Sterna forsteri</i>				X	S	U
Least Tern	<i>Sterna albifrons</i>	X	X	X	X	S	C
Black Tern	<i>Chlidonias nigra</i>				X	S	R
Snowy Owl	<i>Nyctea scandiaca</i>	X			X	W	U
Belted Kingfisher	<i>Megasceryle alcyon</i>	X			X	W, S	C

Source: National Audubon Society (Christmas Count Data), M. Boucher, D. Zimmerlind (Unpublished Data)

Note: Data not collected during Spring and Autumn

\* Area A = Wood Street Bridge to I-195 Bridge

Area B = I-195 Bridge to Route 6 Bridge

Area C = Route 6 Bridge to Hurricane Barrier

Area D = Hurricane Barrier South; all shorebird sitings in this area were from Fort Phoenix State Beach and Pope Beach

\*\* W = Winter S = Summer

\*\*\* A = Abundance

C = Common U = Uncommon R = Rare

### 3.3.7 Mammals--Terrestrial and Marine

As noted above, the salt marshes of the New Bedford Harbor Estuary are home to a variety of small mammals, as well as deer. Marine mammals are not believed to use the affected environment to a significant extent, but are common in Buzzards Bay, and may make occasional use of Outer New Bedford Harbor.

Harbor seals (*Phoca vitulina*) are present in Buzzards Bay and the Elizabeth Islands from mid-October to May; during the winter and early spring, 300 to 400 of them are present in the Bay. The largest colony is at Gull Island, where 280 seals were recorded in 1988.

Gray seal (*Halichoerus grypus*) are occasionally seen in the Bay in very small numbers. Other marine mammals using the Gulf of Maine and Cape Cod Bay that may occasionally be found in Buzzards Bay are Atlantic bottlenose dolphin (*Tursiops truncatus*), harbor porpoise (*Phocoena phocoena*), long-finned pilot whale (*Globicephala melas*), humpback whale (*Megaptera novaeangliae*), and finback whale (*Balaenoptera physalus*).

### 3.3.8 Endangered Species

According to the Massachusetts Natural Heritage and Endangered Species Program (NHESP), there are a number of rare species and high-priority habitats within the New Bedford Harbor Environment. The largest of these are Round Hill Point and the Nonquitt Marsh area in Dartmouth, the Winsegansett Pond area of Sconticut Neck in Fairhaven, and a 2-mile stretch of the Acushnet River south of the New Bedford Reservoir. Endangered, threatened or rare species known to inhabit or use the affected environment are the piping plover (*Charadrius melodus*), roseate tern (*Sterna dougalli*), least tern (*Sterna antillarum*), common tern (*Sterna hirundo*), diamondback terrapin (*Malaclemys terrapin*), eastern box turtle (*Terrapene carolina*), water-willow borer moth (*Papaipema sulphurata*), eastern pondmussel (*Ligumia nasuta*), and American burying beetle (*Nicrophus americanus*) (MNHESP, 1996 and USFWS, 1997).

As discussed in Section 3.3.6, other rare species which occasionally use the New Bedford Harbor Environment include the peregrine falcon (*Falco peregrinus*) and bald eagle (*Haliaeetus leucocephalus*). Leatherback turtle (*Dermochelys coriacea*), Atlantic ridley turtle (*Lepidochelys kempii*), and loggerhead turtle (*Caretta caretta*) are transient species occasionally found in Buzzards Bay and possibly in the vicinity of New Bedford Harbor.

## 3.4 Human Environment

### 3.4.1 Population

The New Bedford Superfund Site crosses the boundaries of four municipalities: New Bedford, Fairhaven, Acushnet, and Dartmouth. Of these four affected communities, the City of New Bedford is by far the largest and most intensely urbanized, serving as

the economic center of the area. **Table 3.9** summarizes the population of the four municipalities of the New Bedford Harbor Environment.

**Table 3.9**  
**Population of the New Bedford Harbor Environment**  
(from DOC 1992a)

New Bedford	99,922
Fairhaven	16,132
Acushnet	9,554
Dartmouth	27,244
Total	152,852

As discussed in the following sections, industry in the New Bedford area has declined somewhat since the Second World War, and with it, to some extent, the economy of New Bedford. The 1990 US Census reported median household income in New Bedford at \$22,647, or just 61% of the median for Massachusetts, while the portion of the City's residents living below the official poverty level was nearly double the state average. Unemployment in New Bedford in 1990 was over 12%, and less than half the City's adult residents had finished high school. Higher rates of income were reported for Fairhaven, Acushnet and Dartmouth; indices of prosperity in these municipalities are comparable to statewide figures. **Table 3.10** summarizes economic statistics for the four municipalities of the New Bedford Harbor Environment.

**Table 3.10**  
**1990 Economic statistics for the New Bedford Harbor Environment**  
(DHCD, 1996; DOC, 1996)

	Median household income	Per Capita Income	Unemployment rate	Poverty Rate
Massachusetts	\$36,952	\$17,224	6.7%	8.9%
New Bedford	\$22,647	\$10,923	12.2%	16.8%
Fairhaven	\$30,097	\$13,114	7.6%	6.5%
Acushnet	\$35,734	\$14,040	5.3%	4.8%
Dartmouth	\$35,138	\$15,389	7.9%	5.7%

The demographics of the area reflect the legacy of immigration, spurred initially by the availability of work in the mills and fishing fleet, but continuing today. The population of the area is largely ethnic; according to the 1990 Census, nearly 30% of New Bedford residents speak Portuguese at home (DOC, 1992b).

### **3.4.2 Historic Patterns of Natural Resource Use and Impacts**

#### **3.4.2.1. Settlement Period**

Before European contact, approximately 21,000 to 24,000 Wampanoags lived in what is now southeastern Massachusetts and Eastern Rhode Island (Russel, 1980; Weinstein-Farson, 1988). With European settlement in the late 17th and early 18th Centuries, human impacts on the watershed and estuarine waters of the New Bedford Harbor Environment increased. Land was cleared for farming and timber; agriculture and grazing became widespread. The settlers used the high salt marsh for cattle grazing, harvested salt meadow hay and cordgrass, and cut ditches to drain the marsh surface (Teal and Teal, 1969). These actions probably caused significant increases in sediment and nutrient loadings to the Harbor Estuary and began the pattern of coastal habitat alteration that continues today.

During the late 18th Century the New Bedford offshore whale fishery was developed, leading to the rapid growth of settlements and infrastructure in the Area. By 1774, New Bedford was home port to more than 50 whaling vessels and a number of merchant ships, Fairhaven had become a shipbuilding center, and blacksmith shops, rope works, cooperages, sail lofts, and candle factories had been established. Between 1775 and 1795, New Bedford's population doubled, to 1,000 residents; increasing populations on the Acushnet River probably resulted in discharge of relatively minor quantities of sewage and debris to Inner New Bedford Harbor.

Construction of wharves and shoreline structures also began during the 18th Century, affecting localized intertidal and subtidal habitats in the New Bedford Harbor Estuary. In 1760, the Old South Wharf was built in Fairhaven, at the site of the present Kelley Wharf (MHC, 1981b). By 1771, New Bedford had more than 30,000 feet of wharfage. The construction of the first Fairhaven-New Bedford Bridge linked New Bedford with Fairhaven and resulted in the loss or alteration of about 3.7 acres (1.5 hectares) of subtidal habitat and restricted circulation and flushing in the Inner Harbor.

Acushnet became an early center of milling and manufacturing, taking advantage of the Acushnet River as a source of water power (MHC, 1981c). Sawmills and an iron forge were developed in Acushnet along the northern portion of the Acushnet River and its tributaries during the 1700s; cotton mills and factories were constructed on the river in the early 1800s. Besides altering river flow, the dams served as barriers to anadromous fish, and in 1790 a Herring Committee was established to ensure that passageways were provided around these obstructions (Belding, 1912). The Herring Committee was also responsible for setting gear and time restrictions in the Acushnet River.

An example of coastal habitat loss in the New Bedford Harbor Estuary during the 18th Century is provided by the history of Mill Pond in Fairhaven. This was a 5 acre (2 ha) tidal embayment at the mouth of the Herring River, southeast of the intersection of present-day Route 6 and Main Street in Fairhaven. During the 1700s, Mill Pond served as a sheltered anchorage for ships, but in the late 1700s, Main Street was constructed over the creek, ending the use of the Pond as a mooring area. Due to the bridge construction, tidal circulation decreased and Mill Pond began to fill in. In



1792, tide gates were installed under the bridge to power a mill, and in 1871, a dam was constructed across the Pond's mouth, converting it to a non-tidal waterbody. By 1906, the Pond had become a wetland of about 13 acres (5.3 ha), which was filled to create Cushman Park (McCabe, 1988). Incremental modifications to the Mill Pond had altered it over time from habitat for fish, shellfish, and birds, to an upland recreational area with little or no habitat value.

#### **3.4.2.2 19th Century**

During the first half of the 19th Century, the New Bedford whaling industry continued to grow, and with it, the population, commerce and infrastructure of the New Bedford Harbor Environment. In 1800, the population of the New Bedford Harbor area was approximately 4,000; by 1850, it was 20,000 (Boss and Thomas, 1983; McCabe, 1988). As the area continued to develop, impacts on coastal resources intensified. An 1834 map shows more than 30 wharves along the western shore of New Bedford Harbor, representing an estimated 9 acres (3.6 hectares) of intertidal and subtidal habitats destroyed (VHB, 1996). During the same period, seven saltworks were developed along the Apponagansett River near Padanaram, probably by diking coastal marshes or salt ponds.

By the 1850s, the combined New Bedford and Fairhaven fleets totalled 426 vessels, employing more than 10,000 seamen, and New Bedford ranked third among U.S. ports for the tonnage of goods shipped. Dredging of the Harbor appears to have begun in 1839, when about 2 ft of sediments were dredged to create a 30 ft wide, 12.5 ft deep channel, affecting no more than 5 or 10 acres of subtidal habitat. A dredged channel to Fairhaven Village was completed in 1840, leading to the development of additional wharves, marine railways, and shipyards, many of which remain in place today (VHB, 1996).

Ship repair and construction during this period probably contributed some contaminants to the Harbor Environment. Copper and lead-based compounds, as well as creosote, were used for antifouling and other purposes, and may have caused locally elevated levels of toxics in the waters and sediments of the Harbor.

In the mid-19th Century, during the heyday of the New Bedford whale fishery, several events occurred that would eventually lead to the decline of the whaling industry. Whale stocks were being depleted, requiring ever longer voyages to fill a vessel with oil. In 1859, petroleum was discovered in Pennsylvania, and by 1860, two companies in New Bedford were refining and distilling petroleum (Boss and Thomas, 1983). During the 1860s, New Bedford businesses were devastated by a tremendous waterfront fire. After the Civil War, the industry declined steadily. Insurance costs rose as whalers ventured into the Arctic for whales; in 1871, 29 New Bedford whaling ships were abandoned in Arctic ice. By 1897, the whaling fleet was reduced to 32 vessels (Boss and Thomas, 1983); and by 1905, the era of New Bedford whaling had ended.

While the New Bedford whale fishery was waning, the Industrial Revolution was getting underway, and New Bedford, with its well-developed port infrastructure and ready supply of capital, was well-positioned to take advantage of it. Beginning in the

mid-19th Century, New Bedford became a major industrial center. The first major textile mill was built in 1849; over the next several decades, many others were built. Telephone, electric, and trolley service were established. Housing, retail establishments, schools and churches sprang up in the new factory neighborhoods as the population burgeoned with immigrants from Ireland, French Canada, the Azores, Portugal, and the Cape Verde Islands. New Bedford's population grew from 15,000 to 27,000 (56 %) between 1870 and 1880; doubled by 1900; and doubled again to 118,000 by 1918 (Boss and Thomas, 1983; McMullin, 1976).

In the 1860s and 1870s, Steamship Wharf was constructed. The railroad was extended to the Wharf, providing a direct shipping link for the factories as well as transportation for tourists taking advantage of ferry service to Nantucket and Marthas Vineyard. The steamers that had carried whale oil to New York City now carried fine textiles to the New York City market. In addition to manufacturing, New Bedford became a major center of coal transshipment, supplying manufacturers throughout the newly industrialized Northeast (Boss and Thomas, 1983). Harbor dredging was increased to accommodate deeper vessels. In the late 1800s, a 200 ft wide, 18 ft deep channel was dredged from the Inner Harbor to Butlers Flat in Buzzards Bay, along with an anchorage in the Inner Harbor, south of Popes Island.

During the late 19th and early 20th centuries, a few mills were developed in Fairhaven, Acushnet, and Dartmouth. Fairhaven's waterfront became a center of boat building and repair, with several marine railways. Fairhaven and Acushnet became residential communities for New Bedford factory workers, while Dartmouth and the northern part of Acushnet remained fairly rural. Padanaram Village in South Dartmouth and other areas along the coast of Buzzards Bay became vacation communities (VHB, 1996).

The rapid economic growth of 19th Century caused increased losses of coastal habitat in the Harbor Estuary. Between 1844 and 1919, dozens of mill buildings were constructed in the North and South Ends of New Bedford and at the head of Clarks Cove, mostly on filled salt marshes (Nelson, et al. 1996). North of Crow Island, on the eastern shore of the Inner Harbor, there was a marsh of about 145 acres (59 hectares (ha)), while on the western shore of the Harbor, south of the present-day I-195 bridge crossing, there was a marsh of 35 acres (14 ha). Other large salt marshes and sandflats were located in New Bedford, directly west and southwest of Palmer Island (57 acres (23 ha)). At least half of the area of Popes and Fish Islands appears to have been salt marsh (4.8 acres (2 ha)). Around 1900, a 50-acre marsh at the head of Clarks Cove was filled. In all, at least 250 acres (100 ha) of tidal and intertidal habitat in Inner New Bedford Harbor and the Upper Acushnet River Estuary were filled during the 19th and early 20th centuries (VHB, 1996).

Tidal exchange in the Inner Harbor and Upper Estuary was reduced by bridges across the Acushnet, while damming continued upriver. The Coggeshall Street bridge was completed in 1893, resulting in the loss of approximately 2 acres (0.8 ha) of salt marsh and subtidal habitats and constricting tidal flow into the Upper Estuary. The Wood Street bridge, constructed in 1900, filled habitats and further reduced flow. In 1869 the New Bedford Reservoir was created, affecting fish migration and altering fresh water inflows to New Bedford Harbor, although the reservoir was used as New Bedford's primary water supply for only 30 years (VHB, 1996).

Wharves continued to be built during this period, primarily in New Bedford, resulting in more lost or altered nearshore habitats. In 1860, a 700' stone jetty was constructed (1.2 acre (0.5 ha) fill) on the east side of Clarks Point. A new bridge from Fish Island to Fairhaven was completed in 1898 (U.S. House of Representatives, 1898), resulting in subtidal habitat loss. By the early 1900s, wharves extended from Howland Street to Maxfield Street in New Bedford. The State Pier was built after World War I, while the development of coal terminals and oil refineries resulted in the filling of salt marsh and other intertidal and subtidal habitats on Popes, Fish and Palmer Islands.

With the increase in industry and population during this period, significant pollutant loadings began to be discharged to the New Bedford Harbor Estuary, including sewage, household, and industrial waste. Tryworks, candle manufacturers, brass foundries, sawmills, cotton mills, and a paper mill established during this period released large quantities of debris, oils, metals, organic wastes, dyes, nutrients, and other pollutants into the Harbor Estuary. Discharges were most significant near the central business districts of New Bedford and Fairhaven, and from industries along the Upper Estuary. The installation of an underground sewer system in the New Bedford area began in 1850, resulting in the piping and filling of smaller streams. This, in turn, altered patterns of water flow, sedimentation, and pollutant runoff along the edges of the Harbor Estuary, concentrating pollutant discharges at "point sources"--the outlets of pipes.

In spite of the growth of anthropogenic impacts during the 19th Century, fish and shellfish were still readily available from the Harbor. Fish and crabs were trapped at the head of the Upper Estuary in the mid to late 1800s; scallop and quahogs were caught along the Fairhaven shore north of the Fairhaven-New Bedford Bridge in the 1880s; quahogs were harvested in the late 1800s from the Coggeshall Street Bridge for depuration and sale; and soft-shelled clams were dug along the Fairhaven shore in 1900 (McCabe, 1988; Boss and Thomas 1983). Commercial scalloping began in the New Bedford Harbor area about 1870. In 1880, New Bedford and Fairhaven inshore lobster landings were 50,000 and 44,000 pounds, respectively (Howes and Goehring, in press). In 1860, a local newspaper article reported large catches of Atlantic menhaden in the Acushnet River. However, the effects of pollution became evident during this period, with the closure of shellfish grounds due to outbreaks of typhoid fever during the 1850s (VHB, 1996).

#### **3.4.2.3 Early 20th Century**

The early 1900s were the height of the textile industry in New Bedford, which at its peak employed more than 35,000 people (Wolfbein, 1968). From 1900 to 1910, 17 new textile corporations were founded, accompanied by the construction of housing, schools, churches, and businesses (Boss and Thomas, 1983).

Rapid population growth during this period generated large loadings of nutrients and raw sewage to the Harbor Environment. In 1904, most of Inner New Bedford Harbor and the northern part of Clarks Cove were closed to shellfishing due to an outbreak of typhoid fever. Around 1920, a main north-south sewer line was installed in New Bedford, carrying sewage and stormwater to waters off Clarks Point via a 3,300-ft

(1,000-m) pipe, but many combined sewer overflow units (CSOs) continued to discharge into the Inner Harbor (CDM, 1990). In 1925, the Inner Harbor was again closed to shellfishing because of typhoid fever (VHB, 1996).

In addition to the habitat impacts of mill development noted in the preceding section, the textile industry contributed significant wastes to the Harbor Environment. Acids, nutrients, metals and toxics were discharged, first by cotton mills, later by manufacturers of synthetic fabrics. VHB (1996) estimates that in 1920, at the height of production, the mills discharged 100,000 tons of biological oxygen demand (BOD) generating materials and 69,000 tons of sodium hydroxide into New Bedford Harbor. During the late 19th century, wastes were mostly discharged along the western shore of the Harbor, but after 1920, the bulk of the discharge shifted to the Outer Harbor, off Clarks Point. The release of great quantities of BOD-generating materials probably resulted in abnormally low levels of dissolved oxygen in some parts of the Harbor, which in turn may have caused fish kills, migration of fish from the area, or other harmful effects on marine resources.

Other industries were sources of pollutants to the Harbor. The New Bedford Copper Works (later Revere Copper and Brass) was a significant source of copper, lead, and other metals. Atlas Tack Company in Fairhaven (now a separate Superfund Site) was a source of heavy metals to the Outer Harbor, discharging near Pope Beach. Coal houses and bins along the waterfront and on Fish and Pope Islands were a source of coal dust, while the oil refineries on the islands were a source of hydrocarbons and other wastes. Tanneries were likely a source of suspended solids, high BOD, chromium, and sulfides (Nemerow, 1978). Boatbuilding and repair facilities along the Fairhaven waterfront were a source of metals, organic solvents, and hydrocarbons. The Acushnet Processing Company, a rubber manufacturer founded in 1910 near the head of the estuary, was a probable source of suspended solids, oils, organic solvents, and high BOD (Sittig, 1975).

Like the whale fishery, the textile industry brought a period of prosperity to New Bedford which turned out to be relatively brief. The New Bedford textiles industry peaked in 1923, then declined rapidly due to a variety of factors: a prolonged strike in 1928, the Great Depression, and competition from the South. From 1917 to 1937, New Bedford lost 21,000 jobs as mills were closed. Some of the remaining mills switched to the production of rayon and silk. The Hurricane of 1938 damaged machinery and stock, placing approximately 10,000 workers temporarily out of work. World War II again brought brief prosperity, but many mills closed after the War (Boss and Thomas, 1983).

During the 1920s, the introduction of diesel power allowed New Bedford fishermen to compete with Gloucester for the Georges Banks harvest and New Bedford's offshore fishing fleet grew. By 1925, the City had 14 large fishing vessels (valued at more than \$25,000 each) and numerous smaller vessels; in 1936, the fleet earned over \$1 million.

In spite of the effects of industrialization, the New Bedford Harbor Estuary and surrounding waters had harvestable quantities of fish and shellfish during the first half of the 20th Century. Belding (1909, 1912) described the Inner Harbor, Clarks Cove, and Priests Cove as "good" quahog production areas and other parts of the Outer

Harbor as “fair.” Waters along the west shore of Sconticut Neck were described as “full of eel grass and scallops” during the 1930s. Quahogs were harvested from as far upriver as the Coggeshall Street Bridge and transplanted to waters west of Sconticut Neck during the 1930s. Data collected by the Massachusetts Division of Marine Fisheries on quahogs relayed from the Inner Harbor, Outer Harbor, and Clarks Cove to depuration waters suggest that significant densities of hard clams were present in these waters in the late 1930s and early 1940s. Boss (1983) describes swordfishing in nearshore waters using sailboats during the early 1900s, and later using motorized vessels. Cod reportedly caught from local waters were brought in daily to Kelley Wharf in Fairhaven during the 1930s (VHB, 1996).

**Table 3.11** summarizes historic and current patterns of natural resource use and impacts in the New Bedford Harbor Environment.

**Table 3.11**  
**Summary of Land Use Activities and Impacts,**  
**and Ecological Effects on New Bedford Harbor Resources**

<b>Selected Time Period</b>	<b>Land Use Activity</b>	<b>Impact Type</b>	<b>Ecological Effects</b>
1200s - 1650	agricultural development by Native Americans	localized erosion and sedimentation; minor changes in watershed hydrology	potentially minor releases of sediments to the Acushnet River and estuary; possible localized smothering of shellfish
1650 - 1750	deforestation and agricultural development by Early Europeans	increases in upland and marsh erosion; minor changes in watershed hydrology; cattle grazing, cutting, ditching in marshes	salt marsh loss, degradation, and hydrologic alteration; small-scale releases of sediments and smothering of shellfish
	scattered residential and commercial development in villages of New Bedford, Acushnet, Oxford and Fairhaven	relatively minor releases of sewage to local streams and New Bedford Harbor	localized increases in nutrients, Biological Oxygen Demand (BOD), resulting in loss of sensitive stream and/or harbor biota
	wharf development in New Bedford and Fairhaven villages	pier construction, minor fills	shading or loss of intertidal and subtidal habitats, potentially affecting submerged aquatic vegetation; loss of nearshore shellfish beds
	grist and sawmills, iron forge, fulling on upper Acushnet River and tributaries	dam construction	blockages to anadromous fish migration and access to spawning habitat
1750 - 1860	small-scale shipbuilding at the head of river	minor fills, pollutant discharges	minor loss of salt marsh and subtidal habitat for fish, shellfish, waterfowl, and wading birds; increased water column turbidity
	harbor development 1839, 1840	dredging of bottom sediments, increasing water depths in central part of harbor	alteration of benthic community; short-term increases in water turbidity; possible changes in tidal flushing patterns

**Table 3.11**  
**Summary of Land Use Activities and Impacts,**  
**and Ecological Effects on New Bedford Harbor Resources**

Selected Time Period	Land Use Activity	Impact Type	Ecological Effects
1750-1860	shipbuilding and repair in Fairhaven and New Bedford	wharf construction; debris discharges; localized release of metals, hydrocarbons	loss or degradation of intertidal and nearshore subtidal habitats; minor changes in tidal flushing particularly along shorelines of mid portion of harbor where wharves concentrated; possible bioaccumulation of metals (Cu, Pb, Zn) in local shellfish
	tryworks and other whaling-related industries	organic waste discharges	increases in BOD in harbor; possible localized harbor areas experiencing hypoxia
	Wamsutta Textile Mill	organic waste and chemical discharges	increases in BOD in harbor in vicinity of N. Front Street-Wamsutta Street; possible localized hypoxia
	saw mills, grist mills, foundry	dam construction	conversion of riverine habitat to pond habitat in upper Acushnet River and tributaries (Acushnet) and Herring River (Fairhaven)
1860 - 1930	port development	dredging of channel, ship turn-around	alteration of 50-80 acres (20-33 hectares) of subtidal habitats; effects on tidal flushing; temporary increases in water column turbidity
	industrial, residential, and commercial development in New Bedford and Fairhaven	wharf and bridge construction	loss of salt marsh and intertidal flats along western harbor shore (40+ acres (16 hectares)), eastern shore (20+ acres (8 hectares), and Clarks Cove (40+ acres (16 hectares)); loss of intertidal and subtidal habitats (2+ acres (0.8 hectares)) for Coggeshall Street bridge, and 0.5 acres (0.2 hectares) for Wood Street

**Table 3.11**  
**Summary of Land Use Activities and Impacts,**  
**and Ecological Effects on New Bedford Harbor Resources**

<b>Selected Time Period</b>	<b>Land Use Activity</b>	<b>Impact Type</b>	<b>Ecological Effects</b>
1860-1930	industrial, residential, and commercial development in New Bedford and Fairhaven	wharf and bridge construction	Bridge; alteration of tidal flushing in upper Acushnet River estuary and Inner New Bedford Harbor; new fill (4+ acres (1.6 hectares)) associated with Fairhaven-New Bedford bridge reconstruction
	water supply	dam construction and water withdrawals	alteration of habitat in upstream portion of Acushnet River; loss of flows to Acushnet River estuary
	coal terminals, oil refineries, and other industries	wharf construction, expansion, and infilling	loss of degraded intertidal and subtidal habitats, primarily along the western shore (10+ acres (4 hectares))
	textile mills and residential areas	exponential increase in organic wastes and chemical discharges	extensive water quality degradation in Inner and Outer New Bedford Harbor, algal blooms, hypoxic and/or anoxic conditions in poorly flushed areas; increased water column turbidity and loss of submerged aquatic vegetation; loss of shellfish and sensitive fish species; bioaccumulation of contaminants in fish, shellfish, and other fauna
	metal industries	waste discharges	bioaccumulation of metals (Cu, Pb, Zn, Cd, Cr); loss of sensitive species due to acute or chronic toxic effects
	boat building and repair industries	metal and chemical discharges	bioaccumulation of metals (Cu, Zn, Pb); toxic effects due to hydrocarbons and solvents



**Table 3.11**  
**Summary of Land Use Activities and Impacts,**  
**and Ecological Effects on New Bedford Harbor Resources**

<b>Selected Time Period</b>	<b>Land Use Activity</b>	<b>Impact Type</b>	<b>Ecological Effects</b>
1930 - present	port access and shipping maintenance	maintenance dredging of channel and maneuvering area	alteration of 30 ± acres (12 ± hectares) of severely degraded benthic substrates
	port protection	hurricane barrier and seawalls	loss of 34.5 ± acres of intertidal and subtidal habitats; severe reduction in tidal flushing in Inner Harbor
	port development	large fills, bulkheading	loss of 51± acres of subtidal and intertidal habitats
	roadway development (I-195, Route 18)	fills, pollutant discharges	loss of 4.7 acres of intertidal habitats; severe reduction in tidal flushing in upper estuary
	industrial development	PCB, metals	bioaccumulation of contaminants in sediments/food web; toxic effects to marine organisms
	residential, commercial and industrial development	bacteria, BOD materials, nutrients	increase in hypoxic and/or anoxic conditions; loss of shellfish and finfish

### **3.4.3 Current Patterns of Natural Resource Use and Impacts**

As New Bedford's textile industry declined, so did the City's population, from 130,000 in 1924 to 105,000 in 1955. It has remained relatively stable since, at just under 100,000 residents. While New Bedford's population was declining, the population of the suburban towns doubled, but the City of New Bedford still accounts for the majority of the area's population, as shown in **Table 3.9**, above. As the textile business waned, the New Bedford area diversified, remaining a regional center for industry, retail trade, and other business. Currently, New Bedford Harbor is characterized by working urban waterfronts in New Bedford and Fairhaven, supporting commercial fishing, shipping, and marina operations.

#### **3.4.3.1 Manufacturing**

Since the late 1930s, New Bedford has attracted a variety of manufacturers and other industrial concerns, although these new employers generally have employed fewer people than the textile mills. A variety of industries has recolonized the old mill buildings, while elsewhere, mills have been razed for housing or commercial

development. In 1960, the New Bedford Redevelopment Authority was formed to implement four major urban revitalization projects, including the North and South Terminal projects. The terminal projects created new highways along the waterfront, including the John F. Kennedy Memorial Highway, and created new waterfront property and bulkheads for industry and fishing. The 1300 acre New Bedford Industrial Park was opened in 1961 in the northern part of the City; in 1982 it was fully occupied with 18 companies employing 2500 people. The Air Industrial Park was developed during the 1980s immediately east of the New Bedford Airport (Boss and Thomas, 1983).

Manufacturing has decline further since 1984, when it represented 8,000 jobs or 45% of employment; at least five major manufacturers have discontinued operations in the New Bedford area since 1980. However, some types of manufacturing increased during the mid-1980s, including instruments, primary metals, chemical and allied industries, and transportation equipment. Even today New Bedford's largest employers are manufacturers: the Acushnet Company; Cliftex Corporation; Aerovox, Inc.; Calish Clothing Corp.; and Polaroid Corp. (DHCD, 1996; City of New Bedford, 1993).

#### **3.4.3.2 Tourism and Recreation**

During recent decades, tourism has grown in importance in the New Bedford Harbor Environment. The New Bedford Whaling Museum has been an important tourist attraction since the 1960s. Passenger ferries run from New Bedford to Marthas Vineyard and the Elizabeth Islands. In 1962, the Waterfront Historic Area League (WHALE) initiated an effort to preserve historic sections of New Bedford, and in 1984, the Bedford Landing Waterfront Historic District was established. Other efforts to encourage waterfront tourism include walking tours, visitor centers, and the berthing of historic vessels along the downtown waterfront. Annual events such as the Sea Fair, Feast of the Blessed Sacrament, and the Whaling City Festival bring thousands to the City. In 1988, downtown New Bedford was designated a "Main Street" district by the Commonwealth, and in 1996, the waterfront historic district was designated a National Park by act of Congress to commemorate the City's whaling heritage.

There are two public beaches in New Bedford. East Town Beach, a quarter of a mile long, is on the east side of Clarks Point, while West Town Beach, a half mile long, is on the northwest shore of Clarks Point. Fort Phoenix, a state-owned beach in Fairhaven, runs along a half mile of shoreline southeast of the Hurricane Barrier. Public access to the shore is also available at the Town of Fairhaven's West Beach, a three-quarter mile beach on the west side of Sconticut Neck. Several other small beaches and numerous jetties along the west side of Sconticut Neck offer public access for swimming, fishing, and other recreational activities (McConnell and IEC, 1986). The public may also access the shore along Hurricane Barrier, at Palmer Island, and at Tonnessen Park. Section 3.5.3 discusses some of the effects of PCB contamination on public access in the New Bedford Harbor Environment.

#### **3.4.3.3 Offshore Fishing and Maritime Industries**

New Bedford Harbor's offshore fishing industry grew rapidly following World War II. The fishing fleet was severely damaged by both the Hurricane of 1938 and Hurricane Carol in 1954 (VHB, 1996). To protect the working waterfront, built the Hurricane Barrier across the entrance to the Inner Harbor between 1962 and 1965. Terminal improvements and fish packing facilities were upgraded; together, these developments made New Bedford the premier fishing port on the East Coast.

Today nearly 300 commercial fishing vessels work out of New Bedford, mostly scallopers and trawlers fishing on Georges Bank, Nantucket Shoals, and the Great South Channel for sea scallops, Atlantic cod, haddock, winter flounder, mackerel, and other species (Doeringer et al., 1986). Fish landings in 1993 were valued at more than \$100 million, making New Bedford the second-largest fishing port in the nation in terms of value of catch. During the late 1980s the City was home to 23 seafood product and fishing-related businesses, employing more than 1,500 people (City of New Bedford, 1993). Recently, however, landings have declined, primarily because of overfishing in New England waters (DOC, 1995), and many large trawlers are now idle.

In addition to the fishing fleet, New Bedford Harbor is home to a variety of port facilities and maritime industries. Merchant vessels call at New Bedford to deliver produce for distribution throughout the Northeast. There is a Coast Guard facility with two 270 ft vessels, two passenger ferries, and at least 1,200 slips and moorings for recreational boats in the New Bedford Harbor Estuary. As of 1965, there were five public boat launches in New Bedford and another three in Fairhaven. Fishing vessels and yachts from throughout the region take advantage of extensive storage and repair facilities at commercial marinas in Fairhaven, New Bedford, and Dartmouth. Fairhaven Shipyard, for example, has the largest travelift in the U.S., a 330-ton hoist capable of hauling 120 ft vessels for maintenance and repair.

#### **3.4.3.4 Inshore Fishing**

##### **3.4.3.4.1 Commercial Fishing**

More than 100 years ago Buzzards Bay, including New Bedford Harbor, was closed to commercial finfishing with nets, seines, and fish traps because of recognition of the importance of the Bay as a spawning area (Cardin et al., 1995). Therefore, with the exception of the occasional harvesting of anadromous fish such as alewives for bait or other purposes, commercial fishing in the New Bedford Harbor Estuary centers on the Estuary's shellfisheries.

In 1971, harvesting of quahogs, scallops, and oysters in the Inner and Outer Harbor and Clarks Cove was restricted because of high bacterial counts caused by sewage releases. In 1979, the Commonwealth closed 18 square miles of the New Bedford Harbor Estuary to the taking of bottom-feeding fish and lobsters due to discovery of PCB contamination. This closure, and some of its economic effects, are discussed in Section 3.5.3.

Commercial shellfishing continues in the New Bedford Harbor Estuary outside of the closed areas. At present, the most important species taken is the quahog or hard clam (*Mercenaria mercenaria*), which is highly abundant in the upper reaches of the Harbor Estuary, particularly in the Inner and Outer Harbor and in Clarks Cove. Soft-shelled clam (*Mya arenaria*) and bay scallop (*Argopecten irradians*) support small commercial fisheries as well. Limpets (*Crepidula fornicata*) are also taken, but the fishery is unregulated, so no data are available. **TABLE 3.12** provides the most recent available landings figures for commercial shellfisheries in the New Bedford Harbor Estuary.

**TABLE 3.12**  
Commercial landings of shellfish in the New Bedford Harbor Estuary, in bushels  
(Whittaker, 1996).

<b>Quahog</b>			
	1993	1994	1995
New Bedford	9,035	8,710	n/a
Fairhaven	14,700	14,000	n/a
Dartmouth	25,653	21,544	15,418 (?)
Total	49,388	44,254	n/a
<b>Soft-shelled Clam</b>			
	1993	1994	1995
New Bedford	0	0	n/a
Fairhaven	1100	1300	n/a
Dartmouth	59	99	82
Total	1159	1399	n/a
<b>Bay Scallop</b>			
	1993	1994	1995
New Bedford	0	0	n/a
Fairhaven	5	10	n/a
Dartmouth	0	0	85
Total	5	10	n/a

At \$41 per bushel landed value for quahogs of mixed size, a rough estimate of the annual value of the New Bedford Harbor Estuary quahog catch is about \$1.8 million dockside. Using an economic multiplier of 4.5, the value of this fishery to the regional economy may be estimated at about \$8 million.

The shellfish catch in the Estuary might be larger if pollution were better controlled. As many as 500,000 bushels of quahogs, worth over \$24 million, may be present in closed or restricted waters (CLF, 1988). Some of these shellfish are relayed to cleaner waters for depuration.

Shellfish species of potential commercial importance that are present in the Harbor Estuary, but not taken because either because of inadequate abundance or contamination, are lobster (*Homarus americanus*), oyster (*Crassostrea virginica*) and whelk (*Busycon* spp.)

While lobsters may not be taken from the New Bedford Harbor Estuary because of the PCB contamination, the lobster fishery in Buzzards Bay and offshore is of economic importance to New Bedford Harbor. Buzzards Bay is a major lobster spawning ground, and landings from the Bay have averaged more than 250,000 lbs annually during recent years. Nearly 200 lobster fishermen work out of New Bedford; about 50 work from Fairhaven; and roughly 10 from Dartmouth (MDMF, 1993-1995), fishing inshore as well as offshore waters. **Table 3.13** provides lobster landings statistics for Buzzards Bay, while **Table 3.14** presents landings for the ports of New Bedford and Fairhaven.

**Table 3.13**  
**COMMERCIAL LOBSTER LANDINGS FOR BUZZARDS BAY**  
**FROM 1981 TO 1991<sup>1</sup>**

Year	Landings (pounds)	Landings (kg)
1981	214,079	97,088
1982	273,775	124,161
1983	317,593	144,033
1984	276,073	125,203
1985	237,374	107,653
1986	238,777	108,289
1987	249,822	113,298
1988	296,956	134,674
1989	316,199	143,401
1990	326,565	148,102
1991	290,769	131,868
1992	193,956	87,978
1993	268,719	121,891

<sup>1</sup> Adapted from Holmes and Geohringer (In Press) and MDMF (1994, 1995)

**TABLE 3-14**  
**LOBSTER HARVEST BY NEW BEDFORD AND FAIRHAVEN FISHERMEN**  
**1991 - 1993<sup>1</sup>**

	1991		1992			
Homeport	Territorial Waters	Non-Territorial Waters	Territorial Waters	Non-Territorial Waters	Territorial Waters	Non-Territorial Waters
New Bedford	152,367 (69,258)	541,266 (246,030)	103,067 (46,849)	583,344 (265,156)	102,647 (46,658)	655,683 (298,038)
Fairhaven	81,769 (37,168)	718,585 (326,630)	110,197 (50,090)	643,693 (292,588)	133,617 (60,735)	599,121 (272,328)
Total	234,136 (106,425)	1,259,581 (572,537)	213,254 (96,934)	1,227,037 (557,744)	236,264 (107,393)	1,254,804 (570,366)
Combined	1,493,717 (678,962)		1,440,291 (654,678)		1,491,068 (677,759)	

<sup>1</sup> Data from MDMF 1993, 1994, 1995; Values are in pounds and (kilograms)

Annual commercial landings for these ports during this period averaged 1.47 million lbs, while the catch landed in Dartmouth ranged from roughly 10,000-30,000 lbs.

#### **3.4.3.4.2. Recreational Fishing**

Recreational finfishing and shellfishing in Inner New Bedford Harbor and the Upper Acushnet River Estuary have been limited by the Harbor's chronic contamination problems, resulting from sewage discharges as well as PCB releases. Sportfishing remains popular, however, in the Outer Harbor and Buzzards Bay. Rod-and-reel fishermen fish for "schoolie" striped bass near the Route 6 Bridge; striped bass, bluefish, tautog, and scup are caught from shore along the Hurricane Barrier, jetties along Clarks Point, Fort Phoenix, and other areas both in the Inner Harbor and Outer Harbor (D. Kolek, PC, 1996). Recreational fishermen in boats catch striped bass, bluefish, tautog and other species in the waters around Little and Big Egg Islands, the Butler Flats Lighthouse, and elsewhere in the Outer Harbor.

Anadromous fish including alewife, blueback herring, and American shad were once abundant in the Acushnet River. Although no catch statistics are available, there is a small alewife fishery on the River, managed by the MDMF (P. Brady, PC, 1996). The alewife harvested in this fishery are probably used primarily as bait for lobster, bluefish, and striped bass.

Quahogs, soft-shelled clams, and bay scallops are taken by recreational fishermen in the New Bedford Harbor Estuary, although recreational landing statistics are unavailable. In 1993, roughly 270,000 pounds of lobster were caught by recreational fishermen in Buzzards Bay, but the amount caught by recreational fishermen from the four affected communities in the New Bedford Harbor Environment is unknown (VHB, 1996).

#### **3.4.4. Impacts of Current Uses on Coastal Resources**

In 1952, ACOE dredged the New Bedford ship channel and turning basin to 30 ft depth, affecting about 15 acres (6 ha) of subtidal habitats. 107,000 cubic yards of dredged materials were disposed of in a designated offshore disposal area south of West Island (Malcolm Pirnie Inc., 1982). Since 1952, two large anchorages have been dredged near the Fairhaven waterfront, along with some smaller navigational projects (ACOE, 1971).

Between 1962 and 1965, the ACOE constructed the Hurricane Barrier to control storm-related flooding and help protect the New Bedford and Fairhaven fleets. The main section of the Barrier is a 3,500 ft (1,070 m) long riprap wall across the entrance to Inner New Bedford Harbor; the channel passes through a 150 ft (45 m) wide opening, with floodgates. A 3,800 ft (1,170 m) seawall, also with floodgates, runs along the northern shore of Clarks Cove; a 3,400 ft (1,035 m) seawall runs along the Outer Harbor on the northeast shore of Clarks Point (by East French Boulevard); and a 3000 ft (920 m) seawall crosses the Pope Beach marsh in Fairhaven.

Construction of the Hurricane Barrier resulted in the loss of an estimated 11.4 acres (4.6 ha) of subtidal and intertidal habitats, while the seawalls in the Clarks Point area resulted in the loss of approximately 23.1 acres (9.3 ha) of primarily intertidal habitats. Moreover, construction of the Barrier significantly reduced tidal action in the Harbor. As described in Section 3.2.3, the Barrier reduced the tidal range within the Inner Harbor and Upper Estuary; reduced flushing, causing retention of pollutants; drastically altered patterns of current flow and wave action; and probably caused a seasonal reduction in dissolved oxygen, and therefore habitat suitability, in the Inner Harbor and Upper Estuary. The dike across the Pope Beach marsh reduced tidal flushing in the northern part of the marsh, causing it to begin to revert to upland habitat (SES, 1988).

Coastal construction and redevelopment projects in the City of New Bedford during this period caused further loss or alteration of the Harbor Estuary's nearshore habitats. Shoreline was bulkheaded and backfilled near Wamsutta Mills, the Coggeshall Street bridge, and along the shorelines of Fish and Popes Islands. In Fairhaven, shoreline was bulkheaded or filled on the south side of Marsh Island (south of I-195) and along the shore by Fort and Middle Streets.

The State Pier was constructed off Commercial Street by filling 7.3 acres (3.0 ha) of subtidal habitats. The North Terminal and extension, located northwest of Fish Island, was completed in 1970 and resulted in the filling of 25 acres (10 ha) of subtidal habitat (City of New Bedford, 1976). In 1968, construction of the South Terminal Project, off Hassey Street, created a 19 acre (7.7 ha) area, principally for fish processing, gear manufacturing, and ancillary services for the fleet. The project also created a 1,600 ft (485-m) deep-water docking facility behind the Hurricane Barrier, where the majority of the fleet unloads its catch. Wharves in the vicinity of the South Terminal provide berthing for fishing vessels.

During this period, a number of small groins or jetties were built along East and West French Boulevards on Clarks Point to control beach erosion, resulting in a minor loss of intertidal and subtidal habitat (2 acres (0.8 ha)). By 1977, at least five such structures had been built along the east shore of the Point, and six along the west side.

The construction of I-95 across the Harbor Estuary in 1970, just south of the Coggeshall Street Bridge, reduced the effective width of the Estuary at this point by 90% (from 1,150 ft (350 m) to 100 ft (30 m)) and destroyed 4.7 acres (1.9 ha) of intertidal and subtidal habitats. Although tidal flow in this area had already been reduced by the Coggeshall Street Bridge, construction of the I-95 crossing probably further constricted tidal flushing of the Upper Estuary.

The discharge of large quantities of sewage, industrial waste, household debris, and other pollutants has continued to adversely affect Harbor resources in the late 20th Century. Nutrients and pathogens are discharged to the Harbor Estuary by the wastewater treatment systems of New Bedford and Fairhaven, as well as by combined sewer overflow units (CSOs), of which there are at least 35 along the Harbor shoreline. In the Inner Harbor, where tides and waves are impeded by the Hurricane Barrier and Coggeshall Street Bridge, levels of nutrients and coliform bacteria are high, and dissolved oxygen is periodically low (VHB, 1996; SES, 1988; Summerhayes et al., 1977).

High levels of fecal coliform bacteria led to shellfishing closures in 1971 (in Clarks Cove and the Outer Harbor), and additional closures in 1979. In 1983, Clarks Cove was again closed to shellfishing due to sewage contaminants (CLF, 1988). By 1987, 3,478 acres of New Bedford shellfish beds, 2,256 acres of Fairhaven shellfish beds, and 1,593 acres of Dartmouth shellfish beds were closed due to sewage contamination (Germano, 1987).

In the Outer Harbor, recent improvements to New Bedford's wastewater treatment system are expected to mitigate wastewater-related nutrient problems. The City's new treatment plant, which began operating in 1996, is designed to impart secondary treatment to 30 million gallons per day (mgd) with a peak capacity of 75 mgd for wet-weather processing (VHB, 1996).

Electrical parts manufacturing plants used large amounts of polychlorinated biphenyls (PCBs) from the 1940s through 1977, and discharged wastes containing PCBs and other contaminants directly to the Harbor, or indirectly through New Bedford's wastewater treatment system. Between 1958 and 1977, an estimated 145 tons of PCBs were discharged to the Harbor area (Howes and Goehringer, in press), while an estimated 200 to 700 pounds of PCBs were being discharged annually during the late 1970s and early 1980s. Residual amounts of PCBs from the City's sewage lines have continued to flow into the Harbor long after their use by manufacturers ceased (Weaver, 1982).

Other industrial facilities (metals finishing, glass and rubber manufacturers, welding, iron foundries, plastics, fish processing, food packaging, and the few remaining textile mills) have also generated discharges. Summerhayes et al. (1985) suggest that metal enrichment in New Bedford Harbor has been occurring for approximately 100 years; in recent years, two firms alone have discharged as much as 200 pounds of copper per day into the Upper Estuary. Section 3.5 details distributions of PCBs and metals in the New Bedford Harbor Estuary.



The growth of the commercial fishing industry during the 20th Century led to the development of seafood processing plants that discharged large quantities of fish waste to the New Bedford Harbor Estuary. These organic wastes greatly increased the BOD in the Harbor Estuary, and probably caused hypoxic conditions and fishkills within the Harbor. One estimate suggests that fish processing operations may result in the annual generation of nearly 3,000 tons of BOD, although, due to treatment of some of the wastes at the New Bedford facility, not all of this is released to the Harbor (VHB, 1996).

Completion of I-195 in 1970 and the JFK Memorial Highway in 1975 also resulted in water quality impacts to the New Bedford Harbor Estuary. The construction of these roads provided opportunity for new industrial development along New Bedford Harbor and increased motor vehicle use, generating hydrocarbons, salts, metals, and other contaminants which are released to the Harbor Estuary as non-point source pollutants (road runoff).

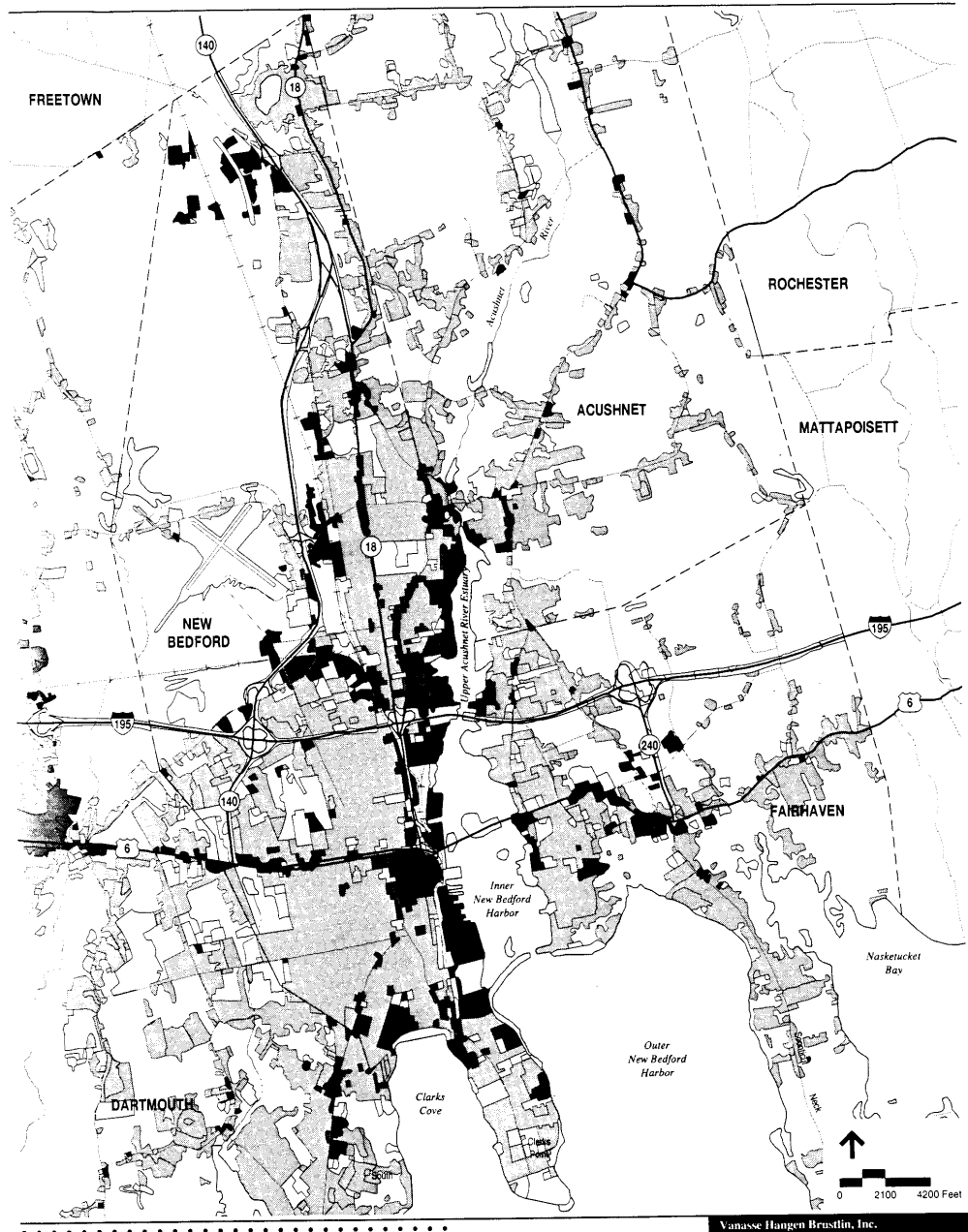
### **3.4.5 Current Land Use**

In spite of the decline of the mills, land use in New Bedford -- and to a lesser extent in Fairhaven, Acushnet, and Dartmouth -- remains dominated by the nodal development patterns of the Mill Era. Vast brick mills -- many now vacant, or partially so -- stand surrounded by residential and retail neighborhoods of two- and three-story wood-frame tenements.

The most intense development is along the western shore of the Harbor and along Route 140. Industrial uses are centered in the old mills along the Acushnet River and Clarks Cove, and in newer industrial parks near the New Bedford Airport and in northern New Bedford. High-density residential uses are concentrated in the central portion of New Bedford and along the Fairhaven and Acushnet waterfronts. Commercial development is located along Routes 6 and 18. The New Bedford and Fairhaven downtown areas are mixed commercial and residential areas, with small industries and public offices. Rural and suburban residential development and undeveloped lands (primarily wetlands) extend east and west of the developed corridor which surrounds the Upper Estuary and parts of the Acushnet River.

**Figure 3.3** describes current patterns of land use in the New Bedford Harbor Environment.

Figure 3-3



- Residential
- Commercial, General Urban
- Industrial
- Transportation, Recreation, Public and Institutional Open Space

Source: Mass GIS

Existing Land Uses  
New Bedford Harbor and Vicinity

New Bedford Harbor Trustee Council  
RP/EIS

70602ELU

### 3.4.6 Baseline for Restoration: Mid-20th Century

In order to provide a blueprint for restoring the natural resources of New Bedford Harbor to their pre-contamination condition, the RP/EIS must attempt to establish a baseline--a measure of the condition that would have existed within the Harbor Environment had the release or discharge of PCBs to New Bedford Harbor not occurred. Because of the complexity and range of cumulative human impacts on the Harbor Environment--before, as well as since, the injury--and the lack of quantitative data on water quality, fish populations, and other measures of environmental quality, a precise, quantitative baseline cannot be established for New Bedford Harbor. Nevertheless, by examining the history of resource uses and impacts discussed in the previous sections, we can develop a qualitative sense of the environmental status of the Harbor in the 1930s and '40s--the period when PCB releases to New Bedford Harbor began--and attempt to isolate, in a general way, the effects of PCBs on the Harbor Environment.

As discussed in the preceeding section, the downtown shorelines of New Bedford and Fairhaven were more or less completely wharved by the mid-19th Century. Navigational channels to New Bedford and Acushnet had been dredged along with turning basins. Around the turn of the the 20th Century, at least 250 acres of salt marsh along the western shores of the Upper Estuary and Inner Harbor and at the head of Clarks Cove were filled for industrial and residential development. Once-forested or agricultural areas near the Harbor had become completely urbanized. Eelgrass beds had entirely disappeared from the Inner Harbor. By the 1940s, therefore, a good deal of the Harbor's original estuarine habitat had already been lost or degraded--perhaps half of the original coastal and nearshore habitat of the Upper Estuary and Inner Harbor had been adversely affected.

As shown also in the preceeding section, the circulation and dynamics of the Harbor Estuary had been significantly modified by the mid-20th Century, though not nearly as much so as today. Tidal circulation in the Upper Estuary and in the upper half of the Inner Harbor, between Coggeshall Street and Route 6, had been reduced and modified by the construction of bridges. Before the construction of the Hurricane Barrier in the 1960s, however, the waters of the lower half of the Inner Harbor communicated more freely with the waters of the Outer Harbor. Tidal amplitude in this part of the Inner Harbor was greater; tidal flushing was more frequent; and some pollutant effects, such as problems caused by low levels of dissolved oxygen in the water column, were probably less severe. Since fish and shellfish could move more easily between the Inner and Outer Harbors before construction of the Barrier, a wider effective range of estuarine habitat was available to these animals, and they were likewise more available for harvest to the urban residents of New Bedford, Fairhaven, and Acushnet.

From historical accounts, we know a little about inshore fisheries in the New Bedford Harbor area during the first half of the 20th Century, and can say that inshore shellfisheries were well developed, barring periods of closure due to bacterial contamination. From anecdotal evidence, we know too that urban residents of

Acushnet and the North End of New Bedford regularly fished and swam in the waters of the Upper Estuary during this period.

As the preceding sections pointed out, New Bedford Harbor was no stranger to water pollution before PCB releases to the Harbor began in the 1940s. Nutrients and pathogens from sewage were a particular problem through most of the 20th Century, leading to closure of shellfish beds in the Upper Estuary, Inner Harbor, Clarks Cove, and off Clarks Point (EPA 1996). Metals, hydrocarbons, and other toxic compounds were also being released into the Harbor, varying in scale and location as a function of changing patterns of industrial production and resource use.

These pollutant patterns were fundamentally different from the discharge of PCBs that began in the 1940s. Though the effects of sewage-related pollutants can be locally severe, they are generally short-lived. Sewage-related pollutants are not generally toxic compounds; they do not biomagnify; they cannot be transferred intergenerationally; and they do not usually have reproductive impacts *per se*. Large inputs of sewage-related pollutants can disrupt an estuarine ecosystem by altering its biochemistry--for example, when nutrient discharges cause plankton blooms, which in turn lead to low dissolved oxygen and fish kills, or reduced water clarity affecting eelgrass beds or other habitats. But although moderate amounts of these pollutants render shellfish unsafe for humans to eat, they are not necessarily harmful to marine organisms themselves, and many species, such as winter flounder, quahog, and oysters seem undisturbed by moderate levels of sewage-related pollutants. Generally, an estuarine ecosystem degraded by sewage discharges is capable of recovering naturally within a few years once the releases are reduced, treated, or controlled. Likewise, shellfish taken from waters contaminated by pathogens can be "depurated" or cleansed by placing them, temporarily, in uncontaminated waters.

By contrast, PCBs are among the most persistent of marine pollutants; they are long-lived in the environment and are retained in the tissues of animals, from polychaetes to humans. As a result, PCBs tend to biomagnify through the foodchain, becoming concentrated in higher organisms, and being transferred through the food web and throughout ecosystems. PCB contamination renders not just shellfish, but finfish as well, inedible by humans; and organisms contaminated by PCBs cannot be depurated. As discussed in subsequent sections of this chapter, the toxicity of PCBs to marine organisms, in New Bedford Harbor and elsewhere, is well documented. PCBs are also known to have harmful effects on reproduction and to be mutagenic (causing mutations), and are thought to be carcinogenic (causing cancer) to humans, as well.

Before dredging of the Hot Spot commenced, approximately 700 tons of PCBs resided in the sediments of the New Bedford Harbor Superfund Site, suggesting that hundreds, if not thousands of tons of PCBs were discharged to the waters of New Bedford Harbor during from the 1940s to the 1970s. While the range of effects of these releases on the biota of New Bedford Harbor and Buzzards Bay will probably never be fully known, there is no question that PCBs were dispersed throughout the biotic and abiotic environment of the New Bedford Harbor Environment and, to a lesser extent, Buzzards Bay. As discussed more fully in Section 3.5, the contamination has caused direct mortality of estuarine organisms ranging from

benthic worms to common terns, and has altered the structure of biotic communities of New Bedford Harbor.

From these data, as well as from historical information on the presence and use of fish and shellfish in the Harbor, it can be deduced that PCB releases to New Bedford Harbor have reduced the abundance and quality of a wide range of estuarine species of ecological and economic value. In many cases, populations and communities affected by PCBs have been injured by multiple anthropogenic impacts. In particular, it seems clear that PCB contamination and habitat loss have been the major sources of impacts on living resources in New Bedford Harbor. Furthermore, lack of high-quality habitat may prevent populations or communities injured by PCBs from fully recovering from the effects of the contamination once the Harbor sediments are remediated.

Equally important, public and private use of natural resources in the New Bedford Harbor Estuary, from the flounder of the Upper Estuary to the lobster of the Outer Harbor, has been significantly curtailed as a result of PCB releases to the Harbor, particularly since enactment of the 1977 fishing closures described in Section 3.5. An urban estuary which not long ago provided food, sport and recreation to urban residents within the affected environment has become a liability, a hazardous waste site of severely limited use. A more complete discussion of the ecological and economic injury caused by PCB releases to the New Bedford Harbor Environment is provided in Section 3.5.

#### **3.4.7 Future Directions - New Bedford's Waterfront**

New Bedford's stakeholders seem to agree that the City's economic future depends upon its waterfront. The City's Economic Development Plan suggests that New Bedford capitalize on multi-modal transportation facilities, Free Trade Zone status, excess industrial capacity, and maritime assets wherever possible by focusing on marine-related industrial activities (City of New Bedford, 1993). Specific actions recommended are:

- Expansion of bulkheads at the North and South Terminals. Needed fill may be available from dredging of PCB-contaminated sediments as well as navigational dredged material.
- Addition of docking facilities at the south side of Fish Island.
- Development of a containerized feeder service into the Harbor to encourage foreign trade.

A number of processes are underway to improve maritime transportation and development on both sides of New Bedford Harbor. As discussed in Chapter 2, Massachusetts Coastal Zone Management is in the process of assessing navigational dredging needs for New Bedford Harbor. The New Bedford/Fairhaven Harbor Master Plan, discussed in Chapters 2 and 4, will undertake a comprehensive port development study. Finally, EPA, working with the Commonwealth and ACOE, is considering an "enhanced remedy" for the Harbor Superfund Site, which would address some of the sediment disposal issues related to navigational dredging in New Bedford Harbor.

In October, 1995, the New Bedford Waterfront Historic Area League (WHALE) and the American Institute of Architects sponsored “HarborVisions!,” a “charrette” or exercise in envisioning the future of the Harbor waterfront. The charrette’s major recommendations were:

- Redevelop the State Pier as an international marketplace and open-air seafood and produce markets
- Develop an aquarium, conference center, and ferry terminal at the site of the vacant Commonwealth Electric generating facility
- Redevelop North Terminal for continued industrial use
- Redevelop the old New Bedford rail station as a transportation hub, with rail link to the New Bedford Municipal Airport
- Develop Palmers Island and the Standard-Times field as public recreational areas
- Redevelop Route 18 (WHALE, 1996).

The proposed development of a gambling casino by the Wampanoags could bring tourists to the outskirts of the City who, with careful planning, might be directed to the historic and waterfront districts.

### **3.5 Injury to the Environment**

As described in Chapter 2, the first step toward natural resource restoration at a Superfund site is assessment of the injury to natural resources and the resulting losses to the public caused by the release of hazardous substances. The government, representing the public trust as natural resource trustee, evaluates injury to the resource and determines the cost of restoring the resources to baseline levels and compensating the public for interim losses. Natural resource damage assessments (NRDAs) are expensive and difficult to do, so trustees cannot always quantify all the effects of a contamination incident. Moreover, New Bedford Harbor was one of the first NRDA cases under CERCLA and the case was settled before the NRDA was completed, so the full measure of damages to the environment stemming from PCBs in New Bedford Harbor may never be known. The broad nature of the injury is, however, suggested by the available information.

The following section summarizes the distribution of contaminants in the New Bedford Harbor Estuary, describes injuries to the environment due to PCB releases to the New Bedford Harbor Environment and provides a partial estimate of the losses experienced by the public as a result.

#### **3.5.1 Contaminant Distributions**

##### **3.5.1.1 Pre-cleanup**

Before EPA and ACOE completed dredging of the Hot Spot, PCB levels in the tide flats and subtidal sediments of the Acushnet River above the Coggeshall Street Bridge ranged as high as 200,000 parts per million (ppm), among the highest levels of PCBs in marine sediments ever recorded (EPA, 1992; Pruett et al., 1990). PCB levels in the peat of the salt marshes of the Upper Acushnet range above 500 ppm. Between Coggeshall Street and the Hurricane Barrier in the Inner Harbor, concentrations of PCBs in estuarine sediments range above 100 ppm in limited areas,

while levels in excess of 10 ppm are more widespread. Concentrations of toxic metals are also high in the sediments of the Inner Harbor, exceeding 1000 ppm in some spots (VHB, 1996).

South of the Hurricane Barrier, along the west shore of Outer New Bedford Harbor, PCB concentrations in sediments range above 50 ppm, though concentrations of 1-50 ppm are more widespread. Measurable levels of PCBs have been found in the sediments of Buzzards Bay throughout the Outer Harbor and in Buzzards Bay beyond the Area III closure line, but these are generally low, with the exception of an area roughly half a mile off Clarks Point, by the City's sewer outfall, where PCB sediment concentrations are in the neighborhood of 50 ppm (VHB, 1996).

PCBs have been detected in the water column throughout the New Bedford Harbor Estuary. Measured concentrations have ranged from over 7500 ng/l in the Hot Spot area to 5 ng/l at the outer edge of Area III. The entire New Bedford Harbor Estuary, therefore, exhibits water column concentrations exceeding the level considered by EPA to cause chronic impacts to living marine resources of 0.03 ng/l (EBASCO, 1990; EPA, 1990b).

**Figures 3.4 through 3.7** describe the distribution of toxic metals and PCBs in the New Bedford Harbor Estuary.

Figure 3-4

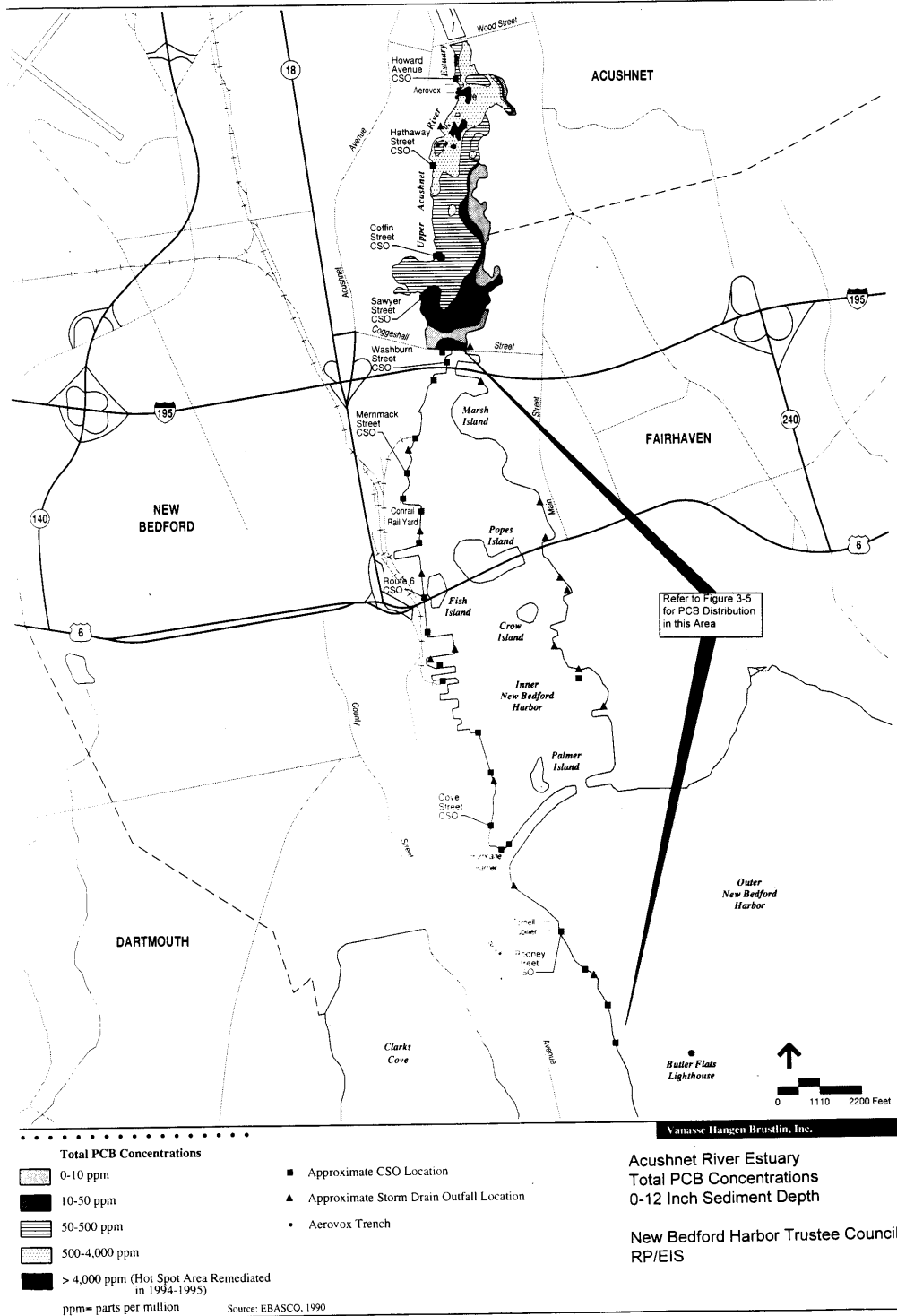




Figure 3-5

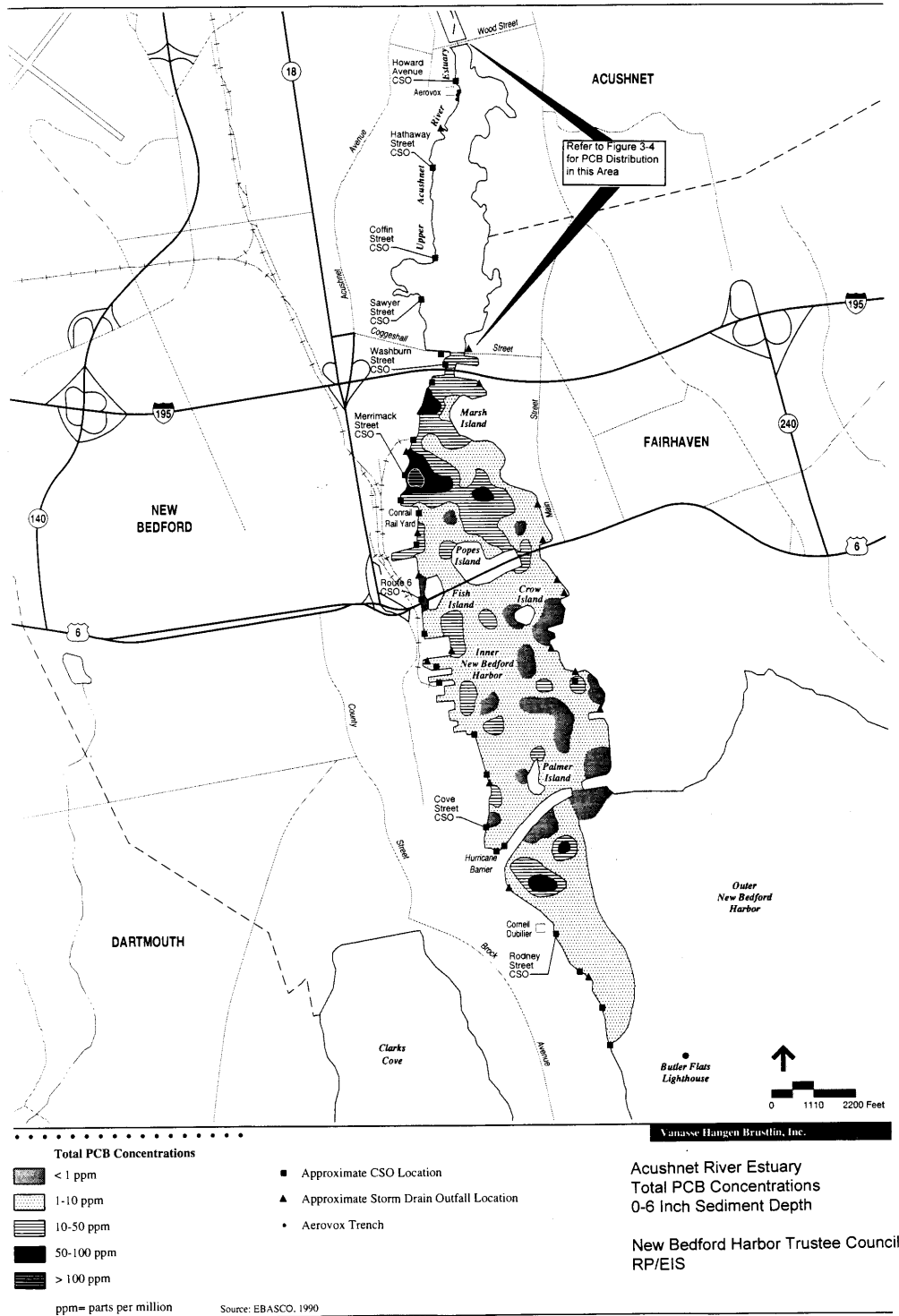


Figure 3-6

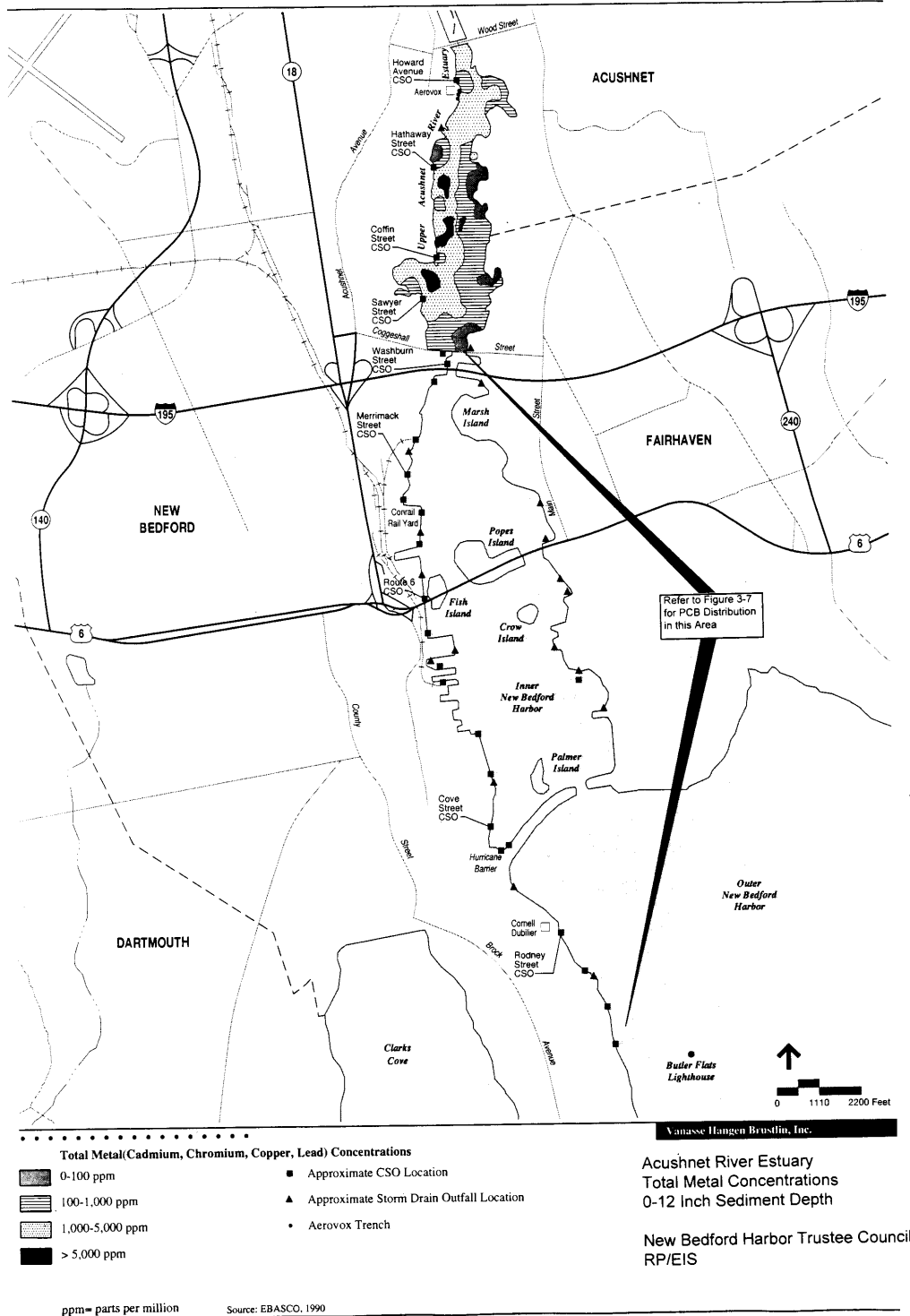
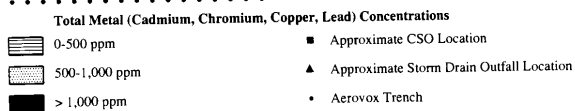
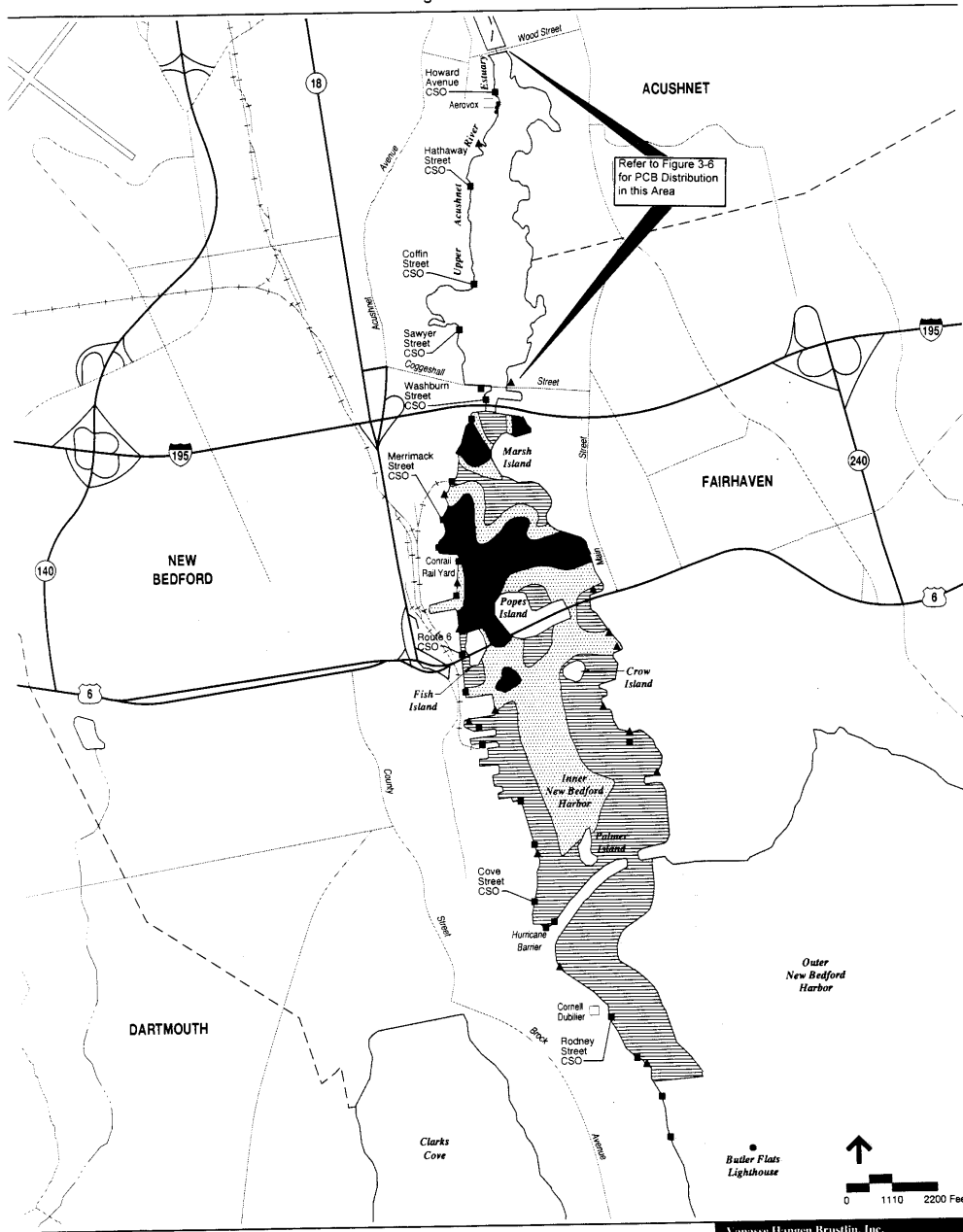


Figure 3-7



New Bedford Harbor  
Total Metal Concentrations  
0-6 Inch Sediment Depth

New Bedford Harbor Trustee Council  
RP/EIS

ppm= parts per million

Source: EBASCO, 1990

170602M6

### **3.5.1.2 Post-cleanup**

Since nearly all the sediments in the Upper Acushnet River Estuary were above the action level of 10 ppm, most of the area between Wood and Coggeshall Streets will be dredged. After cleanup, residual levels of PCBs in most of the sediments of the Upper Estuary will be in the 2-10 ppm range (Dickerson, PC, 1996). An exception is a cable crossing area, which must be capped with clean sediments because it cannot be safely dredged. Also, within the salt marshes of the Upper Estuary, only areas exceeding 50 ppm will be dredged and replaced, leaving wetland areas with PCB levels as high as 50 ppm in place after cleanup (Craffey, PC, 1996; Dickerson, 1995).

Below Coggeshall Street, EPA's action level is 50 ppm. Most of the sediments in Inner New Bedford Harbor, between Coggeshall Street and the Hurricane Barrier, have PCB concentrations of 1-50 ppm (VHB, 1996). Since these concentrations will not be dredged, significant PCB concentrations will remain in this part of the Harbor Estuary. In the Outer Harbor, EPA's current cleanup plans call for dredging only the most contaminated spots, leaving residual levels of up to 50 ppm (Dickerson, 1995).

The distribution of toxic metals in New Bedford Harbor does not necessarily coincide with that of PCBs, particularly in the Inner Harbor where total metals concentrations in excess of 1000 ppm are widespread outside of the areas slated for dredging. Therefore, significant concentrations of toxic metals (cadmium, chromium, copper, and lead) can also be expected to persist in the Inner Harbor's benthic habitats once the cleanup is complete (Dickerson, 1995).

EPA has informally estimated that it may take ten years after completion of the cleanup for the Harbor's water quality to meet EPA's target levels for PCBs, placing that portion of recovery squarely into the next century, around 2015 (Dickerson, PC, 1996). Given that contaminant concentrations are certain to persist in portions of the Harbor sediments, it is probable that the ecosystem will not have fully recovered by that date.

### **3.5.2 Ecological injury**

PCBs have been shown to have a variety of harmful effects on fish, birds, and mammals, including toxicity, mutagenicity, and reduction of reproductive success. Information on the extent of ecological injury to the New Bedford Harbor Environment from releases of PCBs is incomplete, but it appears that PCB contamination in waters, sediments, and living resources has reduced the biodiversity of the Harbor ecosystem, reduced species' reproductive capabilities, and increased mortality in resident species of finfish and shellfish. PCBs have also accumulated or biomagnified across trophic levels, with impacts to birds and other predators (NBHTC, 1993; Weaver, 1982).

#### **3.5.2.1 Species**

Large numbers of fish, shellfish, and birds in the Harbor have been contaminated by exposure to PCBs. Eight of fifteen species of finfish sampled from 1976-1980 in the New Bedford Harbor area showed mean PCB concentrations above the current FDA

limit for edible seafood of 2 parts per million. The maximum observed concentrations in ten of these species exceeded the FDA limit, while the minimum observed concentrations in only three of the species did so (Weaver, 1982; Kolek and Ceurvels, 1981).

The species for which mean PCB levels exceeded the FDA limit were American eel, cunner, three species of flounder (summer, winter, and windowpane), scup, and bluefish. In addition to these species, tautog and striped bass showed maximum observed PCB levels exceeding the 2 ppm limit (Weaver, 1982; Kolek and Ceurvels, 1981).

Among shellfish sampled in New Bedford Harbor during the same period, oysters, soft-shelled clams, blue crabs, and lobsters showed mean PCB levels exceeding the FDA limit; minimum PCB levels observed in soft-shell clams were seven times the limit (Kolek and Ceurvels, 1981). Mean PCB concentration in edible tissues of lobsters sampled was 8.7 ppm; individual samples ranged from 0.1 ppm to 84 ppm (Weaver, 1984).

The one edible marine species for which these early studies found PCB levels to be uniformly low was quahog. Quahogs sampled within the New Bedford Harbor environment showed average PCB concentrations of 0.8 ppm; of 20 samples, only one individual was found to exceed the FDA level with a PCB concentration of 3.3 ppm (Kolek and Ceurvels, 1981).

Herring sampled in Hamlin Pond and the New Bedford Reservoir in 1993 and 1995 showed mean whole-body PCB concentrations below the FDA limit, but mean concentrations in roe and maximum whole-body concentrations exceeded the limit (DMF, 1995).

The toxic effects of New Bedford Harbor PCBs have been documented at both ends of the marine food chain. Amphipods (small benthic crustaceans) exposed to sediments from the more highly contaminated parts of the Upper Estuary, Inner Harbor, and Outer Harbor have low rates of survival (Nelson et al., 1996). Common terns have been lethally poisoned by PCBs as a result of feeding on baitfish in New Bedford Harbor, such as Atlantic silversides, that have high levels of PCBs in their tissues (Nisbet, 1990).

While high levels of PCBs have been documented in species throughout the Harbor Environment, much remains unknown about the ecological effects of the contamination. As discussed in Section 3.3, species within an estuary like New Bedford Harbor are largely interconnected. A great blue heron may be only two steps in the foodchain from a Hot Spot polychaete. It is highly probable, therefore, that the ecological effects of PCB contamination in New Bedford Harbor are not limited to the species in which the injury has been measured, but extends also to species dependent, directly or indirectly, on organisms exposed to high concentrations of PCBs in the waters and sediments the Harbor.

### **3.5.2.2 Habitats and Communities**

Elevated levels of PCBs and other toxic substances have been documented in all the habitats of the New Bedford Harbor Estuary: waters, wetlands, and subtidal and intertidal sediments. Even after clean-up of the Harbor sediments has been completed, elevated levels are expected to persist for some time in the waters and biota of the Harbor Environment.

As discussed in Section 3.3, these estuarine habitats form a complex ecosystem that, even in its currently degraded state, supports a wide range of species. The salt marshes support diverse communities of plants, fish, shellfish, birds, and mammals; provide spawning habitat and forage for marine and avian species; and perform essential biochemical functions within the Harbor ecosystem. The bottom sediments and tide flats are home to dozens of invertebrate species. Some, like quahogs and lobster, are of direct value to humans, while others, like polychaete worms, are of forage value to fish such as tautog and flounder. The waters of the New Bedford Harbor Estuary support a rich assemblage of flora and fauna, ranging from phytoplankton and zooplankton to bluefish and striped bass.

Some of the effects of PCB contamination on the habitats and communities of New Bedford Harbor are suggested by a recent study by EPA on the condition of the Harbor's benthic communities. More highly contaminated areas of the Harbor showed low benthic ecosystem health according to several ecological measures (biodiversity, benthic community condition, and community structure). The study found extremely low benthic biodiversity in the Upper Estuary, which exhibited a degraded benthic community symptomatic of a stressed ecosystem. The Inner Harbor was also found to be "significantly impacted," although less so than the Upper Estuary, with higher biodiversity and less degraded community structure. The Outer Harbor was found to be generally healthy, with normal biodiversity and community structure, although specific areas within the Outer Harbor with higher levels of contaminants exhibited poorer ecological health (Nelson et al., 1996). These findings agreed with an earlier study which showed a correlation between high levels of PCBs and metals in the Harbor sediments and reduced populations of benthic invertebrates (Bellmer, 1988).

The benthic invertebrate communities that these studies examined are a critical food source for a wide variety of estuarine fish and larger crustaceans such as lobsters and crabs. It is probable that the reduced biodiversity and ecological health of benthic communities stemming from the Harbor contamination resulted, in turn, in reduced diversity and abundance of bottom-feeding fish and other predatory species that depend on these communities.

Since PCBs have been shown to impair the reproductive success of birds and other animals, the contamination of New Bedford Harbor may have also reduced the biodiversity and abundance of avian species in the New Bedford Harbor Environment, particularly as regards fish-eating birds such as osprey, terns, and herons (Nisbet, 1990).

While the clean-up of the Harbor can be expected to provide a major improvement overall to the New Bedford Harbor Environment, the dredging itself is not without impacts on habitats and biological communities. Depths will be altered and benthic communities removed. While dredged salt marshes will be replaced, it may be many years before the created marshes replicate the full range of ecosystem functions provided by the natural marshes, depriving the New Bedford Harbor Estuary of some of the special physical and biological functions that only salt marshes can provide.

In summary, PCB contamination has reduced the diversity, health and abundance of biological communities and habitats of the New Bedford Harbor Environment, with particularly severe effects on the fish, shellfish, birds and habitats of the Harbor Estuary. Moreover, the effects of PCB contamination on the natural resources of the Harbor are likely to endure for some time. Natural recovery is expected to proceed slowly following initiation of the Harbor remediation.

### **3.5.2.3 Wider Buzzards Bay ecosystem**

Injuries to natural resources from PCB releases into New Bedford are not limited to resident species. As discussed in Section 3.3, many species move in and out of the Estuary to feed or spawn; in so doing, they may transport contaminants in their tissues. Eels, for example, which exhibited the highest levels of PCBs found among finfish, move out of the Estuary to spawn, while herring move up the watershed; both are important sources of food for birds, sportfish, and other species. The environmental effects of PCB releases in New Bedford Harbor, therefore, extend ecosystem-wide, throughout the New Bedford Harbor Environment, Buzzards Bay, and beyond.

A study of organochlorine residue concentrations in common terns and other species along the Massachusetts coast was conducted from 1971-1981. Study goals were to identify geographic patterns of contamination levels, relate those levels to the patterns of use of the contaminants, and determine the rate of decline of contaminant residue levels using biological monitors. A secondary goal was to determine if contaminant levels were high enough to cause adverse effects. Included in the study were sampling stations in New Bedford Harbor and Buzzards Bay (Bird Island, Wing's Cove, Wareham River, Widow's Cove and Ram Island). Common terns, Atlantic silversides, juvenile sand lance, and mussels were collected and analyzed for PCBs and other organochlorines. Using common tern eggs, the study determined that contaminant concentrations (including PCBs) were highest at Boston Harbor and Buzzards Bay (Bird and Ram Island) sampling stations. Similar results were seen for juvenile Atlantic silversides, mussels and sand lance with PCB concentrations increasing as the distance to New Bedford Harbor decreased. The contaminant concentration ratio between fish and tern eggs varied very little between sampling stations which provided further evidence of the geographic pattern. (Nisbet and Reynolds, 1984)

A 1988 study found that levels of PCBs in the tissues of lobsters and flounder throughout Buzzards Bay were higher than the average for coastal Massachusetts, concluding that "high concentrations of PCBs...in New Bedford Harbor provide a continuous source of PCBs to fishery resources in Buzzards Bay" (Schwartz, 1988).

A 1990 paper documented lethal poisoning of common and roseate terns at Bird and Ram Islands in upper Buzzards Bay, caused by eating fish containing high levels of PCBs from New Bedford Harbor. The same study found high levels of PCBs in the eggs of terns at these two sites, concluding that the contamination of New Bedford Harbor threatened the recovery of the tern population of Buzzards Bay. Moreover, this study stated that PCBs from New Bedford Harbor posed a threat to the survival of a number of other species of fish-eating birds in Buzzards Bay, including the double-crested cormorant, snowy egret, great egret, herring gull, great black-backed gull, ring-billed gull, laughing gull, and least tern (Nisbet, 1990). As mentioned in Section 3.3, the roseate tern is on the federal Endangered Species List, while the least tern has been designated a Species Of Special Concern by the Commonwealth of Massachusetts.

In short, PCB contamination in New Bedford Harbor has had ecological consequences for species, communities, and habitats throughout the Harbor Estuary. Moreover, the effects of the contamination have extended throughout much of Buzzards Bay and beyond and, due to the extraordinary environmental persistence of PCBs, have been not just widespread, but long-lived as well.

### **3.5.3 Losses to the Public**

Three main categories of losses to the public were quantified in the New Bedford Harbor NRDA: (1) losses to commercial and recreational fisheries; (2) losses associated with decreased environmental quality; and (3) losses resulting from beach closures.

#### **3.5.3.1 Fisheries**

As a result of PCB contamination in the New Bedford Harbor Estuary, the Commonwealth of Massachusetts enacted three commercial and recreational fishing closures in September, 1979. These closures continue in effect through today and are expected to remain in effect until some years after harbor cleanup is completed. Area 1 (Inner New Bedford Harbor and the Upper Acushnet River Estuary) is closed to the taking of all finfish, shellfish, and lobsters. Area 2 (Outer New Bedford Harbor, from the Hurricane Barrier south to a line from Ricketson to Wilbur Points) is closed to the taking of lobsters and bottom-feeding fish (eel, scup, flounder, and tautog). Area 3 (from Area 2 south to a line from Mishaum to Rock Points, running through Negro Ledge) is closed only to the taking of lobsters (105 CMR 260.000 *et seq.*) (**Figure 1.1**).

A 1986 study examined direct damages to the New Bedford area commercial lobster fishery, finding that fishermen incurred increased costs from the closures of more than \$50,000 per year, representing a total loss through time of approximately \$2.9 million (as recalculated by the trustees in 1996 dollars<sup>1</sup>) (McConnell and Morrison, 1986). A

---

<sup>1</sup> Net present value of the injury was estimated at \$2.0 million in 1986. Throughout this section, 1986 dollars have been converted to 1996 dollars using a multiplier of 1.4288. The multiplier was obtained by dividing 156.6 (Consumer Price Index (CPI) for May, 1996) by 109.6



second study measured economic damages to recreational angling as a result of the PCB contamination, concluding that direct damages could be conservatively estimated at more than \$60,000 per year, representing a total loss through time of over \$4.4 million in 1996 dollars<sup>2</sup> (McConnell and IEC, 1986).

Together, these two studies suggest that losses to marine fisheries of the New Bedford Harbor Estuary as a result of PCB contamination were over \$7 million. However, this estimate is clearly conservative. First, the full range of potentially affected fisheries was not considered. For example, there is a commercial rod-and-reel fishery for flounder in Narragansett Bay; no study has examined whether such a fishery may have existed in the Outer Harbor before the fishing closures were enacted. Nor has any study examined economic effects on real or potential shellfisheries caused by the Harbor contamination.

### **3.5.3.2 Environmental quality**

Another 1986 study, subsequently published in 1992, used changes in residential property values in New Bedford, Dartmouth, and Fairhaven to estimate the lost value experienced by single family home owners due to the impaired environmental quality stemming from the Harbor contamination. The study found that the contamination and resulting prohibitions on swimming, fishing and lobstering had reduced the value of local environmental amenities to residents near the Harbor, as captured in households' willingness to pay for residential property. Lost value of single family homeowners was estimated at approximately \$45 million.<sup>3</sup> These estimates are conservative because they do not include renters and homeowners in rental neighborhoods despite the large numbers of these people near polluted waters. (Mendelsohn 1992)

### **3.5.3.3 Lost Recreational Use of Beaches**

The aforementioned 1986 McConnell and IEC study measured reduced demand for beach recreation as a result of the Harbor contamination, estimating economic losses to users of area beaches at \$12-16.3 million.<sup>4</sup>

### **3.5.3.4 Total Quantified Losses to the Public**

The damages estimated by the three studies described above cannot be summed. The economic losses estimated by each study overlap to some extent, and since the case was settled before the NRDA was completed, the studies were never

---

(annual average CPI for 1986). The CPI figures, as well as the conversion method, were provided by Richard Bahr of the Bureau of Labor Statistics, U.S. Department of Commerce.

<sup>2</sup> Estimated 1986 NPV \$3.1 million, converted to 1996 dollars as per Footnote 1.

<sup>3</sup> Estimated 1989 NPV \$35.9 million, converted to 1996 dollars using the adjustment factor of  $156.6/125.0 = 1.2525$ , where 156.6 is the CPI index for 1996 and 125.0 is the CPI index for 1989.

<sup>4</sup> Estimated 1986 NPV \$8.3-11.4 million, converted as per Footnote 1.

synthesized. As a result, a truly complete picture of the economic effects of PCB contamination in New Bedford Harbor does not exist.

However, since the studies did not consider the universe of potential damages, the true value of the losses suffered by the public as a result of PCB contamination in New Bedford Harbor was probably greater than indicated by these figures. As noted above, constraints on the NRDA meant that a number of areas of potential injury were not assessed. Contamination may have affected fisheries other than the lobster fishery in Buzzards Bay. Because of the difficulties associated with disposal of contaminated sediments, ship channel dredging has been delayed over the years, the channel depth has decrease, and larger vessels are now unabel to safely enter the port. As a result, navigation, and consequently, harbor front development in New Bedford Harbor have been impeded although these effects cannot be quantified.

In short, while it is impossible to place an exact figure on the losses to the public resulting from PCB contamination in the New Bedford Harbor Environment, the injury to the natural resources of the region is real and has had a considerable impact on many aspects of the economic life of the New Bedford region.

All those who use or would use the natural resources of New Bedford Harbor have been affected by the contamination. This includes resident resource users as well as visitors to the area, and active as well as passive users. Active use of the Estuary has been restricted by the impacts of the contamination on fishing and shellfishing, boating, beachgoing, and other recreational activities.

As noted in Section 3.5.3.1, above, commercial and recreational fishermen have also been affected. In addition to the lobster fishery, for which impacts are well documented, the Inner Harbor and Upper Estuary are closed to fishing for flounder, tautog, eels, scup, quahogs, oysters and other estuarine species. As a result, the in-shore commercial and recreational fisheries common in other New England estuaries are absent from New Bedford Harbor north of the Hurricane Barrier.

There are indications that owners and users of coastal commercial property (for example, marina operators) have been affected by the contamination, through increased development costs, reduced property values, and lost business resulting from delays to navigational dredging. Their customer base--commercial and recreational boat users, shippers, and other end users of marine transportation--have undoubtedly borne some of the added costs of doing business on New Bedford Harbor.

Finally, but perhaps most importantly, all citizens and businesses in the New Bedford area have been affected to some extent by PCB releases to New Bedford Harbor, since the contamination has degraded environmental quality, and reduced the quantity, value and uses of natural resources in the area.

## CHAPTER 4: ALTERNATIVES - ANALYSIS AND CONSEQUENCES

### **Chapter Outline:**

	Page
4.1 No-Action Alternative: No Environmental Restoration .....	4-2
4.1.1 Current Status of the Harbor Environment.....	4-2
4.1.2 Predicted Scenario under Natural Recovery Only.....	4-3
4.1.3 Lost Services/amenities .....	4-3
4.2 The Preferred Alternative: Environmental Restoration .....	4-4
4.2.1 Near-term Restoration Actions.....	4-4
4.2.2 Future Restoration Actions .....	4-5
4.2.3 Emergency Restoration Actions.....	4-5
4.2.4 the Preferred Approach: Select Projects by Restoration Priority.....	4-6
4.3 Specific Proposals/alternatives.....	4-7
4.3.1 Marshes or Wetlands.....	4-13
4.3.1.1 No-action Alternative: No Marsh or Wetland Restoration, Enhancement or Creation .....	4-13
4.3.1.2 Preferred Alternatives.....	4-14
4.3.2 Recreation Areas .....	4-19
4.3.2.1 No-action Alternative: No Recreation Area Enhancement or Development.....	4-19
4.3.2.2 Preferred Alternatives.....	4-19
4.3.2.3 Non-preferred Alternatives .....	4-25
4.3.3 Water Column.....	4-26
4.3.3.1 No-action Alternative: No Water Column Restoration .....	4-27
4.3.3.2 Preferred Alternatives.....	4-27
4.3.3.3 Non-preferred Alternatives .....	4-29
4.3.4 Habitats.....	4-36
4.3.4.1 No-action Alternative: No Habitat Restoration or Enhancement.....	4-36
4.3.4.2 Preferred Alternatives.....	4-36
4.3.4.3 Non-preferred Alternatives .....	4-43
4.3.5 Living Resources .....	4-45
4.3.5.1 No-action Alternative: No Living Resources Restoration or Enhancement.....	4-45
4.3.5.2 Preferred Alternatives.....	4-45
4.3.5.3 Non-preferred Alternatives .....	4-52
4.3.6 Endangered Species .....	4-54
4.3.6.1 No-action Alternative: No Endangered Species Restoration .....	4-55
4.3.6.2 Preferred Alternative .....	4-55
4.3.7 Studies, Plans or Educational Activities .....	4-59
4.3.7.1 Preferred Studies, Plans or Educational Activities.....	4-59
4.3.7.2 Non-preferred Studies, Plans or Educational Activities .....	4-61
4.3.8 Proposals Falling Outside of the Scope of Restoration.....	4-63

## **Chapter 4: Alternatives - Analysis and Consequences**

Chapter 4 analyzes environmental impacts of the proposed action: environmental restoration of New Bedford Harbor. This chapter identifies restoration alternatives under consideration and evaluates their environmental consequences. As described in Chapter 2, restoration priorities were established through a public process of communication between the Trustee Council agencies, other public officials, members of the public, and other stakeholders. Near-term action alternatives were then derived from a public, formal solicitation of restoration ideas (Section 2.2.7.5).

Chapter 4 has two functions: (1) to analyze the environmental consequences of restoration in New Bedford Harbor in a general way, and (2) to analyze the consequences of specific near-term restoration ideas. Therefore, Chapter 4 first examines the proposed Harbor restoration generally (Sections 4.1 and 4.2), then examines each of the proposed restoration priorities (Section 4.3). Specific proposed near-term alternatives are analyzed in this Section, grouped by restoration priority area.

As future restoration ideas are generated through the process described in Chapter 5, additional analysis will be required. In most cases this analysis will be limited to specific actions--for example, environmental analysis as a permit requirement for marsh restoration. Chapter 5 discusses the potential need for future environmental analysis in some detail.

### **4.1 No-Action Alternative: No Environmental Restoration**

No-action/natural recovery (with monitoring) must always be considered in environmental analysis, and should be chosen when it provides greater environmental benefits than other alternatives.

For purposes of this analysis, the no-action alternative assumes that the Harbor cleanup described in Chapters 2 and 3 will be completed in 10-15 years; that it will reduce the level of contaminants in the Harbor Environment; but that no environmental restoration will be undertaken during or after cleanup.

#### **4.1.1 Current Status of the Harbor Environment**

The release of PCBs, heavy metals and other contaminants into the New Bedford Harbor Environment has caused injury to natural resources and lost use of those resources. Sewage, household wastes, commercial wastes such as debris, oil, metals and organics all contributed to a degraded environment.

The discovery that PCBs and other contaminants had been released into the Harbor since the 1940s caused New Bedford Harbor to be added to the National Priority List, by EPA in 1983. Marine sediments, beaches, the water column, and biota were contaminated with PCBs, and this has in turn, affected the area's natural resources and ecosystems. PCBs have been shown to harm reproduction and can cause cancers in marine species.

The impacts from PCB contamination are not limited to natural resources alone. Human use of the affected area has been impacted as well. The contamination resulted in the prohibition of fishing in large portions of the Harbor Environment and other common shoreline activities became infeasible or undesirable. The Massachusetts Department of Public Health (MDPH) posted warning signs along the Harbor prohibiting swimming, fishing, shellfishing and lobstering.

The presence of PCBs in the Harbor Environment has curtailed many water-based activities and eroded confidence in the harbor. As a result, it is no longer considered as desirable a place to visit, live along, or use. Tourist and recreational activities have been lost. Homes and property along the Harbor are less valuable. Commercial development has been curtailed as well. All these factors have contributed to a reduction in the economic potential for the area.

Until the Harbor Environment has been cleaned and its natural resources restored, the potential for economic losses to the area will continue. The area has seen serious declines in manufacturing and the fishing industry in recent years. The environmental condition of the Harbor should be such that it promotes, rather than hinders, economic recovery of the area.

#### **4.1.2 Predicted Scenario under Natural Recovery Only**

Natural recovery is often slow and may not restore resources, habitats, or associated services to baseline condition. Other contaminant sources such as heavy metals and sewage may adversely affect recovery times within the Harbor Environment.

PCBs were designed to remain stable in industrial applications. They are chemically stable (will not easily degrade into other compounds), are able to withstand high temperatures, have low solubility in water, and are non-flammable. These characteristics also mean that they will remain in the environment for a long time and will bioaccumulate in the tissues of living resources. (Weaver, 1982)

The damage assessment conducted on the New Bedford Harbor Environment assumed a natural recovery period of 100 years without remediation. This is a likely scenario given the stability of PCBs and environmental processes taking place. As described in section 3.5.1.2, EPA has informally estimated that once the cleanup is completed, water quality target levels for PCBs may take another 10 years to achieve (Dickerson, PC, 1996). The Harbor cleanup will reduce the concentration and volume of PCBs, but residual PCBs will continue to remain and affect natural resources for 16-100 years.

#### **4.1.3 Lost Services/amenities**

Independent efforts are being made to revitalize the Greater New Bedford area and the Harbor has become one of the focal points. The goal of these efforts is the economic revitalization of the area through projects to increase business opportunities and recreational uses. Potential projects include a national park based upon New Bedford whaling history, an aquarium/oceanarium/hotel complex, a ferry terminal, rail service, and dredging of the navigational channels. These efforts will be coordinated through harbor master planning so that the most beneficial uses will be determined. Without restoration and its source of funds, these benefits would be delayed.

## **4.2 The Preferred Alternative: Environmental Restoration**

Funds to restore injured natural resources are available from settlements with the parties responsible for releasing contaminants into New Bedford Harbor Environment. The Trustee Council has the legal responsibility to use this money to correct the natural resource injury that has occurred to the greatest extent possible.

Environmental restoration will accelerate the natural recovery process and, in turn, should bring economic benefits through increased use and greater confidence in the health of the Harbor. The sooner injuries can be corrected through cleanup efforts and natural resource restoration, the sooner natural resources can thrive in a healthy environment. Such an environment will support larger populations of marine organisms, healthier individuals and a greater diversity of species. This will lead to greater commercial and recreational opportunities such as fishing, shoreline use, boating, and tourism.

A December 19, 1995 editorial in New Bedford *Standard-Times* entitled "Restoring New Bedford Harbor will help restore our very soul" perhaps best explains the need for restoration. The editorial reminds the reader that the communities surrounding the Harbor have depended on the Harbor for centuries. The Harbor has provided a link to commerce and was the focal point of the whaling trade in the 1800s. But it is now a troubled harbor with a troubled soul. The answer does not just lie with the cleanup. "The restoration of the harbor's ravished natural resources is crucial."

The article cites a roundtable discussion hosted by the newspaper and concludes that, "We have lost not only resources, but we have lost much of our self-esteem and the esteem of others. New Bedford Harbor must once again become a source of pride and strength. And restoration of resources and services in our harbor will develop the kind of image that attracts business to invest its money and people to invest their futures in our region." (Standard-Times, 1995)

### **4.2.1 Near-term Restoration Actions**

Typically, natural resource restoration occurs after cleanup. However, because of the protracted remedial process for the site, the Trustee Council chose to undertake near-term natural resource restoration actions so that the services provided by restored natural resources could be returned to the public sooner than if restoration followed cleanup.

Near-term projects can begin the natural resource healing process by enhancing habitats. Near-term projects can also restore lost uses associated with natural resources, such as recreation, through the replacement of areas or services lost.

The focus of near-term restoration is those activities that can be accomplished prior to, or during the cleanup. Preferred activities are those that restore, replace or acquire equivalent resources and would be independent of, and not adversely affected by, the cleanup. Using information from EPA's proposed cleanup plans, the Trustee Council would select appropriate near-term projects from a suite of alternatives. These near-term projects will attempt to address restoration priorities (marshes/wetlands, recreational areas, water column, habitats, living resources and endangered species) throughout the affected environment.

New Bedford Harbor has a navigation channel which allows deeper draft vessels to enter the Harbor for commerce. Through the years this channel has grown shallower through silt deposition. As the channel becomes shallower, larger merchant vessels are prevented from entering the Harbor and as a consequence, take their product elsewhere. The City of New Bedford has requested that the channel be dredged. It is anticipated that the Army Corps of Engineers will be performing maintenance dredging in the upcoming years. The Trustee Council must consider possible impacts that the navigational channel dredging will have on their natural resource restoration efforts. The area where dredging will occur is well defined, although the locations where dredged material will be deposited need to be determined.

To best avoid possible interference by the cleanup or dredging activities, near-term projects should occur in areas outside of the areas proposed for dredging, dredge material disposal and the navigation channel. (Figure 5.2) Selected areas north of Saw Mill Pond on the Acushnet River or south of the Hurricane Barrier are considered to be safe from conflict with dredging and disposal issues. It is not expected that dredged material will be placed in these areas because of the distance material would have to be moved and the lack of approved disposal sites. The Trustee Council will consult with EPA and follow the progress of cleanup and dredging efforts, as well as local municipal efforts, to determine future opportunities for restoration actions.

Specific near-term alternatives are considered in this RP/EIS. As described in Chapter 2, the Trustee Council sought specific ideas from the public, academia, and agencies on possible near-term projects. It is anticipated that implementation of approved projects will occur soon after approval of the RP/EIS. Future solicitations will occur as additional information becomes available on cleanup or dredging activities (see Chapter 5).

#### **4.2.2 Future Restoration Actions**

As the cleanup and maintenance dredging of New Bedford Harbor progress and are eventually completed, natural resource restoration projects within the Harbor itself can begin. The focus of future restoration activities will be to provide direct restoration of injured resources, rather than to restore lost uses or services. When restoration funds have been exhausted, the Trustee Council will disband.

The Trustee Council will periodically evaluate its restoration projects to determine which should continue, which should be initiated, and which should be terminated. Restoration priorities will be reviewed and revised as necessary. Replacement and acquisition will be secondary to direct restoration but will be considered when appropriate.

Monitoring of restoration actions will be a priority and will have to continue even after the Trustee Council ceases to exist. The Trustee Council will evaluate the best means to assure that this monitoring continues and for how long.

#### **4.2.3 Emergency Restoration Actions**

CERCLA defines emergency restoration as "... a situation requiring action to avoid an irreversible loss of natural resources or to prevent or reduce any continuing danger to natural resources..." (CERCLA 111(I)). Typically this occurs when a contaminant release poses an imminent danger of injury to natural resources. Examples of emergency restoration actions

include moving a natural resource from a potentially affected area before injury occurs, isolating a natural resource through containment to prevent injury, or repairing a damaged habitat before migration or spawning occurs. In determining whether emergency restoration is appropriate, the following questions should be considered:

- 1) Will the restoration action protect the natural resource from injury?
- 2) If a restoration action is not implemented, will further natural resource injury result from the release or contamination?
- 3) What would be the consequence of waiting for complete public review of the proposed action?

The release of contaminants into the Harbor Environment has occurred over many years. Natural resources have been exposed to, and injured by, PCBs since PCBs were first released into the Harbor. PCBs have spread slowly from their sources to other areas of the Inner and Outer Harbor, resulting greater numbers of natural resources being exposed to PCBs.

Given that the injury has been continually occurring for such a long period, it is unlikely that emergency restoration actions will reduce the threat of injury. The cessation of PCB manufacture and use, and the completion of "Hot Spot" dredging has reduced contamination, but not eliminated, the primary source of contamination. Several hundred thousand cubic yards of contaminated material still remain in the Harbor.

One situation where it may be appropriate to implement an emergency restoration project is when the opportunity for doing the project is limited by time. Projects may have specific time horizons after which the opportunity is lost. Such would be the case with a land purchase that is only open for a particular amount of time or where the opportunity for matching funds is limited to a given time period. The Trustee Council will evaluate preferred projects for the potential that they will no longer be viable through time. When there is the possibility that a restoration option will be lost, the Trustee Council will also consider whether there is greater benefit from implementing actions through emergency restoration rather than allowing full opportunity for comment.

Public involvement in the development, review, and comment of the RP/EIS will provide greater assurance that the actions being proposed are appropriate, necessary and have public support. It is consistent with the Trustee Council's goals to allow for full public review rather than rush implementation.

#### **4.2.4 The Preferred Approach: Select Projects by Restoration Priority**

Due to time constraints and settlement of the cases, the damage assessment performed was incomplete and was a generalized approach towards determining the impacts of the contamination on natural resources, and such, it remains for the Trustee Council to determine the best approach for restoration. Other environmental impacts are present in the area which may mask or increase the impacts of PCB contamination. Historical information does not describe the quality to which resources should be restored. Rather than exclusively addressing specific injuries, the preferred approach is to take a more holistic view and address natural resource opportunities throughout the affected environment. This will provide



ecological benefits throughout the watershed while having positive effects on the human environment.

Projects will be selected to address the restoration priorities (Section 2.2.6) and by applying the selection criteria (Section 2.2.5). The restoration priorities have equal weight under this approach, which promotes a broader perspective for the restoration actions. It allows for a variety of projects that address both direct restoration and restoration of lost uses or services. Projects can be distributed throughout the affected environment or the supporting environment if that environment contains affected natural resources.

The proposed suite of projects would provide benefits to entire area affected including the four communities, though allocation percentages among the four communities is not envisioned. The best projects within each priority natural resource category that provide the greatest restoration benefit to the New Bedford Harbor Environment would be selected. As the cleanup progresses, restoration priorities may change or the success of early restoration actions may negate the need for further restoration in specific restoration categories.

#### **4.3 Specific proposals/alternatives**

Following the process described in Section 2.2.7.5, the Trustee Council solicited natural resource restoration ideas from the public for near-term restoration projects. Table 4.1 lists the ideas received, including the overall no-action alternative. The ideas were initially subjected to review against the selection criteria described in Section 2.2.5. The results of the Technical Advisory Committee's review against the specific criteria is listed in the Table. Overall results from the technical, legal and public review by the Community Restoration Advisory Board are listed as well. These reviews formed the basis for the advisory groups' recommendations to the Trustee Council. Using this information and after consideration of public comment, the Trustee Council chose preferred alternatives. An environmental impact analysis was then performed on all the alternatives.

The final column of the Table identifies whether the alternative is preferred and the page on which the alternative and analysis can be found. Some alternatives have been combined with similar alternatives at the request of the Trustee Council.

Table 4.1 RESTORATION ALTERNATIVES

☆ Fully meets criteria    ○ Partially meets criteria    ● Does not meet criteria    S Study    ? More information required    P Preferred

Alt #	TITLE	Restores injured resources	Within harbor environment	Ecological/economic benefits	Measurable effects	Use proven technology	Cost effective	Enhance aesthetics	Enable public use	Community involvement	Recommendations			Page No.
											CRAB	TAC	Legal	
NA	No action alternative	○	☆	●	●	○	○	●	●	●				4-3
1	A living machine for water purification and habitat restoration in New Bedford Harbor	●	☆	○	☆	●	●	○	○	○	●	●	?	4-28
2	Restoration of Padanaram Salt Marsh, Dartmouth, MA	☆	☆	○	☆	☆	☆	☆	☆	☆	☆	☆	☆	4-14 P
3	Restoration of Nonquit Salt Marsh, Dartmouth, MA	☆	☆	☆	☆	☆	☆	☆	☆	☆	●	☆	☆	4-16 P
4	Restoration and management of tern populations <sup>1</sup>	☆	○	☆	☆	○	☆	☆	☆	●	●	●	☆	4-54 P
5	Removal of Native American artifacts	●	☆	●	●	○	●	●	○	○	●	●	●	4-61
6	Stock assessment of shellfish and predators in New Bedford, Fairhaven and Dartmouth, and market research for the products <sup>1</sup>	●	☆	●	●	☆	○		○	○	☆	☆	S	4-45 P
7	Long-term monitoring and restoration of shellfish habitats	○	☆	●	○	☆	○	●	☆	●	●	●	S	4-60
8	Fisheries restoration for Dartmouth Areas II and III <sup>1</sup>	☆	☆	○	☆	☆	○	○	☆	☆	☆	☆	?	4-45 P
9	Upper Sconticut Neck/Priest's Cove shellfish restoration and sewer work	☆	☆	○	○	☆	○	○	☆	☆	●	●	?	4-31
10	Bayview sewer project	●	○	●	○	☆	●	○	○	●	●	●	?	4-31
11	Sol-E-Mar area sewer project	●	☆	○	○	☆	☆	☆	☆	○	●	●	?	4-32

<sup>1</sup>  
Combined with other alternatives

**Table 4.1 RESTORATION ALTERNATIVES**

☆ Fully meets criteria    ○ Partially meets criteria    ● Does not meet criteria    S Study    ? More information required    P Preferred

Alt #	TITLE	Restores injured resources	Within harbor environment	Ecological/economic benefits	Measurable effects	Use proven technology	Cost effective	Enhance aesthetics	Enable public use	Community involvement	Recommendations			Page No.
											CRAB	TAC	Legal	
12	Rogers Street/Clarks Cove storm drain	●	☆	○	○	○	☆	○	○	●	●	●	?	4-32
13	Padanaram Harbor dredging	●	☆	●	○	☆	●	●	○	○	●	●	●	4-62
14	Rogers Street boat ramp	○	☆	○	●	○	☆	○	☆	☆	●	●	?	4-24
15	Constructed reefs for lobster and fish habitat enhancement	●	○	○	☆	☆	☆	●	☆	○	●	●	☆	4-42
16	East Clarks Point pumping station <sup>1</sup>	●	○	○	●	☆	○	○	○	●	●	●	?	4-33
17	Cove Road pumping station <sup>1</sup>	○	☆	☆	○	☆	○	○	○	●	●	●	?	4-33
18	Taber Park	○	☆	○	☆	☆	○	○	☆	☆	☆	☆	M A ☆ Fed ?	4-20 P
19	Restoration and management of the New Bedford area shellfishery <sup>1</sup>	☆	☆	○	☆	☆	○	○	☆	☆	☆	☆	☆	4-45 P
20	New Bedford/Fairhaven harbor master plan	●	○	●	●	☆	●	○	○	☆	☆	●	S	4-59
21	Removal & disposal of PCB contaminated grit from main interceptor (from Pearl Street to Cove Street)	○	☆	○	○	☆	☆	○	○	●	●	●	●	4-33
22	New Bedford Police Department Harbor Unit	●	☆	○	○	☆	○	○	☆	○	●	●	●	4-62
23	Restoration management/visualization model of New Bedford harbor ecosystem	●	○	●	●	☆	○	○	○	○	●	●	S	4-61
24	Land conservation - Sconticut Neck marshes and coastline	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	4-39 P
25	Eliminating toxic chlorine discharge from Fairhaven wastewater treatment plant	●	☆	●	●	☆	○	●	○	●	●	●	●	4-33

**Table 4.1 RESTORATION ALTERNATIVES**

☆ Fully meets criteria    ○ Partially meets criteria    ● Does not meet criteria    S Study    ? More information required    P Preferred

Alt #	TITLE	Restores injured resources	Within harbor environment	Ecological/economic benefits	Measurable effects	Use proven technology	Cost effective	Enhance aesthetics	Enable public use	Community involvement	Recommendations			Page No.
											CRAB	TAC	Legal	
26	Massive seeding of large juvenile bay scallops in New Bedford harbor area	○	☆	○	☆	○	○	●	○	○	●	●	☆	4-51
27	Hatchery startup assistance with Taylor Seafood	●	☆	●	●	●	●	●	○	○	●	●	●	4-51
28	Build a dam at the I-95 bridge with possible dewatering pump	●	☆	○	☆	○	○	☆	☆	☆	●	●	●	4-63
29	Wetlands restoration planning and implementation: New Bedford Harbor Environment	○	☆	○	☆	○	○	☆	☆	☆	●	☆	S	4-59
30	Design and development of the New Bedford Aquarium complex	●	☆	○	☆	☆	●	○	☆	☆	☆	●	●	4-61
31	Acushnet aquafarm development	☆	☆	○	☆	○	☆	●	☆	○	●	●	☆	4-52
32	Shellfish restoration Town of Acushnet <sup>1</sup>	○	☆	☆	☆	●	●	●	☆	☆	●	●	●	4-45 P
33	Herring run restoration <sup>1</sup>	☆	☆	○	☆	☆	☆	☆	☆	☆	☆	☆	☆	4-47 P
34	Amos Pratt - House 1810	●	☆	●	●	☆	○	○	○	○	●	●	●	4-63
35	Wood Street - North	○	☆	☆	☆	☆	○	☆	☆	☆	●	●	?	4-64
36	New Bedford hurricane barrier eastern box culvert	○	☆	○	○	☆	☆○	○	☆	☆	☆	☆	☆	4-27 P
37	Relocation of Fairhaven sewerage outfall: hurricane barrier modification	●	☆	●	●	☆	○	○	○	●	●	●	●	4-34
38	Bubble curtain installation: New Bedford barrier gate opening	○	☆	○	○	○	○	●	○	●	☆	●	●	4-29
39	Terrestrial ecological restoration habitat inventory, categorization and mapping project	●	●	●	●	☆	●	☆	○	●	●	●	S	4-60

**Table 4.1 RESTORATION ALTERNATIVES**

☆ Fully meets criteria    ○ Partially meets criteria    ● Does not meet criteria    S Study    ? More information required    P Preferred

Alt #	TITLE	Restores injured resources	Within harbor environment	Ecological/economic benefits	Measurable effects	Use proven technology	Cost effective	Enhance aesthetics	Enable public use	Community involvement	Recommendations			Page No.
											CRAB	TAC	Legal	
40	Herman Melville Shipyard clean up	●	○	○	☆	○	●	☆	☆	○	●	●	●	4-64
41	Artificial reef creation using abandoned fishing vessels	●	☆	○	☆	○	●	☆	☆	○	●	●	☆	4-42
42	Riverside Park Belleville Avenue recreational marine park	☆	☆	☆	☆	☆	○	☆	☆	☆	☆	☆	☆	4-22 P
43	City of New Bedford - from brownwaters to green	●	○	●	●	☆	●	●	●	○	●	●	S	4-61
44	Buzzards Bay tern restoration and stabilization project <sup>1</sup>	☆	○	☆	☆	☆	☆	☆	☆	☆	●	☆	☆	4-54 P
45	New Bedford harbor avian monitoring and restoration project	○	☆	○	☆	☆	☆	○	●	☆	●	●	S	4-60
46	Salt marsh restoration	●	☆	●	●	○	●	○	○	○	●	●	S	4-59
47	Eelgrass habitat restoration	☆	☆	☆	☆	☆	☆	☆	☆	○	●	☆	☆	4-37 P
48	Pumpout vessel for marine sanitary devices	●	☆	☆	●	☆	○	○	○	○	●	●	●	4-30
49	Boat ramp, fishing pier, parking area (Dartmouth)	○	☆	○	☆	☆	☆	○	☆	☆	●	●	☆	4-23
50	Sportfishing piers (Dartmouth, Fairhaven, New Bedford)	○	☆	○	☆	☆	○	○	☆	☆	●	☆	☆	4-25
51	Artificial reef	○	○	○	○	☆	○	●	●	○	●	●	☆	4-42
52	Acushnet River recreation/preservation district	○	☆	☆	☆	☆	●	☆	☆	☆	●	●	☆	4-43
53	Anadromous fish restoration on the Weweantic River	☆	●	○	☆	☆	☆	●	●	○	●	●	☆	4-52
54	Planning for nitrogen removal from the Fairhaven wastewater treatment plant	●	○	●	●	○	○	●	●	●	●	●	S	4-60

Table 4.1 RESTORATION ALTERNATIVES

☆ Fully meets criteria    O Partially meets criteria    ● Does not meet criteria    S Study    ? More information required    P Preferred

Alt #	TITLE	Restores injured resources	Within harbor environment	Ecological/economic benefits	Measurable effects	Use proven technology	Cost effective	Enhance aesthetics	Enable public use	Community involvement	Recommendations			Page No.
											CRAB	TAC	Legal	
55	Tern restoration - Penikese Island	☆	O	☆	☆	☆	☆	O	O	O	●	●	☆	4-54 P

#### **4.3.1 Marshes or Wetland**

Marshes and wetlands provide important habitat for many of the injured fish and wildlife resources within the Harbor Environment. Besides having habitat value, marshes or wetlands provide important functions which protect or enhance the Harbor Environment. Wetlands also cleanse polluted waters, protect shorelines, and recharge groundwater aquifers (Mitsch and Gosselink, 1993). During flood conditions, wetlands provide protection by holding excess water that would otherwise flood surrounding areas.

Found within the Harbor Environment are tidal salt marshes (see section 3.3.1.2) which provide the functions listed above, as well as habitat essential to fish and shellfish affected by PCB contamination.

##### **4.3.1.1 No-action Alternative: No Marsh or Wetland Restoration, Enhancement or Creation**

The no-action alternative would be to leave existing marshes or wetlands alone and not to create any new marshes or wetlands. The New Bedford Harbor Environment contains several marshes or wetlands, some of which function properly. Others are contaminated or through various means have become less than fully functional.

Marshes on the eastern side of the Harbor north of Coggeshall Street have high levels of PCB contamination. Species are exposed to PCBs each time they use the marsh, resulting in detrimental health effects. Allowing these marshes to continue in this condition will allow future generations to become exposed and suffer chronic PCB effects. EPA has proposed to remove portions of the marsh down to a PCB concentration level of 50 ppm, leaving portions of the marsh with levels higher than those protective of natural resources. After removal for the cleanup, EPA will restore the affected marsh areas. The 50 ppm level was decided upon to spare large portions of the marsh from being removed.

Other marshes within the area have undergone a transition due to inadequate tidal exchange. In some cases this has allowed invasive brackish-water plants such as the common reed (*Phragmites australis*) to take over portions of the marsh. When established, this plant provides little habitat value to wildlife. In other cases, inadequate tidal flow has led to hypersaline conditions resulting in a vegetation die off. Such conditions will also no longer support many of the species commonly found in salt marshes.

Marshes or wetlands are critically important within the Harbor Environment. Given that marshes within the Harbor will still have PCB contamination even after cleanup, it is important to restore or enhance other marshes within the Harbor Environment. Failure to restore these resources will allow the habitat value of the Harbor Environment to continue to deteriorate. For these reasons, the no action alternative is rejected.

#### **4.3.1.2 Preferred Alternatives**

The preferred alternative is active restoration of the marshes and wetlands within the Harbor Environment. The Trustee Council will seek opportunities to restore injured or poorly functioning marshes or wetlands within the Harbor Environment. Once identified, the Trustee Council will prioritize the wetland restoration opportunities so that wetlands within the Harbor Environment that support natural resources such as fish, shellfish and avian species will be favored. Wetlands that can be enhanced to replace PCB contaminated wetlands will be favored under near-term restoration activities.

##### **4.3.1.2.1 Padanaram Salt Marsh Restoration**

#### **Project Description**

Proposed Action: To replace an old, damaged undersized culvert with a new, properly-sized arch culvert to improve tidal flushing to a 6.5 acre tidal marsh which is being encroached upon by *Phragmites australis*.

Location: Town of Dartmouth on Smith Neck Road.

Time Frame: Work can begin as soon as funds are received. Work will require approximately three days to complete.

Proponents: Town of Dartmouth and the Dartmouth Natural Resources Trust (DNRT)

Affected Resources Addressed: Salt marsh and the natural resources supported by salt marsh, including plants, mammals, birds, fish, and shellfish, that have been affected by the contamination of the New Bedford Harbor Environment.

#### **Rationale for Adoption**

Nexus to PCB Injury: The plan to cleanup New Bedford Harbor includes dredging of salt marsh where PCB levels exceed 50 ppm. It will be a number of years before these areas can be dredged and restored, and even then some salt marsh will remain relatively contaminated (0-50 ppm). Restoration of marsh habitat that is in the vicinity of New Bedford Harbor but is not impacted by contaminants will help support resources dependent on marshes that have been injured in the New Bedford Harbor Environment. These resources may spend part of their life cycle within the marsh and the Harbor.

Benefits to Resources: The Padanaram Salt Marsh was separated from Apponagansett Bay by the construction of Smith Neck Road many years ago. A 12-inch culvert was installed during the construction to provide for tidal exchange between the bay and the salt marsh. However, the culvert was undersized. The reduced tidal flushing in the marsh has led to a decrease in salinity in the marsh. This problem has been further aggravated by the deterioration of the culvert. Freshwater vegetation has begun to establish in the marsh, including the invasive *Phragmites australis*. Restoring more natural tidal flushing to the marsh should restore the natural salinity to the area and, in response, salt marsh vegetation and dependent fauna should regenerate on the



site. Further, the spread of *Phragmites* should be retarded. The project should lead to an increase in the overall biological productivity of the site which will benefit both the marsh and the New Bedford Harbor Environment.

Benefits to Community: The community at large will benefit from this restoration because of the increased productivity of the marsh and the increase in functions that the salt marsh serves to the Buzzards Bay environment, including nutrient export, nursery habitat for fish, habitat for shellfish and crustaceans, and habitat for birds and other terrestrial wildlife. Further, the marsh is adjacent to open fishing and shellfishing grounds. The site is predominantly bordered by land owned by the Dartmouth Natural Resources Trust and the Dartmouth Conservation Commission and is, therefore, accessible to the public. It is also accessible from Smith Neck Road.

### **Technical Feasibility**

Achievability: Increasing the flushing through a culvert is a simple measure and a common one; therefore, failure of the project is unlikely. An increase in salinity will help the marsh revert to its original salt/brackish community. *Phragmites* will probably not be entirely extirpated from the site, however, its encroachment should be hampered by the increase in salinity.

Impact of Remediation: This site is outside of the area expected to be impacted by remediation activities.

Monitoring: Long-term trends in vegetation will be measured by the Dartmouth Environmental Affairs Coordinator and staff from the Massachusetts Office of Environmental Affairs, Wetland Restoration and Mitigation Banking Program.

Cost: \$15,897 for implementation, monitoring costs to be determined.

Cost Effectiveness: Six and one-half acres of salt marsh/brackish wetlands that have been compromised by human activities will be restored to a more fully functional system. In addition, this marsh is accessible to the public for wildlife viewing and for educational purposes. The restoration would be conducted by the Town at possible cost savings. Therefore, this alternative is considered to highly cost-effective.

### **Impacts on the Environment**

#### Biological:

Impacts on injured resources. This project will take place within the New Bedford Harbor Environment as defined by the Trustees. The proposed activity will provide enhanced habitat for fish, shellfish, and bird species injured by the releases of contaminants. No adverse effect on the injured resources is expected.

#### Impacts on other resources/habitats.

Vegetation: The restoration of tidal flushing in the Padanaram Marsh will be beneficial to the native vegetation. Insufficient flushing has resulted in the marsh becoming less saline, creating an environment more conducive to freshwater plants, including the

invasive *Phragmites*. Improved flushing should kill some of the *Phragmites* and retard its spread. Salt marsh/brackish marsh plants should begin to regenerate in the place of the fresh water plants.

Wildlife: Restoration of a more natural hydrologic regime is expected to enhance the overall productivity of the marsh. Further, a marsh dominated by *Phragmites* provides little wildlife habitat. Therefore, retarding the spread of the *Phragmites* should significantly improve the value of the site for wildlife.

Fish and shellfish: The project is expected to create and enhance habitat for these resources through the restoration of the site's natural salinity, water chemistry, and overall productivity.

Endangered Species: No protected species are expected to be present in the project action area.

Physical: Direct physical impacts to the environment should be limited to the immediate area surrounding the culvert provided that siltation controls are employed. Wetland functions, water quality, and tidal flow are all expected to improve due to this project. No impacts on cultural resources (archaeological or historical), or on land use patterns are expected.

Human: There will be a temporary and minor impact to the human environment through noise and probably some blockage of traffic on Smith Neck Road for the three days that construction is expected to take place.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this project.

#### **4.3.1.2.2 Nonquitt Salt Marsh Restoration**

##### **Project Description**

Proposed Action: Tidal flushing of the 60-acre Nonquitt Marsh is proposed to be significantly improved by installation of a new 100 foot culvert, removal of a tidal slide gate, and replacement of a headwall. Also included in this proposal is the creation of public access to the marsh by construction of a small parking area, expansion of the trail system at the "Smith Farm" owned by the Dartmouth Natural Resources Trust, and the construction of a marsh observation platform.

Location: Town of Dartmouth, in the Nonquitt section, adjacent to Mattarest Lane.

Time frame: The actual construction of the project is expected to require 5 to 7 days to complete. Planning, design and permit acquisition are expected to require 1 to 1 1/2 years.

Proponents: Town of Dartmouth and DNRT.

Affected Resources Addressed: Salt marsh habitat and the natural resources supported by salt marsh, including plants, mammals, birds, fish, and shellfish, that have been affected by the contamination in the New Bedford Harbor Environment.

### **Rationale for Adoption**

Nexus to PCB Injury: The plan to clean up New Bedford Harbor includes dredging of salt marsh where PCB levels exceed 50 ppm. It will be a number of years before these areas will be dredged and restored, and even then some salt marsh will remain relatively contaminated (0-50 ppm). Restoration of marsh habitat that is in the vicinity of New Bedford Harbor but is not impacted by contaminants will help support resources dependent on marshes that have been injured within the New Bedford Harbor Environment.

Benefits to Resources: The Nonquitt Salt Marsh has been compromised by human activities. Specifically, the undersized culvert has reduced tidal flushing resulting in elevated salt levels. Approximately 60 % of the vegetation in the marsh died in the late 1970's after a storm clogged the culvert. The vegetation never recovered. The unvegetated peat also appears to be slowly decomposing and eroding, potentially lowering the elevation of the marsh below that which will support salt marsh. Additionally, the perimeter of the marsh has been invaded by *Phragmites*, and the freshwater scrub-shrub wetland around the edge is increasingly encroaching on the salt marsh. By improving the tidal flushing of this marsh, normal salinity, vegetation, and productivity of the salt marsh will be restored. This will benefit the marsh as well as the overall New Bedford Environment.

Benefits to Community: The community at large will benefit from this restoration because of the increased productivity of the marsh and the increase in functions that the salt marsh serves to the New Bedford Harbor Environment, including nutrient export, nursery habitat for fish, habitat for shellfish and crustaceans, and habitat for wildlife. Further, the marsh is adjacent to open fishing and shellfishing grounds and serves as a recreational and educational resource. The DNRT plans to expand the parking and trail system on the newly acquired "Smith Farm", which abuts the marsh to the west. The trails will provide for public viewing of the marsh, the natural resources present in the marsh, and will lead to a newly constructed viewing platform for overlooking the marsh. To the east, a beach is accessible by boat only.

### **Technical Feasibility:**

Achievability : Due to changes in the elevations of the peat, some areas may not recolonize with vegetation. Also, it is impractical to return the tidal flushing to its original condition. However, an improvement in tidal flushing will clearly benefit the marsh. Culvert replacement/enlargement is a commonly used method, therefore, chances of failure are relatively low.

Impact of Remediation: This site would not be expected to be impacted by remediation activities.

Monitoring: Monitoring could be conducted in conjunction with other wetland restoration projects through a private contractor or educational institution.

Cost: \$186,500.00

Cost Effectiveness: Sixty acres of salt marsh that has been compromised by human activities will be restored through restoration of more natural tidal flushing. In addition, access for the general public for recreational and educational purposes will be created. Therefore, this is expected to be a cost-effective alternative.

## **Impacts on the Environment**

### Biological:

Impacts on injured resources. This project will take place within the New Bedford Harbor Environment as defined by the Trustees. The proposed activity will provide habitat for fish, shellfish, and bird species injured by the releases of contaminants. No adverse effect on the injured resources is expected.

### Impacts on other resources/habitats.

Vegetation: The restoration of tidal flushing in the Nonquitt Marsh should be beneficial to the native vegetation. Hindrance of flushing caused a die-back of vegetation, mostly *Spartina alterniflora*, in the late 1970's. The vegetation has never recovered. Restoration of a more natural hydrologic regime is expected to promote redevelopment of vegetation in what has become salt panne.

Wildlife: Restoration of a more natural hydrologic regime is expected to enhance the overall productivity of the marsh. Vegetative development will provide cover for wildlife and substrate for invertebrates. However, some species, particularly shorebirds, that utilize the existing mudflat in the marsh may lose some habitat. Other wildlife species that utilize the vegetation will benefit from the change.

Fish and shellfish: The project is expected to create and enhance habitat for these resources by returning the site to a more natural salinity regime.

Endangered Species: No protected species are expected to be present in the project action area.

Physical: Direct physical impacts to the environment should be limited to the immediate area surrounding the existing intake structure, culvert, and headwall. Wetland functions, water quality, and tidal flow are all expected to improve due to this project. No impacts on cultural resources (archaeological or historical), or on land use patterns are expected.

Human: There will be a temporary impact to the human environment, predominantly to the Nonquitt Community, during construction. Inconveniences, such as noise and large equipment blocking the road, should be expected. Also, a small stretch of beach will be unusable during construction. However, once the project is constructed,

productivity of this marsh will be enhanced. Also, accessibility to the marsh for the general public will be significantly improved through the construction of trails and a viewing platform on DNRT land. Requests have been made to open up access from the east side of the marsh. Public access is available by boat. A private road is accessible to Nonquitt residents.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to postpone decisionmaking until additional information could be provided to adequately answer the comments received. The areas of concern include: possible septic contamination; public access; design concerns; and costs. The Trustee Council may also consider information from the wetlands study before making a final determination.

#### **4.3.2 Recreation Areas**

Section 3.5.3 describes the losses to the public through the contamination of the New Bedford harbor Environment. The damage assessment conducted determined lost recreational opportunities for recreational angling and beach use.

##### **4.3.2.1 No-action Alternative: No Recreation Area Enhancement or Development**

The no action alternative would be not to implement actions to enhance or develop recreational opportunities. This would mean that the public would continue to use solely existing parks, beaches, and boating facilities.

There is little designated open land that is accessible to the public within the Harbor Environment; given the largely commercial nature of this area, little more is expected to become available. Much of the Harbor is fenced off to prevent the public from accessing it. This means that the citizens of the four communities have limited opportunities to enjoy harbor vistas, or conduct harbor related activities such as fishing or swimming. These activities must be conducted in the Outer Harbor where contaminant levels are lower.

Given that the cleanup will take 10 years or more to complete, and that portions of the shoreline will be taken up by confined disposal facilities, the no action alternative would allow public access in the New Bedford Harbor Environment to remain limited or actually decrease. Some recreational opportunities might develop through the recent designation of the New Bedford Historic District as a National Park.

The no-action alternative should be rejected. Recreational activities and access were directly harmed by the release of PCBs and other contaminants into the Harbor Environment. By selecting the no-action alternative, the public would not be compensated for those injuries and the injury would continue to occur.

##### **4.3.2.2 Preferred Alternatives**

The preferred alternative would develop or enhance recreational opportunities within the Harbor Environment. One of the impacts to the community that was caused by PCB contamination was the loss of recreational opportunities. MDPH prohibited

recreational fishing (except for bait) and swimming in large portions of the Harbor. PCB contamination was not sufficient to close beaches in the Outer Harbor, but still impacted a number of people using those beaches.

A clean environment will invite people to use and appreciate the natural resources. By developing and/or enhancing recreational opportunities, a greater proportion of the community will be able to once again use the Harbor Environment. The Trustee Council will seek recreational opportunities that restore access for a large proportion of the public, have minimal adverse impacts on natural resources, and allow for a better understanding of the importance of those natural resources in the Harbor Environment. Preferred activities are those that secure or enhance areas along the Harbor for passive recreational use; those that increase the public's access to natural resources; and those that enhance the overall aesthetics of the Harbor.

#### **4.3.2.2.1 Taber Park**

##### **Project Description**

Proposed Action: Construct a passive-use recreational park (Taber Park) with an oceanfront bike path, picnic areas, open areas, multipurpose playing fields, and access to the shore to increase public access to natural resources and provide an aesthetic improvement of the Harbor coastline. A park headquarters building with community meeting facilities would also be constructed, serving as an educational center focusing on the park's historical and military significance. The park would help mitigate the impacts created through the siting of a waste water treatment plant (WWTP) at this location.

The Trustee Council would provide funding for activities not previously required by, or agreed to, as mitigation for the WWTP or pursuant to other State or federal contract, law or regulation. Activities under consideration, which have been prioritized by the City of New Bedford, include: 1) beach and shore side access; 2) provision of aesthetic views of Buzzards Bay; 3) restroom facilities protective of the fragile shoreline environment; 4) walkways along beaches, dunes and wetlands; and 5) dune protection.

Location: Southern tip of Clarks Point, on the west side of New Bedford Outer Harbor (Area II). The park would surround the newly constructed Waste Water Treatment Plant, in an area which was once a military base and is the site of Fort Rodman.

Time Frame: Funding will supplement work already being performed on the site.

Proponents: City of New Bedford

Affected Resources Addressed: Recreational opportunities. Increased access to natural resources.

##### **Rationale for Adoption**

Nexus to PCB Injury: The natural resource damage assessment conducted for this action found significant impacts to recreational use and aesthetics resulting from

Harbor contamination. There are limited opportunities to restore recreation/open space along the Inner Harbor. The Taber site would replace sites located along the Inner Harbor that have been lost or affected by the PCB contamination.

Benefits to Resources: Depending on the number of projects chosen, resource benefits could include: greater recreational access to a larger proportion of the communities; an aesthetic improvement to the Harbor shoreline; and increased habitat protection.

Benefits to Community: The community would be able to use a recreational facility along the Harbor, enhancing the quality of life for people living near the park and others using it. The Trustee Council would strongly urge that Taber Park be accessible for all citizens, especially those of Acushnet, Dartmouth, Fairhaven and New Bedford.

### **Technical Feasibility**

Achievability: The area where the park would be located and the types of activities proposed should attract citizens from the area. The park overlooks scenic portions of the Harbor and Buzzards Bay and should provide a variety of activities thus insuring its success. The project would use standard construction techniques in the case of capital improvements.

Impact of Remediation: This site is outside of the area expected to be impacted by remediation activities.

Monitoring: The park and its facilities will be maintained and monitored by the City of New Bedford. Success of the park can be determined through use of the park as measured by periodic gate counts. Gate counts should also provide information on where people are coming from to determine if the park is servicing all four communities.

Cost: The Trustee Council has indicated that it would consider funding up to \$2 million. The City of New Bedford is in the process of securing funding for other required portions of the park.

Cost Effectiveness: Implementation of the project would provide greater recreational opportunities for people living in or visiting the Harbor Environment. Additional funding provided by the City of New Bedford will increase the scope of the project to provide greater benefits.

### **Impacts on the Environment**

#### Biological:

Impacts on injured resources. No significant adverse impact on the injured biological resources is expected.

#### Impacts on other resources/habitats.

Vegetation: The use of walkways and/or bike paths will help to direct pedestrian traffic away from areas where marsh or upland vegetation is located. Minimal impacts will occur through the addition of these walkways.

Wildlife: Given the past uses of the site, minimal impacts to wildlife are expected from the change to passive use. With habitat enhancement, wildlife species may actually begin to inhabit greater portions of the site.

Fish and shellfish: Minimal impacts should result from this action. The majority of the work would be done in upland. The exception would be if public docks, boating facilities or fishing piers were constructed, in which case near-term impacts to shellfish may occur from in-water work.

Endangered species: No protected species are expected to be present in the project action area.

Physical: Direct physical impacts should be minimal and only be comprised of brief construction activities. This site has undergone significant change already through the construction of the WWTP. No impacts on cultural resources (archeological or historical) are expected.

Human: There will be slight impact to the human environment resulting largely from noise and dust from construction. Beneficial impacts should result through greater access to the natural environment and Harbor vistas.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this project. The Trustee Council will provide up to \$2.0 million for activities not previously required by, or agreed to, as mitigation for the WWTP or pursuant to other State or federal contract, law or regulation.

#### **4.3.2.2.2 Riverside Park Belleville Avenue Recreational Marine Park**

##### **Project Description**

Proposed Action: Creation of an Inner Harbor coastal park with picnic benches, walking and biking paths, possibly a pier or boatramp for recreational use, and marsh restoration or other enhancement of coastal habitat. This will increase public access and use of coastal natural resources, provide habitat enhancement benefiting fish, birds and other living resources, and an improvement of neighborhood aesthetics and amenities.

The site borders a small saltwater cove in the North End of New Bedford, between Coffin Avenue and Sawyer Street, adjacent to the Hot Spot Area. The site is characterized by 1) an upland area which was previously industrial (Pierce Mill complex was recently razed); 2) a playground area at Riverside Park; 3) shoreline consisting of remnant wetlands (primarily phragmites); and 4) the cove itself consisting of shallow water and tidal mudflats. Areas immediately north and south of this site have been proposed for construction of CDFs. If the CDFs were to be used as parkland, the proposed alternative could provide a link between them.

The 5-acre site has several potential uses (industrial, commercial, residential or recreational). Initial action would be to determine site potential and whether



contaminants are present on the site. The City of New Bedford would determine its preferred use for the site upon receipt of this information.

Location: Upper Acushnet River Estuary, New Bedford (Hot Spot/Area I).

Time Frame: Initial site assessment could begin pending legal taking of the site by the City of New Bedford. Park construction or wetland restoration would have to wait until cleanup of the cove, and possibly the Upper Estuary, is completed.

Proponents: Riverside Park Group and City of New Bedford

Affected Resources Addressed: Recreational opportunities, wetlands, estuarine fish and invertebrates, and birds.

### **Rationale for Adoption**

Nexus to PCB Injury: The site is adjacent to an area of the Harbor with documented PCB concentrations between 50 and 500 ppm (EPA RI/FS). Canada geese, mute swans, ducks and shore birds feed in this area. The fringing marsh likely exhibits similar levels of contamination and will be part of the cleanup. The site is also adjacent to a residential neighborhood. Access to the cove and marsh is prevented by high fences and signs warning of the contamination danger. The damage assessment conducted on this case reported impacts to recreational use and aesthetics.

Benefits to Resources: Depending on the actual project chosen, resource benefits could include: greater recreational access to a larger proportion of the community; an aesthetic improvement to the Harborshoreline; improved wetland functions, and increased habitat protection.

Benefits to Community: The community would be able to use a recreational facility along the Harbor. Residents who have been most affected by the contamination would be able to once again use the Harbor and surrounding shore areas. The Trustee Council would urge that the park be accessible for all the citizens of Acushnet, Dartmouth, Fairhaven and New Bedford.

### **Technical Feasibility**

Achievability: A determination of achievability will be made after results of the site assessment. The project would use standard construction techniques in the case of capital improvements, and proven restoration techniques if wetland restoration were chosen.

Impact of Remediation: This site is within the area expected to be impacted by remediation activities. There is some potential that construction equipment to be used for the cleanup will have to access the area. The Trustee Council would like to proceed with initial planning and assessment.

Monitoring: The park and its facilities would be maintained and monitored by the City of New Bedford. Success of the project can be determined through use of the park. It

would be beneficial to know where people are coming from and whether the park is servicing all four communities.

Cost: Initial site assessment is projected to cost \$35,000. Park construction or wetland restoration costs would be determined upon receipt of the site assessment.

Cost Effectiveness: The cost-effectiveness of the project would be determined after completion of the initial site assessment. The park would provide greater recreational opportunities than are currently available to the population closest to the area of highest contamination levels.

## **Impacts on the Environment**

### Biological:

Impacts on injured resources. No significant adverse effect on the injured biological resources is expected.

### Impacts on other resources/habitats.

Vegetation: The use of walkways and/or bike paths will help to direct pedestrian traffic away from areas where marsh or upland vegetation is located. Minimal impacts will occur through the addition of these walkways.

Wildlife: Despite high levels of contamination, the cove is still used by various bird species. There may be some impacts during construction but these will be of short-duration and should be far less than those of the cleanup. The actions will not be concurrent.

Fish and shellfish: Minimal impacts should result from this action. The majority of the work would be done in upland. A small pier is being considered. The proponents will be encouraged to reduce the inwater impacts of pier construction. If a pier is needed for the cleanup, it may be possible to have it designed to serve both purposes.

Endangered Species: No protected species are expected to be present in the project action area.

Physical: Direct physical impacts should be minimal and only be comprised of short duration construction activities. No impacts on cultural resources (archeological or historical) is expected. Land use patterns will change from industrial to passive use.

Human: There will be short-term minimal impacts to the human environment resulting largely from noise and dust from construction. Beneficial impacts should result through greater access to the natural environment and Harbor vistas. The intended use of the park would be for passive recreation which is less intrusive than previous uses (industrial-manufacturing). The proposed uses would provide protection to fragile areas and help to educate the public on the importance of preserving these areas.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to fund, up to \$35,000, a contaminant survey of site provided that: 1) the City of New Bedford takes title to the land; and 2) determines and designates how much of the property will be used for the park. Should these conditions be met and if the site survey results are favorable, the Trustee Council, working in close coordination with the EPA, will decide how and when to proceed.

#### **4.3.2.3 Non-preferred alternatives**

The following alternatives are non-preferred for near-term restoration only. The Trustee Council has indicated its interest in pursuing greater recreational access through boat ramps and fishing piers but has chosen to postpone these projects until more information is available on the best locations for these. Information from the Harbor Master Plan would greatly assist the Trustee Council in its determination of access locations that would provide the most services and benefits to the citizens of all four affected communities as regional residents.

##### **4.3.2.3.1 Rogers Street Boat Ramp**

Proposed Action: To build a boat launching ramp, public sportfishing pier, and parking lot on the shore of Clarks Cove. Implementation would include the removal of six above-ground fuel tanks.

Location: Existing ramp is located at the foot of Rogers Street, Dartmouth, MA, and provides access to Clarks Cove.

Resource Injury: The release of PCBs in the New Bedford Harbor Environment has resulted in a loss of recreational opportunities. Recreational boating and inshore sport fishing fell off dramatically when fishing bans were enacted.

Resource Benefits:

- increase public access to Clarks Cove
- increase access points for small boat fishermen
- increase economic returns from increased recreational boating and fishing

Environmental Impacts: Fuel tank removal may require additional cleanup. Minimal adverse effects would be expected to result from implementation of the proposed project.

##### **4.3.2.3.2 Boat Ramp, Fishing Pier, Parking Area**

Proposed Action: To build a boat launching ramp, public sportfishing pier, and parking lot on the shore of Clarks Cove.

Site Description: Adjacent to Clarks Cove, Dartmouth, MA, on Town-owned land in Area II.

Resource Injury: Lost public use of marine resources in the New Bedford Harbor Environment as a result of PCB contamination of physical and living resources, and resulting fishing closures in Areas I, II, and III.

Resource Benefits:

- Restoration of marine recreational opportunities in the New Bedford Harbor Environment.
- Restoration of access to fishery resources.
- Local economic benefits resulting from increased recreational fishing and boating.

Environmental Impacts: Minimal adverse effects would be expected to result from implementation of the proposed project.

#### **4.3.2.3.3 Sportfishing Piers (Dartmouth, Fairhaven, New Bedford)**

Proposed Action: To build public sportfishing piers in Dartmouth, Fairhaven, and New Bedford, with associated parking facilities.

Site Description: New Bedford Harbor (New Bedford and Fairhaven, MA) and Apponagansett Bay (Dartmouth, MA) -- Exact locations to be determined.

Resource Injury: Lost public use of marine resources in the New Bedford Harbor Environment as a result of PCB contamination of physical and living resources and resulting fishing closures in Areas I, II, and III.

Resource Benefits:

- Restoration of marine recreational opportunities in the New Bedford Harbor Environment.
- Restoration of access to fishery resources.
- Local economic benefits resulting from increased recreational fishing and boating.

Environmental Impacts: Minimal adverse effects would be expected to result from implementation of the proposed project.

#### **4.3.3 Water Column**

The water column includes all fresh, salt and estuarine waters in the New Bedford Harbor Environment. PCBs are present in the water column where they can be a source of contamination to fish and wildlife species that use, live or swim in the water column. Demersal fish receive contaminant exposure through the water column as well as bottom sediments. Representative species include winter flounder, bluefish, blueback herring and Atlantic silverside. Phytoplankton and zooplankton including copepod and diatom species receive exposure through the water column. Bivalve mollusks including Atlantic ribbed mussel, blue mussel, Atlantic bay scallop, and the Eastern oyster receive exposure through the water column rather than the sediment. (EPA, 1990)

Besides PCBs, other types of contamination may be present in the water column including human sewage, heavy metals, industrial discharge, salt and grit from roads, agricultural products, and petroleum products. All contribute to the degradation of the water column.

#### **4.3.3.1 No-action Alternative: No Water Column Restoration**

The no-action alternative would be not to take action to restore the water column, relying instead on the Harbor remediation alone, which includes some water treatment for removal of PCBs. As discussed in Chapter 3, the remediation will remove the bulk of PCBs from the Harbor sediments, but will not by any means eliminate them; thus continuing, albeit greatly reduced, exchange of contaminants between the sediments and water column is expected following clean-up.

Under the no-action alternative, water-column concentrations of PCBs could be expected to decline over time, but there is doubt as to when acceptable levels ("ambient water quality criteria," or AWQC) would be reached. As discussed in Chapter 3, the process might take two decades or more. Other factors stand to impede the recovery of the Harbor's water column from PCB contamination, particularly in the Inner Harbor and Upper Estuary. Most notable is the presence of the Hurricane Barrier, which greatly restricts tidal flushing in these areas.

Meanwhile, the water column of New Bedford Harbor remains the principal pathway by which living resources are exposed to the contamination of the Harbor sediments. As discussed in Chapter 3, the fish, shellfish, birds, and invertebrates of the Harbor have been, and will continue to be, severely affected by PCB contamination of the water column of New Bedford Harbor.

#### **4.3.3.2 Preferred Alternatives**

The preferred approach is to initiate actions to enhance or restore the overall quality of the water column. This would require cooperative efforts with other agencies such as ACOE, EPA and local agencies. A water column free of, or one containing fewer contaminants will be less likely to pass contamination on to the natural resources that inhabit it.

It remains unclear whether improving sewage facilities or infrastructure (pipes, combined sewage overflows, pumping stations, etc.) May be allowable under any circumstances. The Trustee Council will continue to examine this issue and make a determination for later project selection actions. These actions tend to be expensive and are more appropriate later when better information is available on the types of projects needed to address all of the restoration priorities.

##### **4.3.3.2.1 Hurricane Barrier Box Culvert**

#### **Project Description**

Proposed Action: The Hurricane Barrier crosses the mouth of the Acushnet River, between New Bedford Inner and Outer Harbor. It was built in the early 1960s by ACOE

to protect the areas surrounding the Harbor from flooding caused by hurricane storm surges. Construction of the barrier resulted in the loss of 11.4 acres of subtidal and intertidal habitat in the Inner Harbor. Tidal flow occurs through a navigation gate and two gated conduits. The barrier has reduced the width of the Harbor mouth by 95 percent, leading to sequestering of pollutants. (VHB, 1996) This has increased the potential for fish kills from reduced oxygen levels within the Harbor. The proposed action would be to install an additional opening in the Barrier, in the vicinity of and existing deepwater bypass channel, thereby increasing tidal exchange between the Harbor and Buzzards Bay.

Location: Hurricane Barrier, New Bedford Harbor

Timeframe: Work on the Hurricane Barrier is the responsibility of the ACOE which will have to coordinate the work with other responsibilities. It is possible that this project could be undertaken in conjunction with the navigational dredging.

Affected resources addressed: The water column and the shellfish, finfish and wildlife resources that reside in or use the Harbor Environment.

### **Rationale for Adoption**

Nexus to PCB Injury: The Hurricane Barrier has trapped some PCBs in the Harbor thus exposing natural resources to contamination. While EPA has determined that PCBs are transported to the Outer Harbor at a rate of 0.5 pounds /day, it can be assumed that the rate would be greater without the Barrier. (EPA. 1990b. page 2-36; EPA. 1996. page 5) At the same time this entrapment has benefited resources outside the Harbor by reducing the spread of PCBs. Once the primary source of PCB contamination has been reduced through remediation dredging, maybe greater tidal flushing would result in improved water quality to benefit the natural resources of the harbor.

Benefits to Resource: Some contaminant concentrations would be reduced and potentially adequate oxygenation, salinity and temperature would be restored. There will be an accelerated water column recovery as remediation progresses. The historic tidal levels will be restored, with potential benefits to wetlands and living resources. The existing constriction of the Harbor mouth may have resulted in missed opportunities for fish and shellfish to enter the Harbor.

Benefits to Community: The community at large will benefit from improved water quality and a healthier Inner Harbor Environment. The potential for fish kills will be reduced and a greater number of natural resources will be able to access the harbor.

### **Technical Feasibility:**

Achievability: Provided that the culvert is properly placed and designed for adequate tidal flow, the goal of greater tidal flushing will be achieved.

Reliability of Techniques: Construction of culverts or other appropriate means of passage is a proven and reliable technique.

Impact of Remediation: To avoid adverse impacts, implementation of the proposal would be coordinated remediation and navigational dredging. One area under consideration for storage of navigational dredge material is Palmer's Cove, on the northwest side of the Barrier. Construction of the containment facility may eliminate box culverts on this portion of the dike. If such action is taken, one or more additional culverts would have to be constructed. This would not be considered to be restoration.

Monitoring: The water quality of the Inner Harbor will be the predominant measure of success. Several groups monitor water quality in New Bedford Harbor for which results will be available.

Cost: The ACOE will determine the cost of this project.

Cost effectiveness: If the project is done in conjunction with the navigational dredging containment facility construction, other groups will cover the costs. If done independently, the Trustee Council would likely enter into a cost-sharing arrangement with the ACOE. The project offers the opportunity to enhance the water column and benefit natural resources at costs lower than other alternatives within this category.

#### **Impacts on the Environment:**

Only beneficial impacts are expected. ACOE will conduct an impact analysis during the design phase and before construction of a culvert or other opening.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this project. The action taken will be for the Trustee Council to request the ACOE fully evaluate the proposal, its benefits and impacts, and if feasible and appropriate, request the proposed modification to the barrier. Total funding requirements and the level of Trustee Council potential cost-sharing would be determined through this evaluation.

#### **4.3.3.3 Non-preferred Alternatives**

##### **4.3.3.3.1 New Bedford Harbor Restorer**

Proposed Action: One or several floating restorer systems would be installed directly in the Harbor, providing mixing, aeration, physical filtration, and biological degradation of water pollutants using indigenous wetland plants, molluscs, and bivalves. These organisms would filter approximately 70 million gallons/day of Harbor water. At the conclusion of the process, a wetland would be created providing habitat for many species.

Location: Acushnet, Fairhaven, or New Bedford, MA, within the harbor. Siting of the Restorer would be determined through initial study. Siting could occur at either a dock, or as a series of floating open marsh rafts or as a greenhouse-enclosed aquaculture/wetland system.

Resource Injury: PCBs and other contaminants are present in the water column, which in turn allows deposition of contaminants on the bottom or uptake by plant life allowing for further uptake by fish and wildlife.

Resource Benefits:

- Improved water quality through filtration and biological decomposition
- Creation of wildlife habitat
- Increase public awareness of the problems and solutions of Harbor cleanup

Environmental Impacts: Fuel tank removal may require additional cleanup. Minimal adverse effects would be expected to result from implementation of the proposed project.

Rationale for Non-preference: While the Restorer has been successful in freshwater environments, it is unproven in saltwater. The Restorer may also be ineffective for the high PCB contamination levels found in the Harbor Environment. Given the experimental nature of this proposed alternative, it failed to meet the criteria that restoration options use proven technology.

#### **4.3.3.3.2 Bubble Curtain Installation: New Bedford Barrier Gate Opening**

Proposed Action: Install a pneumatic barrier across the opening in the Hurricane Barrier.

Location: The Hurricane Barrier crosses the mouth of the Acushnet River, between New Bedford Inner and Outer Harbor. It was built in the early 1960s by the US Army Corps of Engineers to protect the areas surrounding the Harbor from flooding caused by hurricane storm surges.

Resource Injury: Oil spills and low-oxygen waters in New Bedford Inner Harbor; transport of contaminated sediments and waters from the Inner Harbor to Buzzards Bay.

Resource Benefits:

- Prevent migration of contaminants or oil spills out of the Inner Harbor
- Increase dissolved oxygen levels in the Inner Harbor
- Aerate the harbor, leading, potentially, to beneficial biological effects.
- Improve navigation by preventing ice formation and reducing wave action

Environmental Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects though the extent of the benefit is unknown. If a spill occurred there could be containment thus reducing potential impacts. Whether the proposal will contribute appreciably to increasing oxygen levels is unknown.

Rationale for Non-preference: While bubble curtains have been shown to contain spills, ecological benefits related to PCB injury are less certain. The Trustee Council has requested that ACOE evaluate this idea for its potential effectiveness along with an idea to increase tidal flow through the Hurricane Barrier.



#### **4.3.3.3.3 Pumpout Vessel for Marine Sanitary Devices**

Proposed Action: Fund a pumpout barge, to be operated by the City of New Bedford, to pump the holding tanks of recreational and commercial vessels on the New Bedford side of the Harbor, and to transfer this wastewater to the municipal sewage system.

Location: Various locations around the New Bedford Harbor Environment.

Resource Injury: Nutrient loadings from pleasure and commercial vessels.

Resource Benefits: Minor reduction of nutrient and fecal coliform levels in New Bedford harbor.

Environmental Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects by reducing fecal contaminant levels in the water column.

Rationale for Non-preference: There is no link to the injured natural resources. The idea would provide further protection to the water column but addresses only fecal contamination, rather than PCB contamination. There are other sources of funds available for this type of activity. Two pumpout facilities already exist within the New Bedford Harbor Environment.

#### **4.3.3.3.4 Sewer Related Projects**

In response to the Request for Ideas, several ideas were received to implement sewer related projects. The intent of these projects was to improve the overall water quality within the Harbor Environment. In proposing these ideas, the proponents made the argument that a restored environment should be maintained and the only way that can be accomplished in the future is to control contaminant sources to that environment. The dilemma though is that restoration funds must be used to restore resources injured by PCBs in New Bedford Harbor. The majority of the sewer projects do not address a resource injury due to PCBs, rather, they would correct adverse impacts caused by sewage contamination.

Restoration or protection of shellfish beds was the goal of some of the ideas. Reopening shellfish beds in the Outer Harbor that have been closed due to sewage contamination would serve to replace shellfish beds in the Harbor that may not be available for many years. While the goal was replacement, the cause was still not related to PCBs.

Sewer related ideas ranked lower in the review for several reasons. First was the question of whether these types of projects qualify as restoration of PCB injured resources. A final decision has not been made and the Trustee Council will be reviewing the rationale and legal applicability of these projects. The Trustee Council will also look at whether such projects are legally required by the Clean Water Act or other state or federal statute, consent decree, court order, statute, or regulation. Such

a requirement may make the projects ineligible or inappropriate for restoration funding. Another concern was the large expense of conducting these projects. If all of the sewer related projects received were implemented, the total cost (\$32 million) greatly exceeded the total amount of restoration funds.

In response to the desire to increase water quality within the Harbor Environment, the Trustee Council believes that by increasing the tidal flushing action through changes to the Hurricane Barrier, similar benefits can be received.

#### **4.3.3.3.4.1 Bayview Sewer Project**

Proposed Action: Construct a satellite waste water treatment facility package plant and accompanying sewer lines to service 72 homes.

Location: This idea would implement changes to the existing wastewater systems along Bayview, DeGaris, Dutra and Beach Avenues, and Smith Neck Road, Dartmouth, MA

Resource Injury: Existing systems in these neighborhoods allow waste water to discharge into Apponagansett Bay, bringing about a decrease in water quality and in turn, a detrimental effect on the resources present in the Bay.

Resource Benefits:

- Improvement to the water quality along the western shore of Apponagansett Bay

Environmental Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects through improved water quality.

#### **4.3.3.3.4.2 Upper Sconticut Neck and Priests Cove Shellfish Restoration and Sewer Installation**

Proposed Action: Install municipal sewer and stormwater system in the Sconticut Neck and Priests Cove areas, linking more than 450 homes to the Fairhaven Wastewater Treatment Plant.

Location: Sconticut Neck and Priests Cove, Fairhaven. Priests Cove is located on the west side of Sconticut Neck, on New Bedford Outer Harbor.

Resource Injury: Contamination from residential on-site sewage disposal systems and stormwater runoff in the Sconticut Neck and Priests Cove results in closure of shellfish beds in New Bedford Outer Harbor.

Resource Benefits:

- Improve water quality in New Bedford Outer Harbor
- Allow the reopening of some shellfish beds in the Outer Harbor (economic benefit only)

Environmental Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects through improved water quality.

#### **4.3.3.3.4.3 Sol-e-mar Area Sewer Project**

Proposed Action: Install municipal sewerage in the above neighborhoods, resulting in service to 300 homes.

Site Description: The following streets would be sewerred in Dartmouth, MA: William Street, Stoneledge Road, Hannah Street, Mosher Street, Redwood Street, Harvey Street, Hartford Street, Prospect Street, Sol-E-Mar Road, Norton Street, Canfield Street, Merrimac Street, Pearl Street and Adams Street

Resource Injury: Existing systems in these neighborhoods allow storm water carrying wastes to discharge into Clark's Cove, bringing about a decrease in water quality and in turn, a detrimental effect on the resources present in the cove.

Resource Benefits:

- Stopping the most polluted storm water discharge on the west side of Clark's Cove
- Improve water quality
- Allow increased shellfishing
- Allow increased public recreational water uses

Environmental Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects through improved water quality.

#### **4.3.3.3.4.4 Rogers Street/Clarks Cove Storm Drain**

Proposed Action: Upgrade existing catch basins with basins containing sumps, oil, gas and water separators. Install a retention basin at the foot of Rogers Street to catch pollutants in storm water runoff into Clark's Cove.

Location: Catch basins at the foot of Rogers Street, Dartmouth, Massachusetts, allow untreated storm water containing contaminants to discharge into Clark's Cove.

Resource Injury: The introduction of untreated storm water reduces the water quality of Clark's Cove, resulting in degradation of natural resources.

Resource Benefits:

- Improve water quality in Clark's Cove
- Improve shellfish availability

Environment Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects through improved water quality.

#### **4.3.3.3.4.5 Cove Road/East Clarks Point Pumping Stations**

Proposed Action: Increase capacity of municipal sewage system by constructing a new pumping stations and replacing sewer lines on east and west side of Clarks Point.

Location: Clarks Point, New Bedford, MA, located on the west side of New Bedford Outer Harbor).

Resource Injury: Existing CSOs discharge sewage and runoff to Clarks Cove during storms, causing fishing and beach closures.

Resource Benefits:

- Improve water quality by eliminating CSO discharge in this area.
- Allow the opening of closed shellfish beds
- Facilitate increased recreational use

Environmental Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects through improved water quality.

**4.3.3.3.4.6 Removal & Disposal of PCB Contaminated Grit from Main Interceptor (From Pearl Street to Cove Street)**

Proposed Action: Removal and proper disposal of approximately 2,600 cubic yards of PCB-contaminated grit, using a drag and pulley system to remove the grit from the interceptor, and trucks for transport to a disposal site.

Site Description: A section of New Bedford's main sewer interceptor extending approximately 2120 feet from Pearl Street to Cove Street.

Resource Injury: Accumulations of PCB- and hydrocarbon-contaminated grit in this section of pipe cause CSOs to discharge more frequently throughout the City's wastewater system than they otherwise would. As a result, nutrients, PCBs and other contaminants are released to the Harbor Environment.

Resource Benefits:

- Potential improvement of water quality
- Potential restoration of closed shellfish beds
- Potential improvement of recreational opportunities within the Harbor Environment

Environmental Impacts: Implementation of the proposed project may be expected to provide beneficial environmental effects through improved water quality.

**4.3.3.3.4.7 Eliminating Toxic Chlorine Discharge from Fairhaven Wastewater Treatment Plant**

Proposed Action: This idea would upgrade the Fairhaven WWTP by eliminating the use of chlorine for disinfection and replacing it with a safer, nontoxic alternative - ultraviolet treatment through ultraviolet radiation beds and associated facilities. The work would be performed by private contractors under the supervision of the Fairhaven Board of Public Works.

Location: The Fairhaven WWTP is located on Arsene Street, Fairhaven, MA. The outfall from the plant is located within the New Bedford Inner Harbor.

Resource Injury: The Fairhaven WWTP is the reported to be the largest point source of wastewater pollution in the Inner Harbor. The plant provides secondary treatment for an average flow of 2.2 million gallons/day with a permitted monthly average of 5.0 million gallons/day. Chlorine is employed as the primary mechanism for disinfection. As a result, the plant contributes steady input of chlorine residual to the Harbor Environment which can be toxic to marine life.

Resource Benefits:

- Eliminate a significant source of continuing toxic chlorine discharge
- Improve the water quality of the harbor
- Improve the quality and abundance of living marine resources
- Economic benefits from healthy, productive and usable finfish and crustacean populations

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects.

#### **4.3.3.3.4.8 Relocation of Fairhaven Sewerage Outfall: Hurricane Barrier Modification**

Proposed Action: To install an outfall pipe in the Hurricane Barrier while installing the box culvert, thereby providing an outlet for diverting discharges from the Fairhaven WWTP to the Outer Harbor where increased flushing to Buzzards Bay will take place.

Location: The Hurricane Barrier crosses the mouth of the Acushnet River, between New Bedford Inner and Outer Harbor. It was built in the early 1960s by the US Army Corps of Engineers to protect the areas surrounding the Harbor from flooding caused by hurricane storm surges. The Fairhaven WWTP is located inside the Barrier, on the East Bank of the Inner Harbor.

Resource Injury: While the Hurricane Barrier limits tidal exchange between the Inner Harbor and Buzzards Bay, the Fairhaven WWTP is a source of nutrients, pathogens, and other contaminants to the Inner Harbor. Nutrient loadings in confined waterbodies tend to cause low dissolved oxygen (DO) and otherwise impair water quality.

Resource Benefits:

- Improved water quality and aesthetics in the Inner Harbor and at Fort Phoenix Beach
- Accelerated recovery of the water column in the Inner Harbor and Estuary as remediation progresses
- Enhanced fish populations in the Inner Harbor (particularly in warm weather when DO tends to be low).

Environmental Impacts: For the Inner Harbor, the proposed project would provide beneficial environmental effects through improved water quality. There may be

adverse effects for the Outer Harbor through greater discharge but this may be alleviated by greater flushing by tidal movement and currents.

Note: This action is being examined by the Trustee Council and ACOE along with the Hurricane Barrier opening.

#### **4.3.4 Habitats**

Habitat is the complex of geographic features, hydrologic conditions, and living organisms within an ecosystem that provide food, nesting and resting areas, and shelter for fish and wildlife. Habitat restoration would be a basic component of natural resource restoration in the New Bedford Harbor Environment, since, as described in Chapter 3, habitat is essential to the living resources of the Harbor.

Habitat restoration overlaps earlier categories within this chapter, such as Section 4.3.1 and 4.3.3. However, the Trustees deem habitat restoration to be such an important part of the proposed action that this section was included in the RP/EIS to analyze proposed habitat restoration actions that fall outside the scope of Sections 4.3.1 and 4.3.3. As demonstrated by the following preferred alternatives, restoration, enhancement, or replacement of habitat in the NBH Estuary and environs has the potential to substantially improve the abundance and health of a wide variety of living resources in the NBH Environment.

##### **4.3.4.1 No-action Alternative: No Habitat Restoration or Enhancement**

The no-action alternative would be not to implement habitat restoration actions in the New Bedford Harbor Environment. Under this alternative, animals and plants would continue to live in habitats degraded by PCB contamination and other factors. In many cases, this would preclude the success of efforts to restore living resources injured by the PCB contamination, because habitat restoration is often the most cost-effective way--indeed in many cases, the only practical way--to restore populations of plants and animals.

As discussed in Chapter 3, PCB contamination in the New Bedford Harbor Environment has depressed populations of plants and animals and reduced the diversity of estuarine species. However, in a highly urbanized environment such as New Bedford Harbor, most living resources--plants, fish, shellfish, birds, and terrestrial animals--are subject to multiple stressors caused by the cumulative impacts of contamination, habitat loss, and other factors. Habitat loss is often a critical factor preventing the recovery of populations that have been depressed or otherwise injured by contamination or other forms of environmental degradation in a developed estuary such as New Bedford Harbor. The no-action alternative would prevent some resource populations in New Bedford Harbor from recovering from the effects of PCB releases, and would greatly extend the period of recovery for others.

##### **4.3.4.2 Preferred Alternatives**

Preferred alternatives are those that provide direct restoration or enhancement of affected habitat. In many of the affected habitats of the New Bedford Harbor

Environment, however, restoration must wait until cleanup is complete. Therefore, the focus of near-term habitat restoration will be on those areas that can be enhanced to provide greater habitat value and environmental returns. Under the types of actions contemplated for this priority, land acquisition is considered.

### **Land acquisition**

As a means of securing or protecting environmentally productive habitat, the Trustee Council will determine if appropriate land for acquisition is available within the New Bedford Harbor Environment. Information from Harbormaster plans or town master plans will prove valuable in determining appropriate sites and whether such sites might be available for the intended purpose of habitat protection. The Trustee Council will seek advice from the affected communities and the Commonwealth before proceeding with any purchases.

When a parcel is identified, the Trustee Council will use the appropriate state (301 CMR 51) or federal land acquisition regulations as a guide. The Trustee Council will evaluate whether the purchase will provide ecological benefits, whether the purchase furthers the goals of the Trustee Council and whether the parcel can be maintained into the future. An important component of the decision process is whether the land offers opportunity for passive public use.

In determining whether to purchase a parcel the Trustee Council will determine the land's habitat value, its fair market value based on an appraisal and land use survey, whether contaminants are present on the site, whether further restoration is needed, who will control and maintain the land, and what happens when the Trustee Council ceases to exist. The Trustee Council is not able to own or maintain land though agencies represented on the Trustee Council may be able to. The preferred approach would be to have a land trust or similar such group purchase and maintain the land. There must be legal assurances that the land will be held in perpetuity for conservation purposes and that some legal entity is responsible for its care and upkeep.

In order to promote recreational enjoyment for the maximum number of people while preserving habitats on the property to the maximum extent possible, the Trustee Council will consider the following management framework, as appropriate, for each parcel:

- Promote public access for residents of the four affected communities with a minimum of necessary development.
- Bar the construction of buildings or other facilities that have a detrimental effect on the habitat value
- Encourage hiking trail development, but bar the development of paved parking lots or trails
- Bar motorized recreational vehicles of any sort
- Allow fishing and swimming but bar hunting
- Encourage future restoration activities, as appropriate
- Encourage use for purposes of education, outreach, and scientific research

#### **4.3.4.2.1 Eelgrass Habitat Restoration**

## **Project Description**

Proposed action: The distribution and condition of Eelgrass (*Zostera marina*), will be surveyed throughout the New Bedford Harbor Estuary. Potential eelgrass habitat will also be identified and, based on specific biological indicators, priority areas for restoration will be selected. Eelgrass will be transplanted into a subset of these priority areas in the Outer Harbor. The objective of this project is to establish a number of eelgrass beds in order to provide habitat for a variety of finfish and shellfish resources which have been injured by PCB contamination.

Location: Outer New Bedford Harbor.

Time Frame: The project is expected to begin in the Spring of 1998 and continue for three years.

Proponent: Dr. Fred Short, Jackson Estuarine Laboratory, University of New Hampshire.

Affected Resources Addressed: Eelgrass beds serve as important nursery areas for a variety of fish and shellfish species including bay scallops, mussels, lobsters, winter flounder, tautog and a variety of macroinvertebrate infaunal species. Eelgrass also provides a food supply for mummichog and other forage species. All of these resources have been affected to some degree by the PCB contamination. Eelgrass beds should also have a beneficial effect on water quality by filtering nutrients and stabilizing sediments thus reducing suspended sediments in the water column.

## **Rationale for Adoption**

Nexus to PCB Injury: PCBs discharged into the New Bedford Harbor Environment have resulted in elevated levels in a variety of fish and shellfish species including winter flounder, tautog, lobsters, and mussels. While conclusive evidence of a population-level impact on these species is not available, PCBs have been shown to cause reproductive impacts in fish and shellfish. In addition, (Bellmer, 1988, and EPA, 1996) showed lower infaunal species diversity in areas of high PCB concentration in New Bedford Harbor. While eelgrass beds are not known to have been directly affected by the PCB contamination, resources that use this habitat during their life cycle were injured and will benefit from eelgrass restoration.

Benefits to Resource: Eelgrass is an important component of the marine ecosystem. Eelgrass meadows serve several important functions including stabilizing sediment, providing nursery areas for fish and shellfish, filtering suspended particles and nutrients from the water column, and providing an important source of organic matter to the ecosystem (Thayer, *et al.*, 1984). Eelgrass meadows serve as important habitats for forage fish and numerous commercially and recreationally important marine fish and shellfish including bay scallops, quahogs, tautog, winter flounder, and sticklebacks. (Thayer *et al.*, 1984, Heck *et al.* 1989, and Peterson *et al.*, 1984). Creation of eelgrass habitat in the New Bedford Harbor Environment should enhance the local populations of these species and enhance local water quality.



**Benefits to Community:** The creation of eelgrass beds in the New Bedford Harbor Environment should enhance the production of a number of commercially and recreationally important fish and shellfish species including winter flounder and scallops. Once the eelgrass beds are firmly established, scallops could be harvested. In addition, the community will generally benefit from the other functions that eelgrass beds perform, including enhancing water quality and providing an important source of organic matter to the coastal ecosystem.

### **Technical Feasibility**

**Achievability:** Given the importance of eelgrass to commercially and recreationally important marine resources and the marine ecosystem as a whole, restoring this seagrass has been attempted in numerous locations and transplanting techniques have been fairly well developed (Fonseca *et al.*, 1982, 1994; Fonseca, 1990, 1994). The historical existence and persistence of eelgrass beds in certain areas of the New Bedford Harbor Environment (e.g. Clarks Cove) provides the strongest evidence that restoration is possible. In addition, with continued and planned improvements in sewage treatment in the area, water quality is expected to continue to improve, thus enhancing conditions for the survivability of eelgrass. However, a number of factors can prevent eelgrass from successfully taking hold including disruption by crabs and other organisms as well as poor water quality. An evaluation of water quality conditions in the New Bedford Harbor Environment, as proposed in this project, prior to transplanting should enhance the chances of success.

**Impact of Remediation:** Eelgrass transplanting locations would be selected in areas that will not be affected by the remediation activities.

**Time Frame:** The project could begin in the Spring of 1997 and would continue for three years.

**Monitoring:** The objective of monitoring efforts would be to determine the degree of success in establishing eelgrass beds and the functions and values of established beds relative to existing (reference) eelgrass beds. Specifically, monitoring to determine percent survival, areal coverage, number of shoots per planting unit, benthic colonization and fisheries use will be undertaken on a regular basis for three years.

**Cost:** The proposed budget for this project is \$400,000 for personnel, equipment, transplanting, travel, and monitoring.

**Cost Effectiveness:** Restoring eelgrass beds has been shown to be one of the better methods for reestablishing fish and shellfish habitat. Alternative methods of enhancing fishery resources, such as, augmentation of natural stocks with hatched stocks, are often more expensive, target only a single species, and do not have long-term, sustainable value. Matching funds are being sought to reduce the amount requested from the Trustee Council.

### **Impacts on the Environment**

Biological: Transplanting eelgrass should increase the number and diversity of marine organisms in the affected areas, thus enhancing the overall productivity of the New Bedford Harbor Environment. The added vegetation will increase the amount of detritus contributing to the food web (Fonseca, 1992; Kirkman, 1992 ). The eelgrass plants to be used for transplanting will be harvested in small patches from a healthy source bed in the area. It is expected that the harvested areas will be rapidly recolonized.

Endangered species: Protected species may be present in the project action area but this alternative is not likely to adversely affect any protected species. This alternative is likely to improve suitable foraging habitat for endangered and threatened sea turtles (Rosenberg, 1997).

Physical: This alternative would alter the topography of the bottom. The added vegetation will alter the flow regime and function to stabilize sediments. It will also increase the accumulation of organic and inorganic materials and will reduce erosion as a result of sediments binding with the roots (Fonseca, 1992; Kirkman, 1992). Local water quality should improve as a result of reduced suspended sediments in the water column and increase filtration of nutrients by the eelgrass plants.

Human: Transplanting eelgrass is expected to cause minimal disruption to human activities in the New Bedford Harbor Environment. Eelgrass transplanting sites would be chosen based on, in part, the degree of human activities in a given location. For example, known shellfish beds and areas of extensive recreational activity or navigational use will be avoided. Transplanting activity would occur from small boats using SCUBA equipment and small tools. The public would have the ability to participate in the transplanting or monitoring activities and would be allowed to snorkel or SCUBA dive on the sites once established.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this project and provide funding for the first year (\$120,000).

#### **4.3.4.2.2 Sconticut Neck Land Purchase**

##### **Project Description**

Proposed Action: Approximately 160 acres of land on the west shore of Sconticut Neck would be purchased at fair market value for permanent conservation. The land comprises the largest undeveloped, uncontaminated parcel of coastal property within the New Bedford Harbor Environment. Portions of the land have been designated by the Commonwealth as "Estimated Habitat for rare wetlands wildlife" and "High Priority site of rare species habitats and exemplary communities " (MNHESP, 1996). These designations under the Massachusetts Wetlands Protection Act (M.G.L. c. 131, s.40 and regulations 310 CMR 10.00) indicate that the property contains habitat where rare wetlands wildlife have occurred. Within and adjacent to the parcel of land are 3000 feet of coastline, wetlands, saltmarsh, tidal flats, salt ponds, shellfish beds, and bird habitat.

Once purchased, a trail system would be developed for passive recreational use.

Location: Western shore of Sconticut Neck, Fairhaven

Time Frame: The land purchase could begin soon after funding was received.

Proponents: Fairhaven Land Preservation Trust, a community-based volunteer organization with experience in land purchase and maintenance.

Affected Resources Addressed: Salt marsh, uplands, dunes, beach, salt pond, freshwaters wetlands and the natural resources supported by habitat types, including plants, mammals, birds, fish, and shellfish, that have been affected by the contamination of the New Bedford Harbor Environment.

### **Rationale for Adoption**

Nexus to PCB Injury: The idea seeks to acquire the equivalent of injured natural resources that were lost and degraded by the release of PCBs. Acquisition of salt marsh habitat, tidal flats, shellfish beds that are within the New Bedford Harbor Environment but unimpacted by contaminants will help support resources dependent the injured counterparts to these resources.

Benefits to Resources: If implemented, this idea would:

- 1) preserve existing, uncontaminated, productive natural resources and habitat areas;
- 2) provide a sanctuary for wildlife;
- 3) protect saltmarsh and saltpond habitats for commercial fishing species; and
- 4) protect soft-shell clam beds.

Benefits to Community: The land purchase will help maintain the aesthetic value of the Harbor and make the land available for passive recreational activities. The community at large will benefit from increased recreational opportunity as well as the continued productivity of the marsh, tidal flats, and shellfish beds; including nutrient export, nursery habitat for fish, habitat for shellfish and crustaceans, and habitat for wildlife. Further, the area is adjacent to open fishing and shellfishing grounds.

### **Technical Feasibility**

Achievability: The landowner is willing to sell the land for conservation purposes, while the Fairhaven Land Preservation Trust is willing to be designated as grantee and maintain the land. These combined actions will likely achieve the expected natural resource benefits.

Reliability of Techniques: Land purchase and development of a trail system is a simple and proven method to preserve natural resources and enhance recreational opportunities within an appropriate parcel of land. This particular parcel offers functioning habitat which will support natural resources, and in turn, provide opportunities for educational and passive recreational enjoyment.

Impact of Remediation: This site is outside of the area expected to be impacted by remediation activities.

Monitoring: Monitoring would be through periodic property walks. Usage estimates and any adverse impacts to areas surrounding trails could be determined through this method.

Cost: \$380,000 (estimated)

Cost Effectiveness: Land acquisition and maintenance through a local volunteer organization is an effective way of preserving beneficial natural resource habitat. Preserving 160 acres of area which includes State designated wetlands and rare species habitat would be highly cost effective over other similar alternatives.

## **Impacts on the Environment**

### Biological:

Impacts on injured resources. This project would take place within the New Bedford Harbor Environment and would preserve habitat for fish, shellfish, and bird species injured by the releases of contaminants. By designating this property as conservation land it preserve a source of natural resources that could expand into other areas of the New Bedford Harbor Environment when those areas are clean enough. No adverse effect on the injured resources is expected.

### Impacts on other resources/habitats.

Vegetation: The maintenance of this property as a natural environment would continue to provide benefits to the native vegetation. Minimal impacts would occur through the addition of trails to the property. Sensitive vegetation could be protected through the addition of low, unobtrusive fences and warning signage.

Wildlife: Maintaining the natural function of the property will continue to provide benefits to wildlife compared with the alternative of allowing the property to be sold for residential or other use.

Fish and shellfish: The project would preserve fish and shellfish habitat present on and adjacent to the property. No further impacts should result from this action.

Endangered species: The NHESP has determined that endangered species may be present in the project action area. The "significant habitat" designation by the Commonwealth requires additional review of proposed actions to modify the habitat should the property be sold for residential development but would not necessarily prevent the modifications. By maintaining or enhancing the land, threatened or rare wildlife species will continue to use the area. Expected human recreational use will have minimal impacts on wildlife species present. As the area is monitored, further actions can be implemented to protect species of concern.

Physical: Direct physical impacts to the property should be minimal and would result only from trail cutting and walking. No impacts on cultural resources (archeological or historical) is expected.

Human: There would be minimal or no impact to the human environment. Techniques used to cut and maintain trails would largely be non-mechanical. Beneficial impacts would result through greater access to the natural environment and Harborvistas.

Trustee Council Determination: After review and consideration of the public coment, the Trustee Council voted to accept this project.

#### **4.3.4.3 Non-preferred alternatives**

##### **4.3.4.3.1 Constructed Reefs for Lobster and Fish Habitat Enhancement**

Proposed Action:

- Identify suitable sites and materials or designs for constructed reefs
- Develop plans or specifications for one or more reefs
- Construct an initial reef
- Perform a preliminary assessment of success and costs for future applications

Location: Appropriate areas within the Outer New Bedford Harbor and Buzzards Bay would be determined as the first step of this idea.

Resource Injury: Lobster and benthic fish resources were injured as a result of the release of polychlorinated biphenyls (PCBs) in the New Bedford Harbor environment. As a result, commercial fishing for lobster has been prohibited in the Inner and Outer New Bedford Harbor resulting in lost economic benefits.

Resource Benefits:

- Habitat enhancement for fish and other marine organisms.
- Population enhancement and aggregation of fish for commercial and recreational fishermen.
- Recreational diving site development.

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects provided that the site(s) chosen and construction methods used minimize disruption to bottom dwellers.

Rationale for Non-preference: While an allowable restoration option, this idea did not score as high as others. Providing additional habitat specific for lobsters would assist the lobster resource, but Massachusetts Division of Marine Fisheries (MDMF) reports that the lobster stock size is stable in the area. Further there is fishing activity in the areas which are not closed. The siting of reefs would have to be carefully considered to prevent preemption of the bottom for other activities and to not draw resources to contaminated areas.

##### **4.3.4.3.2 Artificial Reef Creation Using Abandoned Fishing Vessels**

Proposed Action: Remove and decontaminate derelict vessels from North Terminal area, New Bedford, MA and place them as artificial reefs. Removal and decontamination could be funded as part of Superfund project; Trustee Council would provide siting funds.

Location:

- Removal: North Terminal, downtown New Bedford, approximately halfway between Route 6 and Coggeshall Street, at the location of EPA's proposed CDF D.
- Reef placement: Sites to be selected, probably in New Bedford Outer Harbor or Buzzards Bay.

Resource Injury: Injury to fish and shellfish from PCB contamination of the New Bedford Harbor Environment.

Resource Benefits:

- Habitat enhancement for fish and other marine organisms.
- Population enhancement and aggregation of fish for commercial and recreational fishermen.
- Recreational diving site development.

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects provided that the site(s) chosen and construction methods used minimize disruption to bottom dwellers.

Rationale for Non-preference: There were considerable concerns about the effectiveness of using once-contaminated vessels for a reef. More information would be needed on placement so that the reef would attract fish without posing a navigational hazard. Another possible source for may be NOAA/NMFS Fishing Capacity Reduction Initiative for which 76 vessels are being considered for a vessel buyout program. Of these, 30 come from the Fairhaven/New Bedford.

#### **4.3.4.3.3 Acushnet River Recreation/Preservation District**

Proposed Action: To acquire for preservation, through outright purchase or the purchase of conservation easements, approximately 4000 acres of undeveloped land in the Acushnet River watershed.

Location: Undeveloped upland, riparian and freshwater habitats along the Acushnet River, between the New Bedford Reservoir and the Acushnet Sawmill, Acushnet, MA.

Resource Injury: The Idea does not address a specific injury, but rather, would protect a range of natural resources and habitats in the watershed which may have been affected by PCB contamination, urban development, and/or other kinds of environmental degradation.

Resource Benefits:

- Preservation of existing living resources and habitats in the watershed.
- Provision of public access for fishing, birdwatching, hiking, etc.

Environmental Impacts: Implementation of the proposed project would be expected to cause beneficial environmental effects through the protection of natural habitat.

Rationale for Non-preference: This idea attempts to acquire resources equivalent to those that were injured by the release of PCBs. This area would provide beneficial habitat consisting primarily of freshwater and upland areas. While this idea would protect habitat and provide recreational opportunities, the preferred alternatives better respond to these priorities. A concern was raised that the cost of the land purchase (\$12 million) would be too large of a proportion of the total restoration funds available. Other concerns focused on the management and maintenance of such a large parcel. The proponents are urged to pursue the project but using alternative sources of funds.

#### **4.3.5 Living resources**

Living resources are the fish and wildlife resources that have been impacted by the PCB contamination. Sections 3.3.2 through 3.3.8 describe the living resources of the New Bedford Harbor Environment, while Section 3.5.3.1 describes the living resources that were injured.

##### **4.3.5.1 No-action Alternative: No Living Resources Restoration or Enhancement**

Under the no-action alternative, the NBHTC would not undertake specific actions to restore or enhance injured fish, shellfish, wildlife or other living resources within the New Bedford Harbor Environment. As noted above and in Chapter 3, this would result in an extended time period of natural recovery, since it is expected to be many years following the clean-up before PCB concentrations reach acceptable levels in the waters, wetlands, sediments and biota of the New Bedford Harbor Estuary. During this period the living resources of the Harbor will continue to be affected by the contamination. PCBs will continue to disperse, and in some cases bioaccumulate or biomagnify, as they migrate throughout the food web. Cumulative or intergenerational impacts may result. Moreover, the recovery of species and populations from PCBs in the Harbor may be depressed or retarded by adverse impacts indirectly related to PCBs, such as other contaminants and habitat loss, particularly in the urbanized, highly degraded Inner Harbor and Upper Estuary.

##### **4.3.5.2. Preferred Alternatives**

The living resources that use or reside in the Inner Harbor and Upper Estuary have been directly exposed to high levels of PCBs and thus are the resources most severely affected by PCB contamination in New Bedford Harbor. As discussed in Chapter 3, these species are consumed by other species--potentially including humans--within and outside the Harbor Environment. Contaminants are thereby transported throughout the ecosystem and beyond. The preferred alternative, therefore, focusses on improving the condition of the living resources that live, feed, breed in, or otherwise use the more severely affected areas of the Harbor Environment, in an effort to improve the health of these resources and thereby enhance and accelerate ecosystem recovery.

Potential approaches to living resource restoration in the New Bedford Harbor Environment include habitat restoration or enhancement; enhancement of spawning

success through direct (e.g., stocking or transplanting) or indirect (e.g., spawning habitat restoration) means; or direct augmentation or transplantation of stocks to improve populations, resource survival, or opportunities for human use.

The preferred alternative--living resource restoration in New Bedford Harbor--would provide ecological benefits throughout the Harbor Environment in the form of increased species diversity and abundance. Broad economic benefits would also result, through increased commercial and recreational harvest of fish and shellfish. Near-term actions would focus on developing sustainable populations of harvestable resources in the Outer Harbor. As clean-up of the Inner Harbor and Upper Estuary proceeds, subsequent actions could place greater emphasis on direct restoration of living resources in these areas.

#### **4.3.5.2.1 Restoration and Management of the New Bedford Area Shellfishery: Area 1,2, and 3**

##### **Project Description**

Proposed action: To restore the New Bedford area shellfishery (quahogs (*Mercenaria mercenaria*), bay scallops (*Argopecten irradians*) and soft shell clams (*Mya arenaria*)) through:

1) the purchase and planting of adult and seed quahogs; 2) relays of contaminated adult quahogs to clean areas to allow depuration to take place; and 3) the purchase and spreading of bay scallop and soft shell clam seed. This would result in the replenishment of shellfish in depleted areas allowing the shellfish stocks to move toward sustainability providing benefits to commercial and recreational harvesters.

Resource assessments and area bottom surveys would be conducted prior to, during, and after any shellfish seeding or shellfish relays (transplants) to determine suitable locations and assess results. Hand diggers, power dredge boats and underwater video will be used to conduct the work. The assessments will determine the types and quantity of shellfish in the study area. Daily monitoring and enforcement activities would be conducted to insure the success of the project. Area closures will be utilized to allow spawn to grow to maturity. Such closures required an enforcement presence to be effective. Water and shellfish meat quality will be sampled throughout the project. The project includes educational opportunities for the local community. The Committee will work with local schools, educational systems and organizations in the area to increase citizens' awareness and importance of natural resources.

Location: New Bedford Inner and Outer Harbor (6100 acres).

Time Frame: The project is expected in to begin in the Spring of 1997 and continue for ten years.

Proponents: Regional Shellfish Restoration Committee, comprised of the Towns of Acushnet, Fairhaven, and Dartmouth, and the City of New Bedford.

Affected Resources Addressed: Quahogs, bay scallops and softshell clams were all identified as species of concern for PCB contamination (ACOE, 1988b). All have



shown some level of PCB contamination though the actual amounts vary by species. Quahogs typically have had low levels which increasing in the Inner Harbor (Schwartz, 1988). Softshell clams showed levels seven times the allowable limit (Kolek and Ceurvals, 1981). Fishing for all three species has been prohibited in the Inner Harbor and some other areas because of closures for sewage and PCB contamination, resulting in a significant loss of income to the shellfish harvesters from the four communities.

### **Rationale for Adoption**

Nexus to PCB Injury: PCBs discharged into the New Bedford Harbor Environment have resulted in elevated levels of PCBs in a variety of fish and shellfish species. PCBs have been shown to cause reproductive impacts in fish and shellfish. Softshell clams show some evidence of increased disease potential in the presence of PCB contamination (NBHTC, 1993a). Fishing closures due to sewage and PCB contamination have directly impacted the shellfish harvesters of the area.

Benefits to Resource: The reintroduction of shellfish species to larger areas of the Harbor will increase the biodiversity of the Harbor. Juvenile shellfish, or spat, are released into the water column where they swim freely until setting on the bottom. The pre-set juveniles provide a food source to other species in the Harbor Environment. Increased numbers of shellfish will benefit other species in the food chain. There will be positive water quality impacts due to filter feeding by the shellfish species.

Benefits to Community: The reestablishment of a sustained shellfish fishery will allow greater commercial employment and recreational opportunities for the four communities. A sustained fishery will provide alternative employment to harvesters impacted by offshore fishing restrictions. Successful implementation will allow the continued harvest of a previously unharvestable resource.

### **Technical Feasibility**

Achievability: The shellfish restoration program will be initially implemented for a period of 2 years during which time, the attainment of stated goals can be assessed. It is expected that several more years of restoration activities will be needed to provide the variety of age classes necessary to sustain the fishery. Achievability can be affected by environmental conditions, species predation and human interference through illegal fishing. These impacts to the restoration program can be mitigated through monitoring and adjustment. Success can be measured through license sales increases, catch rate increases, a greater variety of species comprising the catch, greater recreational fishing opportunities, and avian feeding.

Reliability of Techniques: The use of relays, transplants and seeding are standard techniques used by MDMF and other towns. MDMF will be overseeing the project to insure that state procedures are adhered to.

Impact of Remediation: Remediation and navigational dredging may impacts shellfish beds within the Harbor Environment. A DMF study begun in 1996 will determine the extent of the shellfish resource within the Harbor and produce a relay plan. It is

possible that shellfish within the Inner Harbor could be moved before dredging commences. Relayed shellfish would be allowed to depurate in clean areas.

Time Frame: The project could begin in the Spring of 1997 and would continue for three years.

Monitoring: Municipal shellfish officers would monitor and enforce the shellfish restoration program, including enforcement of closed areas and water quality. The program includes surveys before, during and after relays, transplants or seeding to assess success.

Cost: \$425,000 for the first year.

Cost Effectiveness: A sustainable fishery will increase employment and recreational opportunities throughout the area. With proper management of the shellfish stocks, the initial investment will bring economic returns for years to come.

### **Impacts on the Environment**

Biological: Benefits to the biological environment will occur through increased biodiversity and an increased food supply for other fish and wildlife species. Some water quality improvements should occur through the natural filtering action of the shellfish. Care must be taken to make sure seeding or transplant locations are free of unacceptable levels of contaminants.

Endangered species: Protected species may be present in the project action area but this alternative is not likely to adversely affect any protected species.

Physical: Direct physical impacts to the environment can occur through the use of shellfish dredges and rakes or tongs for hand digging. Such impacts are expected to be minimal. The gear used is small and the bottom conditions are such that they are self-healing. If shellfish stocks within the Harbor are harvested through this project, care will be taken to identify and protect cultural resources (archeological) within the areas where such resources are known to occur.

Human: There would be minimal adverse impacts to the human environment. The operations will primarily occur offshore and will be unobtrusive.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this project and provide funding for 2 years at \$298,000/year. The Trustee Council will work in close coordination with the EPA and will consider alternative methods or areas when conducting shellfish surveys and/or transplants in areas with known levels of contamination.

#### **4.3.5.2.2 Herring Run Restoration**

##### **Project Description**

Proposed action: To restore a significant fish run for river herring (alewife and blueback herring) in the Acushnet River by repairing fish ladders at the Acushnet Sawmill, Hamlin Street Bridge, and the dam at the outlet of the Old New Bedford Reservoir, and transplant river herring into the mid-water pond north of Hamlin Street. The action would create over two hundred acres of new, uncontaminated spawning area which could support a run of 100,000 to 200,000 adult river herring.

Existing dams form impediments to anadromous fish. Combined with declines in water quality, loss of spawning habitat, and overfishing, this has caused declines in river herring and other anadromous fish. Herring are not only important for human use, but are an important food fish for marine and avian species.

Location: Acushnet Saw Mill, Hamlin Street Crossing, and New Bedford Reservoir, Acushnet River, New Bedford and Acushnet

Time Frame: 6 months. Design work can begin upon funding award. Construction can begin after the design phase. MDMF will have to coordinate fish passage work with bridge work at Hamlin Street.

Proponents: MDMF and the Town of Acushnet.

Affected Resources Addressed: River herring (alewives (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*)).

### **Rationale for Adoption**

Nexus to PCB Injury: MDMF sampling of river herring in 1993 and 1995 showed the following test results (**Table 4.2**):

Table 4.2 Concentration (ppm wet weight)

	Mean	Standard Deviation	Sample Size	Median	Minimum	Maximum
'93						
Male fillets	1.010	0.628	5	0.830	0.550	2.100
Female fillets	2.876	4.014	5	1.100	0.550	10.00
Roe	4.108	5.063	5	2.400	0.840	13.00
'95						
Male whole	2.057	1.679	4	1.450	0.830	4.500
Female whole	1.677	1.195	6	1.450	0.660	4.000
Roe	2.820	1.906	5	2.000	1.200	6.000
All fillets	1.944	2.882	10	0.885	0.550	10.00
All roe	3.464	3.670	10	2.200	0.840	13.00
All whole	1.829	1.331	10	1.450	0.660	4.500

(Source: Massachusetts Division of Marine Fisheries, Cat Cove Marine Laboratory, 1996)

These results indicate that river herring are accumulating PCBs in their tissues. Their diet consists primarily of microcrustaceans (copepods) fish larvae, fish eggs, insects, insect eggs and crustacean eggs. (Ross and Biaggi, undated) They are prey to schooling species such as bluefish, weakfish, and striped bass, as well as birds such as gulls and terns. (Ross and Biaggi, undated) The species upon which river herring prey will be exposed to and accumulate PCBs through the water column. River herring in turn will concentrate and pass the PCBs on to species which feed on them thus providing a pathway to birds.

While the PCB concentrations are relatively low, they still exceed the FDA criteria of 2 ppm for edible flesh. While river herring are not as popular a food fish as they were historically, they can be eaten. Their primary importance to humans is as bait.

Benefits to Resource: The proposed action would benefit river herring by increasing herring habitat by 200 acres. This in turn would increase herring abundance leading to an ecosystem-wide enhancement of fish and bird populations.

Benefits to Community: Increased opportunities for recreational or bait fishing for area residents.

### **Technical Feasibility**

Achievability: Once a clear path to the historic spawning grounds is re-established, the Acushnet River river herring population should rebound. Most fish return to spawn in the same watershed from which they hatched (Ross and Biaggi, undated).

Reliability of Techniques: The fish passages to be used are standard for the type and size of the dams to be encountered.

Impact of Remediation: There should be minimal or no impact from the actual cleanup activities which would occur downriver from where this work would occur. Once the dam restoration is completed though, river herring passing through the Harbor upriver will be exposed to PCBs and might accumulate the contaminants. Institutional controls might have to be considered until PCB levels subside.

Monitoring: Monitoring will be conducted by the MDMF. Electronic fish counters can be utilized to monitor success.

Cost: Estimated cost is \$600,000.

Cost Effectiveness: Greater spawning areas may result in an increased river herring population providing benefits from harvest and forage by other species.

### **Impacts on the Environment**

Biological: The biological environment would be enhanced by this action. The addition of functional fish ladders would allow anadromous species to once again occupy historical spawning areas. The ladders might allow other anadromous species such as shad (*Alosa sapidissima*) to travel upriver.

Endangered species: The area contains a species of Special Concern under the Massachusetts Endangered Species Act (MGL 131A). The Eastern Pondmussel (*Ligumia nasuta*) inhabits parts of the upper Acushnet River, occurring in protected areas of lakes, slackwater areas of rivers, and in canals. It favors sand, silty-sand, and to a lesser extent gravelly substrates in slow-moving or still water. The stability of the substrate is important. (MNHESP, 1996b).

While there may be some increase in water flow, sufficient slackwater and sheltered areas should continue to remain and any impacts should be minimal.

Physical: Minimal impacts should result. The introduction of more efficient fish ladders may increase water flow but would also have the effect of moderating that flow throughout the course of the year. If increased flow results, it could transport more silt downstream. The fish ladders would be placed adjacent to the dams, either where existing ladders are present or in more appropriate locations. Short-term impacts to the land may occur during the construction phase by the passage of construction vehicles. Some silting may occur in the water through the construction phase.

Human: Some short-term impacts including noise, dust and traffic interruptions might result during construction. Efforts will be made to minimize these disruptions.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this project. The Trustee Council will consult with the EPA to determine when it will be appropriate to allow fish passage to occur. Stocking and construction activities may be timed to minimize potential uptake from river herring passing through contaminated areas heading upriver.

#### **4.3.5.3 Non-preferred Alternatives**

##### **4.3.5.3.1 Massive Seeding of Large Bay Scallops in New Bedford Harbor Area.**

Proposed Action: The objective would be to develop a “put and take” bay scallop fishery by seeding yearly. Bay scallop larvae would be cultured at a hatchery. After the larvae set, juveniles would be grown to an appropriate size. They would then be transported to grow-out areas in New Bedford Harbor. At best, a sustainable fishery would be created, in which seeded scallops would spawn as adults and maintain a population of bay scallops and a related fishery. Yearly seeding would be done to ensure the presence of mature adults for succeeding generations.

Location: Proposed hatchery to be built in Fairhaven, MA; with shellfish to be transplanted throughout the New Bedford Harbor Environment.

Resource Injury: Shellfish within the New Bedford Harbor Environment have been affected by the release of polychlorinated biphenyls and other contaminants. This has resulted in fishing closures within several areas of the Harbor Environment.

Resource Benefits:

- A sustainable bay scallop fishery.
- Provide economic benefits through direct-indirect employment of people

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects through the introduction of shellfish to the environment.

Rationale for Non-preference: The idea to seed juvenile bay scallops has been incorporated into the preferred alternative, the comprehensive shellfish restoration and management program. Its inclusion as a component of a long-term program has more far reaching benefits and a higher likelihood of success.

##### **4.3.5.3.2 Hatchery Start-up Assistance**

Location: Proposed hatchery to be built in Fairhaven, MA; shellfish to be introduced throughout the New Bedford Harbor Environment.

Resource Injury: Shellfish within the New Bedford Harbor Environment have been affected by the release of polychlorinated biphenyls and other contaminants. This has resulted in the closures to fishing of several areas within the Harbor Environment.

Proposed Action: Construction of a shellfish hatchery in an existing building in Fairhaven. Includes installing water and waste lines, a tight tank for waste water and

associated bathrooms, a new roof installed to accommodate 12' high larval tanks, as well as plumbing, electric, and inside structure and equipment. Following hatchery building completion, culture work would commence, growing shellfish species (bay scallops, oysters, clams and possibly lobsters) for introduction into the New Bedford Harbor Environment.

Resource Benefits:

- Help build sustainable populations of several species of shellfish
- Provide economic benefits through direct and indirect employment of people
- Improve the water column through the introduction of filter feeders

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects through the introduction of shellfish to the environment.

Rationale for Non-preference: The New Bedford Harbor Trustee Council did not think it appropriate that natural resource damage funds be used for a private aquaculture venture. As with any commercial operations of this type, success would depend on the experience and knowledge of the individuals running the operation.

#### **4.3.5.3.3 Acushnet Aquafarm Development**

Proposed Action: To acquire the equivalent of shellfish or fin-fish resources that have been lost through development of aquafarm or fish farm projects.

Location: The aquafarm would be located in the Acushnet River upstream of the contaminated areas in Acushnet, MA.

Resource Injury: Shellfish resources and the water column have been affected by polychlorinated biphenyl (PCB) contamination. The proposed aquafarm would recoup the commercial and recreational losses to the shellfish beds of the Town of Acushnet.

Resource Benefits:

- Provide direct employment opportunities and development of cottage industries, green industries, and export opportunities.
- Increase stocks of shellfish/finfish.

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects through the introduction of shellfish to the environment.

Rationale for Non-preference: The New Bedford Harbor Trustee Council did not think it appropriate that natural resource damage funds be used for a private aquaculture venture. As with any commercial operations of this type, success would depend on the experience and knowledge of the individuals running the operation.

#### **4.3.5.3.4 Anadromous Fish Restoration on the Weweantic River**

Proposed Action: To restore runs of river herring on the Weweantic River by improving an existing bypass at Horseshoe Pond Dam in Wareham.

Location: Weweantic River, Wareham, MA. Approximately 10-20 miles northeast of New Bedford Harbor on Buzzards Bay.

Resource Injury: PCB contamination of sediments and waters of New Bedford Harbor resulted in injury to anadromous fish in Buzzards Bay.

Resource Benefits:

- Increase populations of herring and alewives in Buzzards Bay.
- Enhancement of a fishery usable for bait or for human consumption on the Weweantic River.
- Potential enhancement of species that prey on herring, such as striped bass, bluefish, weakfish and terns.

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects through the reintroduction of forage species to the environment.

Rationale for Non-preference: While the idea would provide restoration to degraded Buzzards Bay river herring stocks, this idea did not rank high because it was remote from the site. It is not known if the returning Weweantic river herring are feeding in the Harbor Environment and being impacted by PCBs. Because of the lack of a direct link to the contamination of New Bedford Harbor, this idea was not judged as a preferred restoration alternative.

#### **4.3.6 Endangered Species**

Endangered species are those recognized as requiring special attention because of their rarity. In the broadest sense, and as used in this RP/EIS, endangered species (also known "listed species") include those designated as "endangered" by the federal government or the Commonwealth, as well as species that are recognized as rare or vulnerable but not in as imminent danger of extinction. These lesser designations include "threatened" status at the federal and Commonwealth level and "of special concern" at the Commonwealth level only. This RP/EIS gives special consideration to listed species in order to avoid adverse impacts on them and, equally important, to increase the survival and success of listed species in the New Bedford Harbor Environment.

In the New Bedford Harbor Environment, the listed species most affected by PCB contamination are common and roseate terns, which reside in Buzzards Bay from May through September, nesting on the islands. Common terns are listed by the Commonwealth as "species of special concern" while roseates are listed by both the Commonwealth and the federal government as "endangered." Terns feed in the Harbor Estuary and, as described in Chapter 3, ingested PCBs there, with documented lethal and reproductive effects. Section 3.3.8 describes other listed species known to



inhabit the Harbor Environment, but since PCB impacts have not been documented for any of these, the preferred alternative for near-term endangered species restoration in New Bedford Harbor pertains to common and roseate terns.

#### **4.3.6.1: No-action Alternative: No Endangered Species Restoration**

The no-action alternative would be not to restore endangered species in the New Bedford Harbor Environment. This approach would rely on environmental improvements resulting from remediation efforts to reduce the threat to common and roseate terns posed by the contamination. As PCB levels decline in the Harbor, so should impacts on the terns that feed there.

At best, this scenario could lead to some recovery of tern populations in Buzzards Bay. However, since the reduced tern populations are stressed by habitat loss and degradation, such recovery would take many years. Moreover, in the context of continuing loss of quality nesting habitat, it is possible that tern populations in Buzzards Bay would never recover from the effects of PCB contamination in New Bedford Harbor, but that roseate terns, in particular, would continue to decline.

#### **4.3.6.2 Preferred Alternative**

The preferred alternative is to begin to restore and enhance nesting habitat for the endangered species most severely affected by PCB contamination in New Bedford Harbor--common and roseate terns. To insure success, the process would begin in the near term, before tern populations decline further, and continue for a number of years, as the Harbor is cleaned up and an uncontaminated food supply once again becomes available. Monitoring would be undertaken to measure the success of the restoration and to ensure that PCBs remaining in the Harbor Environment do not undermine the effectiveness of the proposed action.

The preferred alternative is expected to substantially enhance the ability of tern populations to recover from the effects of PCB contamination in New Bedford Harbor. In addition to this ecological benefit, recovery of tern populations holds the potential for economic and aesthetic benefits, as well, through bird watching and other passive uses of the Harbor Environment.

Of near-term restoration options identified as preferred alternatives by the NBHTC, this is the only one that would require significant action outside of the designated boundaries of the Harbor Environment. This is because terns are a mobile resource; they are clearly a resource of the Harbor, injured by PCBs in the Harbor Environment; but they are threatened by habitat loss as well. The Council has determined that the most effective way to restore this injured Harbor resource is through restoration of nesting habitat which, of necessity, would take place outside of the designated Harbor Environment, on the islands of Buzzards Bay.

##### **4.3.6.2.1 Buzzards Bay Tern Restoration and Stabilization Project**

#### **Project Description**

Proposed Action: (1) Implement biological management and monitoring of tern colonies at Bird Island, Marion, MA and at Ram Island, Mattapoisett, MA to restore populations of common terns (*Sterna hirundo*) and roseate terns (*Sterna dougallii*); (2) reclaim a third tern nesting site at Penikese Island, Gosnold, MA by managing gulls; and (3) rebuild and physically stabilize eroded tern nesting habitats at Bird (and possibly Ram) Islands using available clean disposed dredge material. In addition, a fourth component of this proposal would provide toxicological analyses of tern eggs to monitor PCB levels. Tern populations were once an important part of the wildlife resources of NBH, as well as other parts of Buzzards Bay.

Location: Bird Island, Marion, MA; Ram Island, Mattapoisett, MA; and Penikese Island, Gosnold, MA. All three sites are in Buzzards Bay. Bird Island is owned by the Town of Marion; the latter two sites are owned by the Massachusetts Division of Fisheries & Wildlife (MDFW).

Timeframe: 6 years; 1997-2002; field seasons mainly April through August of each year, except for habitat restoration work, which would be accomplished outside this window. If approved, the Trustee Council has indicated its desire to fund only the first two years and then evaluate.

Proponents: The MDFW, the U. S. Fish & Wildlife Service (USFWS) and I.C.T. Nisbet & Co., Inc. (ICTNC)

Affected Resources Addressed: Common and roseate terns.

### **Rationale for Adoption**

Nexus to PCB Injury: Scientific evidence developed for the trial indicated that terns were poisoned by PCB's as a result of feeding on fish within the New Bedford Harbor Environment. The Trustees argued in 1991 that terns were natural resources of New Bedford Harbor Environment and had been damaged by PCB's from New Bedford Harbor. Settlement of the litigation and funding for restoration was based in part on this evidence.

Benefits to Resource: Populations of both common and roseate terns would be restored, increased and stabilized.

Benefits to Community: The community at large would benefit by tern restoration both aesthetically and economically. Restoration of terns as a functional part of the New Bedford Harbor Environment will contribute to the public's enjoyment of the New Bedford Harbor Environment by increasing species richness and abundance. Recreational and commercial fishermen would benefit directly since terns are an important aid in locating schools of fish. Increasingly, "birds mean business". In 1991, combined retail sales related to hunting and non-consumptive bird use in Massachusetts alone were estimated at \$129.8 million. Emerging businesses such as "ecotourism" would benefit directly.

### **Technical Feasibility**

Achievability: The overall goal of this project is attainable. Portions of this project have been underway since 1990. Partial success has already been achieved, viz. successful partial restoration of the Ram Island colony and successful nesting of terns at both Bird and Ram Islands. This proposal is for the continuation and extension of an already successful technique.

The speed with which the goal is ultimately achieved is likely to be dependent on the extent to which the underlying objectives are met and future actions completed. This will entail continued monitoring and management of sites already restored, restoration of a third colony site at Penikese Island and the restoration of badly eroded habitat using dredged spoil at both Bird and Ram Islands.

Reliability of Techniques: This project would employ proven techniques, with which the managing agencies have had experience, and does not encompass untried or speculative ideas. Management programs to protect terneries and to enhance tern productivity have been in place in Massachusetts at different sites since the 1920's. Restoration of former terneries using proven gull control methodologies has been accomplished successfully at several sites in New England, including Ram Island, Mattapoisett. Toxicological testing of tern eggs and young to monitor post-remediation background levels of PCB's in the tern population would employ standard chemical testing methodologies. Dredging and deposition of spoil to rebuild eroded habitat would use well-known methods long employed in maintenance of navigational channels.

Impact of Remediation: Some of the most serious adverse effects on terns have likely begun to be mitigated with the cleanup of the Hot Spot. Some lower-level adverse effects on terns may likely continue until remediation is completed. However, remediation activities themselves would not be expected to have any material adverse effect on the activities envisioned in this project.

Monitoring: Monitoring of overall project progress would be accomplished by continuous oversight provided by the MDFW and the USFWS. Ultimate success in restoration of terns in the Buzzards Bay area and in the New Bedford Harbor Environment proper would be measured by biological monitoring systems, some of which are already in place, to track tern abundance, distribution and productivity in the entire area.

This project could also be expected to benefit from technical assistance provided by the Roseate Tern (Northeastern Population) Recovery Team.

Cost: First two years - \$124,000 (matching -\$158,000). Remaining four years - \$762,000 (matching -\$416,000)

Cost Effectiveness: This project, as proposed, represents the minimum effort necessary to accomplish the goal of restoring and stabilizing terns in the NBH environment and the greater Buzzards Bay area within a reasonable time frame.

## **Impacts on the Environment**

Biological:

Impacts on injured resources: No effect on the injured resources would be anticipated except for terns, which should be beneficially affected.

Impacts on other resources/habitats:

This activity will require a "Section 404 permit" under the Clean Water Act. Applications for these permits require extensive documentation on the impacts of the action.

Vegetation: The physical rebuilding and stabilization of tern nesting areas at Bird and Ram Islands would involve the deposition and stabilization of clean dredge material and would be likely to have an impact on vegetation at these two sites. The exact extent of this impact cannot be determined at this time, as the project has not been designed.

Wildlife: Active management and monitoring of existing terneries may involve the occasional taking of predators. The initial restoration of the ternery on the "Tubbs Island" portion of Penikese Island will involve discouraging gull nesting on Tubbs Island. Techniques considered for use in discouraging gull use could include auditory and visual harassment, destruction of gull nests, trapping, chemical control, and shooting. Following initial ternery restoration, predator control on Penikese Island would be on an occasional basis.

All of the above project activities are also likely to have positive effects on many wildlife species associated with the tern colonies, including willets, American oystercatchers, spotted sandpipers, killdeer, common eider and other bird species.

Fish & shellfish: No adverse impacts on fish would be expected to result from this project. The physical rebuilding and stabilization of Ram and Bird Islands involving dredging, deposition and stabilization of spoil could potentially have some impact on shellfish beds but would likely be small in area and would be offset by a very large biological benefit to tern populations.

Physical: Physical impacts surrounding the dredging and placement of spoil can be expected. These impacts cannot be evaluated at this time since the project has not been designed and details are unavailable.

No impacts on cultural resources (archaeological or historical) or on land use patterns at the three ternery sites are foreseen. Bird Island Light, no longer in service, is an historical resource of interest, but would not be effected by the project activities. Penikese Island contains assets of considerable interest which would not be affected.

Human: No effects are expected.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this project with the following conditions: 1) no lethal control of predators; and 2) the use of toxicants is prohibited. If non-lethal measures are unsuccessful, the Massachusetts Division Fisheries and Wildlife is to request permission from the Trustee Council before attempting lethal actions.

#### **4.3.7 Studies, Plans or Educational Activities**

In response to the RFI, The Trustee Council received several ideas to conduct studies, plans or educational activities (studies). In addition, the Trustee Council has previously commissioned other studies. Studies may be undertaken by the Trustee Council to further advance the restoration planning process. Studies do not correct a specific natural resource injury and cannot be considered to be restoration per se. Rather, these studies can provide information to assist the Trustee Council in further identifying restoration opportunities, allowing for future planning. The Trustee Council may select from the studies received, or identify others, and implement those that they believe will most assist their efforts. These studies will be implemented at appropriate times throughout the restoration process.

In some cases the information from these studies can be included in the RP/EIS. In other cases, sufficient information is available to implement a variety of preferred restoration projects. As more information from studies becomes available, the Trustee Council will assess the information and priorities.

#### **4.3.7.1 Preferred Studies, Plans or Educational Activities**

##### **4.3.7.1.1 Historic Overview and Natural Resources Status Report - Completed**

The Trustee Council issued a request for proposals in 1995 for a description of the historical use of the New Bedford Harbor environment prior to and through the period when PCBs were introduced to the Harbor and to describe the existing natural resources present throughout the period of interest. The information provided was used in preparation of the RP/EIS and can be found throughout Chapter 3. Final products included a report which describes: (1) the historical uses of the New Bedford Harbor environment; and (2) the status of existing natural resources including data on the location, type and abundance of those resources.

Conducted by: Vanasse Hangen Brustlin Inc., Watertown, MA and Providence, RI  
Status: Completed 9/96

Products: 1) *New Bedford Harbor: Historic overview and natural resources and uses status report.*

2) GIS coverages for the Harbor Environment.

Cost: \$49,208

##### **4.3.7.1.2 New Bedford Harbor Contaminated Shellfish Relay Proposal and Shellfish Survey - Ongoing**

On behalf of the Trustee Council, MDMF is conducting a sanitary and stock assessment survey to determine the feasibility of shellfish (quahog) relays. Before relay or harvest can occur, the sanitary quality of the shellfish, and their abundance must be determined. The sanitary survey is "an evaluation of all actual and potential pollution sources and environmental factors having a bearing on shellfish growing area water quality." (NSSP, 1992) A sanitary survey of the Outer harbor (Area II) was initiated in 1994 resulting in areas being reopened for harvest. Work for the Trustee

Council will focus on the Inner Harbor (Area I) and the Trustee Council will consult with, and work in close coordination with the EPA when sampling in these areas.

Conducted by: Massachusetts Division of Marine Fisheries

Status: Started in 1996, work is ongoing

Products:     1) Sanitary survey of Area I  
                  2) Standing crop assessment of quahogs in Areas I and II  
                  3) Metal and PCB analysis on quahog samples  
                  4) Contaminated relay management plan

Cost:           \$95,974.02

#### **4.3.7.1.3       Alewife PCB Tissue Analysis - Completed**

MDMF collected and analyzed 15 alewife samples taken from the Acushnet River in 1993 and 1995. The purpose of the sampling was to determine whether alewives have PCB uptake during the time they are resident in New Bedford Harbor. Results are provided in Section 4.3.5.2.2.

Conducted by: Massachusetts Division of Marine Fisheries

Status: Completed

Products:     *PCB Tissue Analysis Data Summary Acushnet River*

Cost:           \$3,000

#### **4.3.7.1.4 Wetlands Restoration Planning and Implementation: New Bedford Harbor Environment - Proposed**

Proposed Action:   A study of the wetlands within the New Bedford Harbor Environment. Work to be performed includes:

- estimate historical wetland losses
- identify current wetlands
- identify sources of pollutant discharge and other activities impacting existing wetlands
- identify critical regional wetland resource functions that are of high ecological and societal value
- identify “functional deficits” of estuarine and aquatic ecosystems in the area
- field check potentially impacted wetlands, describe their condition, and prioritize significantly degraded wetlands for restoration
- perform a functional assessment of several wetlands that typify basin wetlands types for evaluating the success of future wetland restoration projects.
- hold public meetings to present results of the study and engage the public in developing wetland restoration goals related to water quality, flood storage, and wildlife habitat.
- draft a wetlands restoration plan that evaluates potential restoration sites based on the restoration goals.
- finalize the wetlands restoration plan

To Be Conducted by: Massachusetts Wetlands Restoration and Banking Program

Status: Concept approved by the Trustee Council. Specific proposal is under development.

Products: See description above.  
Cost: \$35,000 (estimated)

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this study at a funding level of \$35,000. If the cost of the study exceeds this amount, the principal investigator is to provide justification to the Trustee Council for their approval.

#### **4.3.7.1.5 Salt Marsh Restoration -- Inventory and Assessment**

Proposed Action: To identify areas of the Acushnet River and New Bedford Inner Harbor where salt marsh presently exists, once existed, or could exist; and to analyze functional and cost projections to recommend areas for marsh restoration or creation. Similar to proposed study under Section 4.3.7.1.5.

#### **4.3.7.16 New Bedford/Fairhaven Harbor Master Plan - Proposed**

Proposed Action: Develop a comprehensive New Bedford/Fairhaven Harbor Master Plan for economic development and environmental protection of the New Bedford Inner Harbor. The Plan would inventory ecological, industrial, commercial, and recreational resources of the Harbor, then develop goals, objectives and policies to balance preservation of natural resources with water-related economic development activities of all sorts. Community, business, and governmental involvement will be solicited; computer modeling and geographic information system (GIS) would be used. Currently, a committee of City and Town officials is meeting on this topic.

This study would assist the Trustee Council in determining future harbor uses and potential impacts to future restoration actions.

Conducted by: Contract to be issued by Massachusetts Coastal Zone Management.  
Status: Awaiting funding.

Products: Harbor Master Plan  
Cost: Trustee Council has indicated it would fund up to \$50,000 for natural resource components of plan.

Trustee Council Determination: After review and consideration of the public comment, the Trustee Council voted to accept this study at a funding level of up to \$50,000 for natural resource and geographical mapping components of the plan.

#### **4.3.7.2 Non-preferred Studies, Plans or Educational Activities**

The Trustee Council determined that the following studies would not provide information needed by the Trustee Council to assist restoration planning at this time.

##### **4.3.7.2.1 Long-term Monitoring of Shellfish Habitats in New Bedford Harbor**

Proposed Action: The proposed project would be the long term (10 year) monitoring of bioaccumulation and biological effects of PCBs and other organic contaminants in three shellfish species: 1) soft shell clam; 2) hard clam (quahog); and 3) blue mussel.

These species would be used as indicators of the fate and effects of contaminants. The study would monitor the changes in contaminant profiles and associated biological effects through quarterly sampling. This would involve contaminant analysis and determination of reproductive potential and population response.

#### **4.3.7.2.2 Terrestrial Ecological Restoration Habitat Inventory, Categorization and Mapping Project**

Proposed Action: Development of a GIS-based inventory of terrestrial ecological habitats, to inform the restoration process and to aid in planning of future restoration projects.

#### **4.3.7.2.3 Planning for Nitrogen Removal from the Fairhaven Wastewater Treatment Plant**

Proposed Action: Conduct a facilities improvement study to explore options for removing nitrogen from wastewater effluent at the Fairhaven Municipal Wastewater Treatment Plant.

#### **4.3.7.2.4 New Bedford Harbor Avian Monitoring and Restoration Project**

Proposed Action: To monitor bird populations in the New Bedford Harbor Environment, using the less-polluted Westport River estuary as a control environment.

#### **4.3.7.2.5 Restoration Management/Visualization Model of New Bedford Harbor Ecosystem**

Proposed Action: The study would develop a computer simulation model of the dynamic physical, chemical and biological aspects of New Bedford Harbor, emphasizing natural resources identified as having restoration priority, to provide descriptive, predictive and prescriptive capabilities. The study would provide an ecosystem computer simulation model displaying spatially reference hydrographic/watershed data on the harbor for assisting management decisions addressing Harbor restoration and development, and generating community understanding and support

#### **4.3.7.2.6 Design and Development of the New Bedford Aquarium Complex**

Proposed Action: Conduct a feasibility study for the conversion of a vacant harborside facility into an aquarium/oceanarium focusing on marine resources of the Southern New England region. Planned components of the complex include a 460,000 square foot aquarium and marine science facility; an aquaculture center; a hotel/conference center; and ferry terminal.

#### **4.3.7.2.7 City of New Bedford - From Brownwaters to Green**

Proposed Action: To convene a series of scientific panels to discuss treatment and storage of contaminated sediments and associated health issues; beneficial use of CDFs; and development of environmentally sustainable industries in New Bedford.



#### **4.3.8 Proposals Falling Outside the Scope of Restoration**

Proposals in this group are insufficiently related to natural resource restoration. These proposals either failed to address a resource injury or proposed an action that is more appropriately implemented by another entity such as EPA or a state agency. Several of these ideas were related to cleanup activities and could be implemented as part of the Harbor remediation.

The Trustee Council encourages the proponents of these ideas to pursue funding through other means.

##### **4.3.8.1 Removal of Native American Artifacts**

Proposed Action: Under the direction of an archeologist, Native American artifacts would be removed, decontaminated and placed in a museum for public education and enjoyment.

Location: Tidal flats in the Acushnet River located in Acushnet and Fairhaven, MA

Resource Injury:

- Native American artifacts are threatened by remedial dredging in New Bedford Harbor

Resource Benefits: None

Environmental Impacts: The proposed project would not be expected to have a significant adverse impact to the environment provided that in removing the artifacts, minimal sediment resuspension was allowed to occur.

Rationale for Non-preference: The link to natural resource injury is doubtful. The project would protect cultural resources that could be affected by dredging activities conducted under the remediation. Injury would only occur if cleanup activities disturbed or damaged the artifacts. It would be more appropriate for this project to be implemented by the groups undertaking the cleanup activities. Removal of the artifacts would have to be done by personnel skilled in the retrieval of artifacts and also trained to work in hazardous environments.

##### **4.3.8.2 Padanaram Harbor Dredging**

Proposed Action: Dredge Padanaram Harbor north and south of the bridge

Location: Padanaram Harbor, Dartmouth, MA

Resource Injury: The release of PCBs in the New Bedford Harbor Environment has resulted in a loss of recreational opportunities. Recreational boating and inshore sport fishing fell off dramatically when fishing bans were enacted. Due to siltation and

shoaling of Padanaram Harbor, the draft of boats mooring in the Harbor and traveling from the launch area has been decreasing.

Resource Benefits:

- creation of more mooring spaces for recreational boats resulting in increased recreational use and economic returns

Environmental Impacts: The proposed action might increase adverse ecological impacts to the area if the sediments are contaminated or if increased water turbidity results.

Rationale for Non-preference: The link to the natural resource injury is not clear. Recreational boats using Padanaram Harbor are losing access because of siltation and shoaling, not PCB contamination.

#### **4.3.8.3 New Bedford Police Department Harbor Unit**

Proposed Action: Create a Harbor Unit within the New Bedford Police Department to enforce existing criminal and environmental statutes of relevance to New Bedford Harbor. Unit would consist of one sergeant, six officers, and one civilian grant coordinator.

Location: Waters and waterfront of New Bedford, MA; possible cooperation with Dartmouth and Fairhaven, MA.

Resource Injury: Pollution and illegal activity in New Bedford Harbor area.

Resource Benefits: Enforcement of existing law and pollution prevention in and around New Bedford Harbor.

Environmental Impacts: Implementation of the proposed project would be expected to cause beneficial environmental effects by providing increased protection to the environment.

Rationale for Non-preference: This type of action should be performed by the responsible local and state authorities and in some cases already is. The link to the natural resource injury is unclear. While prevention of future injury is a worthy goal, it is not restoration of an injured natural resource. A large portion of the activity would be related to policing functions rather than natural resource protection.

#### **4.3.8.4 Build Dam at I-195 Bridge with Possible Dewatering Pump**

Proposed Action: Build a dam with a fish ladder at the I-195 bridge. A tidal gate would be installed, with pump, in order to empty the river basin for environmental work.

Location: Acushnet, Fairhaven, New Bedford, MA. Area involved would be the Acushnet River, north of the I-195 bridge.

Resource Injury: The area just north of I-195 encompasses the “Hot Spot”, the location of highest levels of polychlorinated biphenyl contamination.

Resource Benefits:

- provide increased recreational use such as swimming, boating, fishing and picnic areas in man-made lake

Environmental Impacts: Significant adverse impacts would be expected to result from implementation of the proposed project for the reasons that follow.

Rationale for Non-preference: The decision to convert an estuary into a freshwater environment may actually harm the marine resources the Trustee Council is responsible for restoring. Potential impacts such as flooding might also occur through the change in hydrology. Flood control north of the dam would be a concern and pumps or a spillway would have to be constantly running and maintained to control the water level.

The Estuary is one of the most important features of the New Bedford Harbor Environment, providing a transition zone between saltwater and freshwater. It contains essential vegetation and provides feeding, spawning and growth areas for marine organisms. It should be enhanced rather than modified.

If implemented, the project would have a high implementation cost as well as a high maintenance cost.

#### **4.3.8.3.5 Amos Pratt House, 1810**

Proposed Action: Rebuild stone wall along the shoreline and backfill contaminated marsh.

Site Description: Private property on the Acushnet River, north of the Wood Street Bridge, Acushnet, MA.

Resource Injury: Proponent believes that PCBs and other contaminants killed the aquatic vegetation bordering his property, leading to destruction of an historic stone wall.

Resource Benefits:

- Aesthetic improvement

Environmental Impacts: The proposed project would not be expected to have a significant adverse impact to the environment.

Rationale for Non-preference: The basis for this idea is that PCBs caused aquatic vegetation to die, which caused the destruction of a stone wall. Further sampling is needed to determine if PCBs are present in this location. Such sampling should be conducted by EPA to determine the extent of contamination in the area. PCBs are not known to kill vegetation. Moreover, vegetation is normally destructive of stone walls.

#### **4.3.8.3.6 Wood Street - North**

Proposed Action:

- to remove PCBs, dredge the area and fill to 4 feet mean low water mark with clean gravel and sand
- build or repair stone walls for shoreline stabilization
- build a canoe and boat ramp on Acushnet conservation land
- repair tidal marsh
- clean and groom a nature trail on conservation land

Location: The area of the Acushnet River north of the Wood Street Bridge, including the river and its shoreline, Acushnet, MA.

Resource Injury: PCBs are located in the river sediment.

Resource Benefits:

- removal of PCBs
- restoration of birds, fish and wildlife
- enhancement of river use by the public
- enhancement of the aesthetics of the area

Environmental Impacts: Implementation of the proposed project would be expected to provide beneficial environmental effects through the removal of contaminants and anticipated enhancements.

Rationale for Non-preference: Parts of this idea fall under the EPA's responsibility for cleaning up the New Bedford Harbor Superfund Site. Restoration funds should not be used to remove PCBs from this area. If PCBs are found in concentrations high enough to warrant removal, and cleanup is performed, then others aspects of the proposal more related to restoration could be considered.

#### **4.3.8.3.7 Herman Melville Shipyard Cleanup**

Proposed Action: Remove the vessels located in the Herman Melville Shipyard, North Terminal, New Bedford, and debris, using a crane and barge.

Location: Commercial waterfront in downtown New Bedford, approximately halfway between Route 6 and Coggeshall Street, at the location of EPA's proposed CDF D.

Resource Injury: Abandoned vessels and other debris litter the Herman Melville Shipyard; soils there are also contaminated with PCBs.

Resource Benefit:

- aesthetic improvement of New Bedford waterfront.

Environmental Impacts: The proposed project would not be expected to have a significant adverse impact to the environment provided that vessel removal was done in such a way to minimize resuspension and spread of contaminated sediments.

Rationale for Non-preference: The link to natural resource injury is unclear. The vessels were left at the site through neglect and abandonment, not because of PCBs. PCBs did not prevent the vessels from being maintained and moved. PCBs only became a concern when the vessels fell into disrepair and sank.

If, as indicated in EPA's proposed record of decision, EPA decides to construct a containment facility at this location, then EPA would have to undertake to removal of the vessels. The owners of the vessels should be responsible for the costs of removal and disposal.

## CHAPTER 5: IMPLEMENTATION OF THE RESTORATION PLAN

### **Chapter Outline:**

	Page
5.1 Coordination of Restoration with Remediation .....	5-2
5.2 The Restoration Process .....	5-6
5.3 Timing and Milestones .....	5-9
5.4 Implementation of Restoration Actions .....	5-10
5.4.1 Plans and studies .....	5-10
5.4.1.1 Procedures .....	5-10
5.4.1.2 Timeframe .....	5-10
5.4.1.3 Budget .....	5-11
5.4.2 Near-term restoration .....	5-11
5.4.2.1 Procedures .....	5-11
5.4.2.2 Timeframe .....	5-11
5.4.2.3 Budget .....	5-12
5.4.3 Future restoration actions .....	5-12
5.4.3.1 Procedures .....	5-12
5.4.3.2 Timeframe .....	5-13
5.4.3.3 Budget .....	5-13
5.4.4 Emergency restoration .....	5-13
5.4.4.1 Procedures .....	5-14
5.4.4.2 Timeframe .....	5-14
5.4.4.3 Budget .....	5-14

## CHAPTER 5: IMPLEMENTATION OF THE RESTORATION PLAN

### 5.1 Coordination of Restoration with Remediation

In order to reverse the loss of natural resource values and uses stemming from PCB contamination of the New Bedford Harbor Environment, and to begin to compensate the public for such losses, implementation of the proposed restoration plan should begin as soon as is practicable. As discussed in Chapters 2 and 3, however, remediation is expected to be a long-term project, and certain remediation decisions may not be made for some years. Therefore, a flexible approach to restoration decisionmaking in New Bedford Harbor is necessary.

At specific sites within the Harbor Environment, particularly within the Upper Estuary and Inner Harbor, the range of restoration options available at a particular time will depend on the progress of the clean up. Current and future restoration decisionmaking in New Bedford Harbor must consider such factors as:

- time-scale and progress of remediation;
- levels of contamination remaining in the environment and natural resources;
- locations of CDFs along the Harbor shoreline.

As discussed in Chapter 2, EPA is the lead federal agency for Superfund site remediation, while the Corps is responsible for dredging and construction operations at the Site. EPA and the Corps are approaching the clean up of New Bedford Harbor in three phases.

Phase I was the clean up of the "Hot Spot" in the Upper Acushnet River Estuary--the most contaminated parts of the Superfund Site. The Hot Spot and its clean up are described more fully in Chapters 2 and 3, while **Figure 5.1** shows the areas affected by the Hot Spot clean up. Dredging for Phase I was completed in September, 1995.

Phase II will address contamination in the remainder of the Upper Estuary, Inner New Bedford Harbor, and parts of the Outer Harbor. Phase II will remediate sediments with lower levels of PCB contamination than Phase I, and it is by far the largest part of the clean up in terms of the area affected (170 acres) and volume of sediments to be removed (450,000 cubic yards). Phase II of the clean up is discussed in more detail in Chapters 2 and 3. EPA released a proposed plan for Phase II on November 6, 1996, which is expected to be finalized in mid-1997.

If all goes according to schedule, Phase II will be completed in approximately 15 years, or about 2011. Recovery of the water column to "ambient water quality criteria" (AWQC)--that is, acceptable levels of PCBs in the water column--may take even longer. EPA intends to begin clean up in the Upper Acushnet River Estuary, and proceed southward. **Figure 5.2** shows the area affected by Phase II of the clean up.

Phase III of the clean up will address additional areas in the Outer Harbor. A schedule for this phase has not yet been set, nor is a site map yet available.

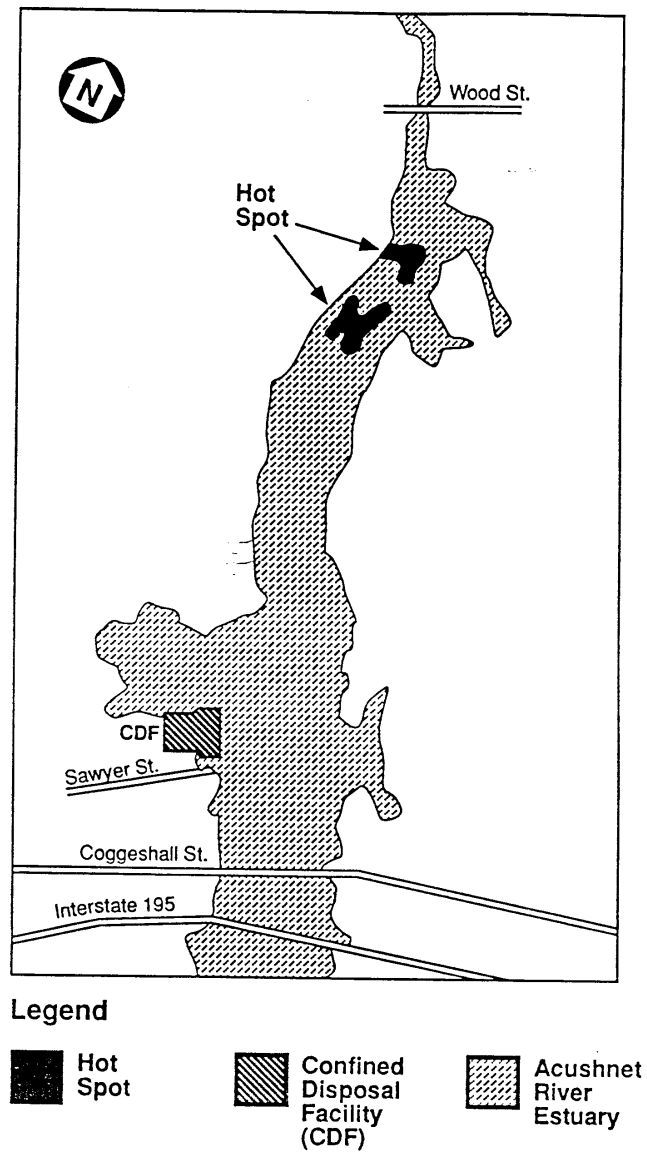
As sediments are dredged from the Harbor, they will be deposited in CDFs, along the shoreline of the Upper Acushnet River Estuary and Inner New Bedford Harbor. Sediments from navigational dredging projects may be used as CDF interim cap material. In the Inner Harbor, the CDFs themselves may be appropriate for a variety of uses including open space/parkland, bird sanctuaries, or wharves. **Figure 5.2** shows EPA's proposed locations for CDFs at the New Bedford Harbor Superfund Site, while Figures 5.3 and 5.4 show how the CDFs will be constructed.

To ensure that restoration actions are effective and are not reversed or “undone” by remediation actions, the Trustees envision a restoration process that is coordinated with the ongoing clean up work over a period of years. The Trustees would periodically select restoration actions that are practicable, effective, and appropriate in the context of the Harbor clean up. Specific milestones--decisions, events or accomplishments pertaining to the remediation and related processes--would trigger new rounds of restoration action by the Trustees.

As mentioned above, EPA has begun dredging the Upper Estuary and intends to proceed southward with the clean up. Therefore, restoration actions will probably become practicable in the Upper Estuary before clean up has been completed in the Inner Harbor. As remediation continues, more restoration options will become available. In some cases, it may be appropriate to adapt the restoration plan, or to shift restoration priorities from those initially identified in the Request for Ideas. This adaptive approach to management of the restoration process would ensure that restoration and remediation actions work together to produce maximum benefit for the Harbor Environment.

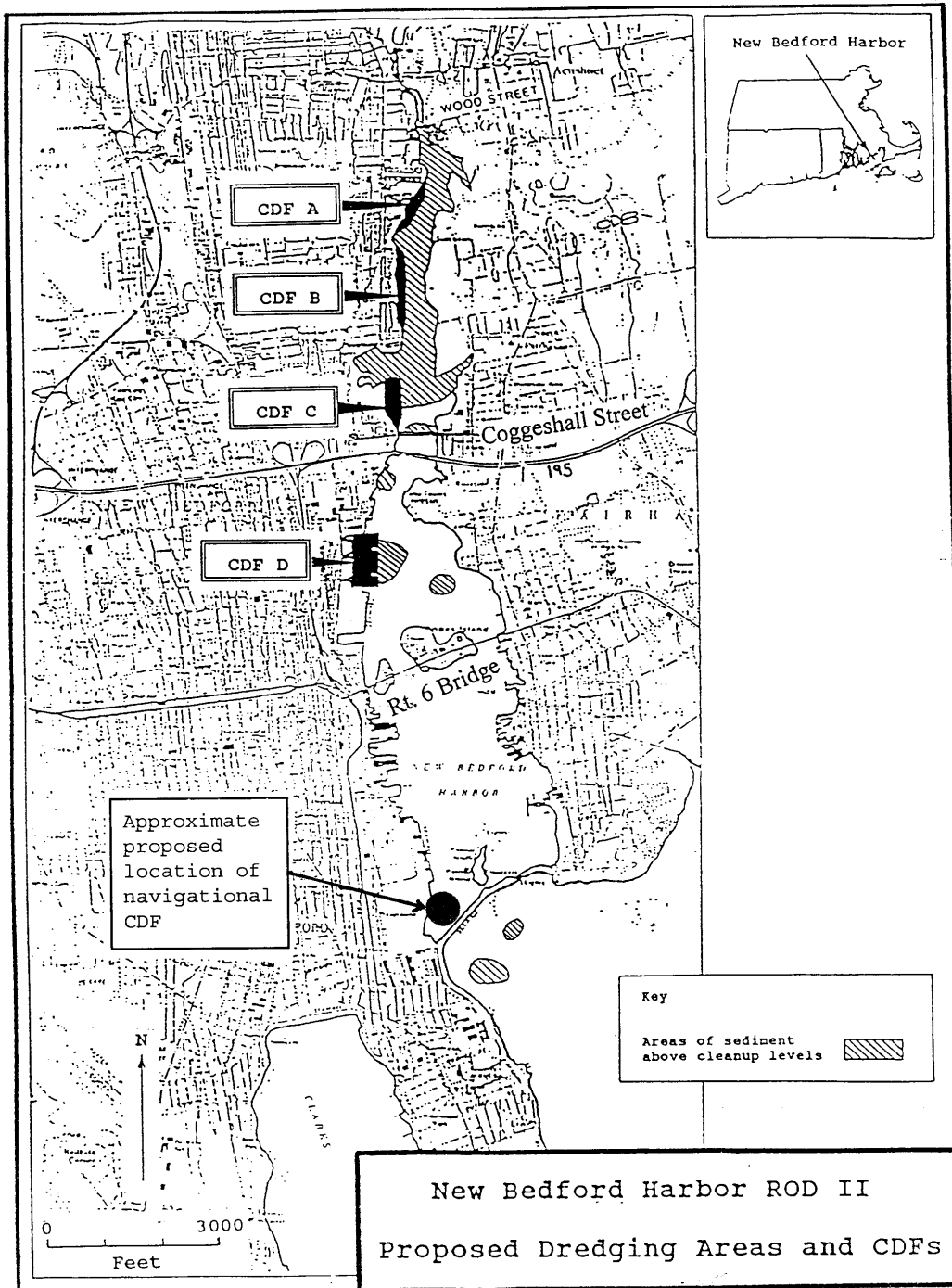


Figure 5.1  
Hot Spot Location Map



Source: EPA Proposed Cleanup Plan for the Hot Spot Area, July 1989

Figure 5.2



Source: EPA Proposed Cleanup Plan, November 1996

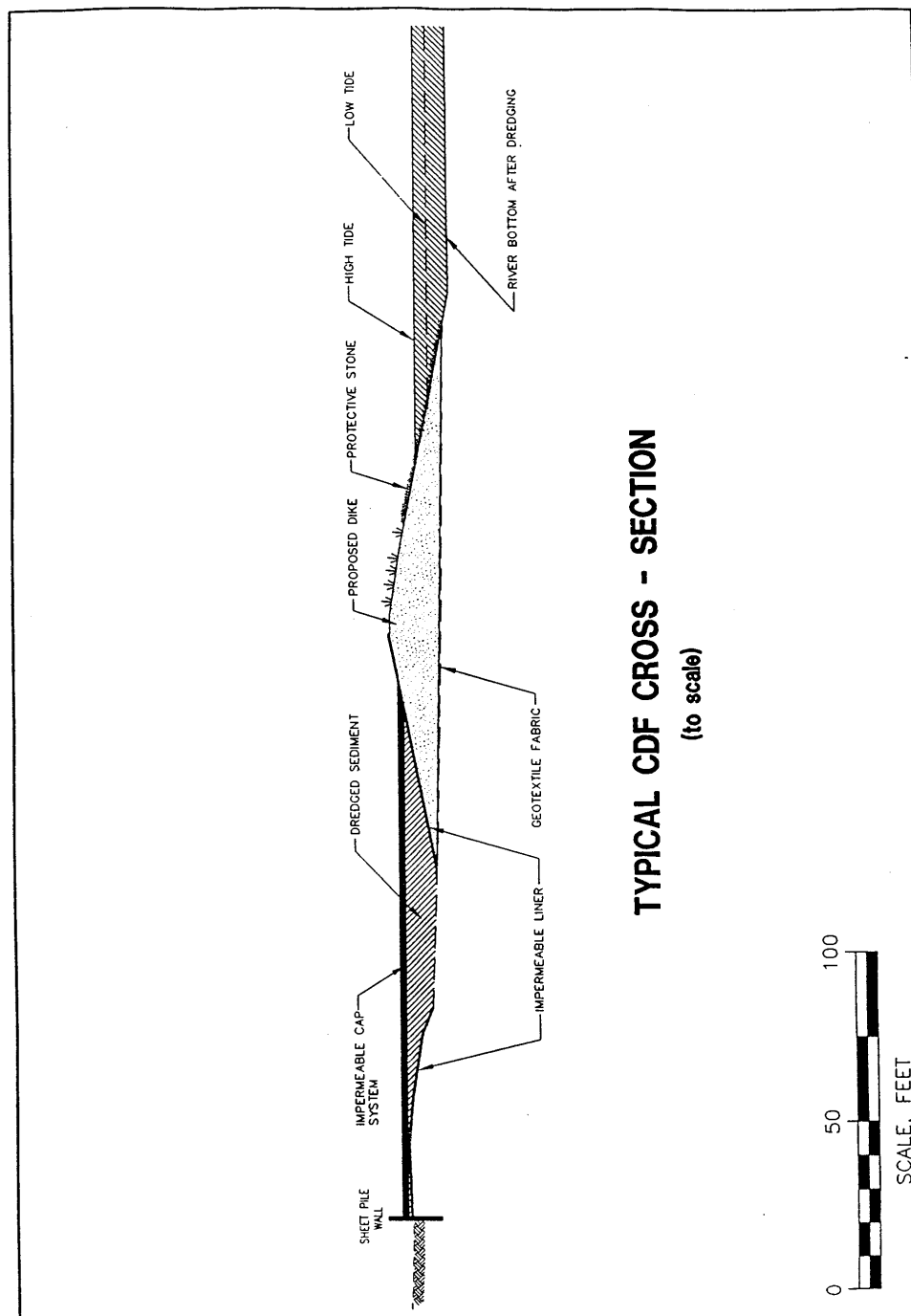
## 5.2 The Restoration Process

Initially, restoration would focus on actions that are not immediately dependent on the progress of the clean up. As described in Chapter 2, the terms of the restoration settlements allow the Trustees to commission plans, studies, reports or assessments of use to restoration planning prior to completion of the RP/EIS. Other restoration actions (with the exception of emergency restoration actions, discussed below) must wait until completion of the RP/EIS. Therefore, finalization of the RP/EIS is an important milestone in the restoration process.

As remediation, CDF construction, and ecological recovery progress, more restoration options will become available, and restoration actions in the Upper Estuary and Inner Harbor will become feasible. The passage of new remediation milestones will allow new rounds of restoration decisionmaking, and implementation, by the Trustees, until completion of the Harbor clean up--the last milestone--allows completion of the restoration. At this point, the Trustees would dedicate the remainder of the restoration trust fund to a final set of restoration actions, and, following necessary oversight or implementation of these actions, the New Bedford Harbor Trustee Council would disband.

Since the Superfund Site remediation is a long-term process, it is impossible to predict with precision the progress of the clean up, timescales of ecological recovery, and other key variables across the next decade and beyond. The Trustees propose the following restoration process and milestones, but flexibility will be necessary to adapt the process to the progress of the remediation and other variables. Particularly in the medium to long-term, the Trustees may need to adapt this schedule by adding or omitting milestones from consideration or by modifying the approach to restoration which is described by this document.

This RP/EIS is designed to accommodate the flexible planning process necessary to begin the restoration process as soon as possible, while maintaining coordination with remediation and other relevant, ongoing projects or processes. The RP/EIS evaluates specific alternatives that can be implemented in the near term, and describes options for the future in a more general way. The Trustees will initially consider proposed alternatives pertaining to a two-year period of action, while the development and selection of future restoration alternatives will be left to future rounds of decisionmaking. This step-by-step approach will allow the Trustees to incorporate the most up-to-date information into their decisionmaking and to adapt the ongoing process of restoration to the condition of the Harbor Environment as clean up and other developments proceed.



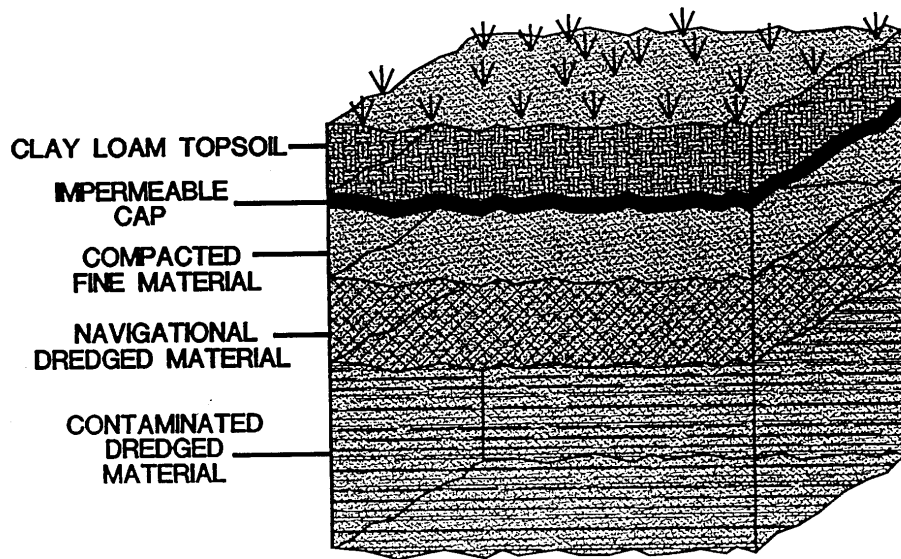
**Figure 5.3 Typical CDF Cross-section**

Source: EPA Proposed Cleanup Plan, November 1996

## BUILDING A CDF

### STEP 5 : INSTALL FINAL IMPERMEABLE CAP

- THE FINAL CAP WOULD ACT AS A PERMANENT UMBRELLA OVER THE DREDGED SEDIMENTS. THE LAYERS WITHIN THE CDF WOULD THEN BE TYPICALLY AS FOLLOWS:



### STEP 6 : IMPLEMENT FINAL LAND USE DESIGN

- ONCE THE FINAL CAP IS COMPLETED, THE CDFs COULD BE BENEFICIALLY RE-USED AS DETERMINED BY THE COMMUNITY. EXAMPLE END USES COULD BE:
  - BIRD SANCTUARIES
  - LIGHT COMMERCIAL FACILITIES
  - ATHLETIC FIELDS
  - SHORELINE PARKS
  - BIKE PATHS

Figure 5.4 Building a CDF

Source: EPA Community Forum Poster Session, November 1995

### 5.3 Timing and Milestones

Following is a general outline of past activities and the expected schedule of restoration in New Bedford Harbor, real or potential milestones, and a summary of the range of restoration actions practicable at each stage of the process.

**Milestone 1 (1991):** Formation of the New Bedford Harbor Trustee Council

**Practicable Actions:** Restoration planning; emergency restoration; commissioning and completion of plans, studies, reports or assessments of use to restoration; outreach activities.

**Milestone 2 (1995):** Completion of the Hot Spot dredging

**Milestone 3 (1998):** Completion of the RP/EIS for New Bedford Harbor

**Practicable Actions:** In addition to the actions listed above, near-term restoration actions (2-year period of funding) that are not directly dependent on the progress of the Harbor remediation or which are not in areas that will be dredged or filled by the remediation. Examples are listed under Section 5.4.2, near term restoration, below.

**Milestone 4 (est. 1998):** ROD II: Finalization of plans for Phase II of the Superfund Site remediation

**Practicable Actions:** ROD II will define EPA's plans for clean up of the Upper Estuary, Inner Harbor, and parts of the Outer Harbor and will determine the locations of most or all of the CDFs along the Harbor shoreline. Therefore, in addition to the actions listed above, ROD II will facilitate the planning and implementation of restoration actions which require knowledge of EPA's plans for the shoreline and sediments of the Upper Estuary and Inner Harbor.

#### **Probable Future Milestones:**

Foreseeable future milestones are:

- Completion of plans and studies commissioned in support of restoration decisionmaking
- Completion of CDF construction
- Completion of contaminant dredging: Upper Estuary
- Completion of contaminant dredging: Inner Harbor
- Completion of Phase II remediation actions
- Completion of contaminant dredging: Outer Harbor
- Completion of disposal site decisionmaking for navigational dredged material
- Completion of navigational dredging activities
- ROD III: Finalization of plans for Phase III of the Superfund Site remediation
- Completion of Phase III remediation actions

Because they depend upon future decisionmaking, it is impossible to predict exactly when or in what order these future milestones will occur. Some will undoubtedly prove to be of greater importance than others, while new milestones, impossible to foresee, may arise.

**Practicable Actions:**

Completion of future clean up activities and related projects in specific parts of the New Bedford Harbor Estuary will allow the implementation of restoration projects directly dependent on the progress of the Harbor remediation in that particular area.

**5.4 Implementation of Restoration Actions****5.4.1 Plans and studies**

As discussed in Chapter 2, the terms of the restoration settlements allow the Trustees to commission plans and studies in support of restoration planning prior to completion of the RP/EIS.

**5.4.1.1 Procedures**

Soon after formation of the New Bedford Harbor Trustee Council, the Trustees began awarding grants and contracts for the development of necessary plans and studies. Some of these studies were conceived by the Trustee Council and affiliated agencies, while others were suggested during the Request for Ideas process described in Chapter 2. The Trustees have used consensus decisionmaking in selecting which studies to commission in advance of the restoration plan.

**Plans and studies commissioned to date by the New Bedford Harbor Trustee Council:**

- New Bedford Harbor: Historic Overview and Natural Resources and Uses Status Report. (VHB, 1996). (\$49,208)
- New Bedford Harbor Contaminated Shellfish Relay Proposal and Shellfish Survey. Massachusetts Division of Marine Fisheries. (\$92,974)
- PCB Tissue Analysis Data Summary, Acushnet River (PCB levels in alewife). Massachusetts Division of Marine Fisheries. (\$3,000)

**Plans and studies currently under consideration:**

- New Bedford/Fairhaven Harbor Master Plan. New Bedford/Fairhaven Harbor Master Planning Committee. Funding amount to be determined, by competitive bid.
- Wetlands Restoration Planning and Implementation: New Bedford Harbor Environment. Massachusetts Office of Environmental Affairs, Wetlands Restoration and Banking Program. \$35,000 requested.

**5.4.1.2 Timeframe**

While the plans and studies commissioned to date have provided information necessary to beginning the restoration process, needs for plans and studies will continue to arise as the restoration proceeds. Plans and studies specific to particular projects, resources or geographic sub-areas of the Harbor Environment will be necessary to evaluate or to implement specific restoration proposals. In addition, some plans and studies will be required to monitor the success of individual restoration projects, and of the restoration as a whole. The Trustees intend to commission plans and studies as necessary throughout the restoration process in order to ensure the success of ongoing and completed restoration projects and to adapt the restoration process as need be to changes in the condition of the Harbor Environment.

#### **5.4.1.3 Budget**

While a budget for future plans and studies cannot be accurately set at present, the Trustees do not foresee spending more than 5% of restoration funding on plans and studies.

#### **5.4.2 Near-term restoration**

Near-term restoration actions are those which can be selected through the RP/EIS process and implemented immediately following completion of the Plan. Alternatives appropriate to near-term restoration include:

- plans and studies;
- restoration actions that are not directly dependent on the progress of the Harbor remediation;
- restoration actions that are not in areas to be dredged or filled by the remediation.

Examples of appropriate near-term restoration actions include:

- projects on the coast or waters of the Outer Harbor, Clarks Cove, Buzzards Bay, or freshwater sections of the Acushnet River;
- projects onshore or in the watershed, such as land acquisition or recreational development;
- projects that transplant or remove living resources from contaminated areas.

##### **5.4.2.1 Procedures**

Preferred alternatives for near-term restoration were identified through the process described in Chapter 2. Following the Restoration Workshop in 1993, six priority areas for restoration were established: 1) marshes or wetlands; 2) recreational areas; 3) the water column; 4) habitats; 5) living resources; and 6) endangered species. To solicit restoration ideas from all parties with an interest in the New Bedford Harbor Environment, a RFI was published in the *Federal Register*, *New Bedford Standard-Times*, and elsewhere in late 1995. As a result, 56 restoration ideas were submitted to the Trustees by citizens, businesses, non-profit groups, local governments, academic institutions, and others.

As discussed in Chapter 2, the Trustee Council's Technical Advisory Committee and Community Restoration Advisory Board reviewed the ideas and made their recommendations to the Trustees at a public meeting on April 9, 1996. The Trustees solicited further public comment in writing and at a public hearing on April 30. On May 14, 1996, the Trustees selected the set of preferred restoration alternatives described in Chapter 4.

Chapter 4 of this document evaluates the preferred alternatives to determine whether implementation of this set of alternatives is the best course of action for near-term restoration in the New Bedford Harbor Environment. Once the RP/EIS has been finalized, the restoration alternatives selected would be implemented through contracts, grants, or inter- or intra-governmental transfers of funds, as appropriate.

##### **5.4.2.2 Timeframe**



In identifying preferred alternatives for near-term restoration, the Trustees decided to limit the period of consideration for implementation and funding to two years. Following completion of the RP/EIS, implementation of near-term restoration could begin in 1998, continuing through 1999. By limiting the period of near-term restoration actions, maximum flexibility would be retained for coordinating restoration with remediation. Future rounds of restoration decisionmaking might continue near-term projects or identify new restoration alternatives to implement, as appropriate.

#### **5.4.2.3 Budget**

The Trustees chose to limit funding for near-term restoration to approximately \$5 million of the \$22 million restoration fund. In so doing, the Trustees can ensure that funding will be available for appropriate future restoration activities throughout the remediation process and on completion of the clean up.

#### **5.4.3 Future Restoration Actions**

Future restoration actions are those that the Trustees would undertake following near-term restoration. These actions would be administered through future rounds of restoration idea consideration and implemented at appropriate intervals throughout the remediation process and on completion of the clean up. Future restoration actions are beyond the specific alternatives analysis of this document but are considered in a more general way in Chapter 4. The same general priority areas applied to near-term restoration would apply to future restoration actions. However, as restoration and remediation proceed it may be appropriate or necessary to shift or modify these restoration priorities to adapt the restoration process to changing circumstances or newly apparent needs.

##### **5.4.3.1 Procedures**

In order to develop future restoration alternatives, the Trustees envision a series of processes similar to the first round of restoration idea solicitation and selection. At appropriate intervals, and taking into consideration the remediation milestones noted above, the Trustees would initiate new solicitations, selecting ideas based on a combination of technical and public advice as was done in 1996.

The major difference is that, since the RP/EIS process will have been completed and alternatives evaluated in a general way, the NEPA process will have been satisfied in advance. Selection and implementation of future restoration ideas would not require the preparation of an overall NEPA document, as was the case for the 1996 round of near-term restoration ideas.

In some cases, however--for example, unusually large or complex restoration projects, or those that require separate federal permits--implementation of a specific restoration action (or set of restoration actions) may require the preparation of an Environmental Assessment (EA). The EA satisfies NEPA's requirement for environmental and public review, but is quicker and less burdensome to produce than an EIS. The use of this procedural framework classifies this RP/EIS as a "programmatic EIS"--an EIS that undertakes general analysis for an entire program, but is linked to project-specific EAs as necessary.

As noted above, the Trustees see this RP/EIS as a flexible management plan which should serve the needs of restoration planning and NEPA compliance throughout the restoration of the New Bedford Harbor Environment. However, should environmental conditions change substantially in unforeseen ways over the course of the restoration, or should the restoration plan require major modification, the preparation of a "Supplemental Environmental Impact Statement" to evaluate the new situation may be necessary at some point in the future.

#### **5.4.3.2 Timeframe**

As noted above, the Trustees intend to coordinate restoration with clean up, completing restoration once the clean up has been completed. Future restoration actions would begin in about 2 years (following the 2-year funding period of the near-term restoration round) and continue through the life of the remediation, until 2011 or so. At that point, the Trustees would initiate a final round of restoration actions, follow through with implementation and oversight as necessary, and disband.

#### **5.4.3.3 Budget**

The Trustees would spend the entire remainder of the restoration settlement account, plus accumulated interest, on future restoration actions. That is, all funds not expended on the initial plans and studies or near-term restoration actions would be expended on future restoration actions (which, as noted above, might include some additional plans and studies, as necessary). Following completion of the remediation, any funds remaining in the restoration settlement account would be committed to a final round of restoration projects, using an idea solicitation and selection process similar to that described above. Decisions will be made regarding funds management for administration, oversight, and monitoring of these final restoration actions.

As discussed in Chapter 2, the restoration settlement account currently stands at approximately \$22 million. Interest will continue to accrue on whatever portion of the settlement is unspent during the restoration process. Therefore, after allocating approximately \$5 million for near-term restoration, at least \$16 million is expected to be available for future restoration actions.

#### **5.4.4 Emergency restoration**

CERCLA provides for emergency, pre-restoration plan restoration actions where immediate action is required "to avoid an irreversible loss of natural resources or to prevent or reduce any continuing danger to natural resources or similar need" (42 USC 9611(i)). The Trustees did not find it necessary to undertake emergency restoration actions in the New Bedford Harbor Environment prior to beginning preparation of this RP/EIS, and once this document has been finalized, the Plan should encompass most if not all restoration needs. It is possible but not likely that an emergency situation may become apparent before finalization of this document that would require expedited action as an emergency restoration.

If an emergency situation within the meaning of CERCLA becomes apparent to the Trustees, the Trustees might in rare cases be required to take action first, followed by environmental review. Such actions could only be taken to avoid, prevent, or reduce an irreversible loss of, or continuing danger to, natural resources.

#### **5.4.4.1 Procedures**

By definition, emergency restoration actions are those that are undertaken before adoption of a restoration plan and the consideration of public comment. Should the need for emergency restoration actions that are unforeseen by this plan become apparent, the Trustees would involve the public in the decisionmaking process to the maximum extent practicable.

#### **5.4.4.2 Timeframe**

It is conceivable but unlikely that emergency restoration needs could arise at any point during the restoration process. Should such needs arise, the Trustees would make every effort to implement the emergency action quickly, and to consider public comment and undertake environmental review at the earliest practicable time.

#### **5.4.4.3 Budget**

Since emergency restoration needs are by nature unforeseen, a budget cannot be estimated in advance. However, should emergency restoration needs arise, the Trustees would limit the budget for such actions to the practicable minimum, while incorporating public comment into as much of the financial decisionmaking as practicable. Even in a worse-case situation, it is unlikely that emergency restoration funding needs would be greater than a few percent of the restoration settlement funds. In any event, the Trustees anticipate that all or nearly all of restoration monies will be spent with full public participation and oversight of the Trustees' financial decisionmaking.

## CHAPTER 6: RELATIONSHIP TO OTHER LAWS AND PROGRAMS

### **Chapter Outline:**

	Page
6.1 Laws.....	6-2
6.1.1 Federal Laws .....	6-2
6.1.2 State Laws .....	6-6
6.1.3 Local Laws.....	6-8
6.2 Policies .....	6-8
6.2.1 Federal Policies .....	6-8
6.2.2 State and Local Policies.....	6-9
6.3 Programs.....	6-9
6.3.1 Federal Programs .....	6-9
6.3.2 State Programs .....	6-9
6.3.3 Local Programs.....	6-10
6.4 Non-governmental Partners .....	6-11
6.5 Summary of Compliance with Potentially Applicable Laws.....	6-12

## **CHAPTER 6: RELATIONSHIP TO OTHER LAWS, PROGRAMS, AND POLICIES**

As discussed in Chapter 2, the two major federal laws guiding the restoration of New Bedford Harbor are CERCLA NEPA. CERCLA provides the basic framework for natural resource damage assessment and restoration, while NEPA sets forth a specific process of impact analysis and public review. However, in developing and implementing the RP/EIS for New Bedford Harbor, the Trustees must comply with other applicable laws, regulations, and policies at the federal, state and local levels. Section 6.1 below lists these potentially relevant laws and policies and discusses their applicability with respect to the restoration of New Bedford Harbor.

In addition to laws and regulations, the Trustees must consider relevant environmental or economic programs or plans in developing and implementing the RP/EIS. As described in Chapters 2 and 5, the most important of these is the Superfund Site clean up, but other efforts are ongoing or planned in or near the affected environment. By coordinating restoration with all relevant programs and plans, the Trustees can insure that the restoration does not duplicate other efforts, but enhances the overall effort to improve the environment of New Bedford Harbor and Buzzards Bay. Section 6.2, below, lists potentially relevant programs and plans and discusses their applicability with respect to the restoration. Section 6.3, below, summarizes the first two sections in tabular form and proposes mechanisms whereby the restoration of New Bedford Harbor can comply with relevant laws and programs.

### **6.1 Laws**

#### **6.1.1 Federal Laws**

##### **Anadromous Fish Conservation Act (AFCA), 16 USC §757a et seq.**

AFCA authorizes the Secretaries of Commerce and/or Interior to enter into cooperative agreements with the states for the conservation, development, and enhancement of the Nation's anadromous fishery resources. Pursuant to such agreements the federal government may undertake studies and activities to restore, enhance, or manage anadromous fish, fish habitat, and passages. The Act authorizes federal grants to the states or other non-Federal entities to improve spawning areas, install fishways, construct fish protection devices and hatcheries, conduct research to improve management, and otherwise increase anadromous fish resources. The Trustees may be able to take advantage of the provisions and funding of AFCA in order to leverage anadromous fish restoration plans and projects in the New Bedford Harbor Environment and Buzzards Bay.

##### **Clean Water Act (CWA) (Federal Water Pollution Control Act), 33 USC §1251 et seq.**

CWA is the principle law governing pollution control and water quality of the Nation's waterways. Section 404 of the law authorizes a permit program for the disposal of dredged or fill material in the Nation's waters, administered by the ACOE.

In general, restoration projects which move significant amounts of material into or out of waters or wetlands--for example, hydrologic restoration of salt marshes or the placement of artificial reefs--require 404 permits. It is probable that some of the New Bedford Harbor restoration projects will require such permits. In such cases the Trustee Council might be the permit applicant; alternately, the project proponent--for example, a municipality or local natural resources trust--might apply for the permit.

In granting permits to applicants for dredge and fill, applicants may be required to undertake mitigation measures such as habitat restoration to compensate for losses resulting from the project. Through coordination with the ACOE, the Trustee Council may be able to leverage restoration projects by "piggy-backing" 404 mitigation projects on selected alternatives. For example, once the restoration planning process has identified priority sites for wetland restoration, a permit applicant might be asked to restore part or all of such a site as a condition for granting a 404 permit. See also Rivers and Harbors Act, below.

Under Section 401 of the Clean Water Act, restoration projects that entail discharge or fill to wetlands or waters within federal jurisdiction must obtain certification of compliance with state water quality standards. The Massachusetts Department of Environmental Protection implements the 401 Water Quality Certification Program through 314 CMR 9.00. In general, restoration projects with minor wetlands impacts (i.e., a project covered by an ACOE Programmatic General Permit) are not required to obtain 401 Certification, while projects with potentially large or cumulative impacts to critical areas require certification.

#### **Coastal Zone Management Act (CZMA), 16 USC §1451 et seq.**

CZMA establishes a policy to preserve, protect, develop and, where possible, restore and enhance the Nation's coastal resources. The federal government provides matching grants to states for the realization of these goals through the development and implementation of state coastal zone management programs. Section 1456 of the Act requires federal actions in the coastal zone to be consistent, to the maximum extent practicable, with approved state programs. It stipulates that no federal licenses or permits be granted without giving the state the opportunity to concur that the project is consistent with the state's coastal policies. Other provisions of CZMA provide for the development of special area management plans (SAMPs) for areas of the coastal zone of particular importance (16 U.S.C. §1456b(6)). In addition, Section 6217 of P.L. 101-508, codified at 16 U.S.C. §1455b, requires states with federally-approved coastal zone management programs to develop programs for the control of coastal non-point pollution control.

In order to comply with CZMA, the Trustee Council sought the concurrence of the Commonwealth that the RP/EIS is consistent with the 27 program policies of the Massachusetts Coastal Program. Moreover, individual restoration projects which may be selected in future restoration rounds must be consistent with the state program. The Trustees anticipate that continued close cooperation between the Massachusetts Coastal Zone Management Program (MCZM) and the Trustee Council will ensure consistency of future actions. Moreover, cooperation with MCZM offers considerable opportunity for leveraging the restoration process--see Massachusetts Coastal Zone Management Program, below. MCZM determined that the proposed RP/EIS was consistent with the MCZM's enforceable program policies. (MCZM, 1997)

Should the proposed activities be modified or be found to have effects on the coastal zone or its uses that are substantially different from originally proposed, an explanation of the change must be submitted to MCZM per 301 CMR 21.17 and 15 CFR 930.66.

### **Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC §9601 et seq.**

CERCLA provides the basic legal framework for clean-up and restoration of the nation's hazardous waste sites, addressing liability, compensation, clean-up, emergency response, and natural resource restoration. Under CERCLA, natural resource trustees assess damages to natural resources resulting from a discharge of oil or hazardous substance and seek to recover such damages. Compensation so received must be used to restore, replace, or acquire the equivalent of lost natural resources and services.

Parties responsible for the contamination of sites are liable for all costs of clean-up and restoration; however, CERCLA also created a revolving fund for use at "orphan" sites or before settlement. CERCLA establishes a hazard ranking system for assessing the Nation's contaminated sites, the most contaminated of which are placed on the National Priorities List.

CERCLA is the principal law guiding the planning and implementation of the New Bedford Harbor restoration; Chapter 2 provides a more complete discussion of the proposed restoration process in the context of CERCLA's requirements.

### **Endangered Species Act (ESA), 16 USC §1531 et seq.**

ESA establishes a policy that all Federal departments and agencies seek to conserve endangered and threatened species and their habitats, and encourages such agency to utilize their authorities to further these purposes. Under the Act, the Departments of Commerce and/or Interior publish lists of endangered and threatened species. Section 7 of the Act requires that federal agencies and departments consult with the Departments of Commerce and/or Interior to minimize the effects of federal actions on endangered and threatened species. In the case of New Bedford Harbor, the identification of endangered species as a restoration priority (Section 2.6) means that specific restoration actions can help conserve and recover protected species and so further the goal of Endangered Species Act.

The Trustee Council determined that the preferred restoration activities would not have any adverse effects upon threatened or endangered species. This determination was forwarded to the National Marine Fisheries Service and U.S. Fish and Wildlife Service (Terrill, 1997) requesting concurrence in the determination for threatened and endangered species under their jurisdiction. Both agencies agreed with the determination (Bartlett, 1997 and Rosenberg, 1997) and concluded that several of the preferred alternatives (Restoration of New Bedford Area Shellfishery, Eelgrass Habitat Restoration, and Restoration and Management of Tern Populations) will provide indirect or direct benefits to threatened or endangered species. No further consultation on these projects is necessary provided project plans do not change or new information becomes available.

### **Fish and Wildlife Coordination Act (FWCA), 16 USC §661 et seq.**

FWCA requires that federal agencies consult with the U.S. Fish and Wildlife Service (USF&WS), the National Marine Fisheries Service (NMFS), and state wildlife agencies for activities that affect, control, or modify waters of any stream or bodies of water, in order to minimize the adverse impacts of such actions on fish and wildlife resources and habitat. This consultation is generally incorporated into the process of complying with Section 404 (see Clean Water Act, above); NEPA (see National Environmental Policy Act, below); or other federal permit, license, or review requirements.

In the case of New Bedford Harbor, the fact that the three consulting agencies for FWCA are represented on the Trustee Council means that FWCA compliance will generally be inherent in the Trustee decisionmaking process. In addition, FWCA provides NMFS and USF&WS with grantmaking authority which may be useful in disbursing funds for specific restoration projects, or for leveraging restoration projects with additional federal funding.

### **National Environmental Policy Act, 42 USC §4321 et seq.**

NEPA is the basic national charter for protection of the environment. Its purpose is to "encourage productive and enjoyable harmony between man and the environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; and to enrich the understanding of the ecological systems and natural resources important to the Nation." The law requires the government to consider the consequences of major federal actions on human and natural aspects of the environment in order to minimize, where possible, adverse impacts. Equally important, NEPA establishes a process of environmental review and public notification for federal planning and decisionmaking.

The Trustee Council has integrated this restoration plan with NEPA's Environmental Impact Statement process in order to comply with NEPA. Moreover, the integrated RP/EIS allows the Trustee Council to use the NEPA process as the basic framework for public involvement in restoration planning. However, public involvement in the restoration planning process thus far has been far greater than required for NEPA compliance alone. The Trustee Council envisions continued close public involvement in the restoration planning process, whereby the public will be involved in developing, shaping, and commenting on restoration decisionmaking throughout the restoration of New Bedford Harbor.

As discussed in Chapter 5, this restoration plan complies with NEPA by serving as a "programmatic EIS" that assesses impacts of the restoration as a whole, as well as impacts of specific restoration projects (Chapter 4). Implementation of future restoration actions may in some cases require additional NEPA documentation, probably in the form of project-specific Environmental Assessments (EAs).

### **Rivers And Harbors Act, 33 USC §401 et seq.**

The Rivers and Harbors Act regulates development and use of the Nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waters and invests the Corps with authority to regulate discharges of fill and other materials into such waters. Restoration actions that require Section 404 permits (see Clean Water Act,



above) are likely to also require permits under Section 10 of the Rivers and Harbors Act, but a single permit generally serves for both; therefore the Trustees can ensure compliance with the Rivers and Harbors Act through the same mechanisms.

### **Other Potentially Applicable Federal Laws**

Clean Air Act, 42 USC §7401 et seq.

Emergency Wetlands Resources Act, 16 USC §3901.

Estuarine Protection Act, 16 USC §1221 et seq.

Fish and Wildlife Conservation Act, 16 USC §2901 et seq.

Marine Protection, Research, and Sanctuaries Act, 33 USC §1401 et seq.

Migratory Bird Treaty Act, 16 USC §703 et seq.

National Historic Preservation Act, 16 USC §461 et seq.

Oil Pollution Act, 33 USC §2701 et seq.

### **6.1.2 State Laws**

#### **Massachusetts Endangered Species Act (MESA), MGL Ch. 131A**

MESA works in much the same way as the federal Endangered Species Act (Section 6.1.1, above) to list and protect rare species and their habitats. Like ESA, MESA defines specific species as "endangered" or "threatened" and considers a third category as well: "species of special concern." MESA is more protective than ESA: listed species include federally protected species as well as others of specific concern to Massachusetts. MESA is administered by the Massachusetts Natural Heritage and Endangered Species Program (NHESP), which identifies rare species habitats and other high-priority natural areas.

Compliance of the proposed restoration with MESA overlaps ESA compliance. As noted above, the Trustees have identified endangered species, including state-listed species, as a restoration priority. Before finalizing the RP/EIS, the Trustees will consult with NHESP to ensure that no aspects of the Plan would have a negative effect on species designated as endangered, threatened, or of special concern by the Commonwealth.

#### **Massachusetts Environmental Policy Act (MEPA), MGL Ch. 30 §61 et seq.**

MEPA is the state equivalent of NEPA (Section 6.1, above). MEPA sets forth a process of environmental review and requires Commonwealth agencies to consider and minimize adverse environmental impacts of State actions on the environment. Like NEPA, MEPA requires public notification and comment before decisions are finalized. The document used to assess impacts is the Environmental Impact Report (EIR), which must be approved by the MEPA office within the EOEA before major State actions can proceed. The law applies to projects directly undertaken by State agencies as well as private projects seeking permits, funds, or lands from the State, but does not apply to private projects requiring local approval only. MEPA review is expressly required for projects that dredge, fill or alter more than one acre of wetlands.

Both NEPA and MEPA encourage consolidation of the two processes where possible to avoid duplication of effort. Therefore, this Draft RP/EIS is also a Draft EIR, conforming to the notice, comment, timing, content, and other relevant provisions of MEPA. Likewise, future restoration actions that require additional NEPA documentation will, where appropriate, incorporate the

MEPA process into restoration decisionmaking. Since MEPA is somewhat more inclusive than NEPA, some restoration actions which do not require NEPA review may require review under MEPA; in such cases, separate MEPA review will be undertaken by the Trustee Council.

### **Public Waterfront Act ("Chapter 91"), MGL Ch. 91**

Chapter 91 is designed to protect public rights in Massachusetts waterways, not unlike the federal Rivers and Harbors Act, above, which it predates. It ensures that public rights to fish, fowl, and navigate are not unreasonably restricted and that unsafe or hazardous structures are repaired or removed. Chapter 91 also protects the waterfront property owner's ability to approach his land from the water, and helps protect wetlands resource areas by requiring compliance with the Wetlands Protection Act. It is administered by MADEP's Division of Wetlands and Waterways through a program of permits and licenses. Chapter 91 authorization is required for alterations of tidelands, great ponds, and some rivers and streams, as well as for dredging and construction of piers, wharves, floats, retaining walls, revetments, pilings, bridges, dams and some waterfront buildings. The Act requires public, municipal and agency notification before a project is authorized, and provides for public hearings, review by affected parties, and the imposition of conditions before authorization is granted. Certain Chapter 91 projects also require MEPA review, above. In order to maintain restoration plan compliance with Chapter 91, the Trustee Council will seek the approval of the Division of Wetlands and Waterways before implementing restoration actions that fall within the law's scope and will ensure that the law's notification provisions are met where required.

### **Rivers Protection Act, St. 1996, C. 258**

The Rivers Protection Act, passed in 1996, modifies the Wetlands Protection Act, below, to strengthen and expand existing protection of watercourses and the lands adjacent to them. The Act establishes a "riverfront area" that extends 200 ft (25 ft in certain urban areas) from the mean annual high water line on each side of perennially flowing rivers and streams. The Act requires projects in the riverfront area to meet two performance standards: no practicable alternatives, and no significant adverse effect. While regulations for implementing the Rivers Protection Act have not yet been written, the Trustee Council intends to follow such developments in order to ensure that restoration actions that fall within the law's scope are in full compliance with it.

### **Wetlands Protection Act, MGL Ch. 131 §40**

The Wetlands Protection Act restricts the removal, filling, dredging or alteration of fresh and salt water wetlands and coastal areas. Permit authority for the administration of the law is delegated to local conservation commissions with oversight and involvement of the Massachusetts Department of Environmental Protection. The Act requires landowners who plan work in a wetland to notify these entities as well as abutters and other nearby landowners, and provides for public hearings and the imposition of conditions before permission is granted. More direct State involvement is required where wetlands greater than 5000 s.f. are affected.

In order to maintain restoration plan compliance with the Wetlands Protection Act, the Trustee Council will seek the approval of the local conservation commission and/or other appropriate authorities before implementing restoration actions that fall within the law's scope, and will

ensure that nearby landowners and other affected parties are notified, as appropriate, of planned restoration actions.

### **Other Potentially Applicable State Laws**

**Massachusetts 401 Water Quality Certification Program, 314 CMR 9.00** (discussed under Clean Water Act, above).

#### **6.1.3 Local Laws**

As appropriate, restoration actions will consider and comply with local zoning ordinances, comprehensive plans, shoreline plans, growth management plans, construction grading or fill permits, noise permits, wetlands bylaws and permits, and other relevant laws, regulations, bylaws, and ordinances.

### **6.2 Policies**

#### **6.2.1 Federal Policies**

##### **Environmental Justice - Executive Order 12898**

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority or low income populations. Environmental justice review should be incorporated into the NEPA process and, where disproportionate adverse effects on minority and low-income populations are identified, address those impacts.

As discussed in Chapter 3, all residents and users of the New Bedford Harbor region have been affected by the contamination of the Harbor and would therefore benefit from natural resource restoration. However, residents of the area surrounding the Upper Acushnet River Estuary--in the North End of New Bedford as well as coastal areas of Acushnet--have been particularly affected by the contamination. In addition, this is a low-income area with relatively large minority populations, primarily of Portuguese or Hispanic descent. A second area that has been particularly affected is the South End of New Bedford, which is also a low-income area with relatively large minority populations.

The Trustees have reviewed the potential for disproportionate adverse impacts of the proposed action on these communities, and have not identified such impacts. Moreover, in order to fully address environmental justice issues in the New Bedford Harbor Environment, the Trustees will seek to implement restoration alternatives with specific benefit to these communities--for example, the proposed Riverside/Belleville Marine Recreation Park described in Chapter 4. Since these are areas where contaminant dredging is planned as part of the Superfund clean-up, implementation of some such actions must wait until completion of the dredging. However, the Trustees have encouraged EPA to expedite clean-up activities in the Upper Estuary in order to allow early selection and implementation of this and other restoration ideas directed toward benefiting minority or low-income populations.

#### **6.2.2 State and Local Policies**

As appropriate, restoration actions will consider and comply with other relevant policies at the state and local levels, e.g. the Massachusetts DEP Stormwater Discharge Policy.

## **6.3 Programs**

### **6.3.1 Federal Programs**

#### *Buzzards Bay Project (BBP)*

BBP is part of the National Estuary Program, a collaborative effort of the EPA and the Commonwealth of Massachusetts. The BBP prepared a "comprehensive conservation management plan" (CCMP) in 1991. The CCMP directs the development and implementation of management recommendations that would preserve and protect water quality and living resources in Buzzards Bay. The bay-wide approach provides a valuable setting for restoration work in the New Bedford Harbor Environment, including management and monitoring tasks.

#### *U.S. Army Corps of Engineers (ACOE)*

ACOE is responsible for maintaining the main federal navigation channel from Buzzards Bay into New Bedford Harbor, operating the navigation gate of the Hurricane Barrier, and assisting in the design and implementation of the Superfund cleanup. The federal navigation channel needs dredging to maintain commercial depths and safe passage. ACOE estimates that approximately 1.7 million cubic yards of unconsolidated sediments will need to be removed. (ACOE 1996). Dredging of the federal channel and associated state channels is now under consideration during planning for remedial and restoration work in the same waters.

ACOE completed construction of the Hurricane Barrier in 1966 providing protection to approximately 1400 acres. The Barrier is maintained by the City of New Bedford, but ACOE would need to be consulted for design changes.

### **6.3.2 State Programs**

#### *Massachusetts Coastal Zone Management (MCZM)*

MCZM's coastal zone management program provides a comprehensive tool to protect marine resources and to promote responsible economic development. Program direction is specified in 27 policies which cover harbor management, hazards, important resources and environments, waterfront development, access, aesthetics, submerged resources, and many more topics of direct interest to restoring New Bedford Harbor.

With financial and technical assistance from the MCZM, New Bedford and Fairhaven are engaged in harbor planning aimed at developing a comprehensive plan for the area between the Hurricane Barrier and the Coggeshall Street Bridge. The master plan will address the needs of various commercial and recreational sectors and will balance economic development with other waterfront uses.

*Massachusetts Department of Environmental Management, Division of Waterways (DEM)*

DEM cooperates with local municipalities to dredge channels connecting federal navigation channels to shoreside facilities. DEM has worked with New Bedford and Fairhaven on numerous dredging projects since the 1940s, including spurs to the State Fish Pier, New Bedford City Marina off Route 6, and the Fairhaven commercial fish wharves.

*Massachusetts Environmental Trust (MET)*

MET was established in 1988 by the Massachusetts Legislature. The Trust acts as an environmental philanthropy and funds programs related to its three purposes:

- 1) to restore, protect, and improve Massachusetts waterways;
- 2) to increase understanding of the harbors, bays, watersheds, rivers and their resources; and
- 3) to engage the public in activities that promote the harbors, bays, watersheds, rivers and their resources.

*Massachusetts Natural Heritage and Endangered Species Program (NHESP)*

MNHESP, within the State Division of Fisheries and Wildlife, is responsible for the conservation and protection of hundreds of plant and animal species that are not hunted, fished, trapped, or commercially harvested in the State. The Program's highest priority is the protection of species that are considered endangered, threatened, or of special concern in Massachusetts. Its overall goal is the preservation of the Commonwealth's biodiversity, accomplished through a comprehensive program of inventory, data management, research, wildlife management, project review and habitat protection. The Program collects information on the abundance, distribution, and conservation needs of endangered and other nongame wildlife and plant species, and develops maps of rare species and natural communities.

The Trustee Council has worked with MNHESP in developing this Restoration Plan in order to identify restoration alternatives that further the protections of habitats of rare species and other areas of exceptional natural value within the New Bedford Harbor Environment, while working to avoid adverse impacts to such natural assets. Toward these ends, the Trustees intend to continue consulting with MNHESP throughout the restoration process.

### **6.3.3 Local Programs**

Regional planning efforts such as the Buzzards Bay Project and a harbor plan must be integrated with local ordinances from the four affected municipalities. The Trustees acknowledge that restoration must also proceed with continuous local involvement and integrate local ordinance.

*Wastewater treatment infrastructure*

Water, sediment, and resource health in the New Bedford Harbor region are strongly influenced by local wastewater treatment systems. The area is served by a mix of residential systems, water pollution control facilities that intercept nutrients from entire neighborhoods, and combined sewer overflows (CSOs) that convey wastes and stormwaters.

The timing of restoration efforts will be coordinated with on-going efforts of the four communities (City of New Bedford, Towns of Acushnet, Dartmouth, and Fairhaven), the Commonwealth's Department of Environmental Protection, and the U.S. Environmental Protection Agency. The Fort Rodman water pollution control facility (located on the western edge of the outer harbor), the CSOs, and regional non-point sources have been shown to contribute PCBs to harbor waters. Source reduction and improved overall water quality are essential ingredients in restoring habitat health and resource availability.

#### **6.4 Non-governmental Partners**

Several private organizations with concerns or interest in the Harbor are active in the region. Information follows on some of the groups expected to participate in the restoration of the New Bedford Harbor Environment.

##### *Coalition for Buzzards Bay (CBB), New Bedford, MA*

CBB was formed in 1987 as a public outreach organization dedicated to informing and involving the public in the clean-up, restoration and protection of Buzzards Bay. The Coalition is a non-profit organization with approximately 1800 members. Major accomplishments include the creation and implementation of the Citizens' Water Quality Monitoring Program, the Environmental Report Card, the New Bedford Project, and several other outreach efforts designed to connect citizens to the Bay. The Coalition is involved in public policy and legislative issues that affect Buzzards Bay.

##### *Citizens for a Clean Harbor, Fairhaven, MA*

Citizens for a Clean Harbor is a community group concerned with the clean-up and restoration of the New Bedford Harbor/Acushnet River. The group's purpose is to update, educate and inform the public on the activities surrounding the New Bedford Harbor Superfund Site so informed and educated decisions can be made.

##### *Hands Across the River Coalition (HATRC), New Bedford, MA*

HATRC was formed in 1990. HARC is an environmental organization that concentrates on environmental justice issues confronting the residents of Southeastern Massachusetts. One of the Coalition's primary goals is the total clean-up of the Acushnet River and New Bedford Harbor. The Coalition has approximately 700 members.

##### *National Wildlife Federation (NWF), Washington, DC*

NWF is the nation's largest citizen conservation education organization with over 4 million members and supporters. Its mission is to educate, inspire, and assist individuals and organizations of diverse cultures to conserve wildlife and other natural resources, and to protect the Earth's environment in order to achieve a peaceful, equitable, and sustainable future. This is accomplished through programs focusing on regional issues, conservation education for both the public and schools, publications, camps and training for camps, outdoor ethics to develop environmental awareness, and evaluating and responding to environmental policy and issues. (NWF 1995)

NWF is an ex-officio member of the Trustee Council through settlement of their 1992 lawsuit.

*Waterfront Historic Area League (WHALE), New Bedford, MA*

WHALE is a 34 year old non-profit preservation and development corporation. WHALE's primary focus is to preserve the character of the communities that it serves, through community and economic development. WHALE services the communities from Westport to Wareham. WHALE's membership totals 620.

## **6.5 Summary of Compliance with Potentially Applicable Laws**

Table 6.1 summarizes the laws, regulations and policies potentially applicable to environmental restoration of the New Bedford Harbor Environment, and presents the approach that the Trustees will use to ensure that the restoration plan, as well as each individual restoration action, complies with all applicable laws and requirements.

**Table 6.1 Summary of Compliance with Potentially Applicable Laws**

<b>FEDERAL</b>				
<b>LAW/REGULATION</b>	<b>SCOPE</b>	<b>RESPONSIBLE AGENCY</b>	<b>COMPLIANCE</b>	<b>PERMIT?</b>
<b>Anadromous Fish Conservation Act, 16 USC 757</b>	Conservation and restoration of anadromous fish resources and habitat	<b>NMFS, USF&amp;WS, MDFW</b>	Project-specific coordination with responsible agencies	<b>No</b>
<b>Clean Water Act (CWA), 33 USC 1251 et seq.; Section 404 &amp; 301</b>	Regulating discharge of dredge and fill material in waters of the US; protection of wetlands.	<b>ACOE, EPA</b>	Project-specific	<b>Yes</b>
<b>Clean Water Act, Sections 401 &amp; 402</b>	Compliance with state water quality standards.	<b>EPA, MADEP</b>	Project-specific	<b>Yes</b>
<b>Comprehensive Environmental Response, Compensation and Liability Act, 42 USC 9601</b>	Provides authorization and program framework for Superfund site remediation and restoration; requires plan development and public involvement.	<b>NBHTC (NOAA, DOI, EOEA) with advice from DOJ</b>	Through use of the NEPA process to guide plan development and public involvement; consultation with DOJ and federal court as necessary.	<b>No</b>
<b>Coastal Zone Management Act (CZMA), 16 USC 1451 et seq.</b>	Compliance with CZMA for protection of coastal zone; certification by state required.	<b>NOAA, MCZM</b>	Project-specific; review at state level.	<b>No</b>
<b>Endangered Species Act (ESA), 16 USC 1531 et seq.</b>	Continued existence of listed threatened and endangered species.	<b>USFWS, NMFS</b>	Partial compliance with RP/EIS. Project-specific consultation with USFWS and NMFS as appropriate.	<b>No</b>
<b>Fish and Wildlife Coordination Act, 16 USC 661</b>	Protection of fish and wildlife. Applies to federal actions only.	<b>USFWS, NMFS</b>	Project-specific coordination with USFWS and NMFS.	<b>No</b>
<b>National Environmental Policy Act of 1969 (NEPA), 42 USC 4321-4370d; 40 CFR 1500-1508.</b>	Disclosure of environmental impacts of proposed project; evaluation of alternatives. Applies to federal actions.	<b>Federal lead agency, EPA</b>	Partial compliance through RP/EIS process. Additional project-specific NEPA compliance as appropriate.	<b>No</b>
<b>Rivers and Harbors Act of 1899, 33 USC 403, et seq.; Section 10</b>	Prohibits obstruction or alterations of navigable waters. Regulates construction of any structures within navigable waters of the US.	<b>ACOE</b>	Project-specific	<b>Yes</b>



STATE				
Massachusetts Endangered Species Act, MGL Ch. 131A	Continued existence of State-listed species.	NHESP	Partial compliance with RP/EIS. Project-specific consultation with NHESP as appropriate.	No
Massachusetts Environmental Policy Act (MEPA), MGL Ch. 30	Disclosure of environmental impacts of proposed project; evaluation of alternatives; public notification and review.	Lead state/local agency, EOEA MEPA Office	Partial compliance if RP/EIS is adopted by the state. Project-specific MEPA documentation as appropriate.	No
Public Waterfront Act, Ch. 91	Public rights to and protection of shorelines and some rivers and streams	Local Conservation Commissions; MDEP	Project specific through consultation and permit as appropriate	Yes
Rivers Protection Act	Protection of rivers and streams and adjacent lands	Local Conservation Commissions; MDEP	Project specific through consultation and permit as appropriate	Yes
Wetlands Protection Act, MGL 131	Protection of wetlands and adjacent lands	Local Conservation Commissions; MDEP	Project specific through consultation and permit as appropriate	Yes
Massachusetts 401 Water Quality Certification Program	Protection of water quality	MDEP	Project specific through consultation and permit as appropriate	Yes
LOCAL				
Zoning Ordinances	Restrict types of development within designated zones.	Local government	Project-specific	No
Noise/Nuisance Ordinances	Restrict noise and nuisance levels.	Local government	Project-specific	No

## **CHAPTER 7: CONSULTATION AND COORDINATION**

### **LIST OF CONTACTS FOR PREPARATION AND REVIEW OF THE EIS**

#### **Federal Agencies**

- Department of Commerce
  - National Oceanic and Atmospheric Administration
  - National Marine Fisheries Service
  - National Ocean Service
- Department of the Interior
  - Fish and Wildlife Service
  - Office of Environmental Policy and Compliance
  - U.S. Geological Service
- Department of Justice
  - Environmental Protection Agency

#### **Commonwealth of Massachusetts**

- Executive Office of Environmental Affairs
  - Coastal Zone Management
- Department of Environmental Protection
- Department of Environment Management
- Department of Fisheries, Wildlife and Environmental Law Enforcement
  - Division of Fisheries & Wildlife
    - Natural Heritage and Endangered Species Program
  - Division of Marine Fisheries
- Metropolitan District Commission

#### **Local and Regional Government Organizations**

- City of New Bedford
- Town of Acushnet
- Town of Dartmouth
- Town of Fairhaven

## **New Bedford Harbor Trustee Council**

### **Trustees:**

Michael Bartlett	Field Supervisor, U.S. Fish and Wildlife Service
Trudy Coxé	Secretary, Massachusetts Executive Office of Environmental Affairs
Sally Yozell	Deputy Assistant Secretary for Oceans and Atmosphere, National Oceanic and Atmospheric Administration

### **Delegates:**

Dale Young	Natural Resource Damage Coordinator, Massachusetts Executive Office of Environmental Affairs
Jon Rittgers	Deputy Northeast Regional Administrator, National Marine Fisheries Service

### **Support Staff:**

Marcia Gittes	Legal Counsel, Department of the Interior
Marguerite Matera	Legal Counsel, National Oceanic and Atmospheric Administration
Keren Schlomy	Legal Counsel, Massachusetts Executive Office of Environmental Affairs
John Terrill	Coordinator, National Marine Fisheries Service

## **Community Restoration Advisory Board:**

<i>Name</i>	<i>Representing</i>
Henry Arruda	minorities
Tom Bauer (Chair)	harbor abutters
Alfred Braley	recreational fishing
Stephen Cassidy	marine
Robert Cook	recreational
Laurel Farrinon (Vice Chair)	environmental
Molly Fontaine	New Bedford representative
John Haaland	Fairhaven representative
James Kendall	commercial fishing
Pete Koczera	Acushnet representative
Christopher Moriarty	shellfish
Bob Rocha	environmental
John Sherman	Dartmouth representative
Lawrence Sylvia	seafood dealer
Shaun Walsh	environmental

### **Technical Advisory Committee**

Bradford Blodget	Massachusetts Division of Fish and Wildlife
Leigh Bridges	Massachusetts Division of Marine Fisheries
Ken Carr	U.S. Fish and Wildlife Service
John Catena	National Marine Fisheries Service
Paul Craffey	Massachusetts Department of Environmental Protection
Gary Gonyea	Massachusetts Department of Environmental Protection
John Terrill (Chair)	National Marine Fisheries Service

### **LIST OF PREPARERS**

#### **COMMONWEALTH OF MASSACHUSETTS**

Massachusetts Executive Office of Environmental Affairs  
Department of Fisheries, Wildlife and Environmental  
Law Enforcement

Bradford Blodget

#### **U.S. DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration  
National Ocean Service  
Damage Assessment Center Carol Jones

Brian Julius  
Norman Meade

National Marine Fisheries Service  
Restoration Center  
Ardito

Thomas

Habitat and Protected Resources Division, Northeast Region  
Information Resource Management, Northeast Region

John Catena  
John Terrill  
Vernon Nulk

#### **U.S. DEPARTMENT OF THE INTERIOR**

U.S. Fish and Wildlife Service  
Carr

Kenneth

Laura Eaton

#### **VANASSE, HANGEN, BRUSTLIN, INC.**

David A. Carlson, L.S.P.  
Alan Hanscom, P.E., L.S.P.  
Robert M. Kaye  
Carol Ann Lurie, A.I. C. P.  
John L. Meyer  
Kathy Miller

#### **James G. Turek, Project Manager**

Nathaniel Norton  
Maia Peck  
Edward Richardson, Ph. D  
Robert Russo  
Anthony Zemba

## CHAPTER 8: LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

#	Name	Agency/Organization	Address	City/State/Zip
1	John Andrade		41 Bedford Street	New Bedford, MA 02740
2	Richard Armstrong	Seaport Council	Fairhaven Town Hall, 40 Centre Street	Fairhaven, MA 02719
3	Thomas Ardito	NMFS Restoration Center F/HC3	1335 East West Highway	Silver Spring, MD 20910
4	Henry Arruda		111 Slocum Road	North Dartmouth, MA 02747
5	Bob Bowen		23 Arnold Place	New Bedford, MA 02740
6	Tom Bauer		1273 E. Rodney French Blvd	New Bedford, MA 02744
7	Jeffrey Benoit, Director	NOS-N/ORM	1305 East-West Hwy., SSMC4, Rm. 11523	Silver Spring, MD 20910
8	Ann Berger, DARP Coordinator	NOS -N/ORCAx1	1305 East-West Hwy., SSMC4, Rm. 10315	Silver Spring, MD 20910
9	Barbara Birdsey	Orenda Wildlife Trust	P.O. Box 669	West Barnstable, MA 02668
10	Carl Bizarro		399 Cedar Grove Street	New Bedford, MA 02746
11	Brad Blodget	MA Division of Fish & Wildlife	Field Headquarters	Westboro, MA 01581
12	Peg Brady	MA Coastal Zone Management	100 Cambridge Street	Boston, MA 02202
13	Alfred Braley	Shellfish Warden	20 Main Street	Acushnet, MA 02743
14	Brian Breginton-Smith	Conservation Consortium	4380 Main Street	Yarmouthport, MA 02765
15	Leigh Bridges	MA Division of Marine Fisheries	100 Cambridge Street	Boston, MA 02202
16	Susan Brown	U.S. Army Corps of Engineers	424 Trapelo Road	Waltham, MA 02254-9149
17	Dr. Robert Buchsbaum	Mass. Audubon-North Shore	346 Grapevine Road	Wenham, MA 01984
18	Lyman Bullard		107 Highland Road	Andover, MA 01810
19	James Burgess, Director	NMFS-F/HC	1315 East-West Hwy, SSMC3, 12th Floor	Silver Spring, MD 20910

#	Name	Agency/Organization	Address	City/State/Zip
20	Kenneth Carr	U.S. Fish and Wildlife Service	22 Bridge Street, 4th Floor	Concord, NH 03301-4901
21	Stephen J. Cassidy		P.O. Box 80012	South Dartmouth, MA
22	John Catena	NMFS - F/NEO2	1 Blackburn Drive	Gloucester, MA 01930
23	Dorothy Checci-O'Brien		1480 State Road	Plymouth, MA 02360
24	Beth Chisholm	Ecologic	143 Dennis Street	Rockwood, ONT N0B 2K0
25	Commandant	U.S. Coast Guard (G-MSO-2)	2100 2nd Street. S.W	Washington, DC 20593
26	Commander	U.S. Coast Guard - 1st District	CG Building, 1408 Atlantic Avenue	Boston, MA 02210
27	James Compton		P.O. Box 1915	Kingston, RI 02881
28	Kristen Conroy	USEPA - REA	JFK Federal Building	Boston, MA 02203
29	William Connor, Chief	NOS - N/NORCAx1	1305 East-West HWY, SSMC4, Rm. 10208	Silver Spring, MD 20910
30	Bill Corey		25 Elm Street	New Bedford, MA 02740
31	Congressman William Delahunt		146 Main Street	Hyannis, MA 02601
32	Ken Deshais	Rizzo Associates, Inc.	235 West Central Street	Natick, MA 01760-3755
33	John DeVillars, Reg. Admin.	EPA Region I	JFK Federal Building	Boston, MA 02203-2211
34	Dave Dickerson	EPA Region I	JFK Federal Building - HBO	Boston, MA 02203-2211
35	Joanne Dobbs	VERSAR Inc.	6850 Versar Center	Springfield, VA 22151
36	Holly Doremus	University of California	School of Law	Davis, CA 95616-5201
37	Rev. John Douhan	Inter-Church Council	412 County Street	New Bedford, MA 02740
38	Donald Dumont		118 Perry Street	New Bedford, MA 02745
39	Arthur Dutra	c/o John Hannigan School	33 Emery Street	New Bedford, MA 02744
40	Charles Ehler, Director	NOS - N/ORCA	1305 East-West Hwy, SSMC4, Rm. 10409	Silver Spring, MD 20910

#	Name	Agency/Organization	Address	City/State/Zip
41	Fairhaven Shellfishermen Assoc		Box 622	Fairhaven, MA 02719
42	Laurell Farrinon	Town of Acushnet	Regional Conservation Commission, 122 Main Street	Acushnet, MA 02743
43	Kenneth Finkelstein	NOAA/HAZMAT c/o EPA Region 1	JFK Federal Building	Boston, MA 02203-2211
44	Molly Fontaine	Department of Public Works	133 William Street	New Bedford, MA 02740
45	Congressman Barney Frank		2210 Rayburn House Office Building	Washington, DC 20515-2210
46	Monique M. Frechette		492 North Front Street	New Bedford, MA 02746
47	H. Paul Friesma	Northwestern University	Institute for Policy Research, 2040 Sheridan Road	Evanston, IL 60208-4100
48	Geoffrey Fulgioni	Mass. Highways, Environmental Div.	10 Park Plaza	Boston, MA 02116-3973
49	Michael J. Gagne	Town of Dartmouth	400 Slocum Road	North Dartmouth, MA 02748
50	Gary Gill-Austern	Nutter, McClennon & Fish	1 International Place	Boston, MA 02110
51	Marcia Gittes	USDOJ, Office of the Solicitor	1 Gateway Center	Newton Corner, MA 02158
52	Captain Ken Golenski		33 Norwood Avenue	Portsmouth, RI 02871
53	Gary Gonyea	MA DEP - DWW	One Winter Street	Boston, MA 02108
54	Ted Govoni		590 Middle Road	Acushnet, MA 02743
55	John Grandy	Humane Society of the US	2100 "I" St NW, Suite 500	Washington, DC 20037-1595
56	Robert Gray		32 Water Street	Fairhaven, MA 02719
57	Hands Across the River Coalition		222 Union Street, Suite #202	New Bedford, MA 02740
58	Jeremy Hatch	Biology Department	University of Massachusetts	Boston, MA 02125
59	Scott Hecker	Massachusetts Audubon	2000 Main Street	Marshfield, MA 02050

#	Name	Agency/Organization	Address	City/State/Zip
60	William Hubbard	U.S. Army Corps of Engineers	424 Trapelo Road	Waltham, MA 02254-9149
61	Stan Humphries	ENSR	95 State Road	Buzzards Bay, MA 02532
62	Tim Iannuzzi	PTI Environmental Services	8201 Corporate Drive, Suite 680	Landover, MD 20785
63	David Janik	Coastal Zone Management	20 Riverside Drive	Lakeville, MA 02347
64	Richard Kellaway	Earth Day New Bedford	First Unitarian Church, 71 Eighth Street	New Bedford, MA 02740
65	James Kendall	Fishing Family Assistance Center	46 Foster Street, Foster Hill Place	New Bedford, MA 02740
66	James Kendall	New Bedford Seafood Coalition	104 Coop Wharf	New Bedford, MA 02740
67	Senator Edward M. Kennedy		2400 JFK Federal Building	Boston, MA 02203
68	M. Cathy Kiley		894 High Street	Fall River, MA 02720-3606
69	Honorable Robert Koczera	House of Representatives-11th	State House	Boston, MA 02133
70	Paul Koczera		115½ Bullard Street	New Bedford, MA 02746
71	Peter Kortright	Horizon Planning Group	P.O. Box 1005	Mattapoisett, MA 02739-0405
72	Ronald Labelle		294 Liberty Street	New Bedford, MA 02740
73	Patricia Lambert	Cape Codders for Wildlife Protection	P.O. Box 921	Orleans, MA 02633
74	John Lindsay	NOAA/HAZMAT- N/ORCA32	7600 Sand Point Way, N.E.	Seattle, WA 98115-0070
75	Dennis Luttrell	Buzzards Bay Action Coalition	P.O. Box 9399	North Dartmouth, MA 02747
76	Honorable Joseph B. MacIntyre	House of Representatives-12th	State House	Boston, MA 02133
77	Rafael Mares	Altern. for Community & Environment	2343 Washington Street, 2nd Floor	Roxbury, MA 02119
78	Marguerite Matera	NOAA-GCNE-NE	1 Blackburn Drive	Gloucester, MA 01930
79	Garry Mayer, Chief	NMFS - F/HC3	1335 East West Highway	Silver Spring, MD 20910
80	Michael McCormick		16 Briarwood Drive	New Bedford, MA 02745



#	Name	Agency/Organization	Address	City/State/Zip
81	Norman Meade	NOAA/NOS-N/ORCAx1	1305 East West Highway, Sta. 10218	Silverspring, MD 20910-3281
82	John Mello		13 Meadow Lane	Acushnet, MA 02743
83	Honorable Mark Montigny	State Senate	State House	Boston, MA 02133
84	Michael Moore	Woods Hole Oceanographic Institute	Mailstop 33	Woods Hole, MA 02543
85	Daniel Morast	International Wildlife Coalition	70 East Falmouth Highway	East Falmouth, MA 02563
86	Chris Moriarty		4 Fenton Street	North Dartmouth, MA 02747
87	Howard Nickerson	Offshore Mariners' Assoc., Inc.	14 MacArthur Drive	New Bedford, MA 02740
88	Marty Niemiec		173 Popes Island	New Bedford, MA 02740
89	Ian C.T. Nisbet		150 Adler Lane	North Falmouth, MA 02556
90	Craig O'Connor, Special Counsel	NOAA - GCNR	1315 East West Highway, SSMC3, Rm. 15706	Silver Spring, MD 20901
91	Robert Olivera		35 Rodman Street	Fairhaven, MA 02719
92	Art Oliveira	2 Harbor View Avenue	P.O. Box 301	Fairhaven, MA 02719
93	Jeffrey Osuch, Town Executive	Town of Fairhaven	40 Centre Street	Fairhaven, MA 02719
94	Dr. Kenneth E. Paulsen		211 Main Street	Fairhaven, MA 02719
95	Robbin Peach	Massachusetts Environmental Trust	33 Union Street, 4th Floor	Boston, MA 02108
96	Katherine Pease	NOAA/GCNR-SW	501 W. Ocean Blvd., Suite 4470	Long Beach, CA 90802
97	Sharon Pelosi	Exec. Office of Environmental Affairs	100 Cambridge Street	Boston, MA 02202
98	Roland Pepin		64 Slocum Street	Acushnet, MA 02743
99	Debbie Pfnister		Thomas Avenue	West Wareham, MA 02576
100	Honorable John F. Quinn	House of Representatives-9th	State House	Boston, MA 02133

#	Name	Agency/Organization	Address	City/State/Zip
101	Andrew Raddant	Office of Envir. Policy & Compliance	408 Atlantic Avenue, Room 142	Boston, MA 02210-3334
102	Herb Rego	Asst. Dir. of Recreation	P.O. Box 1804	New Bedford, MA 02740
103	Dorothy Reichard	Congressman Barney Frank	437 Cherry Street	West Newton, MA 02165-2017
104	Bob Rocha	Coalition for Buzzards Bay	P.O. Box 3006	New Bedford, MA 02741
105	Mr. George Rogers, President	New Bedford City Council	133 William Street	New Bedford, MA 02740
106	Dan Rohlf	Lewis & Clark Law School	10015 SW Terwilliger Blvd.	Portland, OR 97219
107	Roman Rusinoski		P.O. Box 163	Fairhaven, MA 02719-0163
108	Jenny Russell	Island Foundation	589 Mill Street	Marion, MA 02124
109	Frederick R. Satkin	c/o Satkin Mills, Inc.	8 Washburn Street	New Bedford, MA 02740
110	Fred C. Schmidt	The Libraries - Documents Dept.	Colorado State University	Fort Collins, CO 80523-1019
111	John W. Sherman	Town of Dartmouth	400 Slocum Road	North Dartmouth, MA 02747
112	Jack Stewardson	New Bedford Standard Times	555 Pleasant Street	New Bedford, MA 02740
113	Gail Siani	NOAA-DARC	7600 Sand Point Way NE, Bin 15700	Seattle, WA 98115
114	Russell Silvia		97 Coffin Avenue	New Bedford, MA 02746
115	Sgt. J.R. Simmons		P.O. Box 787	Fairhaven, MA 02719-0700
116	Elsie Souza	Congressman Barney Frank	558 Pleasant Street	New Bedford, MA 02740
117	Antone G. Souza, Jr.		P.O. Box 8758	New Bedford, MA 02742
118	William M. Strauss		8 Nashawena Road	Mattapoisett, MA 02739
119	Kathy Sturtevant		22 Briercliff Road	Fairhaven, MA 02719
120	Lawrence Sylvia	Family Fisheries	One Greene & Wood Pier	New Bedford, MA 02740
121	Capt. Mike Taylor	Maritime Terminal Inc.	P.O. Box 7745	New Bedford, MA 02740

#	Name	Agency/Organization	Address	City/State/Zip
122	Rodman Taylor	Taylor Seafoods	56 Goulart Memorial Drive	Fairhaven, MA 02719
123	Mayor Frederick Kalicsz	City Hall	133 William Street	New Bedford, MA 02740
124	Mark Rasmussen, Exec. Dir.	Coalition for Buzzards Bay	P.O. Box 3006	New Bedford, MA 02741
125	James Turek	Vanasse Hangen Brustlin, Inc.	530 Broadway	Providence, RI 02909
126	Wayne Turner	Water Works Group	P.O. Box 197	Westport Point, MA 02791
127	Arthur Valois		716 High Hill Road	North Dartmouth, MA 02747
128	Kevin Villa	Town of Fairhaven	Natural Resource Officer, 31 Bay Street	Fairhaven, MA 02719
129	Shaun P. Walsh		33 16th Street	Fall River, MA 02723
130	Monica Wheeler	Indiana Dept of Environmental Mgmt	100 North Senate Avenue, P.O. Box 6015	Indianapolis, IN 46206-6015
131	Dave Whittaker	Division of Marine Fisheries	50A Portside Drive	Pocasset, MA 02559
132	Jennifer Zorn	Edwards & Kelsey	299 Madison Avenue	Morristown, NJ 07962-1936
133	Paul A. Zychowicz		Box 58	Mattapoisett, MA 02739

## CHAPTER 9: REFERENCES

Army Corps of Engineers (ACOE). 1970. New England Division. Small Navigation Project - New Bedford and Fairhaven Harbor, Massachusetts - Detailed Project Report.

----- . 1988. Wetland Study Report for the New Bedford Superfund Site. U.S. Army Corps of Engineers, New England Division. Prepared by IEP, Inc., Final Report.

----- . 1990. New Bedford Harbor Superfund Pilot Study. Evaluation of Dredging and Dredged Material Disposal. U.S. Army Corps of Engineers, New England Division. May 1990.

Bartlett, M. 1997. Letter to Jack Terrill dated February 12, 1997.

Battelle Memorial Institute. 1990. Modeling of the Transport, Distribution, and Fate of PCBs and Heavy Metals in the Acushnet River/New Bedford Harbor/Buzzards Bay System. Volume I. Final Report. Contract No. 4236-MOD-0019 to EBASCO Services, Inc.

Belding, D.L. 1909. A Report Upon the Mollusk Fisheries of Massachusetts. Boston: Wright and Potter.

----- . 1912. A Report upon the Quahog and Oyster Fisheries of Massachusetts. Division of Marine Fisheries.

----- . 1912. A Report upon the Alewife Fisheries of Massachusetts. Division of Fisheries and Game.

Bellmer, R. J. 1988. The infaunal community of a polychlorinated biphenyls polluted harbor, New Bedford, Massachusetts, USA. Waltham, MA: ACOE New England Division.

Bigelow, H. B., & Schroeder, W. C. 1953. Fishes of the Gulf of Maine. Washington: USGPO.

Boss, J. A. and J. D. Thomas, 1983. New Bedford - A Pictorial History. The Donning Company. Norfolk, VA.

Brady, Phillip, Massachusetts Division of Marine Fisheries, Sandwich Laboratory. Personal communication to James Turek, VHB Inc., 1996.

Buzzards Bay Project. 1991. Buzzards Bay Comprehensive Conservation and Management Plan.

Cardin, S.X., A.B. Howe, S.J. Correia, and T.P. Currier. 1995. Evaluating the effects of two coastal mobile gear fishing closures on finfish abundance off Cape Cod. *N. Amer. J. Fish Manag.* 15:300-315.

CDM. 1983. Interim Summary Report on Combined Sewer Overflows-- Phase 1. Boston, Massachusetts. Report prepared by Camp, Dresser & McKee, Inc., for the City of New Bedford.

-----. 1987. Draft Phase I Facilities Plan and Screening Studies. Boston, Massachusetts. Report prepared by Camp, Dresser & McKee, Inc., for the City of New Bedford.

-----. 1990. City of New Bedford Phase 2 Facilities Plan. Volume IV. Effluent Outfall. Report prepared by Camp, Dresser & McKee, Inc., for the City of New Bedford.

CLF. 1988. Lost Harvest. Sewage, Shellfish, and Economic Losses in the New Bedford Area. Boston, MA. Conservation Law Foundation

Code of Federal Regulations (C.F.R.). 1995. Washington: USGPO.

Code of Massachusetts Regulations (C.M.R.).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund"). 42 U.S.C. §9601 *et seq.*

Costa, J.E. 1988. Eelgrass in Buzzards Bay: Distribution, Production, and Historical Changes in Abundance. Buzzards Bay Project BBP-05.

Costello, Charles, Massachusetts Department of Environmental Protection, Wetlands Conservancy Program, personal communication to James Turek, VHB Inc., 1996.

Craffey, P., MADEP Project Manager. Letter to T. Ardito, July 19, 1996.

DHCD. 1996. Community Profiles. World Wide Web page. Massachusetts Department of Housing and Community Development. <http://www.magnet.state.ma.us/eocd/>

Dickerson, D., EPA New Bedford Harbor Site Manager. Personal Communication, 16 Feb 1996.

-----. Public Presentation: New Bedford Harbor Superfund Site: Community Forum, Nov. 29, 1995, Poster Session. New Bedford, MA.

DMF. 1995. PCB tissue analysis data summary: Acushnet River. Salem, MA: Massachusetts Division of Marine Fisheries, Cat Cove Marine Laboratory. Report #B010-011.

DOC. 1996. 1990 Census Lookup. World Wide Web page. US Census Bureau, US Department of Commerce. <http://venus.census.gov/cdrom/lookup>

-----. 1995. Towards sustainable development: A federal response to the crisis of Northeast fisheries. Draft report. Washington: NOAA Office of Sustainable Development and DOC Economic Development Administration. January.

-----. 1993. Statistical Abstract of the United States 1993. Washington: USGPO.

-----. 1992a: 1990 Census of Population. General population characteristics: Massachusetts. 1990-CPH-1-23. Washington: USGPO.

-----. 1992b: 1990 Census of Population. Social and economic characteristics: Massachusetts. 1990-CPH-2-23. Washington: USGPO.

Doeringer, P.B., P.I. Moss, and D.G. Terkla. 1986. The New England Fishing Industry. Jobs, Income and Kinship. Amherst: University of Massachusetts.

DOJ. 1992. United States and the Commonwealth of Massachusetts complete \$109 Million Settlement in New Bedford Harbor Superfund Case. Press release, Sept. 4. No city.

Ebasco Services Incorporated (EBASCO). 1990. Draft Final Baseline Ecological Risk Assessment. New Bedford Harbor Site Feasibility Study. EPA Work Assignment Number: 04-1L43 EPA Contract Number: 68-01-725C.

Eldridge Tide and Pilot Book. 1994. Charts of Currents, Buzzards Bay, Vineyard and Nantucket Sounds.

Ellis, L. B. 1892. History of New Bedford and its vicinity, 1602-1892. Syracuse: D. Mason & Co.

EPA. 1996. Proposed Cleanup Plan, Upper and Lower New Bedford Harbor. November. Boston: EPA Region I.

-----. 1995. New Bedford Harbor Superfund Site, Community Forum. Poster Session. November 29. Boston: EPA Region I.

-----. 1992. EPA Proposes Cleanup Plan to Address Contamination in the Estuary and Lower Harbor/Bay at the New Bedford Harbor Site. Boston: EPA Region I, Office of Public Affairs, January.

-----. 1990a. EPA Environmental News: EPA selects cleanup plan for Hot Spot at New Bedford Harbor Superfund Site. Press release April 9. Boston: EPA Region I Office of Public Affairs.

-----. 1990b. Feasibility Study of Remedial Alternatives for the Estuary and Lower Harbor/Bay, New Bedford, Massachusetts. Volumes I and II. Draft Final. August 1990. EPA Work Assignment Number 04-1L43. EPA Contract Number 68-01-7250.

-----. 1990c. Baseline Ecological Risk Assessment, New Bedford Harbor. EPA. 1996.

Fairhaven, Town of. 1965. Comprehensive Report - Fairhaven Master Plan. Prepared by Economic Development Associates, Inc. Boston, MA.

Federal Register (F.R.). 1995. Washington: USGPO.

Fonseca, M.S., W.J. Kenworthy, F.X. Courtney, and M.O. Hall. 1994. Seagrass planting in the southeastern United States: methods for accelerating habitat development. *Restoration Ecology* 2(3): 198-212.

Fonseca, M.S. 1994. A guide to planting seagrasses in the Gulf of Mexico. Texas A&M University Sea Grant College Program; TAMU-SG-94-601.

-----, 1992. Restoring seagrass systems in the United States. In Thayer, G.W. ed. *Restoring the Nation's Marine Environment*, pp. 79-110.

-----, 1990. Regional analysis of the creation and restoration of seagrass systems. pp. 175-198. in Kusler, J.A., and Kentula, M.E. ed. *Wetland Creation and Restoration: The Status of the Science*. Island Press, Washington, D.C.

Fonseca, M.S., W.J. Kenworthy, G.W. Thayer, D.Y. 1982. A low- cost planting technique for eelgrass (*Zostera marina* L.). U.S. Army Corps of Engineers, Waterways Experiment Station, Coastal Engineering Technical Aid No. 82-6, Vicksburg, Mississippi.

Germano, F. 1987. As referenced in Conservation Law Foundation, 1988.

Golet, F.C., A.J.K. Calhoun, W.R. DeRagon, D.J. Lowry, and A.J. Gold. 1993. Ecology of Red Maple Swamps in the Glaciated Northeast: A Community Profile. U.S. Fish and Wildlife Service. Biological Report 12. June 1993.

Govoni, J.J. 1973. The Distribution of Some Marine Fish Eggs and Larvae in the Acushnet and Westport River Estuarine Systems, Massachusetts. Southeastern Massachusetts University Report.

Harris, C. A. 1947. Old Time Fairhaven. Reynolds Printing. New Bedford, MA.

Heck, K.L., Jr., K.W. Able, M.P. Fahay, and C.T. Roman. 1989. Fishes and decapod crustaceans of Cape Cod eelgrass meadows: species composition, seasonal abundance patterns and comparison with unvegetated substrates. *Estuaries* 12(2):59-65.

Hegerty, R. B. 1959. New Bedford's history. Monograph. New Bedford: Reynolds-DeWalt.

Hoff, D. J. et al. 1973. A biological assessment of the Acushnet River Estuary. Unpublished paper. North Dartmouth, Mass.: Southeastern Massachusetts University.

Howes, B.L. and D.D. Goehringer. In press. Ecology of Buzzards Bay: An Estuarine Profile. National Biological Service, Washington, D.C. Information and Technology Report.

Huguenin, M. T. and K. M. Childs, Jr. 1986. Assessment of economic damages associated with the use of New Bedford Harbor sediments. Unpublished draft report prepared for NOAA Ocean Assessment Division. Rockville, MD: April.

Hurley, S. 1996. Fisheries Information Summary: Acushnet River. Massachusetts Division of Fish and Wildlife.

Hutt, F. W. 1924 (ed.). A History of Bristol County, Massachusetts. Lewis Historic Publishing Company, New York, New York/Chicago, IL.

Kirkman, H. 1992. Large-scale restoration of seagrass meadows. In Thayer, G.W. ed. Restoring the Nation's Marine Environment, pp. 111-140.

Kolek, Drew, Massachusetts Division of Marine Fisheries, Recreational Fishing Group, personal communication to James Turek of VHB, Inc., 1996.

Kolek, A. & R. Ceurvels. 1981. Polychlorinated biphenyl (PCB) analyses of marine organisms in the New Bedford area, 1976-80. Boston: Commonwealth of Massachusetts, Division of Marine Fisheries, Pub. #12265-36-100-1-81-CR.

Laderman, A.D. 1989. The Ecology of Atlantic White Cedar Wetlands: A Community Profile. U.S. Fish and Wildlife Service. Biological Report 85(7.21). July 1989.

Lloyd Center. 1989. Environmental assessment of the Nonquitt Salt Marsh. S. Dartmouth, MA.: Lloyd Center for Environmental Studies, Report #89-6.

Malcolm Pirnie, Inc. 1982. The Commonwealth of Massachusetts. Acushnet River Estuary PCB Study. December 1982.

MHC. 1981a. Massachusetts Historical Commission Reconnaissance Survey Report. Community: New Bedford.

-----, 1981b. Massachusetts Historical Commission Reconnaissance Survey Report. Community: Fairhaven.

-----, 1981c. Massachusetts Historical Commission Reconnaissance Survey Report. Community: Acushnet.

-----, 1981d. Massachusetts Historical Commission Reconnaissance Survey Report. Community: Dartmouth.

McCabe, M (ed.). 1988. A Picture History of Fairhaven. Spinner Publishing, New Bedford, MA.

McConnell, K. E., and IEc, Inc. 1986. The damages to recreational activities from PCBs in New Bedford Harbor. Unpublished report prepared for NOAA Ocean Assessment Division. Rockville, MD: December.

McConnell, K. E., and Morrison, B. G. 1986. Assessment of economic damages to the natural resources of New Bedford Harbor: Damages to the commercial lobster fishery. Unpublished report prepared for NOAA Ocean Assessment Division. Rockville, MD: December.

McMullin, T.A. 1976. Industrialization and Social Change in a Nineteenth-Century Port City: New Bedford, Massachusetts, 1865-1900. PhD Dissertation, University of Wisconsin - Madison.



MDMF. 1995. 1993 Massachusetts Lobster Fishery Statistics. Massachusetts Division of Marine Fisheries, Tech. Series 28.

Mendelsohn, R. 1986. Assessment of damages by PCB contamination to New Bedford Harbor amenities using residential property values. Unpublished draft report prepared for NOAA Ocean Assessment Division. Rockville, MD: November.

Mendelsohn, R. et al. 1992. Measuring Hazardous Waste Damages with Panel Models. *Journal of Environmental Economics and Management*, Vol. 22, No. 3, May 1992.

Mitsch, W.J. and J.G. Gosselink. 1993. Wetlands. New York: Van Nostrum Reinhold.

MNHESP. 1996a. Letter from Ms. Holly Jewkes, Massachusetts Natural Heritage and Endangered Species Program, to James Turek, VHB, Inc., dated February 26, 1996.

----- 1996b. Letter from Ms. Andrea Arnold, Massachusetts Natural Heritage and Endangered Species Program, to Tom Ardito, dated November 14, 1996.

Natural Resource Damage Assessments. 43 C.F.R. § 11.10 *et seq.*

NBHTC. 1993. New Bedford Harbor Trustee Council: Our plan for moving forward. Unpublished report, dated October 1. Gloucester, MA.

----- 1993a. New Bedford Harbor Environment Restoration Workshop. June 1-3, 1993.

Nelson, W.G. et al. 1996. New Bedford Harbor Long-Term Monitoring Assessment Report: Baseline Sampling. U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Atlantic Ecology Division, Narragansett, RI. EPA/600/R-96/097

Nemerow, N.L. 1978. Industrial Water Pollution. Origins, Characteristics, and Treatment. Addison-Wesley Publishing Company. Reading, MA

New Bedford, City of. 1993. Our Mission is Jobs, A City/Business Partnership. An Inventory and Analysis of New Bedford's Economy - Background Data for the New Bedford Strategic Economic Development Plan, 1992-1993. Prepared by Land Use, Inc. City of New Bedford, MA.

Nisbet, I. C. T. 1990. Requests for Admission. Unpublished paper prepared for New Bedford Harbor Superfund Site litigation.

Nisbet, I.C. T. and L.M. Reynolds. 1984. Organochlorine Residues in Common Terns and Associated Estuarine Organisms, Massachusetts, USA, 1971-81. *Marine Environmental Research*, 11:33-66, 1984.

Nixon, S.W. 1982. The Ecology of New England High Salt Marshes: A Community Profile. U.S. Fish and Wildlife Service Office of Biological Services, Washington, D.C. FWS/OBS-81/55.

NOAA. 1995. New Bedford Harbor and approaches. Nautical chart. Washington: NOAA Coast Survey, chart #13232.

----- . 1994. Distribution and abundance of fishes and invertebrates in Mid-Atlantic estuaries. ELMR Report #12. Silver Spring, MD: NOAA National Ocean Service, Strategic Assessment Division. March.

----- . 1991. Coastal wetlands of the United States: An accounting of a valuable national resource. Monograph. Silver Spring, MD: NOAA National Ocean Service, Strategic Assessment Division. February.

----- . 1990. Estuaries of the United States: Vital statistics of a national resource base. Monograph. Rockville, MD: NOAA National Ocean Service, Strategic Assessment Branch.

NSSP. 1992. National Shellfish Sanitation Program, Manual of Operations, Part I, 1992.

NUS. 1984. Draft Feasibility Study of the Remedial Action Alternatives - Acushnet River Estuary Above Coggeshall Street Bridge, New Bedford, Massachusetts.

PCSD. 1996. Sustainable America. Report of the President's Council on Sustainable Development. Washington: USGPO. February.

Peterson, C.H., H.C. Summerson, and P.B. Duncan. 1984. The influence of seagrass cover on population structure and individual growth rate of a suspension-feeding bivalve, *Mercenaria mercenaria*. *Journal of Marine Research* 42: 123-138.

Pruell, R. J. et al. 1990. Geochemical Study of Sediment Contamination in New Bedford Harbor, Massachusetts. 29 Mar. *Env. Res.* 77-101.

Rosenberg, A. 1997. Memorandum to the Record, dated February 12, 1997.

Ross, M.R. and R.C. Biaggi. Undated. Marine Recreational Fisheries of Massachusetts: River Herring. University of Massachusetts/Massachusetts Division of Marine Fisheries.

Schwartz, J. P. 1988. Distribution and concentration of polychlorinated biphenyls in lobster, winter flounder, and quahogs from Buzzards Bay, Massachusetts. Unpublished draft report. Salem, MA: DMF. September 1988.

SES. 1988. New Bedford Harbor Superfund Project Wetland Assessment. Unpublished report prepared for ACOE, New England Division, by Sanford Ecological Services, Inc., September 1987 (Revised April 1988).

Short, F., University of New Hampshire Jackson Laboratory. Personal communication to John Catena. 1996

Sittig, M. 1975. Pollution Control in the Plastics and Rubber Industry. Pollution Technology Review No. 18. Noyes Data Corporation, Park Ridge, NJ.

Standard Times. 1995. Our View: Restoring New Bedford Harbor will help restore our very soul. *The Standard-Times*, New Bedford, MA. December 19, 1995.

Summerhayes, C.P. et al. 1977. Fine-grained sediment and industrial waste distribution and dispersal in New Bedford Harbor and western Buzzards Bay, Massachusetts. Woods Hole, Mass: Woods Hole Oceanographic Institution, Technical Report WHOI-76-115

Teal, J.M. 1984. The role of one salt marsh in coastal productivity *In*: Productivity Pollution and Policy in the Coastal Zone. Proc. Conf. in Rio Grande, Brazil.

Teal, J. and M. Teal. 1969. Life and Death of the Salt Marsh. Ballantine Books. New York, NY.

Terres, J.K. 1980. The Audubon Society Encyclopedia of North American Birds. Alfred A. Knopf, New York, NY.

Terrill, J. 1997. Letter to Douglas Beach, National Marine Fisheries Service, and Michael Bartlett, U.S. Fish and Wildlife Service, January 9, 1997.

Thayer, G., W.J. Kenworthy, and M.S. Fonseca. 1985. The Ecology of Eelgrass Meadows of the Atlantic Coast: A Community Profile. U.S. Fish and Wildlife Service, Slidell, LA. FWS/OBS-84/02.

Tiner. 1987. A field guide to coastal wetland plants of the Northeastern United States. Amherst: University of Massachusetts Press.

Trustees for Natural Resources. 40 C.F.R. § 300.600 *et seq.*

United States Code (U.S.C.). 1995. Washington: USGPO.

U.S. House of Representatives. 1846. Fortifications at New Bedford. Report to the 29th Congress. 1st Session. Document No. 327.

-----. 1851. Report to the 31st Congress. 2nd. Session. House Report No. 21.

-----. 1874. Letter from the Secretary of War. New Bedford and Nantucket Harbors in Massachusetts. Report to the 43rd Congress. 2nd Session. Document No. 75. Part 3, including Map of New Bedford Harbor.

-----. 1892. Report to the 52nd Congress. 1st Session. Public Park, New Bedford, Mass. Report No. 1398.

-----. 1897. Letter to the 54th Congress. 2nd Session. Survey of Channel in New Bedford Harbor, Massachusetts. Document No. 146.

-----. 1898. Report to the 55th Congress. 2nd Session. Dredging the Channel in New Bedford Harbor, Massachusetts. Report No. 985.

Valiela, I. 1984. Marine ecological processes. New York: Springer-Verlag.

VHB. 1996. New Bedford Harbor: Historic overview and natural resources and uses status report. Prepared for New Bedford Harbor Trustee Council by Vanesse Hangen Brustlin, Inc. Gloucester, MA: July.

Weaver, G. 1984. PCB contamination in and around New Bedford, Mass. Environ. Sci. Technol., V. 18, No. 1, 22-27.

----- . 1982. PCB pollution in the in the New Bedford, Massachusetts area: A status report. Boston: Massachusetts Office of Coastal Zone Management.

Whittaker, D., Mass. DMF. 1996. Personal communication, 8 July 1996.

WHALE. 1995. Harbor Visions! New Bedford, Briefing Booklet. Shaping the City's Edge.

Whitlatch, R.B. 1982. The Ecology of New England Tidal Flats: A Community Profile. U.S. Fish and Wildlife Service, Slidell, L.A.

## CHAPTER 10: COMMENTS/RESPONSES

### **Chapter Outline:**

10.1 Comments .....	10-2
10.2 Response to Comments .....	10-95
10.2.1 General/Technical Comments.....	10-95
10.2.2 Preferred Alternatives .....	10-102
10.2.2.1 Padanaram Salt Marsh Restoration.....	10-102
10.2.2.2 Nonquitt Salt Marsh Restoration.....	10-102
10.2.2.3 Taber Park.....	10-105
10.2.2.4 Riverside Park/Belleville Avenue Recreational Park.....	10-105
10.2.2.5 Hurricane Barrier Box Culvert.....	10-106
10.2.2.6 Eelgrass Habitat Restoration.....	10-107
10.2.2.7 Land Conservation - Sconticut Neck Marshes and Coastline.....	10-108
10.2.2.8 Restoration and Management of New Bedford Area Shellfishery .....	10-109
10.2.2.9 Herring Run Restoration.....	10-110
10.2.2.10 Restoration and Management of Tern Populations .....	10-110
10.2.3 Other Alternatives .....	10-115
10.2.3.1 New Bedford Aquarium/Oceanarium.....	10-115
10.2.4 Preferred Studies, Plans, Educational Activities .....	10-116
10.2.4.1 New Bedford/Fairhaven Harbor Master Plan.....	10-116
10.2.4.2 Wetlands Restoration Planning:New Bedford Harbor Environment.....	10-116
10.2.5 New Alternatives .....	10-116

## **10.1 Comments**

NONQUITT SALT MARSH

---

When a private company or corporation pollutes or destroys a natural resource, they are required to clean up the pollution and restore the resource. The \$20,000,000 in restoration funds is money resulting from just such an event.

The residents of Nonquitt have for over one hundred years and six generations functioned as a single corporate entity, with chosen members who determined policy: built roads, piers, buildings, hired employees and bought property. In short, through officers and an executive committee they conducted their common business affairs in the same accepted manner as the very companies we sued.

Drainage to the Nonquitt salt marsh occurred on their watch and on their property as a result of decisions made by their overseers over scores of years. Whether through lack of foresight, errors of omission, errors of commission; it doesn't really matter. They did it to their own property in their own very private enclave. They managed their own affairs and did not ask the rest of the world for anything but prompt mail delivery. (even on Sundays)

The salt marsh drainage has been an ongoing problem for most of this century, probably as a result of failure to dredge out the original outlet at Barekneed Creek and instead resort to a culvert and/or pipe located at Otter Creek. The Otter Creek outlet has been a maintenance problem for over seventy years and remains so to this day. Over the years there have been storms such as the 1938 hurricane which blew open the original outlet at Barekneed Creek and blew another outlet through the barrier beach midway between Barekneed Creek and Otter Creek (see aerial photograph). Perhaps Mother Nature was trying to tell them something. At least some of the long time residents of Nonquitt eventually began to get the message.

*"In South Nonquitt, the marsh is quite sick. Nature is becoming a sign board full of dire warnings."*

William Julian Underwood, 1987

Mother Nature wasn't the only bearer of bad tidings: beginning sixteen years ago a series of studies of the marsh indicated all was not well. Quotes from the two latest studies follow.

1989 Study by Lloyd Center  
for the Nonquitt Association

*"...any corrective measures will be costly and will involve significant permitting obstacles. This includes any of Metcalf & Eddy's Solution Alternatives (1983). Before further action is contemplated, Nonquitt residents should reach a consensus on what direction to pursue,...."*

1994 Study by Lloyd Center  
for Dartmouth Natural Resources Trust

*"A complete hydraulic study of the marsh ... is beyond the capabilities of the Lloyd Center and is probably cost prohibitive to pursue privately. However, the National Oceanic and Atmospheric Agency (NOAA) has expressed interest in the Nonquitt Marsh as a site for salt marsh restoration. The DNRT along with the Dartmouth Conservation Officer should pursue this possibility, which would bring the necessary expertise and funding to this project."*

Faced with ominous signs and portents, Nonquitt prudently decided to quietly divest itself of the sick marsh and troublesome culvert. From 1983 to 1988 five parcels of the property were conveyed to a Philadelphia Conservationist Trust. This trust then conveyed the properties to the Dartmouth Natural Resources Trust in 1991 to 1993. Giving can be a generous act, but in some cases, such selflessness can be extremely self-serving. The private enclave of Nonquitt was now in a position to apply for restoration funds to study and perhaps restore the sick marsh that had been solely theirs for nearly a century. It seems quite apparent to me that some very well informed people surmised that restoration fund money was coming down the road long before the common folk knew it.



The irony implicit in this situation is that the hundred and twenty summer residences in North and South Nonquitt could certainly raise money nearly equal to the requested grant amount if assessed a thousand dollars per residence. For people of means this would not be a hardship. Consider this:

*"The beach arrived at nine (she brought her own truckload of sand for her rocky shore), the liquor arrived at eleven, the servants arrived at three. Summer has begun!"*

Prominent seasonal resident in South Nonquitt, 1970s

Confronted with such penurious behavior we should perhaps sue the Incorporated Proprietors of Nonquitt for damaging a natural resource (the salt marsh) and polluting the shore line and its shellfish with E.Coli bacteria.

From the Desk of:

## **LAWRENCE M. SYLVIA**

342 Hathaway Blvd. Unit #38▼ New Bedford, MA 02740

Mailing Address: P.O. Box 51293 ▼ New Bedford, MA 02745-0041

Tel: (508)-990-7519 ▼ Fax: (508)-992-4657 ▼ E-Mail:Primestar5@aol.com

### **DATED FAX TRANSMISSION**

**1 of 4 Pages**

Wednesday, January 15, 1997

NB Harbor Trustee Council  
Att: Mr. Jack Terrill  
37 North Second Street  
New Bedford, Ma 02740

Dear Jack:

Please accept these comments from myself as an individual member of CRAB and as a Citizen of the City of New Bedford. I wish these cements to be sent to you in full text, and maybe combined with any other CRAB members comments, but MUST BE sent to you in entirety. I wish these comments to be included in the General Public comments once the EIS is released for Public review and comments.

In General the EIS is well written and contains all information that is needed to get the WHOLE picture on PCB's and the New Bedford Harbor. I suggest that you prepare an Executive summary to shorten the material sent, and if some wants to request the full package it will be available. If the general Public is to review the rationale behind the accepted Proposals, the full EIS is too much to read and understand. The Executive summary should contain the Rationale for the Accepted Proposals as well as the rejected ones.

I also request that the Chart that you did (without Corrections) that listed CRAB & TAC approved projected also be included in EIS. Somewhere in here it says that the CRAB and TAC made recommendations and I want the Public to SEE this list!!!!

A General Comment, There is still some dissention among some Crab members about the Process and judgements that where made by the Trustees and Accepted Projects. It is my personal belief that it is a Well Rounded Group of Projects and will benefit the Public and is the starting process to fulfil the Public interest.

When Crab made its recommendations we attached a list of Pre-Requisites that we would like if a certain Project(s) where to move ahead. Some-where along the lines they are forgotten or not made part of the letters of intent to move forward with a possible accept project. This has only lead to the increased and friction among CRAB members, including myself. It in many ways has lead to the general feeling that CRAB was used as a pawn or a Shield for the Trustees.

Comments on the EIS:

page 10-6

Pages 3-57 line 29 Incorrect

The Car & Passenger services from Steamship authority was ceased, but in 1985? A passenger service Cape & Islands Express(Scamanchi) was established from New Bedford to Martha Vineyard and is Currently operating .

Preferred Alternatives: pre-requisite should be added...

#### WETLANDS RESTORATIONS:

It is my understanding that for any Wetland Restoration Program to succeed there has to be clean and non polluted water to start. The Trustees, nor State of Massachusetts has set out a preliminary review to see if any Wetlands areas meet this clean non-polluted water review. With the limited dollars available, I would much rather spend it on Wetlands Restorations projects that will be successful, and not damage any other areas. This should be a pre-requisite before any proposal moves ahead. The DEM & MASS Wetlands restoration Agency, and along with Town/City Agencies should review water samples in salt Marshes at low use, and high use to make sure all areas are clean, and non- polluted BEFORE any dollars are spent.

#### Pages 4-14 4.3.1.22 NONQUIET SALT MARSH

Monitoring for 10 years by Private Agency and separate funding will be requested. Why in one proposal (4.3.1.2 Padnarm Salt Marsh) the Monitoring will be by the Dartmouth enviromental Affairs, Massachusetts Office of Enviromental Affairs & Wetland Restoration Program, and in the Same town a Private Group or consultant will be hired at an additional requested amount in the future for 10 years of Monitoring??? This Additional 10 years of Monitoring at Additional Costs WAS NEVER Reviewed by CRAB to my knowledge.

4-15 line 25 it can be debated if this area is OPEN to and serves as a recreational resources. Viewing from a Platform, maybe be educational, but Recreational in my minds means PUBLIC access and enjoyment and this AREA Doesn't Allow this with Access.

#### 4-15 Lines 9-19 Benefits to resources:

There has been SERIOUS questions raised about the Water Quality to begin with in this Tidal Marsh. There is some growing belief that Cesspool Run offs and leakages has lead to a polluted Saltmarsh and any Additional Tidal OUTFLOW may bring this Polluted Water out into the Bay and may possible close the Fishing beds in the area. Until this allegation can be reviewed and water Quality samples taken for the Marsh at Peek (SUMMER) and Low ( Winter) as well as Test of Cesspools in the Adjourning areas for Leakages, not funds should be Released for this Project. [see my General comments on Wetlands Restorations]

4-16 Lines 39 See comments above 4-15 9-19... IF this Marsh is indeed polluted or can be in summer months due to leakage from old Cesspools then the shellfish beds along with Fish in the Run off areas can be seriously damaged.

#### 4-17 lines 15,16

Access is available by boat but by a private road???

Are you meaning Access is NOT Available by Boat, but by a Private Road?? Again access is PRIVATE, and only access is for a Newly constructed Viewing platform. And this viewing platform engineering and construction costs should not be included in funding for this project. It must be a pre-requisite for funding,,, if Projects meets all requirements including Water Quality.

#### 4-52 NB area Shellfish Restoration

I believe that the Commonwealth along with the Federal Government has put a Dollar figure on the

Costs of all Shellfish in the Inner Harbor that has been lost or is Condemned. If I were to use current sampling and estimates the Lost \$\$ Amount can EXCEED the Total 20 Millions dollars in the current fund!!! Serious allocations must be given to present and future years. It list the costs as \$425,000 for first year, and says the Program would continue for two additional years for a total of three years. That are the Budget amounts for the next two years?? I want to make sure that these additional two years funds don't get lost or misplaced!!!

#### 4.3.6.21 BB Tern Restoration Project

line 43

I have SERIOUS problems with restoring Terns by (2) MANAGING GULLS ( killing etc). I feel that the Fourth component should become the FIRST toxicological analyses of tern eggs to monitor PCB levels.. All others should follow this as Number one. This seems to be the bases that ALL TERNS have and ARE Eating out of the Hot spots, and ALL Terns are damaged!!!

4-62 lines 25-26.. Where are these Whale Watching Tours operating out of New Bedford. Yes they may Winter in Fairhaven.. But they have NEVER operated out of New Bedford. Who ever wrote this should do his/her research. It could have said that the rebirth of Terns could lead to possible Bird Watching tours operating out of New Bedford, and maybe as successful as the Whale Watching tours operated out of other Massachusetts Ports!!!

This makes anyone who reviews this to QUESTION all of your written material be it either correct or in correct. This sentence damages the Whole EIS in my opinion. Now we have to spends Hours, upon Hours to review EACH Word and Sentence for correctiveness..

#### 4-63 lines 1-10 Reliability of techniques.

If they plan to Use TRUSTEE Dollars to KILL GULLS, as they did else where on another Island.. I questions if this technique was reliable and Tested. I say it is not, and does not meet with the General Publics reviews of Wild Life Management. If the Trustees move ahead and Do Not put a prohibition on any of the Trustee Dollars being spent on Gull Killings, I will personally Lead a QUEST with Public Demonstrations, Letter Writing, Congressional Assistance, and well as the Radical Animal Rights Groups. This may in some ways hold up this Project and think it is very important. But No Other Species should be killed by any means with Trustee Money!!!!

#### 4-64 Lines 25-34 Wildlife:

The most likely techniques would be that the to either trapping or the Poisoning of Adult Gulls.... Line 31-32.. The Physical...Islands would not have any adverse effect on any wildlife Species..... WHAT ABOUT THOSE DAM GULLS you are GOING TO KILL & POISON??

See Comments above 4-63 1-10 No TRUSTEE FUNDS Should be used to Kill. Poison any other Animal or Gulls.. If this moves Ahead Be prepared for the FIGHT and demonstrations at all COUNCIL Meetings, and Press Conferences, and Black SHADOW on the Whole Trustees Restoration Ideas!!!!

Comments on this Proposal.. There is a pre-requisite that All Current Funding Remain in place and that the trustees Funds are in additional to current funds. NO Where does it list currents sources, and amounts of Present funds. It seems to have slipped in the cracks, and wish this information in the EIS!!!!

It concerns me that these tern Proposals are allot more lengthy than any of the Other Proposal, and looks like a JUSTIFICATION by the Trustees and Presenters.. It should be made to look and be the same lengthen as the others..

#### 5-12 5.4.2.3 Budgets..

I do not remember, and yes forget things but at which meeting did the Trustees Vote to completely limit the near Term to Appx 5 Million? Does this Limit include all Possible future year funding? And all Current and Future Studies now or being funded presently??

7-2 Correction

I Lawrence M. Sylvia should be listed a Seafood Processor/Dealer Representative

I wish to thank you for the oportunity to review and comment on this DRAFT EIS.

Yours,

*Larry Sylvia*

LARRY SYLVIA,  
MEMBER OF CRAB  
Citizen of New Bedford

Forever Effected Family Harbor Property & Business Owner Of Seafood Processor/Dealer  
& Other Inner Harbor Associated Business & Property Owner  
(Box Company Inner Harbor North Front Street)

cc: Peg Brady , Alt. TrusteeComonwealth of Mass CZM  
John Bullard NOAA Trustee  
Michael Bartlett, USFWS, Trustee



CITY OF NEW BEDFORD  
MASSACHUSETTS

OFFICE OF THE CITY CLERK  
133 WILLIAM STREET 02740-6182  
Tel. (508) 979-1450

MAR 27 1997

JANICE A. DAVIDIAN  
CITY CLERK  
CLERK OF THE CITY COUNCIL

CLAIRE P. LEMOS  
ASSISTANT CITY CLERK

SHARON M. THOMAS  
ASSISTANT COUNCIL CLERK

March 24, 1997

Comments: T-1, T-2, T-3

New Bedford Harbor Trustee Council, Jack Terrill, Coordinator  
1 Blackburn Drive  
Gloucester, MA 01930-2298

Dear Mr. Terrill:

At the meeting of March 13, 1997, the New Bedford City Council, acting on a motion filed by City Council President George Rogers and Ward Two City Councillor Paul Koczera, voted to "endorse the position enumerated by Jim Simmons, President, HANDS ACROSS THE RIVER COALITION, on the issue of the expenditure of funds by the New Bedford Harbor Trustee Council; and further, that we advise Senators Kennedy and Kerry, Congressman Frank, EPA Regional Office and Harbor Trustee Council of our position."

The poisoning, shooting and/or harassing of one group of birds to benefit another seems unnatural and excessive, not to mention an unwise use of federal funds and the reenforcement and rebuilding of an island that nature seems bent on removing seems to fly in the face of ordinary common sense and past federal policies.

Your help in this matter would be appreciated.

Yours very truly,

Janice A. Davidian, City Clerk  
Clerk of the City Council

JAD:ros

cc: Mr. Jim Simmons  
HANDS ACROSS THE RIVER COALITION  
222 Union Street  
New Bedford, MA 02740

H.A.R.C.



ENVIRONMENTAL

The Honorable:

Senator John Kerry  
421 Senate Russell Bldg.  
Washington, D.C. 20510  
Fax # 2022242742 D.C.  
6175558510 Boston

I am writing this letter to make you aware (if you are not already) of the total OUTRAGE of the group that I have been elected to represent, Hands Across the River Coalition (H.A.R.C.) and possibly every person that has concerns about our environment on the whole south coast. H.A.R.C., in partnership with the International Wildlife Coalition of East Falmouth, and others, request your assistance in a matter of great urgency involving the questionable expenditure of \$680,000 being planned by the New Bedford Harbor Trustee Council (NBHT). According to their draft Restoration Plan and Environmental Impact Statement circulated to the Citizens Restoration Advisory Board (CRAB) members, the NBHT proposes to use \$680,000 on so-called tern restoration projects which involve the following questionable methods and expenditures:

1. The poisoning, shooting and harassment of wildlife predators, including gulls, raptors (hawks, falcons,

owls, night herons and various mammal predators on Penikese, Rail and Bird Islands in Buzzards Bay.

2. The expenditure of \$400,000 for the Army Corp of Engineers to rebuild part of uninhabited Ram Island as it is being eroded by natural ocean and weather forces. Our organizations applaud general efforts to help threatened and endangered species, however, the use of any of the New Bedford Harbor Superfund monies allocated to harbor restoration (\$21,300,000) for the questionable killing of wildlife other than terns by certain sections of the US Fish and Wildlife Service is unacceptable. The USFWS is one of three members of the NBHT and is in a conflict of interest on this matter; they are funding their own agency with money which should be spent on projects which benefit a broader selection of wildlife and habitat in the specific New Bedford area affected by the PCB pollution. Further to the above, the use of \$400,000 to rebuild a small island in Buzzards Bay that nature is washing away, is extremely disturbing. If the logic is to spend this amount of money to help restore a wildlife habitat for one species that may have been affected by PCB, why not spend

H.A.R.C.



ENVIRONMENTAL

this sum on sewage treatment or landfill capping in the New Bedford area. This would, in turn, help all species of wildlife (including valuable commercial fish and shellfish stocks) directly in the area hardest hit by the PCB pollution.

The Draft Restoration Plan is available from the New Bedford Trustee Council, as they have already circulated it to the CRAB group. If the NBHT is unwilling to provide you with this document, we will certainly be willing to provide you a copy.

Also please note that the Restoration Advisory Board voted against the project(s) in question; however, the New Bedford Trustee Council, made up of the USFWS, NOAA and the EOEI elected to ignore the CRAB vote and saw fit to award themselves the \$680,000 for their "in-house" tern restoration programs.

Please assist us if at all possible. The citizens of the greater New Bedford/Buzzards Bay area need significantly better independent oversight of the PCB Superfund restoration monies. Twenty-one million dollars is a great

temptation for the three governmental agencies involved and it appears it is a temptation they cannot resist.

THANK YOU FOR TIME TO CONSIDER THIS MATTER.

PREP: International-Wildlife  
Coalition, Falmouth

Daniel Morant

Sincerely yours,

Jim Simmons





Comments on  
Buzzards Bay/New Bedford Harbor Environmental Draft EIS

Submitted by: Barbara Birdsey  
Trustee, Orenda Wildlife land trust  
April 21, 1997

Re: Endangered Species Sections

1. The tern restoration programs are all outside of the three project areas. Comment G-1  
Comment T-2
2. Sec. 3-32 Roseate, common and least terns are listed as being commonly observed from 1986-1995 while several species of gulls are rarely seen. Comment T-5  
This applies to all four areas studied.
3. We were told that these tern projects should not include poisoning per a meeting with Ronald Lambertson (U.S. Fish and Wildlife) in March 1997. Comment T-1
4. The fourth component of the project description includes analyses of tern eggs to monitor PCB levels. This infers two things. Comment T-6
  - a. That eggs and chicks would have to be destroyed to do toxicological testing which seems illogical if you are trying to have more terns.
  - b. That there has apparently been study to determine that terns were endangered by PCB's. We would like to request a copy of this study. Comment T-7
5. Rational that this project would increase ecotourism is misleading as none of these areas are frequented by tourists. Ram and Bird Island might be visited by an occasional boater. Penikese Island is used as a school for juvenile male delinquents. Comment T-8
6. Cost: \$124,000 first two years, \$762,000 the next four years. Nearly \$1,000,000 out of the settlement seems a controversial sum when other major projects deal with the real problem - clean-up and protection. It should be acknowledged that, until the harbor is cleaned up, terns could still be exposed to contaminated food supplies.

P.O. Box 669 • West Barnstable, MA 02668 • (508) 362-4798 FAX (508) 362-7478

Comment T-9

It makes more sense to clean-up the harbor; then monitor the effect on terns before suggesting a drastic gull removal program.

Comment G-2

7. The local people and governmental bodies that the trustees are suppose to listen to are against these projects. They include:

CRAB Citizens Advisory Board  
Hands Across The River Coalition  
The New Bedford City Council

Why seek input if you refuse to acknowledge their concerns?

In light of the controversy at the Monomoy National Wildlife Refuge, any program that includes mass killings of herring and greater blackbacked gulls should be avoided. Public outcry in this instance proved that most citizens are opposed to mass extermination of gulls, especially by DRC 1339, as it causes a long and painful death.

415 Summer Street  
New Bedford MA 02740

April 28th. 1997

MAY - 1 1997

Mr. Terrill,  
The New Bedford Harbor Trustee Council,  
One Blackburn Drive,  
Gloucester MA 01930-2298

Comments: G-1, P-2, N-4, R-1,  
B-1, HE-1, T-2, H-1, W-1, NA-1

Re: \$21 million cleanup fund for New Bedford Harbor, MA

Dear Mr. Terrill,

I understand that there are proposals to spend a portion of the resources in areas outside the New Bedford harbor! According to the Sunday Standard Times, dated April 27th. 1997, " Officials are pushing marsh cleanups in Nonquitt and Padanaram, seagull killing on Penekese Island and work on islands off Mattapoissett and Marion."

May I inform the New Bedford Harbor Trustee Council, that I consider these proposals to be an arrogant slap in the face, for the people who have had to tolerate a polluted environment. What is more, to take away capital from a poor area and give it away to a selection of well healed communities, shows a total lack of understanding as to the size and scale of the environmental problems around the Acushnet River.

I am very much in favor of using available resources to create a harbor master plan; restoration of the Acushnet River herring run; a wetlands study plan; the proposed Riverside Park construction; and a new proposed hurricane barrier box culvert installation.

May I also suggest another project for your consideration, which includes the planting of public trees either side of the river, up to one quarter of a mile inland from both river banks. The trees would for the most part planted either side of existing streets and would not only be a beautiful addition to our environment, but would help provide shade in the summer time, control water run-off and improve air quality. The planting would provide tangible evidence both sides of the river that there has been a real effort to mitigate the environmental errors of the past.

Yours Most Sincerely



Mr. Philip Bargioni and Mr. Edward Metivier of New Bedford  
Tele. No. 508-996 8826, 508- 993 0632

PB/EM

CC: EM

page 10-15

MAY 16 1997

2 May 1997

Jack Terrill, Coordinator  
New Bedford Harbor Trustee Council  
One Blackburn Drive  
Gloucester, MA 01930-2298

Comments: G-4, F-2, T-4

Dear Jack,

Comments on Draft Restoration Plan/Environmental Impact Statement

I wish to offer the following comments on the Draft Restoration Plan/Environmental Impact Statement (EIS), issued by the New Bedford Harbor Trustee Council (NBHTC) on April 8, 1997.

1. General comment on the Preferred Alternatives. I generally support the Council's selection of preferred alternatives, including most of the specific restoration projects proposed for support (see list below). However, I have reservations about the appropriateness of one other project, because of questions about whether the resources that would be restored were in fact damaged by the PCBs discharged into the New Bedford Harbor Environment (NBHE).

(a) Resources damaged. For the NRD trial, the Trustees prepared evidence claiming damage for only three natural resources: sediments, shellfish, and terns. Although these claims were not proved in court, the EIS appears to accept that these resources were damaged (see section 3.5.2) and many of the restoration projects are addressed to restoring them. As far as I can tell by scrutinizing the EIS, the only other findings about natural resource damage are those listed in Section 3.5.3: impairment of recreational and commercial fisheries, reduced property values, and lost recreational use of beaches. Although there are a few statements in Section 4 that imply damage to other natural or human resources, I have not found any statement of the Trustees' findings anywhere in the EIS that would support these statements. For example, Page 4-20 states that "The natural resource damage assessment conducted for this action found significant impacts to recreational use and aesthetics resulting from harbor contamination." However, this statement appears to be incorrect, because page 3-56 states that the case was settled before the NRDA was complete, and the EIS makes no other reference to such a finding except in Section 3.5.3.3, which is limited to lost recreational use of beaches.

(b) Appropriate resources for restoration. I believe that projects that would restore (or provide the equivalent of) the resources mentioned in the previous paragraph are appropriate for restoration. These include the following projects:

2. Restoration of Padanaram Salt Marsh.
3. Restoration of Nonquit Salt Marsh.
- 4, 44, 55 (consolidated, see point 2 below) Restoration of tern populations.
5. Stock assessment of shellfish and predators.
6. Fisheries restoration for Dartmouth Areas I and II.
19. Restoration and management of the shellfishery.
24. Land conservation - Sconticut Neck.
32. Shellfish restoration, Acushnet.
33. Herring run restoration.
36. Hurricane barrier box culvert.
42. Riverside Park Belleville Avenue recreational marine park.
47. Eelgrass habitat restoration.

I believe that these projects are appropriately matched to the damaged resources, and I therefore support the use of Trust funds for these projects.

Comment F-2

(b) Partially inappropriate project. The remaining project proposed for Trustee support -- 18: Fort Taber Park -- is less clearly related to any damaged natural resource, and I believe that at least parts of this project as described in the EIS are inappropriate for Trustee support. There appear to be significant differences between this project and no. 42, in that the Riverside Park Belleville Avenue recreational marine park is specifically aimed at recreational use of coastal and marine resources, whereas the Fort Taber Park project would also include "...picnic areas, open areas, multipurpose playing fields,....community meeting facilities and .....an educational center focusing on the park's historical and military significance." There seems to be no basis for these specific aspects of the Fort Taber Park as restoration of natural resources damaged by PCBs. The EIS includes no findings that these aspects of recreational opportunity were in any way damaged or restricted by the discharge of PCBs. Absent such findings, I believe that the use of Trust money for these parts of the project would be inappropriate. Although these parts of the project are certainly desirable and would be socially beneficial, they should be funded from other sources. Page 4-21 states that Additional funding provided by the City of New Bedford will increase the scope of the project to provide greater benefits. This wording implies that the Trustees would support all the parts of the project listed, including the questionable ones that I have pointed out earlier in this paragraph. I urge the Trustees to reconsider their proposed support level for this project, and to limit their support to aspects of the project that are clearly related to injured resources. Project no. 42 provides an appropriate model.

Comment T-4

2. Buzzards Bay Tern Restoration and Stabilization Project: Clarification of the relationship between the proposed action and the proposed support. See section 4.3.6.2.1, pages 4-54 through 4-56. As indicated in the previous paragraph, I support funding of this project and consider it especially worthy of the Trustees' support because it is directly aimed at restoring one of the three resources for which damage was documented. The EIS does not make fully clear the relationship between the proposed project and the

proposed support. As stated under "Timeframe", page 4-54, this proposed project has been designed as a 6-year program: the Trustee Council has indicated its desire to fund only the first two years and then reevaluate. Accordingly, some of the comments in the evaluation (pages 4-54 through 4-56) need qualification, because they apply to parts of the program that would occur largely or exclusively in years 3-6. Specifically, the first two years' activities under the Habitat Restoration part of the project would be limited to scoping, design and permitting (the last activity to be conducted equally in years 2 and 3). Although it is appropriate to list likely benefits, costs, impacts and permitting issues of the construction part of this project at the present time, the EIS should make clear that the construction is not proposed to take place until years 4 and 5 (i.e., 2001-2002) and that the Council is not proposing to support this activity at present. The appropriate time to weigh these aspects of the program will be later, when the Council reviews the scoping and design and reevaluates this part of the proposal in light of firm estimates of cost and impact.

3. Buzzards Bay Tern Restoration and Stabilization Project: Discrepancies between Table 4.1 and the text. See section 4.3.6.2.1, pages 4-54 through 4-56, and Table 4.1, pages 4-9 through 4-12. There are two apparent discrepancies between Table 4.1 and the text:

(a) The table includes alternatives nos. 4 and 55, although these were consolidated into alternative no. 44 and consequently dropped as separate proposals. The footnote incorrectly suggests that 44 was incorporated into 55, rather than vice versa. It is somewhat misleading to include evaluations of alternatives 4 and 55 in this table, when they are no longer proposed independently. I suggest that alternatives 4 and 55 should be excluded from the table, perhaps with a footnote explaining their exclusion. The same procedure should be followed in other cases where proposals have been consolidated.

(b) The table indicates that several alternatives, including alternative 44, "partially meet [the criterion]" that the project should be "within the New Bedford Harbor Environment". However, selection criterion 2 on page 2-16 stated that "Project ideas that are outside of the New Bedford Harbor Environment will be considered, provided that they restore injured natural resources within the New Bedford Harbor Environment. This can occur for species that feed or spend a life stage within ..... or seasonally enter the Harbor Environment but move out into Buzzards Bay or the Atlantic Ocean." Alternative 44 (among others) meets this criterion fully, not partially. If the intention of this classification is to give lower priority to projects that are designed to restore resources within the NBHE but are actually carried out outside the NBHE, this should be stated clearly, and the lower priority designation should be distinguished from a classification that implies that the projects do not fully meet the selection criteria. I suggest in any case that the Council should review its decision to give lower priority to such projects. A project that restores the natural resources of the NBHE is equally valuable whether the

actual work is carried out inside or outside the arbitrary boundaries established for the area. The proposal for alternative 44 makes it clear why restoration of tern populations that use the NBHE can only be effected by a project conducted outside the boundary.

Comment G-4

4. Contaminant Distributions. See section 3.5.1, pages 3-56 through 3-57, and Figures 3.4 through 3.6. This section is limited to summarizing contaminant levels measured in sediments within the NBH Estuary. It gives no information of any kind on the occurrence or levels of contaminants in living resources such as fish, crustaceans, shellfish, or birds, even though this information is the basis for the findings of injuries to these resources in Section 3.5.2. This section should be expanded considerably to give details of contamination of living resources. Additional figures should be included to show the distribution and levels of PCBs (not only metals, as at present shown in Figures 3.4 through 3.6) in sediments and in selected living resources. The congener-specific PCB data generated by Aquatec (1990) and used as the basis for my conclusions (Nisbet 1990) about injury to terns and matching of "fingerprints" should also be cited and summarized here.

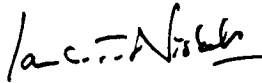
5. Ecological Injury. See section 3.5.2.1, pages 3-62 and 3-63. This section is almost limited to cataloguing the extent to which PCB levels in fish and shellfish exceed the current FDA limit for edible seafood of 2 parts per million. The FDA limit, however, is totally irrelevant to assessing ecological injury. It is an administrative level which is used to determine whether edible tissues of fish and shellfish should or should not be permitted to enter interstate commerce. It was set (a long time ago, based on obsolete data on toxicology and interstate commerce) by balancing potential harm to human health against potential harm to the fishing industry. If it has any relevance to New Bedford Harbor, this would be for assessing economic injury -- the harm suffered by commercial fishermen and others resulting from harvesting bans. This section should be completely rewritten and replaced by an assessment of the actual and potential injury to fish, shellfish, and vertebrate consumers of fish and shellfish. The paragraph in this section dealing with amphipods and terns is appropriate in this respect, but seriously incomplete. It should be extended to deal with other groups of organisms and should include assessment of potential injury to species that have not been studied directly.

6. Wider Buzzards Bay Ecosystem. See section 3.5.2.3, pages 3-65. This section is incomplete, in that it does not cite other sources showing that PCBs migrating from New Bedford Harbor were responsible for elevated concentrations of PCBs in biota throughout Buzzards Bay. For example, a paper by Nisbet and Reynolds (Organochlorine residues in common terns and associated estuarine organisms, Massachusetts, 1971-81, Marine Environmental Research 8: 33-66, 1984) not only gave additional data on contamination in NBH, but showed that PCBs migrating from NBH could be traced in tissues

of mussels, fish and terns throughout Buzzards Bay. The citation of Nisbet (1990), although correct as stated, does not mention the evidence that I presented showing that the "fingerprint" of PCBs from NBH could be traced in biota in other parts of the Bay, and indicating that the terns that were lethally poisoned by PCBs had actually been feeding on fish within NBH.

Please incorporate this letter in the record of public comments on the EIS.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'Ian C.T. Nisbet', with a stylized flourish at the end.

Ian C.T. Nisbet, Ph.D.  
President



4 MAY 1997

Dear MR. TERRIL,

I am a registered voter, and as a lifelong resident of NEW BEDFORD, I have a vested interest in the "maintenance" of my home town!! I wish to convey my opinions and my expectations on what should be done with the money allotted for the P.C.B. cleanup.

It has become quite apparant, that if left to themselves to make decisions on what to do with STATE and/or FEDERAL funding, that former Mayor JOHN BULLARD, current Mayor ROSEMARY TIERNEY, and various CITY COUNCIL members can and will squander and/or missappropriate millions!!!

I am, of course, referring to the annual "invisible" SNOW-REMOVAL fund and the recent 2.5 Million dollar School Dept. scandal. My recommendations for any "early" spending are as follows:

- 1) Restoration of the ACUSHNET RIVER Herring run ( \$600,000 )
- 2) Restoration of Eelgrass, N.B. Harbor, & CLARK,S COVE (\$400,000)
- 3) NEW BEDFORD Shellfish management (\$425,000)
- 4) Creation of a HARBOR-MASTER plan (\$50,000)
- 5) Wetlands restoration study plan (\$35,000)
- 6) RIVERSIDE PARK construction..... How about a SPORTS COMPLEX including: indoor SOCCER/HOCKEY/BASKETBALL/RACQUETBALL/LACROSSE/BATTING CAGES, ETC.  
This would bring TOURNAMENT,S and \$\$\$\$ to NEW BEDFORD as well as give young men & women something else to do besides drugs!!!
- 7) Hurricane Barrier box culvert

I also wish it to be known that I very strongly do not want the money to be spent on:

- A) MATTAPOISETT, MARION, and PENEKESE Tern & Seagull population control (\$380,000 over 6 years) DO NOT SHOOT SEAGULLS!!!
- B) Restoration of NONQUITT Saltmarsh (\$166,000)
- C) Restoration of PADANARAM Saltmarsh (\$16,000)

I think the residents of B & C can pay for it themselves!!!!

(2)

These projects & figures I got from an article in the STANDARD TIMES  
written by CHRIS GOSALVES in the APRIL 27, 1997 issue.

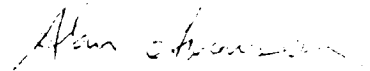
I would like YOU to send ME a copy of the complete list of the 56 total  
projects that were considered.

Please be expeditious with your reply.

Thank You for the opportunity to express my civic concerns.

Sincerely,

ALAN SPANSON



P.S. My writing address is...

P.O. BOX 61021  
NEW BEDFORD, MASSACHUSETTS ✓  
02746-0021



*City of New Bedford*

OFFICE OF CITY COUNCIL

133 William Street

New Bedford, Massachusetts 02740

(508) 979-1455

Fax: (508) 979-1451

PAUL KOCZERA  
Councillor Ward Two

Comment: R-1

May 9, 1997

New Bedford Harbor Trustee Council  
c/o NMFS, F/NE02  
1 Blackburn Drive  
Gloucester, MA 01930

Dear Members of the Trustee Council,

I am writing to endorse the recommendation of the Trustee Council pertaining to funding a waterfront recreation park at the former Pierce Mill site. I support this recommendation for a multitude of reasons, several of which I will go over in this letter.

1. The river around the proposed site has one of the highest level of PCB's in the waterway.
2. The neighborhood has deteriorated over the years mainly due to the pollution in the river and the negative image associated with living near the river.
3. The area where the park will be located will unfortunately carry the burden of having 2 CDF's nearby.
4. The residents have and will suffer the long-term health effects caused by the PCB's and heavy metals in the river.
5. The proposed plan for the park meets the criteria for funding under the restoration guidelines.
6. This park would improve the quality of life for the residents and will give back a small portion of what was taken from them by the dumping of PCB's.

This concludes my comments on the Draft Restoration Plan. I will also like to add that I know the Trustee Council has been receiving pressure to release large amounts of the trust fund early. I would hope that funds will remain in the account for projects that have been approved but may have to wait for portions of the Acushnet River to be treated.

Sincerely,

PAUL KOCZERA  
City Councilor

Residence: 115 1/2 Bullard Street

New Bedford, MA 02746

Tel. (508) 992-7224

**UMass Dartmouth**

285 Old Westport Road  
North Dartmouth  
Massachusetts 02747-2300  
USA

Comment: G-6

May 13, 1997  
via fax: 202-482-2663

Mr. John Bullard  
Department of Commerce Building  
14th and Constitution  
Rm. 5222  
Washington, DC 20230

Dear John:

How's it going?

We had a renewed discussion the other day about how the Center for Marine Science and Technology could develop a program to monitor the New Bedford Harbor ecosystem.

In addition to being interested in the problem and developing our relationship with The Buzzards Bay Coalition, I am concerned that a thorough monitoring activity is not being undertaken. Without such activity, it will be extremely difficult, if not impossible, to manage remediation and recovery.

Please let me know your thoughts on how to proceed.

Sincerely,



Brian J. Rothschild

BJR/afw

page 10-24



575 Osgood Street  
Box 6310  
North Andover, MA 01845

MAY 23 1997

May 21, 1997

New Bedford Harbor Trustee Council  
c/o NMFS, F/NE02  
One Blackburn Drive  
Gloucester, MA 01930-2298

Dear Sirs:

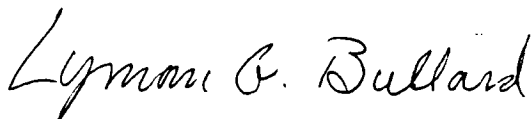
I am writing in reference to your RP/EIS, Project 4.3.1.2.2, Nonquitt Salt Marsh Restoration.

From what I know of the situation the plan for replacing the present flushing system with an open channel should substantially increase the tidal exchange.

Mention is also made of the possibility that decomposition of the peat has decreased its elevations so that it may not recolonize with vegetation. Apparently probable water levels throughout the marsh should be determinable through hydrologic studies. If necessary, it would seem that a combination of dredging of some areas and building up others could facilitate re-vegetation. In any event, the planting of appropriate grasses over all or some of the marsh as done elsewhere could greatly accelerate normal growth.

It seems, therefore, that if the construction can achieve proper tidal exchange, both some dredging and filling as well as introduction of new grasses could become important to the success of the restoration process.

Sincerely,



Lyman G. Bullard

MAY 27 1997

# Congress of the United States

Washington, DC 20515

---

Comments: G-3, N-7, F-1, R-1,  
L-1, T-2, AQ-1, H-1

---

May 22, 1997

The New Bedford Harbor Trustee Council  
1 Blackburn Drive  
Gloucester, MA 01930

Dear Council Members,

We write to express our opinions on the most beneficial expenditures of the funds administered by the Council for the restoration of New Bedford Harbor.

We initially wish to register our strong disagreement with those who believe that no restoration funds should be spent now. The restoration fund, originally \$20 million, is now a higher amount because of the interest that has accrued since the Council agreed to place the money in an interest bearing account. The people who live in the Greater New Bedford area have significant environmental and other needs, and we believe it would be a mistake to simply let this money sit unspent, except for the administrative expenses that are incurred by the Council for office space and related expenses, until the entire harbor restoration project is completed.

Citizens with difficulty finding adequate public funds for a variety of environmentally important projects ought not to be denied, by some form of bureaucratic delay, the benefit of funds which were contributed expressly for their benefit for use in such projects. We were pleased when you agreed to begin the process of accepting applications. We know that it is possible for you to proceed, not just with the implementation of this round, but with the initiation fairly soon of a second round, without in any way interfering with the use of this fund, which, after all, exists in part in response to a Congressional mandate.

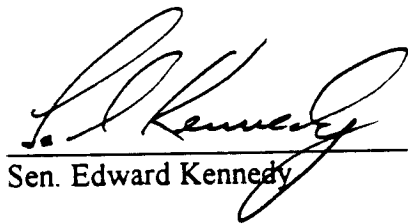
For example, we believe that the preparation of a Harbor Master Plan, the funds for Sconticut Neck in Fairhaven, and the funds for parks in New Bedford are obvious legitimate uses of these funds, and it is impossible for us to conceive circumstances in which they would be unwise or unnecessary uses no matter what the outcome is of the PCB disposal issue.

We also strongly believe that there are other very important projects, which you should begin considering, which would significantly increase the ability of the people of the Greater New Bedford area to benefit from the harbor. One of the most important of these is the plan for the development of an aquarium on the waterfront, an obvious harbor-related use which is widely recognized as being of great benefit for the city. We believe it would be a grave error to decline to consider a second round of proposals that could include this and other valuable projects while we are in the implementation stage of the first round.

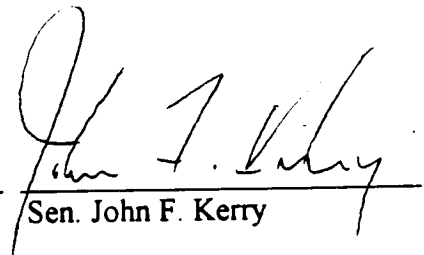
page 10-26

As Members of Congress, we are very conscious of the fact that these funds exist for the benefit of the people in the New Bedford area, and ought to be used to enhance their ability to recover the full use of an asset that was diminished by environmental mistakes. Keeping millions of dollars of funds in a bank account for an indefinite period, except for administrative withdrawals, does not serve this purpose. We do not mean to endorse every proposal that you have put forward for the first round -- the expenditure in Nonquitt, for example, seems a dubious one given the priorities that we ought to be following. And we urge you to look very carefully at the thoughtful objections that have been proposed to the tern and sea gull population issue.

But we write this letter to strongly support the general thrust of these proposals and to urge that, once final decisions have been made and implementation has begun on them, you initiate a second round in which equally important proposals, such as the aquarium, can be brought forward and subjected to this process.

  
Sen. Edward Kennedy

  
Rep. Barney Frank

  
Sen. John F. Kerry

The volunteers of CRAB were charged with reviewing 56 proposals in 6 weeks: a total of 280 pages of text. Our discussion of these proposals was open, often heated, and very time consuming. We then voted openly, without secret ballots, and our vote was recorded by Ivo Almeida.

The Trustee Council did not allow any CRAB member to vote on any proposals that he/she submitted; and those of us who submitted proposals did not even get a copy of our proposals in our own packet. CRAB members who did submit proposals, freely made the other members aware of their involvement, and abstained in large part from the discussion of their own project(s).

Having conscientiously observed the rules of selection put forth under Trustee guidance, we assumed that the same process would be used by the Trustees in their deliberations. Only after the Trustees had made selections which inexplicably violated some of the very criteria that they had laid down for our selection process, did CRAB members learn that the Trustees' process was remarkably different. The difference emerged only after many questions posed by puzzled CRAB members, and even now the Trustees' selection process remains a thing of mystery to some of us; and therefore, probably to most common folk.

In order to clear up this mystery for those of us not schooled in the ways of our government agencies, I request that the Trustee Council answer some questions regarding their selection process and that both the questions and answers be included in the written record. I realize that the time constraints of this meeting (5-22-97) will prevent us from dealing with all these issues tonight, but I request complete answers from the Trustees in the near future.

CRAB was told that all Trustee Council members (and their staffs) did not participate in the selection process for all 56 proposals, but that a proposal is considered only by those who had expertise and/or knowledge of the material in a given proposal.

Comment G-8

**QUESTION:** Who got to judge each proposal? Please give each person's position and agency affiliation, and if more than 1 person was involved, the recorded vote.

CRAB was told by the Trustees several times that the Trustee's business usually conducted at our joint meetings was quite lengthy because these meetings were the only time that the Trustees (and staffs) communicated with each other. Since CRAB never heard the Trustees



argue among themselves about any proposal at these joint meetings; it would seem that somehow a consensus had been reached beforehand.

Comment G-9

**QUESTION:** How is this consensus achieved, by mental telepathy? Or perhaps, a quid pro quo arrangement to accept and support each other's proposal selections.

When members of CRAB raised questions regarding unclear issues of Trustee-favored proposals, these issues were never resolved or even considered further unless some CRAB member persisted in vigorously pressing the issue.

Just a few of many examples:

Comment N-1

1. *What ever happened to the issue of "water quality" at Nonquitt raised by Larry Sylvia and Steve Cassidy?*

2. *Whatever happened to the request by Molly Fontaine that a caveat preventing the killing of seagulls be included in the Tern Project Proposal?*

Comment T-1

3. *Whatever happened to Chris Moriarty's concern about the exorbitantly priced and totally inappropriate 17 foot boat requested by the Tern Project Proposal?*

Comment T-11

CRAB members perhaps naively assumed that the Technical Advisory Group had arranged some access to professional and/or academic resources in any scientific discipline needed to assess the value of a submitted proposal. Based upon our fragmentary understanding of the Trustee selection process, this seems not to have been the case.

Comment G-10

**QUESTION:** If the Trustees did not have the in-house expertise to judge a submitted proposal and did not seek it elsewhere, how could they conscientiously execute their stewardship of Restoration funds?

CRAB was told that submitted proposals did not have to be technically complete (indeed, on the limited space of the submission form, it would have been impossible to do so). CRAB was also told that financial estimates on submitted proposals needed to be merely "ballpark" figures. As a result, CRAB members asked very few hard questions of a technical or financial nature. Perhaps we wrongly assumed that the Trustees would carry on a rigorous examination of both these issues and that CRAB would be a part of this effort.

Comment G-11

**QUESTION:** Why were some projects which were approved by CRAB, rejected by the

Trustee Council without any technical or financial basis for the rejection? Or does the statement, "I don't think it will work." constitute a rigorous technical review? Why were some projects rejected by CRAB, accepted by the Trustee Council without any rigorous examination of the scientific premise involved? Why has there been no rigorous examination of the workup of funds requested in accepted proposals?

Some examples:

Comment N-5

1. *What about the proposed 10 year monitoring of the Trustee approved Nonquitt Project and its unspecified cost?*

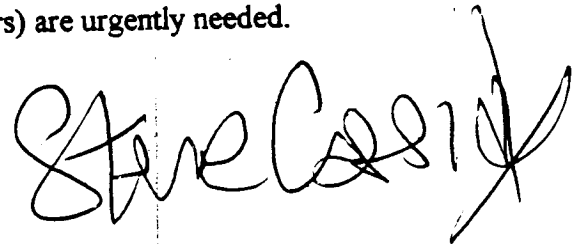
2. *What about the unproven assertion that it would be "impossible" to restore drainage to the original natural channel at Barekneed Creek?*

Comment N-9

3. *What about examination of the unproven assumption that the decline of the tern population is due in part to the effects of PCBs on mating behaviors?*

Comment T-12

After the expenditure of time and effort by the volunteers of CRAB, offered willingly and in good faith, I for one would like to feel that we worked together with governmental agencies to achieve the best possible selection of submitted proposals and the best use of Restoration funds. I regret to say that I do not feel that way now. Complete and candid answers by the Trustee Council to my questions (and to those of other CRAB members) are urgently needed.



**Sarkin Mills, Inc.**

8 Washburn St., New Bedford, MA 02740 (508) 999-1228

May 22, 1997

The New Bedford Harbor Trustee Council  
c/o NMFS, F/NEO2  
One Blackburn Drive  
Gloucester, MA 01930

Dear Council Members:

It is difficult to refrain from redundancy with regards to the arguments and criticisms of the first round of projects selected by the Council. Further, by request of my colleagues, I have been asked to abstain from criticizing projects proposed by other sources, although as a citizen I abhor the constraint on free speech. I will comply with both requests however, knowing that arguments have been recorded in prior testimony before the Council regarding the project ideas, in variance to community concerns and trust that they remain clear to the Trustees. I will endeavor to once again appeal to reason and common sense in an attempt to secure funding in the current round of project selection for components of The New Bedford Aquarium.

Had the Council funded the aquarium feasibility study, we would still be waiting for approval and cash disbursement. Instead, we are now completing the design and feasibility phase, funded through a combination of state and city efforts. That fact alone is testament to changing priorities, driven by broad base community support. Similarly, new interpretations of NRD funding latitude, has been accepted by the Courts since the original request for ideas was submitted to the Council on the original application for \$2 million by the Aquarium Corp. Under existing interpretations, approved projects have similar components to the aquarium proposal that are acceptable to the Trustees, they lack the enthusiasm of public support that the Council has seen from the private sector. If the Council has accepted shoreline parks, then the 3 acre park adjacent to the South Central portion of the city, on the aquarium site should also qualify under the same guidelines.

Given the additional caveats of economic benefit, and the independent Market and Economic Analysis, projecting mid-range attendance of 1,312,000 people visiting our harbor every year, it would appear that funding for this park in the Area One zone would have a higher priority for funding to the Trustees. To that equation, add the fact that the Council continually receives more requests by community citizens, representing



the largest and most diverse groups of organizations and individuals in the region, for funding to be applied to the Aquarium/Explorium/Public Park than all of the other proposals combined.

Under the tenet of "restore, replace, or acquire the equivalent of such natural resources", it is clear that long before this harbor was contaminated, it was a commercial harbor. A large measure of the loss suffered by the residents of this city is to the commercial value of this port. Globally, it is fact, that the changing nature of commercial ports is toward mixed-use harbor facilities. Absent any contamination, this port would likewise under-go commercial revitalization as a mixed-use facility. The mandate of this community (reinforced by state law under Chapter 91) dictates that our mixed-use port will retain its' commercial vitality with freight, the tradition of our fishing fleet and the additional exploitation of tourism, interested in viewing a working seaport. This fact is recently confirmed by Congressional decree, that created a National Whaling Historic Park. The meaning of the harbor in relationship to the national park, can only be comprehended adequately in context to the theme and proximity of the Aquarium/Explorium and the public park that extends into the harbor.

Achieving a pristine condition in a commercial port is not possible, either today or in the foreseeable future. To restrain funding from the central harbor based on an ultimately unachievable goal defies common sense logic. We believe that given the opportunity, we can demonstrate support for our position by some of the top experts of NRD law in the country. This process has not given us that opportunity.

If we are to adhere to the proposed schedule for implementing this project, based on the lengthy procedure of the Council thus far observed, it is unlikely that resolution will occur in a period of time to be beneficial to the citizens that have incurred the loss of value accrued to this environmental penalty. Conceptually, it is my belief that NRD funds are to compensate the citizenry for the loss caused by environmental damage. "Restore, replace or acquire the equivalent" in terms of Council decisions compensates the fewest number of residents but the largest force of political power. If the Council adheres to the principal of waiting for an end point resolution to the harbor clean-up, it is likely that few who were deprived of the value will be alive to reap the rewards of the judgment.



The mandate of a Trustee is to respond in the best interests of the beneficiary. The citizens of this community have made clear that funding a component of The New Bedford Aquarium is equivalent to acquiring the commercial loss suffered by the degradation of their harbor, in numerous public testimonies. It is however of far greater importance, for the long term preservation and stewardship of our marine habitat resources than most comprehend. This funding opportunity for the Trustees is time sensitive. Financial support has diminishing value if the project is delayed or deferred beyond the reasonable window of opportunity. Further, the match of funds just by making the site available, far over-shadows the investment of the Council.

I ask that you refer back to the words of EPA Region I Director, John De Villars, "No better use of New Bedford Harbor Trust Funds could be made than for The New Bedford Aquarium." The ancillary benefits specifically to this harbor and its' outreach to the global ocean systems are a compelling story of the Explorium programs. It has the singular ability to provide a venue for true interaction of community residents with science, education and economic development directly benefiting restoration of our damaged harbor environment.

In view of the extent of solid information thus far developed for this project, I ask that the Council review it's position for funding on what will be The New Bedford Aquarium and to reconsider, as a start, the original request for funding. To that end, we remain ready to provide the Council a detailed presentation of this project in order to better comprehend its' value to the mandate of the Trustees.

Very truly yours,

Frederick R. Satkin  
President  
Satkin Mills, Inc.



UNIVERSITY OF MASSACHUSETTS BOSTON  
Department of Biology

100 Morrissey Blvd.  
Boston, MA 02125-3393

Tele.: 617-287-6615

Fax: 617-287-6650

email: hatch@umb.sky.cc.umb.edu

May 22, 1997

MAY 23 1997

Mr. John Terrill  
New Bedford Harbor Trustee Council  
One Blackburn Drive  
Gloucester, MA 01930-2298

Comments: F-2, T-4

Dear Mr. Terrill,

I offer the following comments on the *Draft Restoration Plan/Environmental Impact Statement* issued by the New Bedford Harbor Trustee Council on April 8, 1997. I write as a Biology professor with extensive experience in Buzzards Bay.

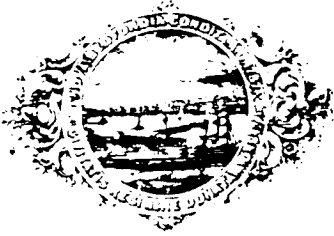
In general I approve of the selected proposals that address restoration of damaged resources. However, it is not evident that all the proposals do so sufficiently: for instance, the Fort Taber Park (page 4-20) includes substantial components that do not appear to be restoring natural resources injured by discharge of PCBs.

Section 3.5 on *Injury to the Environment* includes very little information about the distribution of contaminants in the biota, either in New Bedford Harbor, or in the wider Buzzards Bay Ecosystem. A paper by Nisbet and Reynolds (1984. *Marine Envir. Research* 8:33-66) is relevant.

Concerning the tern restoration project: it is my understanding that injury to these bird populations has been documented, and I consider that the proposed project (page 4-54) will be contributing directly to restoration. From my personal experience I know that both Common and Roseate terns feed in the New Bedford Harbor Environment. Terns form an integral part of coastal ecosystems and the proposed work is particularly appropriate for funding.

Sincerely,

Jeremy I. Hatch  
Associate Professor



*City of New Bedford*

OFFICE OF CITY COUNCIL

133 William Street • New Bedford, Massachusetts 02740 • (508) 979-1455

*George Rogers*  
*Councillor at Large*

*City Council President*

MAY 29 1997

Mr. Jack Terrell  
Ex.Dir.  
NEW BEDFORD HARBOR TRUSTEE COUNCIL  
Fax 508 282-9301

5-23-97

Dear Mr. Terrell:

Following another story in the local newspaper and having had an opportunity again today to appear on a local talk radio show, I have to advise you that there continues to be a great deal of concern, not only by those of us privileged to represent the citizens of this community in our elective capacities, but also by the public as a whole, on the issue of use of Trustee Council monies on projects that in NO way will benefit the NEW BEDFORD HARBOR.

I refer, of course, specifically to the various projects being considered for funding in the neighboring communities, BEFORE a dime is spent in NEW BEDFORD.

It is not that we begrudge our sister communities some benefits from the Council funding, but it does seem not only inappropriate but downright INDECENT to fund a Padana am project, for example, before the most hard hit area of the City, the Riverside Park area.

I think that any reasonable person would agree that the money should FIRST be spent in New Bedford and then, if funds are still available, spend some in the towns, but please, let's get our priorities straight.

I will ask the City Council to endorse this letter and the sentiments contained therein at our next Council meeting on June 12.

Please consider this communication yet another "comment" to be included in your ongoing process.

Sincerely,

*George Rogers*  
Council President

page 10-35

Arthur F. Machado  
8 Hacker Street  
Fairhaven, MA 02719  
(508-993-4727)

The New Bedford Harbor Trustee Council  
c/o Mr. Michael Bartlett  
One Blackburn Drive  
Gloucester, MA 01930-2298

MAY 29 1997 May 25, 1997

Dear Mr. Bartlett:

I am writing to recommend to you and the other trustees an important restoration project not currently on your list of preliminary proposals. I plan to attend the June 18th meeting at the Seaport Inn in Fairhaven and would appreciate an opportunity at that time to discuss the proposal with the Council and with other meeting participants.

You are quoted in the May 23rd New Bedford Standard-Times as stating that..."saltmarsh is the basis for the whole aquatic food chain, including fish and shellfish. Fishing waters will benefit from restoration, which will restore the economy". I couldn't agree with you more; and my proposal involves protecting a saltmarsh which, because of its location in the outer harbor itself, more directly impacts restoration of the harbor than do marshes in Padanaram and Nonquitt (though I strongly support restoration and protection of these marshes as well).

I am proposing that the Council use funds at its disposal to purchase currently vacant but technically buildable lots on the shore side of the saltmarsh at Priest's Cove on Sconticut Neck. These lots at the west end and on both sides of Hacker Street are held by absentee owners identified in Fairhaven Assessor's Office records as John J. DisAngro Sr. and John J. DisAngro Jr. of 7 Kettering Rd., Norwood MA 02062 (owners of lots on N. side of Hacker); and Allan R. and Earl J. Correia of 281 Sweetgum Ct., Palm Harbor FL 34683 (owners of lots on S. side of Hacker).

Though these lots are technically buildable, it is highly unlikely that the Fairhaven Conservation Commission --on which I sit as an Associate Member-- or the State D.E.P. would approve construction. The lots, therefore, could probably be purchased at bargain prices. Town ownership would insure a protective buffer for this very important saltmarsh. The project would also demonstrate the Council's concern for saltmarsh that isn't situated near "affluent, summertime communities". Priest's cove is decidedly middle class and overwhelmingly year-round residential.



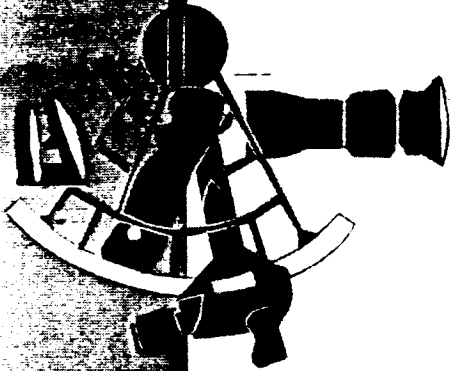
Please submit my proposal to the Council. I will be happy to provide whatever additional information you or they require either before or during the June 18 meeting in Fairhaven.

Sincerely,

A handwritten signature in black ink, appearing to read 'Art Machado', with a stylized, cursive script.

Art Machado, Ph.D.

R.M.Gracia, D.M.D.,M.D.  
20 Fort St.  
Fairhaven, MA 02719



MAY 29 1997

5/25/97

The New Bedford Harbor Trustee Council  
One Blackburn Drive  
Gloucester, MA 01930-2298

Dear Sir:

Let me join the opposition voices to spending the New Bedford Harbor restoration money on projects in Nonquitt and Padanarem. While we all know that salt marshes are important in the food chain, it is a far stretch to say that this is significant in restoring New Bedford's harbor. The pollution damage was done to New Bedford's harbor and the money is to be used to correct this damage. Now lots of people from nearby areas want to dip into the pot. The people who live in Nonquitt have fouled there own area. It is a private enclave and they should manage this problem privately by seeking their own grant from the State or Federal agencies.. The people of New Bedford don't have the clout in the Statehouse or in Washington and it is up to the trustees of this fund to see that they are not shortchanged by this money being spent in other areas. There are projects all over Buzzard's Bay that are worthy and should be tackled but this fund was set up to help New Bedford and should therefore be spent in New Bedford.

Sincerely,

R.M.Gracia, D.M.D., M.D.

Commonwealth of Massachusetts



# Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

May 27, 1997

New Bedford Harbor Trustee Council  
One Blackburn Drive  
Gloucester, MA 01930-2298

MAY 30 1997

Dear Councilors:

I would like to comment on the draft RP/EIS for New Bedford Harbor. I am writing as one of the primary architects of the plan to restore common and roseate tern populations in Buzzards Bay. I have followed stories in the press and attended the public hearing on the draft EIS in New Bedford on May 21, 1997 to gain a better understanding of the general public sentiment that surrounds the tern restoration plan. In my capacity as State Ornithologist for the Commonwealth of Massachusetts and as Leader of the federal Roseate Tern (Northeastern Population) Recovery Team, I feel compelled to address these issues.

I realize that the citizens of New Bedford are looking at restoration funds to address a broad spectrum of community needs. Whether or not these additional ideas should be funded is, of course, yours to address. For the short term, I would like to point out that the tern restoration proposal (1) is a direct restoration of a damaged resource, (2) is expected to be supported by very substantial in-kind cost-sharing from a number of agencies and organizations, and (3) involves a rather modest cost, especially if spread over 6 years.

While you have indicated support for only the first 2 years of the project, 1998 and 1999, to be followed by an evaluation, I would like to reemphasize that all aspects of the tern restoration plan are important for its ultimate success. Elements in the plan are all important tasks identified in the federal Roseate Tern (Northeastern Population) Recovery Plan. I recommend that the total package be funded for 6 years. This would ensure the long-term success of the restoration project.

Obviously, I think the tern restoration proposal is a very strong one and I can attest to the fact that it is solidly based on good science, the experience of the best people in the field, and sound management strategies. First, I'd like to address one of the



## Natural Heritage & Endangered Species Program

page 10-39

Route 135, Westborough, MA 01581 Tel: (508) 792-7270 x 200 Fax: (508) 792-7275

An Agency of the Department of Fisheries, Wildlife &amp; Environmental Law Enforcement

<http://www.state.ma.us/dfwele>

most controversial parts of the plan, the element that calls for the restoration of the historic Penikese Island ternery. George Mackay wrote (1897) that this island had been a major tern colony since the earliest recollection. As late as 1952, then State Ornithologist Joseph A. Hagar estimated there were 7-10,000 pairs of terns, but by 1960 the island had been overrun by gulls.

In order to restore terns on small islands where they once bred and where they have been outcompeted by gulls, some form of gull control is an essential element. This has been accomplished with great success at several sites in Maine and at Ram Island in Mattapoisett, Mass. in 1990-1991. Gull control is only one side of the coin; the other side, less recognized, is endangered species restoration. Chemical control with DRC-1339 is why we have terns at Ram Island today and why we have Atlantic puffins nesting in Maine. I would just like to point out that this is a proven, safe methodology that has been hugely successful. The Monomoy experience was an aberration.

The concern over gull control at Penikese has been way overblown. In reality, it is quite likely it would not even have become an issue, had it not been for the influence of last year's experience at Monomoy. In addition to the successful use of 1339 gull toxicant at Ram Island in 1990-1991, a successful pilot application was also made at Penikese Island in 1995. The planned work at Penikese Island would be on a small portion of the island known as "Tubb's Island". I estimate that about 250 pairs of "large gulls" (herring & great black-backed gulls) would be killed, or about 30% of the gulls at Penikese Island as a whole. That 250 pairs of gulls is less than one (1) percent (.007) of the 32,661 pairs of gulls estimated by my agency to be nesting in Massachusetts in 1995.

You should be aware that gulls have been determined to pose a threat to health and safety by contaminating surface water supplies and by creating a hazard at airports. My agency and sister wildlife agencies in other states have been working diligently with other agencies to downsize the regional gull populations by restricting food resources at open landfills. While this strategy appears to be working, with nesting "large gulls" estimated in 1995 to be off about 30% from a decade ago, it does not eliminate the occasional need for small localized control programs to accomplish other objectives. Restoration of terns at specific sites is one such objective.

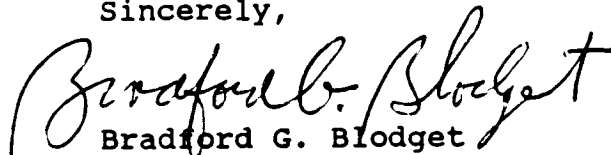
The need to restore the ternery at Penikese Island is urgent. As of 1996, about 87 percent of the remaining roseate terns in the northeastern U.S. (3,215 pairs) were all concentrated at 3 sites--- Bird and Ram Islands in Buzzards Bay, Mass. and Great Gull Island off eastern Long Island, N.Y.--and 1,715 of these pairs were at Bird and Ram Islands. Roseates share Bird and Ram Islands with some 2,880 pairs of common terns. Restoration of the ternery at

Penikese Island is a strategically important element in the overall restoration plan for terns in Buzzards Bay, including the New Bedford Harbor environment. Based on inspection of the erosion damage at Bird and Ram Islands on May 8, 1997, this is even more crucially important than I realized at the time the plan was drafted. Unless and until lost habitat is repaired at these sites, terns in Buzzards Bay have no other alternative sites for nesting.

Because of the crucial conservation importance of restoring the Penikese ternery as soon as it can possibly be accomplished and because of the seriousness of the chemical control issue, I have decided to modify the original plan to reflect the public's distaste for the use of chemical control. Even though control with 1339 gull toxicant is the most effective and cost efficient method known, the overall plan is far too crucial for restoration and recovery of tern populations to allow it to be jeopardized by the chemical gull control issue. I am therefore amending the proposal to remove chemical control and replacing it with alternative, more labor intensive techniques.

I would be pleased to respond to questions you might have, either directly or through the Technical Advisory Committee. Reflecting the reality of the situation, I plan to immediately begin drafting appropriate revisions to remove chemical gull control entirely from the plan. I hope that this will address a major concern and make the plan more acceptable to all.

Sincerely,



Bradford G. Blodgett  
State Ornithologist

May 28, 1997

New Bedford Harbor Trustee Council  
C/o NMFS, F/NEO2  
1 Blackburn Drive  
Gloucester, Mass. 01930

Comments: P-2, F-2, E-2, L-2,  
Sh-2, HE-1, T-2, T-10, NA-3

Dear Sir;

Thank you for sending me a copy of the Draft Restoration Plan, for the whole New Bedford Mass. Harbor, it was very interesting reading!

But the following part of your plan has nothing to do with restoration: Padanaram Salt Marsh @ \$16,000., Nonquitt Marsh \$186,000., Fort Taber Park \$2,000,000., Eelgrass habitat \$400,000. (Which is not needed in this type of harbor), Land acquisition, on Sconticut Neck in Fairhaven, Mass. \$380,000., (Too much land in this state is in land trust at present) Living Resources of the New Bedford area Shellfishery \$425,000., Needless killing of Sea-gulls, for Buzzards Bay terns, on Bird, Ram and Penikese Islands in Buzzards Bay, as stated in your hearings, the many dead Sea-Gulls I have found on the beaches in Fairhaven a few years ago, were from a Sea-gull kill on a Penikese Island, as was stated in your hearing \$124,000. for 2 years).

All sea-gulls are a great benefit to humanity, they have very strong bodies and eat all sorts of by-products most other sea birds would never eat. These other birds a few people claim they are helping is all a gimmick to spend a lot of money to create other problems in our close by ocean, if sea-gulls did not clean the food by-products, from humanity and nature then uncontrolled sicknesses would befall humanity here.

Such problems are in this New Bedford, Mass. harbor, since Route 195 was allowed to pass through the city and into Fairhaven, Mass., When others wanted this route to go around this area, rain and snow run off ends up in this harbor, presently there are those who look the other way at this big problem.....But I have been watching a town the size of Fairhaven just south of Worcester, Mass. the past thirty years, this town has the nicest lake in all of Massachusetts....but in recent years that lake has become very oily, just like the waters in the New Bedford, Mass. harbor, in that town much unusual weed growth has taken place in that lake, in winter 30 years ago people use to drive their cars on to that lake to go fishing but now they are wondering why the waters in that lake do not freeze right, too many power boats use that lake in summer, but that is not the problem!! These same people do not realize that Route 395 should never have been built so close to their lake. But the type of tires made these days and the lamp-black put into them, to make them black, as they wear, it goes to

For above reason, the restoration of shellfishery and use of \$425,000. should not be allowed at present. Until more is known why the water in this harbor is so oily!

That which should be allowed at present, should be the Acushnet River Herring run, building of fish-ladders at each of the 3 dams, rebuilding of the gate at the lake to control water flow into the river and the removal of loam which has washed into that river since it once was taken care of, there is also one more stone dam in this river where Fairhaven village was once located, when Fairhaven and Acushnet were once known as Fairhaven, I visited it 25 years ago.

In time the EPA plans to bury the dredged PCB's along the banks of the upper river, but this Restoration group and the EPA should work together, there in the water about 30 feet from shore at the end of Sawyer Street a Cofferdam should be built, 200 feet long by 100 feet wide, rubber lined, into all sludge from the harbor should be placed into it, plus that, that is stored presently on shore, this building of a CDF as stated in Figure 5.4 of your restoration plan, this man made island would in time be covered and capped, with a cement cover, it is in that whole area I would like to see made into a park like the one on the water front in Toronto, Canada, known as Ontario Place and Exhibition Place, there a cruise ship is on stilts in the water, here a Whale ship could be built from the water line up on the CDF, with sails, this type ship would never leave this harbor and a Exhibition hall for the U.S.A., in this planned park would be using restoration funds, of good use for this whole area.

Sincerely, Yours  
*Roman Rusinoski*  
Roman Rusinoski  
P.O. Box 163  
Fairhaven, Mass. 02719-0163

page 10-42

*City of New Bedford*

OFFICE OF THE MAYOR

---

Comments: F-1, H-1

---

MAYOR  
ROSEMARY S. TIERNEY133 William Street  
New Bedford, Massachusetts 02740  
508-979-1410  
Fax: 508-991-6189

May 29, 1997

New Bedford Harbor Trustee Council  
c/o NMFS, F/NEO2  
1 Blackburn Drive  
Gloucester, MA 01930

Dear Trustee Council Members;

I am writing, on behalf of the City of New Bedford, to provide comment on the Draft Restoration Plan/Draft Environmental Impact Statement for the New Bedford Harbor Environment.

The New Bedford Harbor Environment was significantly impacted by the release of polychlorinated biphenyls (PCBs) and other contaminants into the harbor. These impacts have had great and severe effects on the natural resources, economy, and citizens of the Harbor Environment. The Restoration settlement funds provide an opportunity to overturn these effects and make the New Bedford Harbor Environment cleaner, livelier, more economically advantaged and more accessible to the public. The Draft Plan contains many projects that will assist in doing just this.

I would like to express my strong support for projects such as Fort Taber Park, the Restoration of the Area's Shellfishery, and the development of the New Bedford/Fairhaven Harbor Master Plan. Furthermore, I applaud the Trustee Council's efforts to initiate this first round of funding prior to the completion of the Environmental Protection Agency's (EPA's) cleanup, and encourage the Council to consider a second round in the near future.

NBHTC

5/29/97

Page 2

I appreciate the opportunity to comment, and I look forward to the implementation of the Restoration Plan.

Sincerely,



Rosemary S. Tierney  
Mayor

cc: Congressman Barney Frank  
Senator Mark Montigny  
Arthur J. Caron Jr., Corporation Counsel  
Molly Fontaine, Environmental Planner



Comments regarding: Draft Restoration Plan / Environmental Impact Statement  
for New Bedford Harbor

Bob Rocha

MAY 29 1997

My remarks mirror what has been our primary concerns for the last few meetings, primarily the Tern Restoration Project and the Nonquitt Marsh Project.

*Nonquitt Marsh:* My concerns are: spending money on a marsh that will still be polluted by discharge from failing septic systems and public access. The access issue seems to be receiving attention from DNRT and other involved parties. I have no idea what's happening with septic systems. However, we should press hard for a guarantee that septic problems will be dealt with before money is spent, and go public about our desire for this guarantee.

The politics (the apparent inside track) involved with this project are dubious at best. But if the other concerns are dealt with I hope that we won't vote against this project and thereby punish the species that could benefit from this marsh restoration.

*Tern Restoration:* For the first time, the text in this document attempts to make some sort of correlation between ingestion of PCB tainted fish and effects on tern habitat. However, this document also points out that Fish and Wildlife owns Ram and Penikese Islands (P. 4-61). This fact, and the arrogance shown by Ken Carr at the joint TAC - CRAB meeting, gives me the impression that this project will get rammed through (pardon the pun) no matter what objections are raised. It looks as if they've had their minds set on this for a while.

The project does have some merit, at least for Bird and Ram Islands. (Including Penikese is too much of a stretch.) We do have to remember that this project involves an endangered species. Damage to this species was also used as a determination for resource injury and compensation funding. (P 4-62).

Once again, the politics of this case are very distasteful but an endangered species stands to benefit.

Alexander Y. McFerran  
423 Sandy Valley Road  
Westwood, MA 02090

May 29, 1997

MAY 30 1997

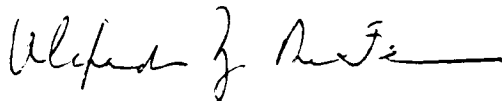
New Bedford Harbor Trustee Council  
c/o NMFS, F/NE02  
One Blackburn Drive  
Gloucester, MA 01930-2298

Dear Sirs:

I am writing in reference to the project planned to restore the Nonquitt Salt Marsh---  
RP/EIS, Project 4.3.1.2.2.

It is my understanding that this project is designed to restore tidal flows to the Nonquitt Marsh, and thereby stimulate marine life in and vegetation around the marsh. I am in favor of such an undertaking since I have watched the deterioration of the Marsh for the last twenty years. The revitalization of the area will benefit the environment in and around the Marsh as well as in Buzzard's Bay. All of us in the area will benefit from the ecological reclamation that will take place if the project is a success---which I hope and expect it will be.

Sincerely,



JUN - 4 1997



# Division of Fisheries & Wildlife

Nongame Advisory Committee

30 May 1997

New Bedford Harbor Trustee Council  
One Blackburn Drive  
Gloucester, Massachusetts 01930-2298

Comment: T-4

As Chairman, I am writing on behalf of the Massachusetts Nongame Advisory Committee in support of the proposal for tern restoration within Buzzards Bay. The Committee unanimously approves and considers the tern restoration proposal included in the draft RP/EIS to be timely and crucial. The proposal addresses all of the key elements identified in the federal Roseate Tern Recovery Plan and focuses on the three sites within Buzzards Bay—Bird, Ram, and Penikese Islands.

The seven member Nongame Advisory Committee was established under M.G.L. Chapter 131, § 5B. It is charged with advising the Director of the Division of Fisheries and Wildlife on matters dealing with all plants and animals that are not hunted or fished. Therefore it works with and advises the Division's Natural Heritage and Endangered Species Program. Each member's career has been as a professional biologist or naturalist (see attached list). The Committee's overall objective has been to maintain and enhance the Commonwealth's biological diversity.

The Committee has concluded that the restoration and conservation of tern populations in Massachusetts requires proactive management. Tern populations have clearly suffered long-term declines in the Commonwealth. This has been the result of predation by and competition with gulls plus the physical erosion of the islands on which they have nested. Now, most remaining nesting colonies are on the mainland where they are more vulnerable to predation by mammals.

In Massachusetts during the 1940's, the Common Tern population was estimated at 40,000 pairs and the Roseate Tern population at 5,000 pairs. By 1996, there were 11,221 pairs of Common Terns and 1,721 pairs of Roseate Terns. The severe decline of the Roseate Tern population and its restriction to just a few sites, caused the U.S. Fish and Wildlife Service to list it as an Endangered Species. The decline of the Common Tern resulted in its listing as a Special Concern Species by Massachusetts.

Field Headquarters

Westborough, Massachusetts 01581 (617) 366-4470

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

page 10-47

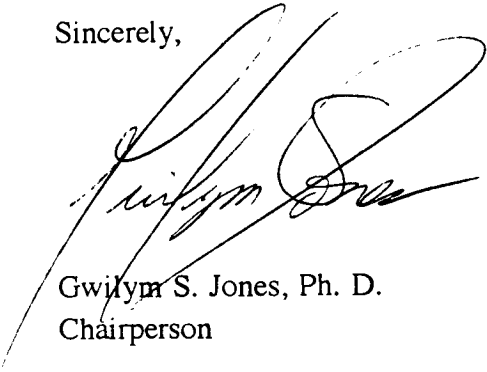
Restoration of the endangered Roseate Tern, which nests only among nesting Common Terns, is particularly urgent. Two of the three nesting colonies in North America are in Massachusetts—Bird and Ram Islands. These two colonies in Buzzards Bay contain more than half of the Roseate Tern population in North America. (The third site is nearby on Great Gull Island, eastern Long Island, New York.) Adding to the crisis is the fact that both Bird and Ram Islands are suffering severe erosion. This emphasizes that restoration of the Penikese Island historical tern nesting site is critically important.

Further, terns from the Buzzards Bay colonies range into New Bedford Harbor. Because terns were one of the three resources identified as having been negatively impacted by PCB's in the out of court settlement, it is appropriate to direct sufficient restoration funds to aid in the recovery of their population. Remediation within the harbor should be accompanied by recovery of the colonies.

The tern restoration proposal is strong, addressing the four crucial elements that are essential for tern population recovery— 1) protective management of existing colonies at Bird and Ram Islands, 2) restoration of the nesting colony on Penikese Island, 3) habitat restoration at Bird and, possibly Ram, Islands, and 4) testing of tern eggs and chicks for PCB contamination. The proposal is well constructed..

Thank you for the opportunity to present our views. The Massachusetts Nongame Advisory Committee urges you to fund the tern restoration project.

Sincerely,



Gwilym S. Jones, Ph. D.  
Chairperson

Members, Massachusetts Nongame Advisory Committee

Kathleen Anderson, founder Manomet Bird Observatory; ornithologist

22 Winter Street, Middleborough, MA 02346

Marilyn Flor, retired, Massachusetts Audubon Society; naturalist

5 Ridgewood Terrace, Rockport, MA 01966

C. Barre Hellquist, Professor of Biology, North Adams State College; aquatic botanist

391 West Road, Adams, MA 01220

Gwilym S. Jones, Professor of Biology, Northeastern University; mammalogist

70 Roundtop Road, Framingham, MA 01701

James MacDougall, Land Manager, Essex County Greenbelt Association

82 Eastern Avenue, Essex, MA 01929

Mark Mello, Director, Lloyd Center; entomologist, herpetologist

P. O. Box 87037, South Dartmouth, MA 02748

Pamela Weatherbee, author of Flora of Berkshire County; botanist

236 Sweetbrook Road, Williamstown, MA 01267



Comment: T-4

**Massachusetts Audubon Society**

*North Shore Conservation Advocacy*  
*William B. Endicott Wildlife Sanctuary*  
346 Grapevine Road • Wenham, Massachusetts 01984  
Telephone: (508) 927-1122 Fax: (508) 922-8487  
*endicott@massaudubon.org*

May 30, 1997

Mr. Jack Terrill, Coordinator  
New Bedford Harbor Trustee Council  
National Marine Fisheries Service  
One Blackburn Drive  
Gloucester, MA 01930-2298

Dear Mr. Terrill,

The Massachusetts Audubon Society supports the use of money from the restoration fund for New Bedford Harbor for Buzzards Bay tern restoration and habitat stabilization. We are glad to see that this project has been included in the list of 12 preferred restoration ideas prepared by the Council. We think it should be at the top of the list since terns are one of the three resources for which damage as a result of the contamination of New Bedford Harbor was clearly proved. There is a particular need for roseate terns restoration, as they are federally listed as endangered.

Providing funding for protecting and restoring terns clearly fits the intention of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Common and Roseate Terns were directly injured by the PCB contamination of New Bedford Harbor, as indicated in the Draft Restoration Plan/Environmental Impact Statement (RP/EIS) and in the research of Dr. Ian C. T. Nisbet. Nothing in CERCLA indicates that all funds need to be spent on projects specifically within New Bedford Harbor, but that funds need to be used in support of restoring natural resources injured by the toxic wastes.

The project consists of continued restoration, management, and monitoring of tern colonies at Bird and Ram Islands, restoring terns to Penikese Island, rebuilding and stabilizing eroded areas on Bird and Ram Island to maintain the integrity of nesting sites, and monitoring tern eggs for PCB residues. This is a six year project with an approximate cost of \$886,000 of which \$124,000 will be spent in the first two years of work. Cost sharing by several state and federal agencies will contribute significantly to the project. The terns are currently in a very precarious position, not only because of the impacts of PCBs from New Bedford, but also because the two current nesting sites, Bird and Ram

Island, have experienced heavy erosion over the past few years. This is why the rebuilding and stabilization work proposed for Bird and Ram Islands and the need to establish a third nesting area at Penikese Island are so important to insure the future health of terns in the New Bedford Harbor region.

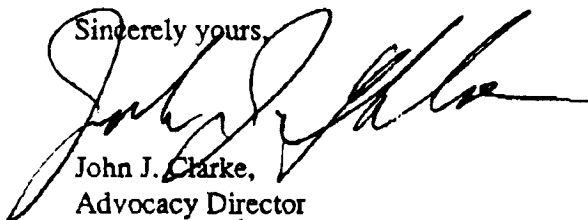
The Society's main concern is that the Trustee Council needs to commit to funding this project in its entirety over the six year time-frame. The Draft RP/EIS is unclear on this, stating that the Trustee Council will commit funds for only the first two years and then reevaluate this project. The first two years will be largely focused on monitoring, design, and permitting that will help to determine the specifics of the rest of the project. The major remedial actions, such as stabilizing nesting islands, will not take place until the following four years. It is therefore absolutely essential that the Trustee Council commit to the entire six years of this project. The cost of the project, when spread out over the six years is not great, but the anticipated benefits to New Bedford Harbor and Buzzards Bay are substantial.

Past experience has shown that terns respond well to the kinds of management measures that are being proposed. The proposed management measures are consistent with the federal recovery plan for Roseate Terns. The recent elimination of chemical controls on gulls by the project proponent should eliminate public concern about this particular aspect of the project.

*The Massachusetts Audubon Society is a voluntary association of people whose primary mission includes the preservation of a Massachusetts environment that supports both wildlife and people. The Society's programs encompass three broad areas: biological conservation, environmental education, and advocacy. The Society is one of the largest independent conservation organizations in New England with a membership of 55,000 households.*

We thank you for this opportunity to comment.

Sincerely yours,



John J. Clarke,  
Advocacy Director

cc    Senator Edward Kennedy  
      Senator John Kerry  
      Representative Barney Frank  
      Brad Bodgett  
      Dr. I.C.T. Nisbet

**SIDLEY & AUSTIN**  
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

CHICAGO  
DALLAS  
LOS ANGELES

1722 EYE STREET, N.W.  
WASHINGTON, D.C. 20006  
TELEPHONE 202 736 8000  
FACSIMILE 202 736 8711

FOUNDED 1866

NEW YORK  
LONDON  
SINGAPORE  
TOKYO

WRITER'S DIRECT NUMBER

(202) 736-8161

May 30, 1997

New Bedford Harbor Trustee Council  
c/o NMFS, F/NEO2  
1 Blackburn Drive  
Gloucester, MA 01930

Re: Draft Restoration Plan Environmental Impact Statement/Environmental Impact Review for the New Bedford Harbor Environment

Dear Sir/Madam:

General Electric Company ("GE") appreciates the opportunity to submit these comments on the "Draft Restoration Plan Environmental Impact Statement/Environmental Impact Review for the New Bedford Harbor Environment" (April 1997) ("Draft Plan"). Our comments focus on the Draft Plan's failure to describe how PCBs have caused injury to the ecosystem of New Bedford Harbor. Without such a showing, it is impossible to select appropriate restoration options because one does not know what injuries are to be restored.

The Draft Plan does not demonstrate that releases of PCBs into the Harbor have injured the Harbor's ecosystem. Although we recognize that the focus of the Draft Plan is on restoration options, before a restoration plan can be developed, it is necessary to understand how the release of hazardous substances, in this case PCBs, has injured natural resources. Without such an understanding, one cannot know which resources are injured and to what extent they must be restored. Although this task is typically addressed through a natural resource damage assessment, it appears that no such assessment has been performed for the New Bedford Harbor Site, probably because the trustees settled their claims for natural resource damages early in the process. The existence of a restoration fund, however, is not a valid reason to avoid the trustees' obligation to show that PCBs have caused injury to natural resources, and the Draft Plan's limited three page description of ecological injuries allegedly resulting from PCBs is completely inadequate to this task.



New Bedford Harbor Trustee Council  
May 30, 1997  
Page 2

The Draft Plan uses two approaches to support a showing of ecological injury. First, it claims that the presence of elevated levels of PCBs present in the Harbor sediments and biota shows that the ecosystem has been impaired. Second, it relies on two studies -- one a collection of data concerning the effects of PCBs on Harbor benthos (Nelson, 1996) and the other an advocacy document prepared in the context of litigation (Nisbet, 1990) -- to attempt to show more specifically how the PCBs have harmed biota in the Harbor. Neither method is sufficient.

The Draft Plan's primary mode for showing injury is to describe the elevated levels of PCBs in Harbor sediment and biota. Draft Plan at 3-62 to 3-65. The presence of PCBs alone, however, does not mean that there has been an injury to the biota in the Harbor. Such injuries can only be shown through studies linking the PCBs to impacts on populations, communities or ecosystems within the Harbor. Exceedance of the FDA tolerance, touted by the Draft Plan as a sign of ecological injury, merely shows that humans cannot (or should not) consume fish; it does not show that the fish themselves are harmed. Indeed, as the Department of Interior has recognized, "[m]any organisms, including man, can carry low levels of foreign chemicals in their tissues with few or no known measurable effects from those chemicals. Injury determination in this rule is based on demonstrable adverse biological response from the oil or hazardous substance." 51 Fed. Reg. 27683-84. Accordingly, to show injury, the trustees must do more than simply identify the presence of PCBs in biota; they must show specifically how the presence of the PCBs has caused an injury to those biota.

Even where the Draft Plan attempts to make such a showing, it falls far short of demonstrating that PCBs have caused any significant injury to populations, communities or ecosystems within the Harbor. The Draft Plan first states that a study by Nelson (1996) shows low survival rates for amphipods and "low benthic diversity" and "degraded benthic community" in areas of the Harbor contaminated with PCBs and metals. Draft Plan at 3-63, 3-64. The Draft Plan, however, does not clarify whether these effects resulted from PCBs or metals, and without some direct link to PCBs, the cited study does not demonstrate that PCBs have injured benthos in the Harbor. More problematic is the Draft Plan's unsupported hypothesis that the "reduced biodiversity and ecological health of benthic communities stemming from the Harbor contamination resulted, in turn, in reduced diversity and abundance of bottom-feeding fish and other predatory species that depend on these communities." Draft Plan at 3-64. If such broader effects in fact have occurred, one would expect that data showing reduced biodiversity and abundance of fish and other predatory species would exist. Yet, the Draft Plan presents no such data. Thus, while Nelson (1996) might arguably show some injury to the benthic community, it cannot be used to demonstrate injury to other organisms that might feed on benthos.

The Draft Plan also relies on a litigation report prepared by Nisbet (1990) to claim that common terns were lethally poisoned by PCBs as a result of feeding on baitfish in New Bedford Harbor. Draft Plan at 3-63. This document is also used to support claims that "PCBs from New Bedford Harbor posed a threat to the survival of a number of other species of fish-

New Bedford Harbor Trustee Council  
May 30, 1997  
Page 3

eating birds in Buzzards Bay, including the double-crested cormorant, snowy egret, great egret, herring gull, great black-backed gull, ring-billed gull, laughing gull and least tern." Draft Plan at 3-65. Putting aside the question of whether the trustees should rely on an advocacy document prepared in support of litigation to show injury in the Draft Plan, if PCBs were causing such significant impacts (i.e., threatening the survival of these birds), one would expect that these effects would be obvious and documented. The lack of any studies showing such widespread effects, however, suggests that they are not in fact occurring.

In short, although the Trustee Council has received funding for the natural resource damage restoration process through a previous settlement, it must still show how PCBs have caused ecological injury in New Bedford Harbor. The Draft Plan's reliance on the presence of PCBs and vague and hypothesized impacts from limited and possibly biased studies is inappropriate and insufficient to show such injury. Unless such injuries are clearly identified and demonstrated, the trustees cannot make a rational decision about appropriate restoration projects.

Please do not hesitate to contact me should you have any questions

Sincerely yours,

A handwritten signature in black ink, appearing to read "Thomas G. Echikson", written in a cursive style.

Thomas G. Echikson

## INTERNATIONAL WILDLIFE COALITION



June 1, 1997

New Bedford Harbor Trustee Council  
 1 Blackburn Drive  
 Gloucester, MA 01930

Comments: G-1, G-2, G-7, T-1,  
 T-2, AQ-2

Dear Council Members:

I am writing to comment on the draft proposals for the restoration of New Bedford Harbor.

I was surprised to see that the funds are being used via a Comment G-7 grant system whereby state and federal government offices (knowledgeable of the existence of the funds) are voting to use this money to fund their own pet projects. Clearly, I would have thought the wiser action would have been to assemble a panel of experts (with no conflict of interests with regards to personal benefit) and have them draft a plan for the maximum environmental benefit of New Bedford Harbor.

I specifically am shocked to see that hundreds of thousands of dollars are to be used to poison gulls and kill other predators, re. tern recovery. As a wildlife organization, we applaud the use of funds for wildlife recovery, but we cannot condone cruel, frivolous or wasteful programs. I also note that the Citizens Advisory Board voted against these projects, only to have them later adopted by the Council. This is most inappropriate. The tern projects proposed are well outside of New Bedford Harbor. More to the point, however, is that the very government offices that will be getting the money made the deciding votes on these proposals. They elected to ignore the citizenry and give themselves the money.

On an additional issue, I agree with the Council in the rejection of the proposed aquarium on many grounds. Within the past few years there have been a number of aquariums in the United States that have gone bankrupt. A recent example is the relatively new aquarium in Camden, New Jersey. This facility was to revitalize an urban area, however, the benefit has been minimal at best. It remains a significant financial drain on the local community.

page 10-55

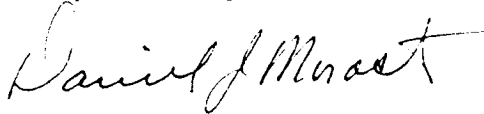
UNITED STATES  
 70 East Falmouth Highway  
 East Falmouth, MA 02536-5954

CANADA  
 P.O. Box 461, Port Credit Postal Station  
 Mississauga, Ontario L5G 4M1

UNITED KINGDOM  
 P.O. Box 73  
 Hartfield, East Sussex TN7 4EY

I urge the Council to broaden their environmental perspective and to develop a coastal master plan for the best use of the twenty million dollars available. It is my understanding that these funds are to restore the environmental quality of New Bedford Harbor. I respectfully suggest Council-funded projects focus on this primary objective.

Respectfully,

A handwritten signature in cursive script, reading "Daniel J. Morast".

Daniel J. Morast, President  
International Wildlife Coalition  
70 East Falmouth Highway  
East Falmouth, MA 02536  
Phone: 508-548-8328, ext 202  
Fax: 508-457-1988

Comments upon the "Draft Restoration Plan Environ

Environmental Impact Review for the New Bedford Harbor Environment" by  
Robert J. Olivera, Director, Fairhaven Fisheries Institute, Inc. (FFI)

Comment T-1, Comment T-4

Plans for restoration and stabilization of Buzzards Bay terns are worth-  
while. Every effort should be made to accomplish this goal, however,  
without a gull poisoning component. (4.3.6.2.1)

Comment SH-1

Comment SH-3

Plans for restoration and management of the New Bedford Area Shell-  
fishery: Area 1, 2, and 3 are worthwhile. Native quahogs should be utilized  
as seed donors, as is done in Martha's Vineyard, and seed from the notata,  
genetically distinct, subspecies of *Mercenaria mercenaria* should be pro-  
hibited. Further introduction of the notata into this area diminishes  
biodiversity, already a problem because of PCB contamination, and the  
thinner-shelled subspecies notata must interact with quahogs' main shell-  
attacking predators. Not only would crabs have a thinner-shelled object  
of predation; but, shellfishermen, particularly power dredge operators,  
would have increased discards as a result of more broken-shelled catch,  
increasing the harvesting effort. In 1953, Glude and Landers reported  
that bullraking and power dredging effects are both dissipated within  
500 days of their conclusion. Dredging destroys sea-grasses and benthic  
algae and recolonization proceeds slowly; therefore, broken-shelled dis-  
cards must be kept to a minimum. (4.3.5.2.1)

Comment NA-4

Plans for restoration and management of the New Bedford Area Finfishery  
are incomplete because "...the damage assessment performed was incomplete"  
(4.2.4). In 1996, I questioned the Chair, Technical Advisory Committee,  
Mr. John Terrill, whether a striped bass (*Morone saxatilis*) project would  
conform to guidelines establishing which species had been damaged by PCB

(1)

discharges into the New Bedford/Fairhaven Harbor environment. He was most obliging; helping research this question for me and providing a copy of the only natural resource assessment than extant, the EBASCO Services' "Draft Final Baseline Ecological Risk Assessment: New Bedford Harbor Site Feasibility Study", which the EPA funded and was following in determining, at the time, what constituted the New Bedford/Fairhaven Harbor environment's biota. Striped bass received short shrift in that report. The Draft RP/EIS prepared by the Trustee Council, April, 1997, rectified this shortcoming. Table 3.1 'Fish using fresh water habitats in the Acushnet River' (Hurley, 1996): Table 3.6 'Finfish in the New Bedford Harbor Estuary' (from VHB, 1996; Kolek & Ceurvais, 1981; Hoff et al., 1973): Table 3.7 'DOMINANT COMMERCIALY VALUABLE FISH SPECIES IN BUZZARDS BAY IN ORDER OF ABUNDANCE AND PREFERRED PREY ITEMS' Adopted from Howes and Geohringer (In Press): and, D. Kolek's personal communication of 1996 found at the Recreational Fishing section (3.4.3.4.2) each document that striped bass inhabit the New Bedford/Fairhaven Harbor environment. Striped bass have been contaminated by exposure to PCBs in the New Bedford Harbor area. (3.5.2.1) J.A. Whipple, in 1984, reporting to NMFS on the bioaccumulation of PCBs in stripers, as part of the project resulting from the settlement of the polluting of Hudson River by General Electric, found in "The impact of estuarine degradation and chronic pollution on anadromous striped bass", that PCBs biomagnify in them because of their biology. "PCB contamination renders ... finfish...inedible by humans; and organisms contaminated by PCBs cannot be depurated." (3.4.6) "As a result of PCB contamination in the New Bedford Harbor Estuary, the Commonwealth of Massachusetts enacted three commercial and recreational fishing closures in September, 1979. These closures continue in effect through today and

(2)

are expected to remain in effect until some years after harbor cleanup is completed. (3.5.3) "Furthermore, lack of high-quality habitat may prevent populations or communities injured by PCBs from fully recovering from the effects of the contamination once the harbor sediments are remediated." (3.4.6)

In consideration of the aforementioned, FFI proposes an aquaculture-based project to aid in the restoration of this species, *Morone saxatilis*, injured by the release of PCBs into the New Bedford/Fairhaven Harbor environment. This project should be an Emergency Restoration Action. (4.2.3)

#### The Fairhaven Fisheries Institute Striped Bass Project (FFISB)

FFI is a 501(c)(3) research and educational community economic development corporation. FFI is publicly supported, with a representative governing body, organized to benefit the New Bedford/Fairhaven area.

In 1994, FFI met with representatives of the University of Mass., Dartmouth, led by Chancellor Peter Cressy, to promote aquacultural initiatives for this area: proposals included urban aquaculture to re-colonize vacant factory space in southeastern Mass., mariculture, aquacultural training for members of the local fishing industry negatively affected by the New England 'fisheries crisis', stronger linkages with aquaculturists and other marine scientists from outside southeastern Mass., and development of integrated aquacultural programs with local primary and secondary schools. Also, in 1994, FFI met with the administration of Greater New Bedford Regional Vocational and Technical High School to inform them the appropriateness of aquaculture as a core curriculum in keeping with the mandates of the Mass. Education Reform Act of 1993, to facilitate the transference of an existing curriculum from the Bridgeport, Conn. Aquacultural High School to their own

(3)

school, to liaise between themselves and University of Mass., Dartmouth's, emerging aquaculture program, and, finally, to highlight the potential linkage between aquaculture programs and hydroponics and other forms of agriculture and culinary arts.

In 1995, FFI was a sponsoring agency for a symposium on aquacultural opportunities for southeastern Mass. held at University of Mass., Dartmouth. In 1995, FFI was funded by The New Bedford Corporation to undertake a study of the feasibility of finfish mariculture in Buzzards Bay.

In 1996, FFI submitted a report to The New Bedford Corp., "Buzzards Bay Aquaculture: Finfish Mariculture", concluding that there is adequate space for the production of ten million pounds of finfish in net-pens within Buzzards Bay. One full-time job in direct farm employment is created for each 17.6 tons of fish maricultured; hence, over 250 local jobs. In 1996, with the authorization of the Mass. Division of Marine Fisheries, FFI began to culture juvenile striped bass obtained from the Crane Aquaculture Center, University of Maryland, in a New Bedford/Fairhaven area land-based facility preparatory to their envisioned placement in grow-out net-pens in Buzzards Bay. FFI's report to The New Bedford Corp. concluded that a pilot project to evaluate growth and survival of *Morone saxatilis* in a research and development farm should be undertaken over a two-year period. Such an approach would minimize expenses and risks; but, simultaneously, yield valuable data which will permit a sound biological and economic examination of the constraints and benefits and a solid foundation for any further development. At the same time, this project would be used for both public education and the training of those specifically choosing to be aquaculturists. Commercial fishers especially, whose skills are not easily transferable to other occupations, would benefit by becoming aquaculturists, at least to supplement their income during the fisheries crisis, because they already possess most of the requisite knowledge and skill

(L)



In spring of 1997, FFI is expanding and consolidating its aquacultural plant at the Andonian Cryogenics factory, 88 Hatch St., New Bedford. FFI requests emergency funding as part of this process. The need for additional back-up equipment and manpower is real and pressing. FFI is beginning to conduct aquacultural operations in previously unoccupied mill-space just northwest of Riverside Park Belleville Avenue Recreational Marine Park. (4.3.2.2.2) At least two other aquaculture facilities are situated in nearby factory space. Andonian Cryogenics and FFI already have a synergistic relationship as regards hi-tech, when appropriate, or other levels of technological implementation of fisheries science.

Aquaculture's potential as a springboard for intellectual products originating locally meshes with the designated marine science focus for University of Mass., Dartmouth, within the U. of Mass. system's plan. The economic development plan for the Commonwealth of Mass., "Choosing to Compete", identifies southeastern Mass. as the locale for marine science and technology and aquacultural specialization within the state.

Aquaculture is consistent with the City of New Bedford's Economic Development Plan. (3.4.7) Aquaculture is cited as of the highest priority in the Town of Fairhaven's Economic Development and its Master Plan. The report of the Governor's Commission on Commonwealth Port Development identified this area for aquaculture and aquaculture-based educational projects. (4.2.1) Aquaculture is required to conform to governmental programs, policies and laws as identified in the Draft RP/EIS, Chapter 6. Since FFI will only obtain non-genetically altered *Morone saxatilis* for this project, not only can they be cultured on land; but, they have the potential to be maricultured or utilized for stock enhancement in the wild. (1.3)

(5)

The FFISB Project addresses the interests, occupations, and demographics intended to be represented on CRAB. (2.1.2.2) FFISB Project can be implemented in the near term without being affected by cleanup activities. (2.2.1) FFISB Project mitigates injuries which the Trustees have identified as best addressed through remediation and restoration activities. The FFISB Project corresponds to the mitigation required for affected user groups. (2.2.2) FFISB promotes the goal of restoration. (2.2.3) FFISB furthers the commitments of the Trustee Council. (2.2.4) The FFISB Project conforms to the selection criteria established by the Trustee Council:

1. FFISB will lessen the pressure on the wild harvest fishery stocks. It provides the potential for wild-stock enhancement and a better understanding of the biological ramifications of anthropogenic and natural alterations in striped bass habitat. Services that the resource provided prior to PCB contamination will be restored; namely, fresh high-quality edible stripers would be available to local consumers, restaurants, processors, distributors, and aquaculturists.
2. FFI envisions harvesting not only be undertaken directly from the upland facility at 88 Hatch St., New Bedford; but, eventually, from grow-out mariculture facilities sited in the New Bedford/Fairhaven Harbor Environment. (See Map 'Potential locations for deep water aquaculture in Buzzards Bay, MA')
3. Mariculture and associated industries located in the New Bedford/Fairhaven Harbor Environment create additional stakeholders with a powerful economic rationale for insuring high water quality. Land-based aquaculture provides economic, scientific, and educational benefits to the public.
4. As a 501(c)(3) corporation, FFI is not allowed to operate for private profit. FFISB is designed to push forward a sustainable striped bass

(6)

population while creating and maintaining jobs.

5. FFISB will determine the viability of striped bass aquaculture in a re-colonized area mill. It is compatible with the mixed-use nature of the area. As I discussed with Trustee Bullard, once the net-pen grow-out sites proposed for the New Bedford/Fairhaven Harbor Environment receive government approval, they will contribute to the area's aesthetics, particularly as regards the New Bedford National Park. They will help to maintain a vibrant working waterfront. The documented condition of the fish maricultured in the area should help assuage public disdain for the condition of the natural resources of the local marine environment. Tourists and locals could partake of fresh, healthful stripers obtained locally. Mr. Gregory Swanzey, Director, Schooner 'Ernestina' Commission, agrees with FFI that the feeding and harvesting of locally maricultured fish, as well as the deployment and maintenance of the net-pens, would be a tourist attraction.

6. Economic effects of the FFISB Project are easily identified and quantified in terms of direct benefits. Multiplier effects will come into play. Harvest pressures on the wild stocks will diminish. Direct enhancement of the wild stock becomes a possibility.

7. FFISB will utilize proven technologies with high probability of success. The methodology for the culture of *Marone saxatilis* is a well-developed technique. Whether the physical and chemical environment of the local waters is conducive to the mariculture of striped bass, a species already collected in Buzzards Bay and whose known water quality requirements are met here, awaits analysis of the results of actually doing it here. Land-based aquaculture of this species has been occurring for over a century.

8. FFISB Project should provide a high cost-benefit ratio, although additional data should be generated and analyzed to determine the specific circumstances that prevail locally.

(7)

9. The goal of the FFISB Project is a sustainable striped bass fishery in this area that would be available for consumption, as well as, research and education. The opportunity for community involvement in this project will continue after the Trustee Council's actions have ceased.

(2.2.5)

FFISB meets the restoration priority areas agenda established by the Trustee Council:

- 1) The recirculating systems used by FFI in our indoor systems utilize bacterial filtration to maintain water quality, mimicking the functions of wetlands and marshes and, in effect, replacing these functions.
- 2) Potential exists for linkage between our facility and the nearby, proposed, Riverside Park Belleville Avenue Recreational Marine Park. FFISB could evolve an enhancement component of benefit to recreational anglers.
- 3) FFI provides clean saltwater to the fish we culture indoors. FFI has not been able to utilize the saltwater closest to our facility because of the high levels of pollution. FFI is required to transport water from Buzzards Bay, outside of Area III, to replace the nearby saltwater which is unusable because contaminated.
- 4) FFISB replaces ecosystem services to our cultured stripers, e.g. clean water and food, that had been denied them in the New Bedford/Fairhaven Harbor Environment because of its contamination.
- 5) The abundance and health of this living resource, *Morone saxatilis*, would, most likely, improve if FFISB evolves to include an enhancement component. Near term, more and healthful stripers would become available for human utilization.
- 6) Although not listed as an endangered species, striped bass management plans in place recognize the vulnerability of this species. (2.2.6)

(8)

FFISB correlates well with mitigation of effects upon the affected human environment identified in the Draft RP/EIS. Local citizens have been denied the in-shore fishery opportunities common to most New England estuaries. (3.4.3)&(3.5.3) Generally, this area suffers from reduced economic health as a consequence of the New Bedford/Fairhaven Harbor Environment's pollution. (Table 3.10) There has been an outmigration from the area as a result of the lack of adequately remunerated jobs having a future. Personnel who FFI have identified as crucial to the success of FFISB are being recruited for employment outside this area, already. Only striped bass from a miniscule number of facilities have been approved by MDMF for importation into this state for aquacultural purposes. Demand for these stripers exceeds supply as most facilities no longer produce pure *Morone saxatilis* which we require for FFISB. Biodiversity in striped bass culture has diminished as almost all growers have switched to hybrid striped bass production. Our ability to maintain our excellent working relationship with the source of the stripers that FFI now holds, Crane Aquaculture Center, University of Maryland, and the ability to retain necessary personnel requires funding which is time-sensitive and requires almost immediate action by the Trustees. (4.2.3)

Since local striped bass in the wild are subject to continuing danger, by providing a protected environment FFISB Project will restore human utilization of this natural resource; apparently conforming to the CERCLA requirements for emergency restoration action. (5.4.4)

Since acknowledgement of stripers as an affected natural resource occurred so late in the planning process, which was designed to have flexibility, and since FFISB was proffered to the Trustees during the allotted time for public comment prior to the finalization of the RP/EIS; the Trustees may prefer to consider FFISB a near-term restoration project because of this recent new scientific finding.

FFI has a successful history of generating matching funds. FFI has always benefited from many hours volunteered to its programs. FFI has the loan of equipment useful to the FFISB Project; e.g. microscope, YSI 55 dissolved oxygen/temperature meter, pH meter and other test equipment, as well as, a complete closed recirculation system outfitted for saltwater fish culture. Funding had been received from The New Bedford Corp., a 501 public funding corporation. Stripers produced as a result of the FFISB Project can be utilized to introduce or reacquaint locals with this native fish and generate further public support.

Almost all of the FFISB payroll will accrue to residents of the four affected communities. FFISB production facilities can serve as a model for future aquacultural efforts in the area. The World Bank predicts that 50% of the total value of the world's seafood will be produced by aquaculture in the year 2010. The aquaculture industry will be required to produce \$60 billion in additional product annually to meet this need. This area cannot afford to miss out on this growing sustainable industry.

Standard toxicological testing should be used to determine if the PCB use in the area had contaminated fish cultured upland from the 'Hot Spot' during the FFISB Project at the re-colonized 88 Hatch St. complex. Standard methods can be utilized to determine growth and overall health of striped bass cultured during the FFISB Project. As a requirement of our license to culture 'undersized' stripers, MDMF requires the submission of reports and the right to inspect our facility.

FFISB Project requires funding for a two year period. During this time, not only the indoor culture of striped bass will occur; but, the necessary preconditions would be in place to pursue planning for permit acquisition for the contemplated net-pen mariculture grow-out sites. (See map)

(10)

# Timeline/Milestones:

- Month- 1-3 Assemble staff/obtain and set-up culture system/reconnoiter aquaculture facilities being operated successfully
- 4-6 Establish biological filtration system/live-transport first stripers to 88 Hatch St., New Bedford/renew license from, and generate report to, MDMF relative to stripers being cultured/ fish and water quality determined during entire timeframe of project
- 6-9 Live-transport additional striped bass for FFISB/ travel to symposia/ confer with consultants/ maintain fish and water quality
- 10-18 Site visits to other aquaculture facilities/ attend conference and symposia/ confer with consultants/maintain fish health
- 18-24 Live-transport additional striped bass for FFISB/ renew license from, and generate report to, MDMF/ pursue permit acquisition for potential mariculture sites/FFISB Evaluation

Budget-	Payroll&fees	\$172,800
	a)Project Coordinator	\$72,000(3/4time)
	b)Aquaculture Technician	45,500(3/5time)
	c)Utility Personnel	30,000
	d)Withholding(Soc.Sec.&Unemp)	16,800
	e)Consultants	8,500
	Accounting,auditing,&legal	7,750
	Insurance	1,500
	Rent	7,200
	Utilites	980
	Fax&phone	2,400
	Computer	2,400
	D.O./Conductivity Meter	1,435
	Fish transport/travel	7,300
	Feed/Prophylactics	2,250
	Equipment(tanks,pumps,etc.)	4,800
	Misc.expenses	5,300
	*Total	\$216,115

Fairhaven Fisheries Institute  
35 Rodman St.  
Fairhaven,MA 02719

Telephone (508) 996-9887

page 10-67

(11)

## MAP - POTENTIAL LOCATIONS FOR DEEP WATER AQUACULTURE IN BUZZARDS BAY, MA

*Narrative:* This map delineates and notes the surface area (in hectares) of four potential sites for deep water aquaculture in Buzzards Bay (as determined by Sea Forest Plantation Co., Ltd.). It also includes a comprehensive summary of the various data requested for study, including: municipal boundaries, deep water areas, significant coastal development, surface level water temperatures at the three deep water monitoring stations, and excluded use zones (i.e., cable, navigation, anchorage, fish trapping, dump, disposal and spoil areas).

*Source(s) of Information:*

- Potential Aquaculture Areas - compiled by the Boshe Institute from longitude and latitude locations provided by Sea Forest Plantation Co., Ltd.
- Navigation Channels - compiled by the Boshe Institute from nautical charts (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Edition 25, June 1983) into a digital map database (1:40,000 scale)
- Cable Areas - compiled by the Boshe Institute from nautical charts (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Edition 25, June 1983) into a digital map database (1:40,000 scale)
- Anchorage Areas - compiled by the Boshe Institute from nautical charts (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Edition 25, June 1983) into a digital map database (1:40,000 scale)
- Fish Trapping Areas - compiled by the Boshe Institute from nautical charts (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Edition 25, June 1983) into a digital map database (1:40,000 scale)
- Spoil, Dump and Disposal Areas - compiled by the Boshe Institute from nautical charts (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Edition 25, June 1983) into a digital map database (1:40,000 scale)
- 30 foot Water Depth Contour - compiled by the Boshe Institute from nautical charts (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Edition 25, June 1983) into a digital map database (1:40,000 scale)
- Municipal Boundaries - boundary file for the State of Massachusetts, MASSGIS

page 10-68



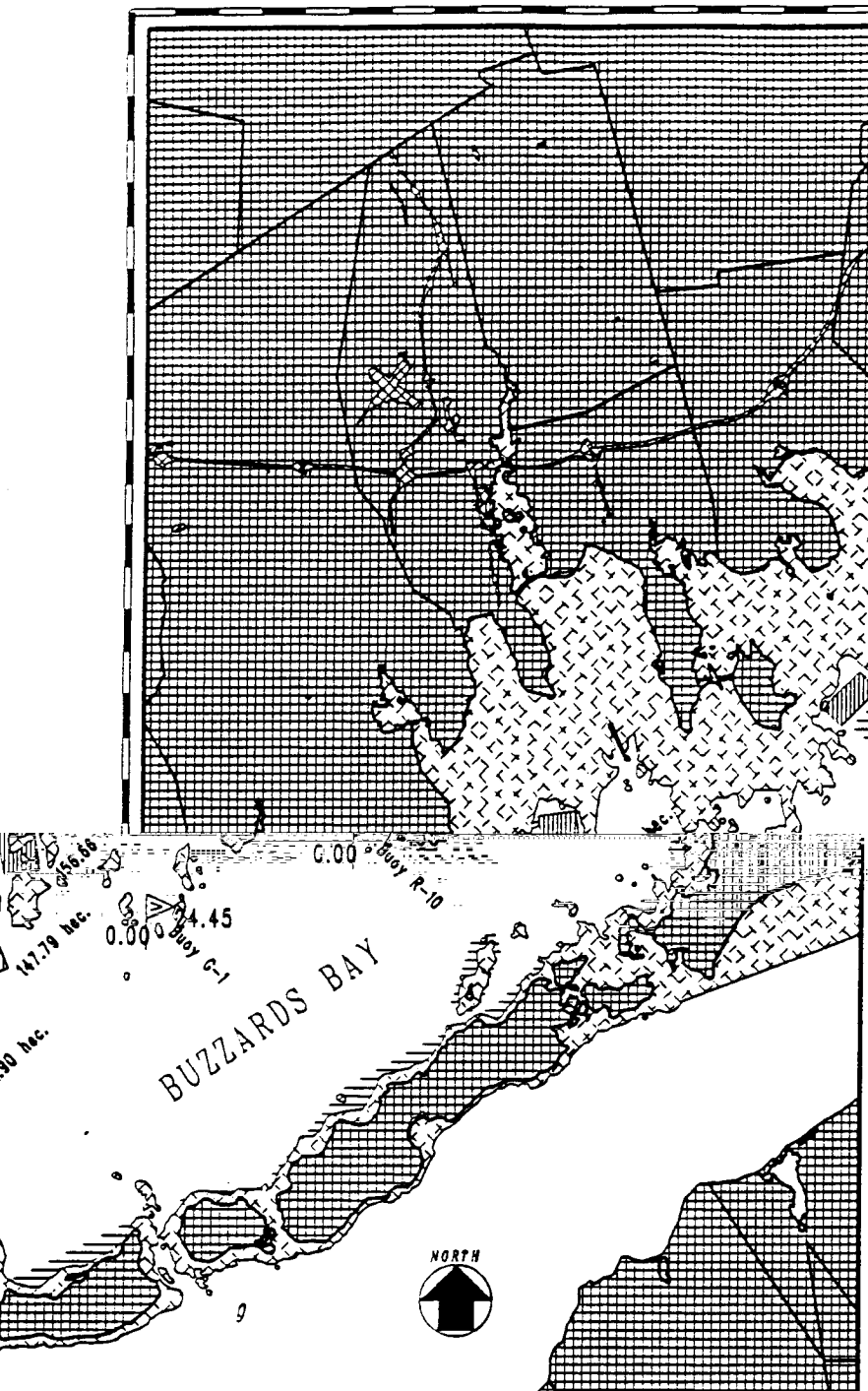
- Water Monitoring Stations - from "Plankton & Water Quality in Buzzards Bay, Mass., Oct. '87 - Sept. 1990." J. T. Turner, D. G. Borkman and R. W. Pierce. Prepared for the Massachusetts Department of Environmental Protection, Office of Watershed Management, Research and Demonstration Project 87-15. March, 1994.
- Station Locations - from longitude and latitude locations provided by the Fairhaven Fisheries Institute.
- Minimum and maximum water temperatures, dissolved oxygen, depth of monitoring, and cruise number - compiled into a digital database by the Boshe Institute from sources in appendix '1' and '7' of Turner et al.

*Notes:* All data referenced compiled for Buzzards Bay only. Other areas shown are approximations of data.

The final representation and delineation of aquaculture areas have been redefined to not include "Excluded Use Areas" indicated on the map. Surface area measurements (in hectares) calculated from map data, and do not include "Excluded Use Area" intrusions into delineated aquaculture areas.

Minimum and maximum surface level water temperatures calculated from 45 samplings taken at eight water monitoring stations in Buzzards Bay between October, 1987, and September, 1990, and documented by Turner et al.

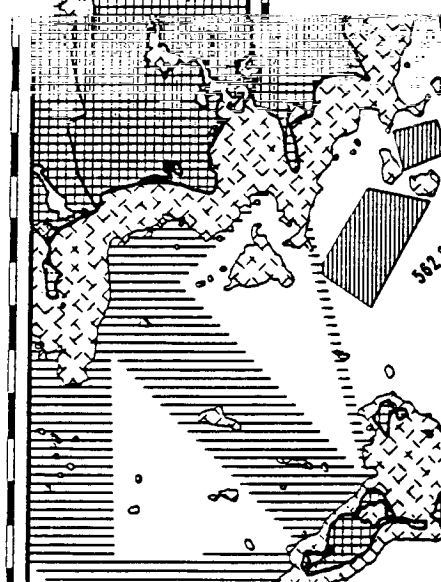
*Date Map Prepared:* April 5, 1996, for the Fairhaven Fisheries Institute by the Boshe Institute.



ONS FOR  
ULTURE IN  
, MA  
0.88 hectares

- |  |                      |  |  |
|--|----------------------|--|--|
|  | Municipalities/Land  |  | Navigation Channel                       |
|  | Coastal Development  |  | Excluded Use Area                        |
|  | Water Depth < 30 ft. |  | Station & Min./Max. Surface Water Temp.  |
|  | Water Depth > 30 ft. |  | Potential Aquaculture (area in hectares) |

Map prepared for the Fairhaven Fisheries Institute by the BOSHE Institute from WASSGIS, MA/DEP & Sea Forest Plantation data.



POTENTIAL LOCATION  
DEEP WATER AQUACULTURE  
BUZZARDS BAY  
Aquaculture Area = 980

Map prepared: 4/5/98



# DARTMOUTH NATURAL RESOURCES TRUST

PO Box P-17, DARTMOUTH, MA 02748 (508) 991-2289

Comments: P-1, N-8

June 2, 1997

Jack Terrill,  
Coordinator  
New Bedford Harbor Trustee Council  
One Blackburn Drive  
Gloucester, MA 01930-2298

## BOARD OF DIRECTORS

DAVID WILSON  
President

ANNE WEBB  
Vice-President

NAT HARRIS  
Treasurer

MARTHA MUNRO  
Secretary

TERI BERNERT  
ANDREW BURNES  
DAVE GIFFORD  
MICHAEL KENOE  
DAVID LORANGER  
MARK MELLO  
DANIEL PERRY  
RALPH POPE  
SANDRA RYACK-BELL  
TED SHWARTZ  
KATHY TRACEY  
KATHERINE WHITE  
JIM WILLIAMSON

Dear Mr. Terrill:

On behalf of Dartmouth Natural Resources Trust, Inc., I want to express again my support for the Padanaram (Draft Restoration Plan EIS/EIR,4.3.1.2.1) and Nonquitt Salt Marsh (Draft Restoration Plan EIS/EIR,4.3.1.2.2) restoration proposals.

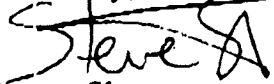
The marsh restoration proposals will improve the health of the respective marshes by increasing their tidal exchange. The resulting habitat improvement should, in turn, benefit the region's fisheries and improve the economies that rely on them.

In addition, the Nonquitt Marsh Proposal provides for the expansion of public access to DNRT's Smith Farm Reserve. The expanded trail system will be an important recreational and educational asset for the surrounding community.

Dartmouth Natural Resources Trust is a non-profit land trust with 700 members. The Smith Farm Reserve, which encompasses 2/3 of the Nonquitt Marsh, is our largest reserve.

Thank you for your consideration.

Sincerely,

  
Steve Sloan  
Executive Director

JAMES P. MCGOVERN  
3RD DISTRICT, MASSACHUSETTS

COMMITTEE ON  
TRANSPORTATION AND INFRASTRUCTURE

SUBCOMMITTEES:  
SURFACE TRANSPORTATION  
WATER RESOURCES AND ENVIRONMENT

**Congress of the United States**  
**House of Representatives**  
Washington, DC 20515-2103

512 CANNON BUILDING  
WASHINGTON, DC 20515-2103  
(202) 225-6101

DISTRICT OFFICES:  
34 MECHANIC STREET  
FIRST FLOOR  
WORCESTER, MA 01608  
(508) 821-7358

1 PARK STREET  
ATTLEBORO, MA 02703  
(508) 431-8025

218 SOUTH MAIN STREET  
SUITE 204  
FALL RIVER, MA 02721  
(508) 677-0140

<http://www.house.gov/mcgovern/>

June 4, 1997

Comment: G-3

The New Bedford Harbor Trustee Council  
1 Blackburn Drive  
Gloucester, Massachusetts 01930

Dear Council Members:

I write to express my strong support of the New Bedford Harbor Trustee Council's community-oriented efforts to restore and enhance environmentally-damaged habitats of Dartmouth, Massachusetts, and all of the New Bedford Harbor.

Those people most directly affected by these clean-up activities are among our best resources for effective and practical decision-making regarding restoration efforts. I strongly advocate a grassroots effort which incorporates the interests of the entire community, including supporters and non-supporters, of any proposed use for these federal funds. To this end, I support the Council's efforts to accomplish this goal.

Alternatively, "no action" by the Council is unacceptable, as it leaves environmentally-sensitive habitats in Dartmouth and the entire Harbor without a course for recovery. Now that the Environmental Protection Agency is close to a Record of Decision with regard to the overall clean-up procedure, there is no reason to wait. We must proceed with the clean-up and restoration because every year that passes makes the task of restoring the natural habitats of shellfish and other wildlife more difficult -- and ultimately unachievable at any reasonable cost. Our environment does not wait -- it continues to decline. The answer is obvious: we must act now.

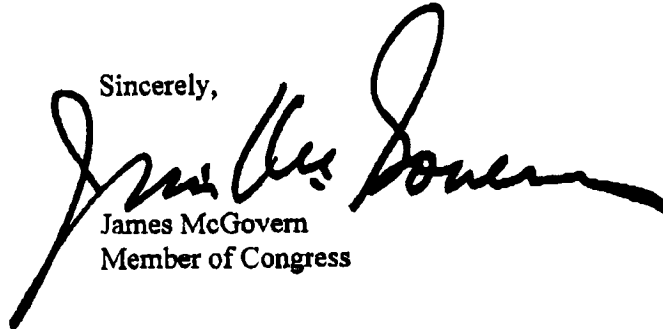
And we must act because the most important legacy that we can preserve for future generations is a safe and clean environment. Each of us has benefited from the environmental strides made over the past three decades. We must continue to do more. We must work toward the day when concern for the environment is no longer the catastrophic threat of pollution but maintenance of a healthy and thriving eco-system. To that end, I want to enthusiastically work with the Council.

The New Bedford Harbor Trustee Council  
June 4, 1997  
Page 2

The preservation and restoration of our environment is critically important to our future, to our children and to our overall well-being. That is why the New Bedford Harbor Trustee Council's efforts to improve the environment has my strong support. Further, I strongly endorse continuing rounds of project funding before the PCB clean-up is complete so that our environmental goals for Dartmouth and all of New Bedford Harbor can be achieved.

I thank you for your consideration of my comments.

Sincerely,

A handwritten signature in black ink, appearing to read "James McGovern", written over the typed name and title.

James McGovern  
Member of Congress

JM:dm



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
300 Westgate Center Drive  
Hadley, Massachusetts 01035-9589

---

Comments: T-4

---

In Reply Refer To:  
FWS/Region 5/ES-TE

---

JUN 19 1997

---

Mr. Jack Terrill  
New Bedford Harbor Trustee Council  
National Marine Fisheries Service  
One Blackburn Drive  
Gloucester, Massachusetts 01930-2298

Dear Mr. Terrill:

The purpose of this letter is to provide you with my support for the New Bedford Harbor project proposal, Restoration and Management of Tern Populations. This project proposal addresses essential conservation and management needs of both common terns (*Sterna hirundo*) and endangered roseate terns (*Sterna dougallii*) on three Buzzards Bay islands, Bird, Ram and Penikese.

The Buzzards Bay population of roseate terns is a significant part of the North Atlantic population of this endangered species. The protection and conservation of the roseate terns at Bird and Ram Island are critical to the species' survival and recovery. These islands are two of the three largest remaining nesting colonies of this species, and together support nearly 50% of the nesting pairs in the entire North Atlantic population. Ram and Bird Island are currently subject to partial over-washing and are suffering serious storm erosion. One component of the proposal involves protection from erosion of tern nesting habitat on Bird and Ram Islands.

I believe that it is entirely appropriate to utilize a portion of the New Bedford Harbor settlement fund for the Restoration and Management of Tern Populations project. Roseate and common terns have been adversely affected by PCBs released from facilities in New Bedford. The tern restoration proposals published in the EIS/Restoration Plan would directly fulfill the requirements of the natural resource damages settlement to restore natural resources injured as a result of PCB releases to the environment. Additionally, it will have direct and long-lasting benefits to one of Massachusetts most distinctive endangered species, the roseate tern.

Sincerely,

Ronald E. Lambertson  
Regional Director



*City of New Bedford*

OFFICE OF CITY COUNCIL

133 William Street • New Bedford, Massachusetts 02740 • (508) 979-1455

JUN 23 1997

George Rogers  
Councillor at Large

City Council President

Mr. Jack Terrell, Ex. Dir.  
NEW BEDFORD HARBOR TRUSTEE COUNCIL  
2 Blackburn Dr.  
Gloucester, MA 01930-2298

Comments: G-1, R-1

4-27-97

Dear Mr. Terrell:

Following today's Standard-Times front page story about the inexplicable rush to move forward in spending trust fund monies on remediation projects that have nothing whatsoever to do with the NEW BEDFORD harbor, I felt another letter for comment purposes would be in order.

While I do not purport to speak for all eleven councilors, I can say without any fear of contradiction that my words embrace the feelings of a majority of the body, feelings we have already expressed in more than one vote taken on this issue. In fact, at our last meeting, the body voted to refer to the Ordinances Committee my motion to move forward rezoning the Pierce Mill site-so-called, in preparation for what we envision as a multi-use park, recreation and open space area, something we feel the area deserves and something that, in justice, should be provided, given the fact that the PCB pollution caused most of its damage here, not 6 or 7 miles away in NONQUIT!

At any rate, let this be another letter or comment, urging the Council to agree to the Pierce Mill recreation, park, open space concept which we have advanced in more than one forum, including a "charette" held a couple of weeks ago in the heart of the very community which has been most consistently impacted by the PCB problem. Indeed, my suggestion that the area be put into recreational park and open space use, endorsed by Ward 2 Councilor Paul Koczera, in whose ward the area is located, was roundly applauded by the participants.

Accordingly, I again urge you and the Council members to authorize this project and provide the needed funding.

Sincerely,

George Rogers  
Council President

CC: Coun. Koczera

Residence and Office: 23 Robeson Street • New Bedford, MA 02740 • Tel. (508) 996-2716

FAX: (508) 997-2262

IN CITY COUNCIL, May 6, 1997

Endorsed.

Janice A. Davidian, City Clerk

Presented to the Mayor for approval May 8, 1997

Janice A. Davidian, City Clerk

Returned unsigned May 30, 1997.

a true copy, attest:

*[Signature]*  
City Clerk

page 10-75

JUL - 7 1997



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

JOHN F. KENNEDY FEDERAL BUILDING  
BOSTON, MASSACHUSETTS 02203-0001

Comments: G-14, G-15, G-16,  
G-17, G-18, G-19, G-20, G-21,  
G-22, G-23, G-24, G-25 R-4, R-5,  
B-2, SH-4, HE-2

July 2, 1997

OFFICE OF THE  
REGIONAL ADMINISTRATOR

John Terrill  
NOAA, National Marine Fisheries Service  
1 Blackburn Drive  
Gloucester, Massachusetts 01930-2298

RE: Draft Restoration Plan Environmental Impact Statement/Environmental Impact Review for  
the New Bedford Harbor Environment

Dear Mr. Terrill:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, we have reviewed the Draft Environmental Impact Statement (DEIS) for the New Bedford Harbor Restoration Plan in New Bedford, Massachusetts. We recognize the importance of the plan and appreciate your patience waiting for our formal review comments. We apologize for any inconvenience our delay may have caused.

As you know, discharges of PCB's into the New Bedford Harbor have resulted in significant environmental damage, economic loss and erosion of the quality of the human environment. EPA has been actively involved in ongoing efforts to remediate polluted portions of New Bedford Harbor and has encouraged and supported the New Bedford Harbor Trustee Council (NBHTC) efforts to initiate implementation of smaller-scale, short-term projects that catalyze natural resource restoration within the harbor. The DEIS describes a range of immediate, future and emergency actions, plans and studies intended to serve as the foundation for an estuary-wide plan to restore the affected portions of the harbor. Additionally, the DEIS chronicles the public process developed to generate a list of restoration projects to restore natural resources injured by PCB releases to the harbor. EPA actively supports the goals of the NBHTC to restore natural resources damaged by PCB's as well as human uses of those natural resources in the harbor. We believe there are many opportunities to restore a wide range of natural resources and uses in the harbor during and following completion of the cleanup of contaminated sediments within the harbor.

In general, EPA endorses the 12 preferred alternatives selected by the NBHTC for "near-term" implementation. We support implementation of preferred restoration alternatives that will maximize environmental benefits without conflicting with the ongoing harbor cleanup activities. In some cases, however, this may require that various restoration activities, or portions thereof, must be properly timed to be successful in the context of the overall cleanup process. We are also concerned that some of the restoration projects have the potential to resuspend highly

page 10-76

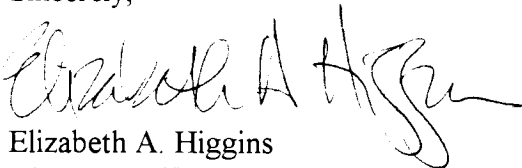


contaminated sediments. To that extent, EPA does not support activities that would increase or alter the spacial extent of PCB contamination as a result of resuspension. EPA has worked, and will continue to work, with the Trustees to ensure that none of the restoration work will interfere with or delay the Superfund remedy for the harbor. The FEIS should indicate that all activities conducted to support restoration projects will be coordinated through the EPA before they begin. Additionally, we believe that the phased approach (in conjunction with the cleanup) for restoration activities is a practical and effective strategy.

According to the DEIS, the NBHTC proposes to solicit ideas for additional future restoration actions, "periodically selecting restoration actions that are practicable, effective, and appropriate in the context of the ongoing cleanup." We continue to believe that the proposed Aquarium and Marine Science Center can directly benefit New Bedford Harbor through its ability to educate and build understanding and respect for natural resources; study how fisheries can be restored to the harbor; convert blighted waterfront property to clean, positive use; and improve access to the waterfront. We hope the NBHTC gives positive consideration to the Aquarium and Marine Science Center during its next round of restoration project evaluations.

In conclusion, for the reasons above, EPA has rated this EIS "LO-1 Lack of Objections-Adequate" in accordance with EPA's national rating system, a description of which is attached to this letter. This rating is based on EPA's evaluation of the information provided for the restoration plan and our conclusion that the FEIS should correct several inaccuracies and provide additional technical information associated with various alternatives. We believe our concerns can be resolved in the FEIS and we look forward to working with you to move the harbor restoration process along to the point of implementation. Please feel free to contact Timothy Timmermann of my staff at 617/565-3279 if you wish to discuss these comments further.

Sincerely,



Elizabeth A. Higgins  
Director, Office of Environmental Review

#### Attachments

cc:

Congressman Barney Frank  
David Dickerson, EPA  
Cynthia Catri, EPA  
Ed Reiner, EPA  
Phil Colarusso, EPA

## Technical Comments

### Section 1.2.2

Comment G-14

While the cleanup is directed at removal of PCB contaminated sediment, EPA believes that the FEIS should reflect that the areas of highest metals contamination will also be removed.

### Section 1.2.4

Comment G-15

While it is true that the cleanup will leave behind sediment with PCB concentrations below 10 ppm in the upper harbor and below 50 ppm in the lower harbor, it is inaccurate to imply that the PCB and metal sediment contamination is the only problem in the harbor. Combined sewer overflows, which are not within the scope of the Superfund remedy, also contribute to natural resource damages.

### Section 2.1.1

Comment G-16

CERCLA allows EPA to recover response costs addressing the release or threat of release of hazardous substances which harm human health and the environment. This includes natural resources damages. It is unclear if this section of the DEIS addresses only an assessment of natural resources damages since the first paragraph includes in the assessment a consideration of the amount of money needed to cleanup the contamination. Remediation is a separate action from NRD restoration activities. The FEIS should clearly explain that EPA activities address risks posed to human health and the environment and the Trustees activities address natural resource damages.

Comment G-17

Additionally, the definitions of "injury" and "site" include oil within their scope. This should be clarified if used in the context of EPA's activities under CERCLA since CERCLA's definition specifically excludes petroleum (42 U.S.C. §9601 (14)). EPA considers used oil (which contains hazardous substances) to be within the scope of CERCLA.

### Section 2.1.1.2.1

Comment G-18

The second paragraph of the DEIS indicates that CERCLA requires EPA to work with the U.S. Coast Guard to respond to and clean up all hazardous releases. The FEIS should reflect that the U.S. Coast Guard has been delegated to be the lead response agency for releases in maritime areas only.

### Section 2.1.3.2

Comment G-19

The FEIS should provide clarification to reflect that the January and May, 1992 Proposed Plan and Addendum were all one proposal for remediating the Harbor and Upper Buzzards Bay rather

than two separate phases of the cleanup.

Additionally, this section mischaracterizes EPA's actions in 1995. EPA did not revise the 1992 Proposed Plan through the community forum and then present a revised version in 1995. The revised Proposed Plan for ROD 2 was issued in November 1996. In April 1995, EPA outlined for the community forum (as well as for the public through cable and newspaper announcements) its conceptual modifications to the 1992 proposed plans based on public and resource agency comments received during the comment period held on the 1992 plans. This concept originally included a proposal to locate one of the CDF's in the cove area. Any reference to a 1995 version of a Proposed Plan should be deleted, since no such document exists.

### **Section 2.2.2**

Comment G-20

The Trustees have identified injuries best addressed through restoration and remediation. EPA disagrees that development options are limited by disposal of contaminated materials. In fact, EPA believes just the opposite; that development opportunities are available through the use of CDF's for things such as marine facilities, parks, and recreational use.

### **Section 2.2.7.4**

Comment G-21

The Trustees identified the Acushnet River north of Wood Street as a restoration area not likely to be affected by the cleanup. EPA would like to clarify that preliminary sampling of this area indicates that certain areas north of Wood Street are indeed contaminated above the 10 ppm TCL. These areas will be included in EPA's remedial program. EPA reminds the Trustees that a Feasibility Study Addendum for the hot spot sediments is expected to be issued in early 1998. Additionally, EPA intends to issue another decision document for the hot spot sediment currently stored in a CDF at Sawyer Street. An additional decision document will also be required for "phase 3" of the harbor cleanup for the outer harbor area.

### **Section 3.2.1.2**

Comment G-22

The second and third sentences of the first paragraph appear to contradict one another. The second sentence indicates that in the outer harbor there is a net transport of sediments seaward, while the third sentence says essentially the opposite. The FEIS should correct this inconsistency.

### **Section 3.5.1.2**

Comment G-23

While it is true that EPA has set an action level of 50 ppm below the Coggeshall Street bridge (PCB-contaminated sediment below that level will not be dredged), it is inaccurate to say the result is that significant PCB concentrations will remain in this part of the harbor. In fact, according to Figure 3-5, most of the remaining sediment concentrations fall either within the 1-10 ppm range or less than 1 ppm. In addition, should navigational dredging go forward in the harbor, contaminated sediment within the channel will be removed thereby further reducing the

amount of contaminated sediment below the Coggeshall Street bridge.

#### Section 4.3.2.2.2

Comment R-4

The Riverside Park Belleville Avenue Recreational Marine Park project would create an inner harbor coastal park that may include a boat ramp or pier for recreational use, marsh restoration or other enhancement of coastal habitat. The DEIS documents that park construction or wetland restoration would “have to wait until cleanup of the cove, and possibly the Upper Estuary, is completed.” This project borders a cove which is presently dominated by fringing salt marsh and intertidal mudflat all of which is targeted for dredging. This cove represents one of the greatest in-harbor opportunities for salt marsh and mudflat restoration. While EPA itself will replace some natural habitat lost as a result of dredging, the Trustees should also consider the value of this area for salt marsh and mudflat restoration. Plans for a boat ramp or pier at this location may conflict with such natural habitat restoration objectives.

Comment R-5

EPA would like to reiterate that close coordination and control of timing must be brought to bear for this proposed project. EPA agrees that the concept of a marine related park in this area is a good one, especially if either of the surrounding CDF’s B or C can be linked into a park system. The potential problem we see, however, is that such a park would inevitably attract people to the areas containing contaminated sediments. Therefore, EPA supports the DEIS statement that creation of the park would wait until the upper harbor dredging is completed (remedial dredging will proceed north to south) or EPA believes that the park should be constructed in such a way as to restrict access to the shore (e.g., using hedgerows or fences) until the dredging is complete.

#### Section 4.2.1

See comment to section 2.2.7.4 regarding remediation above Wood Street Bridge.

#### Section 4.3.1.1

Comment G-24

The FEIS should note that in addition to EPA's proposal to remove portions of the marsh which exceed 50 ppm PCB's, EPA also proposes to reestablish the saltmarsh in those areas destroyed by dredging.

#### Section 4.3.3.2.1 Hurricane Barrier Box Culvert

Comment B-2

The rationale section for this restoration proposal in the DEIS incorrectly references EPA's measurement of PCB flux, and the overall discussion of existing impacts and potential improvements is speculative in nature. The 0.5 lb/d flux rate referenced here is the flux from the upper to the lower harbor (using EPA's definitions) **as measured at the Coggeshall Street bridge** during 1994 and 1995. Thus the barrier is not a significant factor in this 0.5 lb/d flux rate, and the actual flux from the lower to the outer harbor (as measured at the hurricane barrier) has

historically been much lower. Before any new culverts are installed, EPA believes that the water quality impacts of such an undertaking should be thoroughly studied. Perhaps the academic community could be called upon to study or model these impacts. At a minimum, EPA suggests coordination with the various Buzzards Bay stakeholders. If it is determined that a new culvert would be an overall benefit, EPA agrees that it should be installed after the ROD 2 dredging is complete.

#### **Section 4.3.5**

Comment HE-2

Although we support the Herring Run Restoration project, we are concerned that fish may accumulate PCB's while traveling through the harbor. The FEIS should explain how the restoration project will be implemented or delayed (through institutional controls or otherwise) until the harbor sediments are cleaner.

#### **Sections 4.3.5.2.1 and 4.3.7.1.2**

Comment SH-4

EPA reiterates its concern for close coordination between the Trustees and EPA when planning and conducting shellfish surveys or transplants. EPA believes that more information on the degree of sediment resuspension from power dredges is required before use of this type of equipment is allowed in areas of sediment with high PCB contamination. EPA also reminds the Trustees that two localized areas of high PCB contamination exist south of the hurricane barrier (near the Cornel-Dubilier facility). Care should be taken when performing shellfish surveys or relays in these areas as well.

#### **Section 5.1**

Comment G-25

The DEIS incorrectly states that "some of the CDF capacity will be reserved for sediments from navigational dredging projects." More correctly, capacity is reserved for an interim cap to cover the contaminated sediments during initial settlement. Depending on a number of logistical and cost considerations, this interim cover may or may not be made up of navigational sediments. The report also states that the CDF's may be usable as wharves. EPA notes the potential for a number of other reuse options, including some that may be of interest to the Trustees (e.g., shoreline open space, bird sanctuaries). EPA believes that at least parts of CDF's A, B and C should be reserved for natural resource enhancements, including the intertidal and subtidal areas of the seaward facing berms and looks forward to additional discussions with the Trustees concerning this matter.

Public Hearing Transcript

New Bedford Harbor Trustee Council  
Hayden-McFadden School  
361 Cedar Grove Street  
New Bedford, MA 02740  
May 22, 1997

Note: Transcript has been reformatted from original. Original is on file with the New Bedford Harbor Trustee Council

COMMONWEALTH OF MASSACHUSETTS

IN RE: NEW BEDFORD HARBOR

NEW BEDFORD HARBOR TRUSTEE COUNCIL

Hayden-McFadden School  
361 Cedar Grove Street  
New Bedford, MA 02740  
May 22, 1997

MS. SOUZA: I'm Elsie Souza, and I'm representing Congressman Barney Frank.

"Dear council members, we write to express our opinions on the most beneficial expenditures of the funds administered by the council for the restoration of New Bedford Harbor.

We initially wish to register our strong disagreement with those who believe that no restoration funds should be spent now. The restoration fund, originally \$20 million, is now a higher amount because of the interest that has accrued since the council agreed to place the money in an interest bearing account. The people who live in the greater New Bedford area have significant environmental and other needs, and we believe it would be a mistake to simply let this money sit unspent, except for the administrative expenses that are incurred by the council for office space and related expenses, until the entire Harbor Restoration Project is completed.

Citizens with difficulty finding adequate public funds for a variety of environmentally important projects ought not to be denied by some form of bureaucratic delay, the benefit of funds which were contributed expressly for their benefit for use in such projects. We were pleased when you agreed to begin the process of accepting applications. We know that it's possible for you to proceed not just with the implementation of this round, but with the initiation fairly soon of a second round without in any way interfering with the use of this fund, which, after all, exists in part in response to a congressional mandate.

For example, we believe that the preparation of a Harbor Master Plan, the funds for Sconticut Neck in Fairhaven, and the fund for parks in New Bedford are obvious legitimate uses of those funds, and it is impossible for us to conceive circumstances in which they would be unwise or unnecessary uses no matter what the outcome is of the PCB disposal issue.

We also strongly believe that there are other very important projects which you should begin considering which would significantly increase the ability of the people of the greater New Bedford area to benefit from the harbor. One of the most important of these is the plan for the development of an aquarium on the waterfront, an obvious harbor related use which is widely recognized as being of great benefit for the city. We believe it would be a grave error to decline to consider a second round of proposals that could include this and other valuable projects while we are in the implementation stage of the first round.

As members of Congress, we are very conscious of the fact that these funds exist for the benefit of the people in the New Bedford area and ought to be used to enhance their ability to recover the full use of an asset that was diminished by environmental mistakes. Keeping millions of dollars of funds in a bank account for an indefinite period, except for administrative withdrawals, does not serve this purpose.

We do not mean to endorse every proposal that you have put forward for the first round. The expenditure in Nonquitt, for example, seems a dubious one given the priorities that we ought to be following, and we urge you to look very carefully at the thoughtful objections that have been proposed to the tern and sea gull population issue.



But we write this letter to strongly support the general thrust of these proposals and to urge that once final decisions have been made, an implementation has begun on them, you initiate a second round in which equally important proposals, such as the aquarium, can be brought forward and subjected to this process."

And it's signed by Senator Edward Kennedy, Representative Barney Frank, and Senator John F. Kerry.

MR. TERRILL: Thank you, Elsie. Next up, Brian Rothschild.

MR. ROTHSCCHILD: Maybe I'll just speak to everybody. My name is Brian Rothschild. I'm director of the Center of Marine Science and Technology at the University of Massachusetts Dartmouth. We have several programs that relate to --

AUDIENCE: I can't hear you.

MR. ROTHSCCHILD: As I said, my name is Brian Rothschild. I'm director of the Center of Marine Science and Technology at U-Mass Dartmouth. The center has several programs that relate directly to the subject matter covered in the EIS. These programs include fisheries, monitoring of marine systems, shellfish management, the development of new monitoring for Buzzards Bay and Cape Cod, the Cape Cod area. And we also are embarking on a large aquaculture program. Me and my colleagues have gotten together and we've discussed the draft statement and we think it's generally very good.

We do suggest, however, that there's a very, very strong need to include the development of baseline studies so we can study the affect of the restoration and how it is developing into the future and to separate the natural changes in the environment from those that result from the restoration.

I would just point out in closing that our new laboratory will be opening in a month right in the middle of Area 2 in the restoration area. It has 15 laboratories, a running seawater system. It's completely equipped to do all sorts of chemistry and analysis. So we just stand ready to be part of the institutional mechanism and institutional development that results from the restoration.

I would add in closing that we've been working closely with the aquarium looking at science, education, and economic development, and we have also been working with the Buzzards Bay Coalition, and so we see ourselves, as our laboratory opens, to be part of the community, part of the effort, and we look forward to progress in the restoration. Thank you very much.

MR. TERRILL: Thank you, Brian. Next is John Andrade.

Comment G-5

MR. ANDRADE: Excuse me if I don't sound totally familiar with the entire topic that we're talking about here today, but I am very concerned with the aspect of \$23 million being available in the city of New Bedford to correct past environmental problems. I am very familiar with the brown fields concept and the environmental justice issues that concern the entire area of

superfund projects and dealing with the environment in general. We have a particular concern in regards to how these moneys will actually be spent to benefit the people of New Bedford and particularly the older neighborhoods in the city that have been affected by the economic downfall that we've seen over the last 15 years. I am very concerned with types of economic developments that will be done with this type of money and how they will actually impact the neighborhood that I am from, the South Central Old Bedford Village neighborhood, which is adjacent to the waterfront and the William National Park. We are very concerned with getting dollars and cents to help revitalize this neighborhood as well as to rejuvenate the economy of that neighborhood. We feel, one, that the waterfront is a very important part of that, and of course, the aquarium project is very high on our list of projects that should be financed through the city, federal, and state fund and particularly through this Trustee Council fund that it has available.

We are also concerned with what types of funds could be utilized to help rectify the problems that have been caused by the Morse Cutting Tools building in the South Central neighborhood. That building, which is now in the process of being dismantled, we know that has been deemed as an oil spill site by the Department of Environmental Protection. There had been an emergency response clean up there in 1992. We presently have two 21E's that show that there is presently close to 60,000 gallons of oil in the tunnels underneath the east building on the Purchase Street side of the Morse Cutting Tools facility. And we also know that there is a tunnel that leads from the Wing Street all the way to the harbor. There's a tunnel underneath the street that leads right to the harbor where the oil is leaking into the harbor.

So we find it very hard to find that there is a superfund project going on right now dredging the harbor at the same time that federal and state officials know that there is oil being leaked into the harbor as we speak, particularly from this particular site. And as I reiterated, this information is on record at the DEP in Lakeville. And we also have a 21E concerning the building known as the St. James Old Catholic School that when we did a 21E on that particular building, it shows where the contamination from the Morse Cutting Tools has leaked over to the St. James building and where the 21E shows how the tunnel that from goes from Wing Street all the way down to the waterfront some thousand yards leaking into the harbor.

We are concerned that the necessary cleanup for that area may be affected by what contamination has been left by the Morse Cutting Tools. I am very puzzled to find that all of the coordination that was done with the federal courts saying whether it's Copper, Revere & Brass, Cornell Dubleir, Dubilare, or whatever the other companies that were involved with the contamination of the harbor that Morse Cutting Tools, Gulf, and Western Paramount Company and all of the above corporations that are involved with the Morse Cutting Tools facilities industrial complex since 1861 has been overlooked as very large contaminator of our neighborhood, the oils and other types of contaminants that we are aware of that were spilled and let out into the air as well as into the ground by this particular site and how it's not included in the overall cleanup of the city of New Bedford. It makes no sense to me to clean up the harbor and to leave the land adjacent to the harbor still contaminated. We have just recently received from the DEP a report that was done back in February showing definite contamination of the soil in the area and potential air contamination because of the soil that is contaminated in that area. And the air that is contaminated may be in the houses of the people who live in that

area. We have been able to demonstrate some 60 residents of that area who have died through certain types of cancer and upper respiratory diseases. We have also been able to determine that there have been lot of workers who worked at Morse Cutting Tools who are also deceased because of certain contaminations.

So we feel that there should be a wider or broader look at the picture and how it would better include what is being determined and how it can best affect the economic revitalization and also the cleaning of the South Central Bedford Village neighborhood and how it also would affect and compliment the surrounding neighborhoods and the waterfront and the downtown district. We feel that a lot of this money should go back into economic development.

I'm not saying that other ideas that have been put forth are not good and worthy ideas, but it was all contaminated because of economic development that this city prospered off of from the days of the whaling right up into mill days of the industrial revolution. That prosperity that came to New Bedford is now also killing New Bedford. And how do we make that come back and bring it back to the people who should benefit from it, which is the citizens of the city? And not just my neighborhood. I want to make it very clear that just because I'm a person because of Cape Verdian descent that I'm not here talking about something that should be just for our people, for our community. We're looking for the entire city of New Bedford to benefit from this, but more so from the economic development point of view than just cleaning up the harbor. Thank you.

MR. TERRILL: Thank you, John. Next up, Steve.

MR. CASSIDY: I have a statement that I was going to read but --

MR. TERRILL: Can you come up, Steve.

MR. CASSIDY: Steve Cassidy. I had a statement that I was going to read, but I've decided that rather than read it, I'll simply pass it out to the members of the Trustee Council and their staff.

Because to many of you, it won't make too much sense unless you knew the background. My statement is primarily a criticism and a critique of the process by which the Trustee Council and their staff arrived at their selections of projects. My criticisms are directed to their method of selection, and unless you were on the scene at the time this was going on, the meetings of CRAB and the joint meetings of CRAB and the Trustee Council, there'd have to be a lot of filling it in for it to make any particular sense.

So rather than waste the time at the meeting when other people have things to say, I'm simply going to pass the statement out to all of the members of the Trustee Council and their staff, anybody from CRAB that's here, and anybody else who wants a copy. And that's all I have to say.

MR. TERRILL: Thanks, Steve. Do you have that copy for us?

MR. CASSIDY: In a minute. Presses are still running.

MR. TERRILL: Next, Chris Moriarty.

MR. MORIARTY: My name is Chris Moriarty. I'm a member of CRAB, and I'm from the town of Dartmouth. The reason I wanted to speak this evening was because this is supposedly just a draft plan, and I have several questions. I have taken part in the evaluation of these proposals. I, like Steve, have some questions about how it was done, but that's neither here nor there. What I would like to bring out is that all of these proposals should be held up to the light of day; namely, some things are quite positive.

For instance, CRAB voted to put some funds up for a study of the aquarium. Not to sell it, but to study it. For instance, I was in Florida for the winter and had a chance to go to the aquarium in Tampa. And on the television, I was quite surprised to find out after one year of operation they laid off 400 people and they are having one hell of a hard time. I have not heard that up here. I have not seen any negatives brought forward. And I'm not saying you shouldn't do something. But damn it, let's do this thing honestly. Any proposal should be able to stand up to the light of day.

The proposal of Nonquitt, should it have its detractors, and they should be able to speak and then it should be evaluated. As far as I'm concerned, there are no gods here. And I'm only speaking for myself as an individual and a member of CRAB. But for instance, the shellfish in the harbor the gentleman was just speaking, he was talking about, Oh, going into the harbor. The shellfish is polluted. A study was supposed to be done. All of a sudden, there are no CRAB meetings. We are suffering from a lack of communication; when the state study will be done, when the funds will be turned loose to try and do something about the contaminated shellfish in the harbor. And whatever we propose or whatever we are in favor of should be held up to the light of day as well. And it shouldn't be a sales pitch. And that's only my comment. It doesn't make it write or wrong. But guess what? There are facts, and some facts stink. And some of the costs stink. And yet, I have not got answers that they have been held up to the light of day just as ours have. I agree with what the senator said: let's free up some of this money and let's get some of these people to work. Because it's about work, people, and what happens in this harbor. And it should also be pointed, and I'm sure it has before, that these funds are definitely restricted and that many people who have an idea of accessing them is the court. And anybody who wants to contact any member of CRAB, please feel free to do so, because that's what we're supposed to be doing, we're supposed to be putting forth your ideas of what you think you would like to find out. And I agree. It's about time that we heard something about a second round of proposals. And I'd like to see it in writing how we're going to handle it. I hope it's a heck of a lot better than we tried to handle it first. Because those of you who remember, we, as CRAB, were used as a punching bag by the Standard Times. We were used as a punching bag by anybody who wanted something and didn't have a target. Of course, what they are saying turned out not to be true, but I never saw one retraction in the Standard Times.

So all I'm asking is, let's do this fairly so that the public will feel that their money -- and it is their

money -- is being spent to their best benefit. So anything that I'm willing to back, I'm willing to hold up to the light of day. I hope everybody else is as well. Thank you.

MR. TERRILL: Thank you, Chris. Next up, Paul Bizarro.

MR. BIZARRO: My name is Carl Bizarro. I'm chairman of the Neighborhood United, which is the crime watch organizations of neighborhood groups in the city. I have, actually, some questions about the preferred alternatives referring to the development of Riverside Park recreational area. I don't know what that is exactly and what's meant by that. Does anyone know what that is? What area specifically are you talking about?

MR. TERRILL: You know where the playground area is down there now, it would be developing that area heading east -- I'm sorry, heading west and over by where the Pierce Mills site is.

MR. BIZARRO: That would be heading south.

MR. TERRILL: I'm sorry.

MR. BIZARRO: The property is not owned by the city or the state or anybody right now, it's going to private development?

AUDIENCE: Correct.

Comment R-2

MR. BIZARRO: Only because I want to touch on something Mr. Andrade brought about up about the affect it has on the community. As Mr. Bullard is well aware of, those communities were based on jobs. The factories were there, the houses were there to support those jobs. The jobs are gone. The houses are vacant. There's no jobs in the area. As community groups, we go out in the community to fight and to get something going in there. People don't have jobs. So to suggest that somehow a recreational area is going to improve the area, I don't think so. It might make the river look better, but talk about maintenance staff that's been completed, talk about security for the area. We have a park now -- and going back to that, the last meeting at Normandin Junior High School about a year ago, at that time I asked that the soil be re-tested at Riverside Park. I've never heard from anybody one way or another about is it contaminated or not. That hasn't happened again. That's just one small thing.

Comment R-3

But again, the importance of putting a park and the affect that it has on the neighborhoods, if we try to revitalize our communities and neighborhoods, we need jobs, we need moneys, we need economic development. That is the basis by which other things will happen, but until that happens -- you can create something, but now it falls on the city to maintain it, the police department to patrol it, and all these things will still be there. So I hope that somewhere along the line -- and I'm sure you have considered the affect it has on the surrounding community outside that area which will be developed. We have a lot of empty houses, we have a lot of fires in vacant houses, drugs, crime, all that exists. And that will not change until we provide jobs, until we get the water and sewage rates down. This is industrial land now and maybe a mixture of both recreational and industrial to bring the sewer rates down, to do all these things that will bring our communities and neighborhood back.

As Mr. Andrade pointed out, this is the basis that we think really has to be approached. How do we get people jobs? How do we get people to come back to those neighborhoods to live in there, to have access to jobs? Originally they came there to work because they could walk to work. The jobs aren't there. But it's just, we need something to grab onto. People are desperate. I can tell you they're desperate. We've had vigils and walked through the neighborhoods, and people tell us there's nothing for the kids, there's no jobs, there's no opportunities. So if you can somehow, in all this money -- it's a lot of money. I can't imagine what a million dollars is, but \$23 million is a lot of money. If a small portion of that can be for economic development and maybe plant some seeds for growth, then maybe the neighborhoods will have a chance. Maybe we'll have housing markets where somebody might want to own a house in that area. Right now they're all for sale just about. Anybody that wants a house, they're all for sale cheap. But build on the economic advantages of the area and all the other good things that come along with it. But I just want to support that that's very, very important. And again, I still want to see Riverside Park tested for contamination.

MR. TERRILL: That's part of the proposal.

MR. BIZARRO: Okay. Thank you.

MR. TERRILL: I apologize for getting your name wrong.

MR. BIZARRO: That's okay.

MR. TERRILL: Steve Sloane.

Comment N-8

MR. SLOANE: Hello, my name is Steve Sloane, the executive director for the Dartmouth Natural Resources Trust. It's just been a little while since, I guess, we talked about this, so I wanted to reiterate how we strongly feel, with the Fishing Commission and the Town of Dartmouth, that both the salt marsh restoration projects and the Padanaram Salt Marsh as well as the Nonquitt Salt Marsh will have a very significant effect to the fisheries in the area and the natural resources in the area. And so I think those natural ecosystems being restored is something which we can all see the benefits of, and additionally, recreational aspects which would be improved on our Smith Farm reserve which we own. I think we'd also offer some recreational assets to the greater community, which is well worth supporting. I was a little concerned however, just as an aside, that the funding was described as dubious. I think I'd like to thank our senators, representatives, and all the others.

MR. TERRILL: Thank you, Steve. Molly.

MS. FONTAINE: My name is Molly Fontaine. I'm the environmental planner for the City of New Bedford. I'm also a member of CRAB. I'm also a member of the City of New Bedford. I'm here in my capacity both as a member of CRAB and as the environmental planner. The city will be submitting formal comment in writing to the Trustee Council before June 2nd. I do not have it with me tonight.

But I want to clear up an issue that possibly might be an issue to the Trustee Council after reading the local newspaper over the past couple weeks. There was an article in the Standard Times that indicated that there were residents in the South End of New Bedford who don't want Fort Taber Park to go forward and they want the funding to be spent elsewhere. We were able to meet with the councillor who had met with those residents, and unfortunately, the way the article was written did not clearly indicate what they had presented. What they were wondering was if we have several grants that are going to be going towards the implementation of Fort Taber Park, and what they were wondering is if we end up with more grant money than we need to complete the park and the park plan, could we possibly spread some of that money around other areas of the South End.

So I just want to let the Trustee Council know that we are still going full steam ahead with the plans for Fort Taber Park. We do still need funding, and at the time, we are not getting more than we need. So I just wanted to make that clear for you tonight. And I'd also just like to do a quick little support for the shellfish work for New Bedford, Dartmouth, Fairhaven, and Acushnet. We do feel very strongly about that. We have some areas that are newly open and they're doing very well. And we'd really like to see that work go forward soon. And it's very important to us, as is the development of the Harbor Master Plan, which did finally go out to public bid. So, you know, I just wanted to -- we will formally state these for you, but just briefly.

MS. BRADY: I have a question. Do you think that the residents that were opposed, or perceived that they opposed the Fort Taber project, do you think that they will be submitting any comments?

MS. FONTAINE: I can mention it to them that, you know, when the deadline is. I know some of them. Actually, I'm working with them on another project right now. So I can ask. But if they do have a formal comment, they can submit it. But I guess it's more important that, you know, it was clearly not stated that way in the paper and there has been -- you know, we've gotten a lot of calls about it, why you're not going to go ahead with the park. But we are, and they're not in opposition to the park. They just want to make sure that other areas of the South End. And one thing that we did mention to them was that in the next round of funding, there are other beaches in the South End that they'd like to see approved, and I thought that we could maybe come in when the next round of funding is available.

MS. BRADY: I just think it would help clarify if they were on record clarifying.

MS. FONTAINE: If they want to, I'll ask them, and I'll tell them how to go about doing that.

MR. TERRILL: That's the last of the people who have signed up. You have a question? Why don't you come up. And then, John, we'll get you.

MR. ROCHA: Bob Rocha, CRAB member, also the Coalition for Buzzards Bay. Most of my comments have been in writing before, and Jack has already received those. But I want to make a remark to a couple people that talked earlier. They were a little off the subject of this meeting, but I'll try to bring it back. Your concerns about economic development and all those

things, they can't speak to those issues if project ideas for those kind of things are not mailed in. They only respond to project ideas that they receive. I have written -- back in the days when we were all being the punching bag, as Chris had mentioned, I put a letter in the paper, and one of my comments in there was, if you've got concerns that you don't think they're taking care of, when there's round two, put in a project idea, and that idea becomes a proposal. They can't respond to it if they don't see it in writing. So if that's a concern, John and Carl, get this stuff in writing next time it comes in.

AUDIENCE: Mr. Rocha, the aquarium is economic development, so there is some plans --

MR. ROCHA: Right. I'm just saying, you know, you both addressed other issues. I'm just saying when it's time for those things. It's just a reminder to people that they can't respond to things that they don't see. That's all. But I know you said there was some in for the next time.

MR. TERRILL: Thank you, Bob. John.

MR. ANDRADE: I didn't come to respond to him, but I got a response to you too, sir. First of all, I been living in New Bedford all my life, and CRAB, I don't know when and how you was organized or formed, and I don't know anything about any of your meetings. And I don't know anybody from my community that sits on your committee or your board or anybody that looks like me that sits on your committee or your board. So when you talk about issues that concern my community or my board, I would like to be part of it to give you my input. But when you have your meetings and when you do your advertisement or whatever, it's never circulated to my neighborhood. So for me to give these folks input in writing or otherwise, we need to be part of the process. I think that's what we're talking about. We're not part of the process. And that's why -- I don't know who you're alluding to, but to mention me in your alludness, I just take exception to what you're talking about.

I just basically want to comment to Molly, and only because she brought it up, in regards to the South End and the \$8 million that's been set aside, from what I understand, for the sewage treatment plant for the South End revitalization for Taber Park. I'm sure it's a fantastic idea. For me, it's not a priority. For the people in the South End, I'm sure it is. The area that I'm concerned with is that the South Central neighborhood, which was allocated \$440,000 back in 1995, has now been told by the City of New Bedford that we have to share that \$440,000 with the Ward Five area around Brigham Street and Goulart Square and Ashley Park further down the South End area and South First Street. We have taken \$440,000 from one neighborhood and now try to spread it throughout the whole geographical area, which is ludicrous in regards to economic revitalization or impact on \$440,000. I can see more of an impact of \$440,000 in an area versus a whole section of the city of New Bedford, and particularly when that money was earmarked for an area that was very highly depressed and in much more need of that money, particularly when you look at -- you got something having \$8 million. Are you going to spend \$8 million for Taber Park? Is that what's happening? And you still want more money from these folks. I'm not saying that's what you're saying, Molly, but this is what I'm hearing coming from other people in the city.



What we are saying is that you're going to have \$8 million down the South End. Bring it down to South Central, bring it downtown. We want some of that money as well as some of this money, some of the money from CDBG. Everybody else is getting all the money. We want some of it too, to revitalize our neighborhood. And let me tell you something, sir, about economic development. The aquarium project is very important to South Central. It's very important to downtown. We have the highest unemployment rate in the entire city of New Bedford of 26 percent. The city, no matter what anybody says, we have 26 percent. Economic development is very, very important for everybody sitting in this room. No matter what neighborhood you come from, what ethnic background you are, it's very important for everyone.

And I'm for birds and flowers. And my background, I grew up, you know, working and farming all my life. Cranberries, I picked cranberries, planted cranberries, you name it. I know about farming. I'm an environmentally aware individual. But economic development is very important if we're going to change New Bedford around, if we're going to change the south coast around. We've got to bring more dollars for economic development.

And I ask you not to criticize what I say or what I have said or misunderstand me. If you want to know more what I'm talking about, invite me to your meetings. We have our meetings. They're open to the public. They're advertised all the time. And if you don't know, I'll give it to you if you come to our next meeting. Because the key thing here, ladies and gentlemen, this our city, our town. And we must work together to make the things happen. And if it's \$23 million or \$8 million or \$440,000, I don't think one group or one committee has a right to say what it should get or what it should not get.

MR. TERRILL: Any other comments to the Trustee Council on the Draft Restoration Plan Environmental Impact Statement? Seeing none, I close the comment session. Go ahead, John.

MR. BULLARD: I appreciate the time that you all have taken to come out here and give us your comments. As I said before, we will consider them seriously. \$23 million is an awful lot of money to spend in the greater New Bedford area. It doesn't happen all the time. It is something, when that opportunity comes, to see 30 people show up to offer suggestions on how to do that. And it says something not all together encouraging. There are rules that Jack took a very quick amount of time to go over about the requirements of this money that come out of the court case and the responsibility that we have as trustees in deciding what to do with it. It's not free money. It doesn't go to whatever need is greatest. It has very specific purpose. And we take our jobs seriously about that.

And I hope that people who want to affect these decisions take their jobs seriously too, you know. The rules, we have to pay attention to. We're going to make recommendation next month on what should be in the final plan for this first round of early action projects. And then we're going to work as hard as we can on seeing that these projects get into implementation so we can see results of these investments. So that all the people can see results of these investments. And I think it won't be too much later than that that we will start to think about, should there be a second round of early action projects, as a number of you have

suggested. You know, the normal way of doing this is to wait until a cleanup is finished and then you do the restoration work afterwards. So we're all kind of departing from the normal procedure in undertaking some restoration work before the removal of PCBs take place because we sense the urgency that many of you have expressed. And we all continue to feel that. So I think that we'll try and make the best decisions we can. We appreciate the comments you've given to help us with that, and we'll try and get these underway soon. And then we'll look and see if it's appropriate to undertake another round of early action. And that's certainly not something that's out of the realm of possibility.

MR. TERRILL: Thank you, John. Next meeting of the Trustee Council is going to be June 18. It's going to start at one o'clock p.m. It will be at the Seaport Inn, Fairhaven. Trustees will be reviewing all the public comment received, both written and oral. There will be a transcript from this hearing presented to the trustees, so they'll have it. And as far as the environmental impact process, we will be preparing a final Environmental Impact Statement with the final alternatives in there. And what will happen also is all the comments received will be responded to in that Environmental Impact Statement. Remember, you have until June 2nd to submit written comments if there's anything additional you want to provide. Thank you very much for coming out.

(The meeting was concluded at 7:38)

## **10.2. Response to Comments**

### **10.2.1 General/Technical Comments**

**Comment G-1:** Several commenters stated that projects outside the area of the greatest contamination should not be approved.

**Response:** The release of a hazardous substance (PCBs) into the New Bedford Harbor Environment occurred at two primary locations: 1) the Inner Harbor north of Route 195; and 2) the Outer Harbor south of the hurricane barrier. Over time, the PCBs spread beyond the Harbor and out into Buzzards Bay by the action of the tides, the flow of the river, and by transport through the municipal wastewater system. Natural resources throughout lower Buzzards Bay were consequently exposed to PCBs. In addition fish and wildlife feeding on contaminated material or organisms or passing through the Harbor Environment received doses of contamination and suffer its effects. Accordingly, in order to restore the natural resources injured by the contamination of the harbor, it is necessary and appropriate to look beyond the areas of greatest contamination.

In order for the Trustee Council to begin restoration in the near-term, pre-cleanup projects must avoid areas which are likely to be subject to cleanup activities. By funding projects outside the immediate area now, the Trustee Council can begin the restoration process immediately.

**Comment G-2:** Two commenters objected to Trustee Council support for projects that the Citizens Restoration Advisory Board (CRAB) does not support.

**Response:** The Trustee Council sought advice on restoration projects from members of the community, local officials, technical experts, legal advisors and the general public. The Trustees reviewed and seriously considered all the advice and comments that they received. This input is reflected in the Trustees' decisions. The ultimate responsibility for judging how to best accomplish restoration of the injured resources rests with the Trustees.

**Comment G-3:** Several commenters suggested that restoration settlement funds should be used in the near-term rather than waiting for the cleanup to be completed.

**Response:** The Trustee Council agrees that benefits to natural resources and the public can be achieved through the early initiation of restoration activities.

However, since significant restoration activities must occur after the cleanup, the Trustee Council is required to reserve a large portion of the funds for future expenditures. The Trustee Council will strive to balance near-term needs with future needs so that natural resource restoration goals can be achieved.

**Comment G-4:** One commenter noted that RP/EIS Section 3.5 includes very little information about the distribution of contaminants in the biota. A paper by Nisbet and Reynolds (1984. Marine Environmental Research 8:33-66) is relevant.

**Response:** The Trustee Council appreciates notice of this research paper. The Council reviewed the paper and the information in Section 3.5 and provided more specific information regarding contaminants in the Final RP/EIS.

**Comment G-5:** Two commenters stated that restoration settlement money should be used to provide economic relief within the affected community.

**Response:** The United States and the Commonwealth of Massachusetts filed complaints in federal district court alleging injury to natural resources from the release of contaminants into the New Bedford Harbor Environment. The claims were eventually settled and funds provided for restoration of the injured natural resources. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund) requires that money received from such a settlement be used only to “restore, replace, or acquire the equivalent of such natural resources.” (CERCLA Section 107(f)(1)). CERCLA also clearly defines “natural resources”: land, fish, wildlife, biota, air, water, ground water, drinking water supplies and other such resources (CERCLA Section 101(16)).

Natural resource injury settlement funds must be linked to the natural resource injuries that occurred and cannot be used for economic development or relief. The Trustee Council believes that successful restoration of natural resources will yield significant economic benefits through increased and improved opportunities for a wide range of uses of the Harbor Environment, including tourism and recreational opportunities.

**Comment G-6:** One commenter stated that the restoration activities, as outlined in the Draft Restoration Plan/Environmental Impact Statement, lack monitoring necessary for management of remediation and recovery.

**Response:** The Trustees agree that monitoring is a critical component of successful site remediation and natural resource restoration. Further discussions by the agencies involved (EPA, ACOE, MDEP) in the cleanup and restoration of New Bedford Harbor will determine the extent of ongoing monitoring activities and the need for new monitoring initiatives. The Trustee Council is committed to appropriate monitoring of any projects it implements or funds. At this stage of planning, we cannot be more specific but will ensure this is an important component of project by project approvals.

**Comment G-7:** One commenter stated that it is inappropriate for the Trustees to grant money to fund projects conducted by their own agencies.

**Response:** The Trustees’ primary concern in allocating restoration funds is the restoration of injured resources. The Trustees should consider proposals for resource restoration submitted by their own agencies along with all other proposals. In some circumstances, the staff of the Trustee agency is best qualified to perform or oversee restoration work, particularly, for

example, where the agency has strong expertise or statutory authority in management of particular species.

**Comment G-8:** One commenter asked who the technical reviewers of each proposal were, their positions, affiliations and the recorded votes?

**Response:** The names of technical reviewers were provided to the public at a November 14, 1995 Trustee Council meeting. They are repeated here:

<b>Name</b>	<b>Position</b>	<b>Agency</b>
Ivo Almeida	Outreach Coordinator	MA Coastal Zone Management
Michael Amaral	Endangered Species Coord.	US Fish and Wildlife Service
Tom Ardito	Program Analyst	National Marine Fisheries Service
John Boreman	Director	UMass/NOAA CMER Program
Philips Brady	Aquatic Biologist III	MA Division of Marine Fisheries
Leigh Bridges	Assistant Director	MA Division of Marine Fisheries
Kenneth Carr	Environmental Contaminants Supervisor	US Fish and Wildlife Service
John Catena	Fishery Biologist	National Marine Fisheries Service
Paul Craffey	Section Chief, Bureau of Waste Site Cleanup	MA Department of Environmental Protection
Carolyn Currin	Microbiologist	National Marine Fisheries Service
David Engel	Leader, Chemical and Physical Processes Team	National Marine Fisheries Service
Bruce Estrella	Aquatic Biologist III	MA Division of Marine Fisheries
Gary Gonyea	Environmental Analyst/Protection	MA Department of Environmental
Technical Support		
Thomas Minello, Ph.D.	Division Chief, Fishery Ecology	National Marine Fisheries Service
Judy Pederson	Manager, Coastal Resources	Massachusetts Institute of Technology Sea Grant
Catherine Pedevellano	Ecologist	US Fish and Wildlife Service
Laurel Rafferty	Harbor Planning Coordinator	MA Coastal Zone Management
Ed Reiner	Wetland Protection Program Coordinator	Environmental Protection Agency
Charles Roman, Ph.D.	Unit Director	National Biological Service
Jan Smith	Coastal Non-point Source	MA Coastal Zone Management Coordinator
Jack Terrill	Fishery Administrator	National Marine Fisheries Service
Jim Thomas	Senior Scientist,	National Marine Fisheries Service
		NOAA Restoration Center
Ralph Tiner	National Wetland Inventory Coordinator	US Fish and Wildlife Service

No votes were taken on individual alternatives. The technical reviewers followed standard federal technical evaluation procedures by using score sheets and assigning scores based on how well the project met the stated restoration criteria. The scores were tallied and averaged to determine a ranking. The highest ranking projects for each restoration priority were then considered further and the recommendations made by consensus. These recommendations were shared and discussed with the Community Restoration Advisory Board before presentation to the Trustee Council at the public meeting on April 9, 1996.

**Comments G-9 and G-10:** One commenter asked for further information (1) describing the decision-making process the Trustees used to reach consensus on selecting the preferred alternatives from the proposals submitted, and (2) how the agencies obtained advice on projects for which they had no expertise.

**Response:** Prior to reaching decisions on the alternatives, the Trustees considered advice from CRAB and the TAC, reviewed public comments, and consulted with staff, legal advisors, and project proponents. The Trustee Council also sought advice from various experts as the Trustees deemed appropriate. Decisions on the preferred alternatives were then made at public meetings of the Trustee Council .

**Comment G-11:** One commenter asked why some projects approved by CRAB were rejected by the Trustee Council without providing an explanation of the technical or financial basis for the rejection.

**Response:** The Trustee Council adopted eight of the ten CRAB-recommended projects for consideration as preferred alternatives. The Aquarium/Oceanarium Feasibility Study was not legally acceptable. A description of the remaining project, installation of a bubble curtain just inside the hurricane barrier, was forwarded to the U.S. Army Corps of Engineers (ACOE) along with the Trustees' request for ACOE consideration of installation of an additional box culvert within the hurricane barrier. Either the ACOE or the Trustee Council may consider future implementation of the project pending a determination by the ACOE of its effectiveness for New Bedford Harbor. This issue is also discussed in the response to Comment G-2.

**Comment G-12:** One commenter stated that the RP/EIS fails to describe how PCBs have caused injury to the ecosystem of New Bedford Harbor, and that it is impossible to select appropriate restoration options without such a description. The commenter further cites the lack of a natural resource damage assessment which would typically address the natural resource injury.

**Response:** During the litigation of this case, the Trustees relied upon studies and expert testimony to demonstrate a clear link between PCB contamination and widespread injury to natural resources or the services provided by those resources. On that basis the Trustees recovered \$20.2 million for natural resource restoration. Settlement of the Trustees' claims occurred before a natural resource damage assessment was completed. Once settlement had occurred, the Trustees determined that it was most appropriate to expend recovered funds on restoration of natural resources, rather than on completion of a lengthy and expensive damage assessment. By addressing a new phase in activities related to New Bedford Harbor, that is, planning for the expenditure of the damages recovered by the Trustees to restore injured resources, the Restoration Plan allows restoration of natural resources to begin.

**Comment G-13:** One commenter stated that all proposals should be held up to the light of day.

**Response:** The Trustee Council believes that all proposal ideas have been fully and fairly evaluated in a public forum. As described above, the evaluation process has included

community, technical and legal review of the projects. Multiple opportunities have been provided for public comment, both written and oral. The project implementation process will also provide public opportunities for project review, including objectives, design, personnel and budget.

**Comment G-14:** The EPA requested that the FEIS reflect that areas with high concentrations of heavy metals will also be removed through the remedial dredging.

**Response:** Section 1.2.2 of the FEIS has been modified to reflect this concern.

**Comment G-15:** The EPA notes that besides PCB and heavy metal contamination, there are other sources of contamination that contribute to natural resource damages. The EPA believes that it is inaccurate to imply in Section 1.2.4 that the PCB and heavy metal problems are the only ones in harbor.

**Response:** The focus of the Trustee Council's restoration efforts is limited to the natural resource injury caused by the PCB contamination. The damage assessment conducted, and the resulting funds received through settlement of the complaints, specifically address the PCB contamination injury. While the Trustee Council recognizes the influence of these other sources of contaminants in contributing to a degraded Harbor Environment, the Council's restoration actions will not, nor can not, directly address these problems. FEIS Section 1.2.4 now clarifies that there are other sources of contaminants.

**Comment G-16:** The EPA requested that Section 2.1.1 be modified to clarify the roles of EPA and the Trustee Council.

**Response:** FEIS Section 2.1.1 has been modified.

**Comment G-17:** The EPA requested clarification of the definitions for "injury" and "site" with respect to oil and EPA's authorities under CERCLA for oil.

**Response:** The definitions used are from the National Contingency Plan and apply to both CERCLA and the Oil Pollution Act. The Trustee Council has modified the definition to include a clarification on EPA's role under CERCLA for oil.

**Comment G-18:** The EPA noted that DEIS Section 2.1.1.2.1 indicates CERCLA requires EPA to work with the U.S. Coast Guard to respond to and clean up all hazardous releases. EPA requested that this be clarified to reflect this delegation is for marine areas only.

**Response:** FEIS Section 2.1.1.2.1 has been modified to clarify this role.

**Comment G-19:** The EPA requested clarification on the January and May 1992 Proposed Plan and Addendum. EPA notes that there was one proposal rather than two separate phases of

the cleanup. EPA also provided clarification for their activities in 1995 and 1996 and requested that the FEIS reflect this.

**Response:** The requested modifications have been made the FEIS Section 2.1.3.2.

**Comment G-20:** The EPA commented that in Section 2.2.2 development options are not limited by disposal of contaminated material but that the use of confined disposal facilities allow the development of such things such as marine facilities, parks, and recreational use.

**Response:** It is a matter of degree. While the suggested reuses of confined disposal facilities will allow for some limited development, they will not support the full range of uses typically found in an urban harbor setting. Once capped, the underlying contaminated sediments should not be disturbed such as would occur with the installation of underground utilities. Building construction is limited by the weight carrying capacity of the confined disposal facility. The timing of development is another issue. Several years will have to pass before the confined sediments settle enough to support reuse. The Trustee Council acknowledges and encourages the EPA to continue its efforts to work with the local communities to develop options for the beneficial reuse of the confined disposal facilities.

**Comment G-21:** The EPA clarified that preliminary sampling of Acushnet River north of Wood Street indicates that some areas are contaminated with PCBs above 10 ppm and will be included in EPA's remedial program. EPA also provided information on various decision documents planned for the cleanup activities.

**Response:** The Trustee Council appreciates receiving this updated information which has been incorporated into FEIS Sections 2.2.7.4 and 4.2.1, and will consult with the EPA on restoration activities north of Wood Street to insure that there is no interference or risk of contamination.

**Comment G-22:** The EPA suggested modifications in Section 3.2.1.2 to contradictory sentences.

**Response:** The Trustee Council has corrected the contradiction in FEIS Section 3.2.1.2.

**Comment G-23:** The EPA expressed concern, and believes it is inaccurate to say in Section 3.5.1.2 that significant concentrations will remain in the harbor after the remedial dredging. The agency notes that remaining areas will contain sediments in the 1-10 ppm range or less than 1 ppm, and that navigational dredging will also remove additional sediments.

**Response:** While there will be an overall reduction in PCB contamination in the harbor, the Trustee Council believes EPA's own record indicates that significant concentrations of PCBs will remain after the cleanup has been completed. The EPA's ecological risk assessment concluded that a target cleanup level (TCL) of between 0.1 and 1.0 ppm PCBs would protect the marine ecosystem. By the EPA's own estimation, approximately 1.65 million cubic yards of contaminated sediment would remain by choosing EPA's preferred option over a TCL of 1



ppm. The Trustee Council acknowledges that this is not a viable alternative because of the high cost and potential implementation difficulties.

**Comment G-24:** The EPA requested changes to DEIS Section 4.3.1.1 to note that in addition to EPA's proposal to remove portions of the marsh which exceed 50 ppm TCL, EPA also proposes to reestablish saltmarsh in areas destroyed by remedial dredging.

**Response:** FEIS Section 4.3.1.1 has been modified to reflect this information.

**Comment G-25:** The EPA noted that DEIS Section 5.1 incorrectly states that "some of the CDF capacity will be reserved for sediments from navigation dredging projects." Rather, capacity is reserved for an interim cap to cover the contaminated sediments. The EPA also clarified that CDFs have a variety of reuse options including natural resource enhancements.

**Response:** FEIS Section 5.1 will be corrected and modified to include this information.

## **10.2.2. PREFERRED ALTERNATIVES**

### **10.2.2.1. PADANARAM SALT MARSH RESTORATION**

**Comment P-1:** Two commenters expressed support for the Padanaram salt marsh restoration project.

**Response:** The Trustee Council notes the support and for the reasons specified in the EIS has decided to implement this project.

**Comment P-2:** Several commenters expressed opposition to the Padanaram salt marsh restoration project.

**Response:** The Trustee Council believes that the Padanaram salt marsh restoration offers an excellent opportunity, at low cost, to restore degraded salt marsh habitat. When adequate tidal flow is restored, the Padanaram marsh will have salinity levels which again support salt marsh vegetation and the associated fish and wildlife resources. Restoration of salt marsh habitat for marine resources will clearly replace a portion of the habitat injured or lost due to PCB contamination of the harbor. This salt marsh will be used by resident species as well as by marine and avian species that are known to frequent other areas of the Harbor Environment.

### **10.2.2.2. NONQUITT SALT MARSH RESTORATION**

Note: The Trustee Council has decided to postpone a decision on the proposed Nonquitt Salt Marsh restoration until more definitive answers to the questions posed by the Trustees can be provided by the project's proponents.

**Comment N-1:** Several commenters believed that the Nonquitt Marsh restoration project should not be approved because pollution from unimproved septic systems continues to contaminate the marsh and may harm fish and shellfish.

**Response:** The presence of low levels of pollution from residential septic systems in areas adjacent to Nonquitt Marsh is not likely to have an adverse affect on the proposed restoration project. Restoration of Nonquitt Marsh was proposed because natural, historic marsh vegetation has died back across much of the marsh, reducing the biological value of the marsh to the New Bedford Harbor ecosystem. The die-back was caused primarily by a lack of tidal flushing of the marsh, resulting from the installation of an inadequately-sized culvert beneath Mattarest Lane

Studies (Metcalf and Eddy, 1983; and Lloyd Center for Environmental Studies, 1989) have found that the replacement of the culvert with one of adequate size should lead to revegetation of the marsh, increased habitat value, restoration of biological communities, and the enhancement of other ecological functions normally provided by healthy salt marshes. These changes will benefit the fish, shellfish and wildlife of the entire New Bedford Harbor Environment. Many New England saltmarshes are subject to minor inputs of sewage from nearby residential areas, but nevertheless support diverse, abundant communities of fish and wildlife. In fact, healthy wetlands tend to filter pollutants, and may in some cases serve as a buffer to help keep land-based pollutants from contaminating natural resources such as quahog beds further offshore.

Massachusetts' Title 5 program requires that residential septic systems meet specific standards. The Trustee Council supports improved compliance with existing environmental requirements, and believes that upgrading of residential septic systems can benefit natural resources in New Bedford Harbor.

**Comment N-2:** Two commenters stated that the Nonquitt Marsh project should not be approved for early funding because it is outside the Acushnet River area or outside of the City of New Bedford.

**Response:** As discussed in the response to Comment G-1, the extent of the Trustees' natural resource damages claim was based on evidence that the natural resources of New Bedford Harbor Environment -- fish and birds in particular--move freely in and out of wetlands and waters throughout the Inner and Outer Harbor, Buzzards Bay and beyond, and consequently were exposed to harbor PCB contamination. The enhancement of salt marsh habitat on Outer New Bedford Harbor would benefit fish and birds and other natural resources throughout the Harbor Environment as well as provide benefits to people who use such resources, whether through consumptive uses like fishing, or passive uses like birdwatching. Further, Nonquitt Marsh is adjacent to Outer New Bedford Harbor and the Area III fishing closure, and is, therefore, within the affected environment as defined by the New Bedford Harbor Trustee Council. (See Federal Register 60 FR 52167)

**Comment N-3:** One commenter stated that the Nonquitt Marsh project should not be approved because public access to the marsh and beach is limited.

**Response:** The primary purpose of the Nonquitt Marsh restoration project is to restore natural resources--specifically, to improve habitat for fish and wildlife injured by PCB releases to New Bedford Harbor. The Nonquitt Marsh project would benefit publicly-owned natural resources throughout the Harbor Environment by increasing physical and biological exchange between the waters of the Harbor and the marsh.

Overland public access to areas adjacent to Nonquitt marsh would be provided as a part of this project through the construction or extension of public trail.

**Comment N-4:** Three commenters suggested that scarce restoration funds should be spent in New Bedford, which was the primary source of contamination, where the pollution damage was done and which has limited financial resources, and not in Nonquitt which is a private, wealthy community.

**Response:** See response to Comment N-2, above. Implementation of the Nonquitt Marsh restoration project would provide benefits to the natural resources of the entire New Bedford Harbor Environment and to all those who enjoy and/or rely upon these resources. Money is being retained for future projects focusing on the Inner New Bedford Harbor.

**Comment N-5:** Two commenters stated that the proposed 10-year monitoring plan and its proposed costs for the Nonquitt Marsh project has not been adequately reviewed.

**Response:** A 10-year monitoring plan for the Nonquitt Marsh restoration was included in the original project idea submission, but was not evaluated in the New Bedford Harbor Draft Restoration Plan and Environmental Impact Statement because the Trustees have not yet determined the appropriate time period for recovery monitoring, nor have they yet determined who will plan and implement the monitoring. Cost will certainly be a consideration in determining the appropriate level and type of monitoring for all implemented projects.

**Comment N-6:** One commenter stated that the Nonquitt Marsh project should include regrading/planting to ensure success.

**Response:** Recolonization of the marsh surface by *Spartina* spp. and other marsh vegetation would be expected to occur over a period of years following hydrologic restoration of the marsh. Replanting and regrading of the marsh surface would certainly accelerate the process of recovery, but would increase the cost of the project as well.

**Comment N-7:** Several commenters expressed opposition to this project for unspecified reasons.

**Response:** The Trustee Council notes the opposition to this alternative.

**Comment N-8:** Several commenters expressed support for the Nonquitt salt marsh restoration project.

**Response:** The Trustee Council notes the support for this alternative.

**Comment N-9:** One commenter suggested that the Trustees need to examine the assertion that it would be “impossible” to restore drainage to the original natural channel at Barekneed Creek, which the commenter regards as unproven.

**Response:** The project’s proponents have been asked to consider this suggestion and to report back to the Trustee Council.

#### **10.2.2.3 TABER PARK**

**Comment F-1:** Several commenters expressed support for Taber Park.

**Response:** The Trustee Council notes the support for this alternative.

**Comment F-2:** Three commenters stated that restoration funds should not be used for Taber Park or should be used there in a more limited fashion. One of the commenters suggested that the Trustee Council limit its support to aspects of the park clearly related to injured resources.

**Response:** The public lost multiple recreational uses of the Harbor due to PCB contamination of the harbor. Recreational losses were included in the Trustees’ calculation of damages in the suit brought against harbor polluters. The Trustee Council agrees with the comment that restoration funds should be spent only on those aspects of the park which will provide the equivalent of such lost recreational uses to the public. The Trustees believe that assisting in the construction of limited aspects of Taber Park is a way to provide the public with the equivalent of some of the lost recreational uses of the harbor. Given the many uses and demand for available shoreline along the harbor, there are limited opportunities within the harbor environment to create recreational/open space. The Trustee Council will restrict its participation at the park to those areas and facilities which the city has not previously committed to provide, and which are related to the natural resource injury.

#### **10.2.2.4. RIVERSIDE PARK BELLEVILLE AVENUE RECREATIONAL MARINE PARK**

**Comment R-1:** Several commenters indicated support for development of Riverside Park.

**Response:** The Trustee Council notes the support for this alternative. The Council has approved funding for a site contaminant study to begin once three conditions have been met by the City of New Bedford: a) the City must obtain title to the property; b) the City must dedicate the area for the park, and c) agree to provide continuing support for park maintenance.

**Comment R-2:** One commenter suggested that the soil in the area proposed for the park should be tested for contamination before proceeding.

**Response:** The Trustee Council agrees with this comment and has authorized funding for a contaminants study. See the response to Comment R-1.

**Comment R-3:** One commenter suggested that the Trustees should consider a mixed-use development of the site and that the Site will have to be maintained.

**Response:** The City of New Bedford must determine the best use or mix of uses for this parcel of land. It may be possible to combine residential, commercial and recreational/passive uses of the parcel. The Trustee Council has stated its desire to consider construction of a park at this location once further information is available on the site's contaminant load.

**Comment R-4:** The EPA asks the Trustee Council to consider the value of this area for salt marsh and mudflat restoration and is concerned that a boat ramp or pier may conflict with habitat restoration objectives.

**Response:** The Trustee Council recognizes the potential of this area for restoration of salt marsh and shoreline habitat and will consider these actions as the project progresses. The Trustee Council believes that this project can provide a variety of benefits both to injured natural resources and the public. At this early stage, specific plans are unclear and the Council's commitment is only for the contaminant study. If the study results are favorable and there is a commitment by the City of New Bedford to proceed, the Trustee Council will work with the project's proponents to develop a project that incorporates the greatest benefits to the injured natural resources and the public. Any structures erected on the site will be subject to permit review to evaluate potential impacts to the environment before construction commences.

**Comment R-5:** The EPA supports the concept of a marine related park and the Trustee Council's intention to wait until the upper harbor dredging is completed before beginning construction. The EPA suggests that if this is not possible, to restrict access to the shore until dredging is complete.

**Response:** The Trustee Council will work in close coordination with the EPA on any actions it intends to take in this area.

#### **10.2.2.5. HURRICANE BARRIER BOX CULVERT**

**Comment B-1:** Several commenters expressed support for construction of an additional box culvert in the hurricane barrier to increase tidal flow within the harbor.

**Response:** The Trustee Council notes the support and has decided to ask the ACOE examine the appropriateness and feasibility of this project. The Trustee Council believes that it is

important to increase tidal flow within the harbor. Since the ACOE manages the hurricane dike at the mouth of the harbor, any changes made to the barrier have to be approved by the ACOE. The Trustee Council is willing to consider for cost sharing with the ACOE should the ACOE determine that this project is appropriate and feasible.

**Comment B-2:** The EPA commented that the PCB flux rate (0.5 pounds/day) used in the rationale for this alternative is incorrect. EPA states that this is the rate of PCB transfer from the upper to lower Harbor as measured at Coggeshall Street in 1994 and 1995 rather than the transfer rate through the hurricane barrier. The actual rate is believed to be less. The EPA further suggests that water quality impacts be determined before any new culverts are installed.

**Response:** The Trustee Council used information from the EPA's Draft Final Feasibility Study of Remedial Alternatives for the Estuary and Lower Harbor/Bay which modeled transport processes. The results from the TEMPEST/FLESCOT Model indicated a transport rate of 105 kg/yr which is equivalent to approximately 0.6 pounds/day. The Trustee Council will cite this source in the FEIS.

Regardless of the figure used, the Trustee Council believes that the Hurricane Barrier has had an impact on water quality in the harbor by sequestering the various contaminants present there, while at the same time benefitting the Buzzards Bay ecosystem. Several actions will improve water quality in the harbor. The new wastewater treatment plant at Fort Rodman will help reduce sewage and organic contaminants in the harbor. EPA's cleanup efforts will reduce PCB and heavy metal contaminants. The Trustee Council believes that increasing tidal flow will assist the achievement of better water quality.

EPA's call for a the potential impacts to water quality is valid and the Trustee Council will ask the ACOE to include this as part of its feasibility study.

#### **10.2.2.6. EELGRASS HABITAT RESTORATION**

**Comment E-1:** One commenter expressed support for restoring eelgrass within appropriate areas of the New Bedford Harbor Environment.

**Response:** The Trustee Council notes the support and has decided to implement this project.

**Comment E-2:** One commenter expressed opposition to restoring eelgrass within the New Bedford Harbor Environment because the commenter believes that eelgrass is not needed in this type of harbor.

**Response:** Eelgrass provides valuable habitat for estuarine fish and wildlife, notably flounder, tautog, scallops, and quahogs. Therefore, the Trustee Council believes that eelgrass restoration in the New Bedford Harbor Environment can contribute significantly toward restoring natural resources injured by PCB releases to the Harbor.

Eelgrass was once widespread in the New Bedford Harbor Environment. Significant eelgrass beds remain in areas of the Outer Harbor, particularly off Sconticut Neck and in the Fort Rodman area. During the 1930s, eelgrass declined in Buzzards Bay and elsewhere due to the “wasting disease,” caused by a protozoan. More than 50 years later, eelgrass beds have not fully recovered in many New England waters.

Before any eelgrass restoration is undertaken in the New Bedford Harbor Environment, the Trustees will conduct an assessment to ensure that attempts to restore eelgrass are restricted to areas of the Harbor Environment where water quality, water clarity, substrate characteristics, and other factors are suitable for the growth of eelgrass. In all likelihood, this will limit the project to the Outer Harbor and Clarks Cove.

The commenter is correct in suggesting that eelgrass restoration is not appropriate for the more industrial, commercial, or polluted areas of the Harbor Environment. By focusing on less contaminated areas of the Harbor Environment, there is a high probability that eelgrass restoration efforts will be successful and that they will, therefore, provide significant benefits for natural resources injured by PCB releases.

#### **10.2.2.7. LAND CONSERVATION - SCONTICUT NECK MARSHES AND COASTLINE**

**Comment L-1:** Several commenters expressed support for acquiring land on Sconticut Neck to preserve it as conservation land.

**Response:** The Trustee Council notes the support and has decided to implement this project.

**Comment L-2:** One commenter expressed opposition to acquiring land on Sconticut Neck for the purpose of preserving it for conservation land.

**Response:** The Trustee Council has reviewed habitat value information for the Sconticut Neck land available through the Massachusetts Natural Heritage and Endangered Species Program. Based upon that review, the Trustee Council has determined that this acquisition offers great benefits to natural resources because of the habitat types found on the property and the species it supports and believe that it is appropriate to preserve the habitat value of this parcel of land for conservation purposes.

Natural resources, including land, are subject to high levels of contamination within the Harbor Environment. By preserving this productive and uncontaminated parcel, the Trustee Council will insure that further stresses from human use will not be applied to the natural system at this particular site. There will also be public benefits from limited public access to the site allowing for greater public appreciation and use of the natural resources present and the services they provide.

When contaminated areas within the harbor environment are eventually cleaned up, they will no longer pose an ecological hazard to natural resources. Much of the surrounding topography will be changed by the construction of containment areas. It is likely that some of these areas will not provide habitat value equal to what it has replaced, or what was found

before the contamination. As a result, it will be important to maintain the Sconticut Neck property as conservation land after the cleanup is completed.

#### **10.2.2.8 RESTORATION AND MANAGEMENT OF NEW BEDFORD AREA SHELLFISHERY**

**Comment SH-1:** Several commenters expressed support for restoring shellfish resources within the New Bedford Harbor Environment.

**Response:** The Trustee Council notes this support and has decided to implement this project initially for two years.

**Comment SH-2:** Opposition to restoring shellfish resources within the New Bedford Harbor Environment until more is known why the harbor is so oily.

**Response:** The Trustee Council recognizes that developing a fishery in a contaminated environment may not be appropriate. The goal of this project is to develop a sustainable fishery by transplanting shellfish from Inner New Bedford Harbor waters to cleaner areas in the Outer Harbor, followed by comprehensive management of the fishery. Once in cleaner waters, the shellfish would eventually rid themselves of contaminants through their natural siphoning action, over a period of time. Shellfish must be tested and must meet FDA tolerance levels for contaminants in order to be approved for harvest.

The oily sheen on the harbor may come from a variety of sources including (a) polychlorinated biphenyls (PCBs) and other oils being released from the sediment, (b) discharges from ships and/or shore runoff. The contaminant levels in the shellfish will be determined before any shellfish are moved, and only those with acceptably low levels of PCBs and/or metals will be transplanted out of the Inner Harbor.

**Comment SH-3:** One commenter stated that native quahogs should be utilized as seed donors and that seed from the notata, genetically distinct, subspecies of *Mercenaria mercenaria* should be prohibited because it reduces biodiversity.

**Response:** The Trustee Council notes this comment and will make this recommendation to the project applicants for incorporation into project design.

**Comment SH-4:** The EPA expressed concern about conducting shellfish surveys or transplants in areas with high PCB contamination. The EPA asked that the Trustee Council coordinate its shellfish activities with the EPA.

**Response:** The Trustee Council acknowledges the need for close coordination and will consult with the EPA on Harbor related activities, particularly those activities that may resuspend or spread PCB contaminants.

#### **10.2.2.9. HERRING RUN RESTORATION**



**Comment HE-1:** Several commenters expressed support for restoring the Acushnet River herring run.

**Response:** The Trustee Council notes the support and has decided to implement this project.

**Comment HE-2:** The EPA expressed support for the herring run restoration but noted concerns that river herring may accumulate PCB's while traveling through the harbor and asked that the FEIS explain how the project will be implemented to eliminate this concern.

**Response:** River herring sampled from the Harbor have shown PCB contamination and this is a valid concern. River herring are primarily used for bait and serve as forage for other species. To reduce the possibility of river herring being a source of PCB contamination to other species project implementation may be done in stages to address this concern. The first stage will be design, followed by contracting, then actual construction. This process may take several years. The schedule for construction of the three fishways may be modified so as to delay the opening of the run until such time as PCB levels in the Harbor have been reduced. During this time, stocking of the reservoir may be accomplished. Stocked fish will return to the area four or more years after stocking. This may allow sufficient time for a substantial portion of the cleanup to be completed.

#### **10.2.2.10. RESTORATION & MANAGEMENT OF TERN POPULATIONS**

**Comment T-1:** Several commenters stated that gulls and other predators should not be killed as part of the restoration project.

**Response:** The Trustee Council would like to accomplish the tern restoration without killing gulls or other predators, if possible. In fact, the Trustee Council instructed the applicant to use non-lethal means of controlling gulls and other predators. This may include human presence in the gull nesting areas, noisemakers, or use of dogs. If this effort is not successful, the applicant is to return to the Trustee Council and seek permission before proceeding with lethal means.

**Comment T-2:** Several commenters expressed opposition to the tern restoration project because the projects are located outside New Bedford Harbor.

**Response:** As discussed above, the comment relating to funding of projects outside the immediate New Bedford Harbor area was considered by the Council. (See Comment G-1.) Although the primary focus of most restoration activities will be within or in close proximity to the areas of direct impact, the Trustee Council must also consider the impact of the contaminant release on the entire affected ecosystem.

The roseate tern (a federally and state listed endangered species) and the common tern are known to have been contaminated and adversely affected by the ingestion of contaminants biomagnified through the food chain. This injury was one of the bases of the complaint filed against the defendants in the AVX case. The proposed projects present an important opportunity to restore the tern population which was injured by contaminant releases from the

Site. In order to address the injuries which the species incurred at the Site, it is necessary to focus restoration efforts at their nesting colonies.

**Comment T-3:** One commenter stated that the Trustee Council should not use funds to rebuild the shoreline along Bird and Ram Islands since wave action will cause erosion and destroy the project; and further, the project is not consistent with past federal policies.

**Response:** Bird Island, Ram Island and Great Gull Island in New York are the primary nesting locations on the eastern coast of the U.S. for endangered roseate terns. The loss of any one of these locations could create a threat to the continued existence of the species. As storm waves breach the island and travel inland, tidal pools which either inundate or eliminate nesting locations are formed. Rebuilding the shoreline will protect the islands' resources from further injury. The tern restoration plan has identified these critical areas and proposes to take immediate action to secure and strengthen shorelines to prevent such tidal damage and erosion.

Before this project may be implemented, the project's applicants will be required to apply for necessary federal and state permits assuring compliance with all applicable federal and state laws or regulations.

**Comment T-4:** Several commenters stated their support for the roseate and common tern restoration project.

**Response:** The Trustee Council notes the support and has decided to implement this project for two years, with restrictions on lethal control of predators.

**Comment T-5:** One commenter noted that roseate terns are listed in EIS Table 3.8 as being commonly observed while several species of gulls are rarely seen.

**Response:** The source of the information was the National Audubon Society Christmas Count Data. It provides a good snapshot in time for a particular location but as expressed in Table 3.8, cannot be used to judge the overall health or abundance of the species. Roseate terns declined to levels leading to a designation of endangered under the Endangered Species Act. Such a designation considers abundance throughout the range of the species. The Massachusetts population of Roseate terns declined from 5000 pairs in the 1940's to 1721 pairs in 1996. Similarly, common terns declined from 40,000 pairs to 11,221 pairs.

**Comment T-6:** One commenter stated that the study component of the project, which would require destroying eggs and chicks, is inconsistent with the goal of preserving and restoring the tern population.

**Response:** Sampling of eggs and chicks will utilize only inviable/dead specimens.

**Comment T-7:** One commenter stated that the rationale that the project would support ecotourism is misleading since none of the areas are frequented by tourists. The islands in question do not attract tourists because of limited access or use.

**Response:** The reference to ecotourism refers to the assumption that an increased avian population will provide greater opportunities for birdwatching and other nonconsumptive uses of natural resources throughout the New Bedford Harbor Environment and Buzzards Bay environments. In making this assumption, the Trustee Council was not indicating an expectation that the nesting locations themselves would be tourist attractions. The success of the restoration would in fact be significantly impaired if the nesting locations were exposed to substantial pedestrian traffic. However, it is expected that the terns would be observed and appreciated when they are in habitats outside their nesting areas, such as the feeding habitat within the New Bedford Harbor area.

**Comment T-8:** One commenter stated that funds should be spent on cleanup and protection.

**Response:** CERCLA clearly limits the use of funds obtained as a result of settlements and judgments brought against Responsible Parties. Sections 104 and 106 of CERCLA authorize EPA to conduct clean-up (“remediation”), and protection (“abatement actions”) at Superfund sites. By comparison, Sections 107(f) and 111(l) authorize the natural resource trustees to restore natural resources injured and/or destroyed by releases of hazardous substances from the site.

The Consent Decrees, pursuant to which the litigation in this matter was concluded, provided for the payment of separate funds for EPA’s remediation activities at the Site, and the Trustees’ natural resource damage restoration activities. EPA received the majority of the settlement funds (\$69.7 million) as compensation for its past and future expenditures for remediation work at the Site. The natural resource trustees received approximately \$20.2 million for restoration work related to injuries in the New Bedford Harbor Environment. Pursuant to the Consent Decree with Federal Pacific Electric Company (FPE) and Cornell Dubilier Electronics, Inc. (CDE), an additional \$10 million was set aside in a Court Registry account for natural resource damages and/or response costs relating to the Bay portion of the Site. Allocation of the \$10 million in the Court Registry account to the Trustees and/or EPA will be determined after EPA selects a remedial action for the Estuary/Lower Harbor/Bay portion of the Site, and in accordance with the terms of a Memorandum of Agreement concerning natural resource damages and/or response costs in the matter of U.S. v. AVX between the United States (EPA and NOAA) and the Commonwealth of Massachusetts dated September 3, 1992.

It is the responsibility of EPA to clean up the Site so that it does not pose a risk to human health or the environment. When EPA has completed its task, the Trustees will be able to conduct additional restoration activities without fear that past contamination will undermine or reverse their efforts. In exceptional circumstances, if the Trustees believe that the EPA cleanup was not sufficient to protect trust natural resources, the Trustees may conduct further remediation activities. The expenditure of natural resource damages settlement funds for site remediation would limit the availability of funds for restoration when the cleanup was completed. Clearly, Congress acknowledged the importance of each of the vital but distinct functions of remediation and restoration and intended that the Trustees use their portion of the settlement funds for restoration of injured and/or destroyed natural resources.

**Comment T-9:** One commenter stated that the tern restoration project should not be funded until the harbor has been cleaned up in order to avoid exposing more terns to contaminated food supplies.

**Response:** The initial dredging of the “Hot Spot” has reduced the total contaminant load in the Harbor Environment. Still more needs to be done to reduce the impacts to the natural resources. However, not all of the terns to be produced by the tern restoration project would be subject to harmful PCB concentrations because not all of the terns would feed on the most highly contaminated portions of the food chain. The expanded numbers of terns resulting from this project will provide a more secure reservoir of birds to replace any birds that may be continued to be injured until PCB concentrations gradually decrease in the food chain as a result of sediment remediation.

**Comment T-10:** One commenter objected to lethal control of gulls since they play an important role within the ecosystem by cleaning the ocean of various natural by-products.

**Response:** The Trustee Council recognizes the importance of gulls in the Buzzards Bay ecosystem. However, there is an imbalance in gull populations due to human actions (such as creating open dumps and landfills). As a result of increased population, gulls are dominating areas previously occupied by common and roseate terns, thereby preventing nesting by these species. Therefore, the Trustee Council has concluded that it is desirable to support the roseate terns by securing suitable nesting habitat.

**Comment T-11:** One commenter suggested that the Trustee Council should not approve the purchase of a 17-foot boat for this project, because the boat is exorbitantly priced and totally inappropriate.

**Response:** Specific project design and an associated budget will be negotiated before implementation of this project. The Trustee Council will require the applicant to reduce costs where possible, and justify the entire budget.

The Trustee Council recognizes that in order to have safe access to the islands where restoration will be performed, use of a boat is essential. However, alternatives to purchase of a boat, such as leasing, will be pursued. If it is necessary to purchase a boat, the applicant will be required to a) justify the boat selected; b) justify the price to be paid; c) sell the boat post-project and return the funds to the trust fund; and, d) return the equipment to the Trustee Council for use on other projects associated with natural resource restoration for the Superfund Site.

**Comment T-12:** One commenter stated that It is an unproven assumption that the decline of tern population is due in part to the effects of PCBs on mating behavior.

**Response:** The Trustee Council disagrees with this comment. Specific studies have been published and included in the Court Record. Common tern eggs that were sampled in 1972

and 1973 from Ram and Bird Islands had PCB concentrations averaging 29.4 mg/kg wet weight and 12.8 mg/kg, respectively (Nisbet and Reynolds, 1984). Dead or dying common terns, with no obvious injuries, were collected from Bird Island in 1990. Liver samples taken from these birds (all eventually succumbed) yielded PCB concentrations between 3.9 and 840 mg/kg (Aquatec, 1990). Samples of Atlantic silversides (a prey species of the common tern) taken from New Bedford Harbor had PCB concentrations ranging from 3.7 to 75 mg/kg (Aquatec, 1990). It was concluded that PCB contamination led to the mortality. Roseate tern samples showed lower PCB concentration levels largely due to lower PCB levels in the prey of roseate terns (striped anchovies).

Additional studies have occurred in the Great Lakes on Foster's terns (NWF, 1997). When PCB concentration levels in the tern chicks dropped, mortality dropped as well and compared with a colony at a unpolluted site located nearby. This did not indicate lower levels in the environment though. It was determined that the amount of rainfall determined the amount of contamination received. More rainfall brought greater stirring of the sediment.

Another effect found was that the reduced levels allowed chicks to hatch and survive for several weeks, only to die after one month. It is believed that the levels were not sufficient to kill the embryo in the shell, but would affect the chicks later. This effect has also been found in other species around the Great Lakes/St. Lawrence region.

### **10.2.3 OTHER ALTERNATIVES**

#### **10.2.3.1. NEW BEDFORD AQUARIUM/OCEANARIUM**

**Comment AQ-1:** Several commenters expressed support for funding for the proposed Aquarium/Oceanarium.

**Response:** The Trustee Council notes that a great deal of public support has been expressed for the construction of an aquarium/oceanarium in New Bedford. The Council has carefully reviewed the proposal and has concluded that it does not meet the criteria established by law and in the consent decrees for restoring, replacing, or acquiring the equivalent of the natural resources injured or destroyed at the Site. The Trustees see no linkage between the aquarium/oceanarium and the restoration of injured resources at the Site. It is possible that some aspects of the aquarium complex, as it is ultimately developed, which may be eligible and appropriate for restoration funding. The applicant is invited to submit such ideas for review by the Trustee Council when it makes future funding decisions.

One commenter stated that there is precedent for the use of natural resource damage funds for the construction of an aquarium, and in support cites what he characterizes as a decision by the Exxon Valdez Oil Spill Trustee Council (EVOSTC) to use natural resource damage monies for the construction of an aquarium in Seward, Alaska. The New Bedford Harbor Trustee Council has learned that the EVOSTC did provide funding "to support development of the research components of the Alaska Sea Life Center" (Eric Myers, Director of Operations, EVOSTC, emphasis added). The EVOSTC required such a facility to provide research on the long-term impacts of the oil spill on the injured natural resources and there were no existing

facilities in Alaska which had such research capabilities. The EVOSTC did not provide funding for the construction of the aquarium located adjacent to the research facility.

Proponents of the Trustee Council's funding of the aquarium emphasize their expectation that such a facility will promote the development and growth of the New Bedford economy. The Trustee Council acknowledges this legitimate community concern; however, CERCLA requires that settlement funds be used for the purpose of restoring, replacing, or acquiring the equivalent of the natural resources which were injured or destroyed by the release of the contaminants at the Site. The Trustee Council is not authorized to fund programs which solely promote economic recovery.

**Comment AQ-2:** One commenter stated that the aquarium proposal should be rejected because: 1) several have gone bankrupt, 2) one in Camden, NJ did not meet goal of revitalizing the area; and 3) Camden aquarium is a financial drain on community.

**Response:** As discussed in the response to Comment AQ-1, the Trustee Council rejects the alternative as proposed because it does not meet the legal requirements as a project which would restore, replace or acquire the equivalent of the natural resources injured as a result of PCB releases from the Site. However, the Council has not assessed the likelihood of the project's success.

#### **10.2.4 PREFERRED STUDIES, PLANS, EDUCATIONAL ACTIVITIES**

##### **10.2.4.1 NEW BEDFORD/FAIRHAVEN HARBOR MASTER PLAN**

**Comment H-1:** Several commenters expressed support for funding of the Harbor Master Plan.

**Response:** The Trustee Council notes the support and for the reasons specified in the Draft RP/EIS has decided to implement this study.

##### **10.2.4.2. WETLANDS RESTORATION PLANNING: NEW BEDFORD HARBOR ENVIRONMENT**

**Comment W-1:** Three commenters expressed support for conducting a wetlands inventory within the New Bedford Harbor Environment.

**Response:** The Trustee Council notes the support and for the reasons specified in the Draft RP/EIS has decided to implement this study.

#### **10.2.5. NEW ALTERNATIVES**

**Comment NA-1:** Two commenters suggested that the Trustees should plant trees up to 1/4 mile from the Acushnet River.

**Response:** The Trustee Council cannot consider a new suggestion for this round of funding since the time for public review has passed. The Trustee Council entered into a formal process to request restoration ideas from the public, state and federal agencies, local citizens and governments. The alternatives considered in the Draft RP/EIS were those ideas received and reviewed under this process. The Trustee Council expects that later rounds of restoration project selection will occur as progress is made towards the cleanup. The authors are encouraged to submit this and other ideas at those times.

**Comment NA-2:** One commenter proposed an additional site for land acquisition on Sconticut Neck as an opportunity for preservation of a salt marsh.

**Response:** The Trustee Council agrees that salt marsh restoration is an important component of restoration activities. Further, land acquisition to preserve and protect functioning salt marsh or other important habitats is a preferred strategy. The author is encouraged to submit this idea for the next round of restoration project selection.

**Comment NA-3:** One commenter stated that the Trustee Council should combine efforts with the Environmental Protection Agency (EPA) to build a coffer dam at the foot of Sawyer Street, 30 feet from shore and approximately 200 feet long by 100 foot wide, where sludge would be deposited. It would be covered with cement providing a location for a park with a whaling ship.

**Response:** Responsibility for remediation lies with the EPA, which makes determinations on cleanup methods and disposal means and locations. EPA has held a public comment period on the locations where contaminated material from the harbor will be stored will be stored. The commenter is urged to contact EPA directly.

**Comment NA-4:** One commenter submitted a new proposal to fund a striped bass aquaculture project under emergency restoration provisions.

**Response:** The Trustee Council has not authorized emergency funding for any restoration project thus far, and would do so only under exceptional circumstances, because it is essential that restoration ideas be given full and fair scrutiny by the public and the Council before any decision is made. The numbers of striped bass have increased dramatically in Buzzards Bay and elsewhere on the East Coast in recent years, causing the Atlantic States Marine Fisheries Commission to determine that stock has been fully restored. The Trustee Council has determined that there are no indications that this project would be appropriate for funding as an emergency restoration action. The commenter is urged to submit this idea for consideration by the Trustee Council for the next round of restoration project selections.

## **Appendix A**



## **APPENDIX A: GLOSSARY OF TERMS/ACRONYMS USED**

**ACOE - U.S. Army Corps of Engineers**

**AFCA - Anadromous Fish Conservation Act (16 USC §757a et seq.):**

**AG - Attorney General**

**Anadromous Fish:** Fish that hatch in fresh water, move to sea water to grow to adulthood, and then return to fresh water to reproduce.

**AWQC - ambient water quality criteria**

**Baseline:** The condition or conditions that would have existed at the site had the release of hazardous substances not occurred.

**BBP - Buzzards Bay Project**

**Bioaccumulation:** The transfer of toxins from one level of the food chain to another, resulting in elevated amounts of toxins in the higher levels of that food chain.

**Biota:** the animal or plant life of an area.

**BOD - biochemical oxygen demand** - A measure of the amount of oxygen consumed in the biological process that break down organic matter in water.

**CBB - Coalition for Buzzards Bay**

**CDE - Cornell-Dubilier Electronics, Inc.**

**CDF - Confined Disposal Facility:** An on-shore facility separated into cells that can be used for sediment storage/disposal and dewatering, and water treatment.

**CDM - Camp, Dresser, and McKee, Inc.**

**CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act (42 USC § 9601 et seq.):** A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous wastes sites.

**C.F.R. - Code of Federal Regulations**

**CLF - Conservation Law Foundation**

**C.M.R. - Code of Massachusetts Regulations**

**CRAB - Community Restoration Advisory Board:** A committee of the Trustee Council made up of citizen advisers to provide a community perspective to restoration planning and implementation.

**CRIS - Court Registry Investment System:** An investment repository maintained by the United States Courts in which payments from U.S. Court cases are deposited and invested in Treasury securities.

**CSO - combined sewage overflow** - The structure designed to provide relief to a sewer system that carries both sewage and storm-water runoff

**CWA - Clean Water Act** (33 USC §1251 et seq.)

**CZMA - Coastal Zone Management Act** (16 USC §1451 et seq.)

**DHCD - Massachusetts Department of Housing and Community Development**

**DOC - U.S. Department of Commerce:** An agency designated as a Federal Trustee.

**DOI - U.S. Department of the Interior:** An agency designated as a Federal Trustee.

**DOJ - U.S. Department of Justice:** The Federal agency responsible for representation in court of certain Federal agencies.

**Ecosystem:** A biological community together with the physical and chemical environment with which it interacts.

**EA - Environmental Assessment:** A concise public document that has three defined functions: (1) provides sufficient evidence and analysis for determining to prepare an EIS; (2) helps identify better alternatives and mitigation measures; (3) facilitates the preparation of an EIS.

**EIR - Environmental Impact Review**

**EIS - Environmental Impact Statement:** Similar to an EA, this document describes a proposed federal action that potentially affects the quality of the environment and human life. This document details proposed actions and feasible alternatives and their respective consequences.

**EO - Executive Order**

**EOEA - Massachusetts Executive Office of Environmental Affairs:** The Governor of Massachusetts has designated the Secretary of EOEA to be the State Trustee.

**EPA - Environmental Protection Agency**

**ESA - Endangered Species Act** (16 USC §1531 et seq.)

**Estuary:** A semi-enclosed coastal body of water where fresh water from rivers and other upland sources meets and mixes with salt water.

**FDA - U.S. Food and Drug Administration**

**FPE - Federal Pacific Electric Company**

**F.R. - Federal Register**

**FWCA - Fish and Wildlife Conservation Act** 16 USC §661 et seq.)

**GIS - geographic information system** - Computer software which allows the linking of graphic and textual information.

**HATRC - Hands Across the River Coalition**

**MCZM - Massachusetts Office of Coastal Zone Management:** an office within EOEA which develops state policy to protect resources and manage development in the coastal zone.

**MDPH - Massachusetts Department of Public Health**

**MDEM - Massachusetts Department of Environmental Management**

**MDEP - Massachusetts Department of Environmental Protection:** a department within EOEA which administers Massachusetts' environmental regulatory programs for the protection of water, air, and land resources.

**MDFWELE - Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement:** a department within EOEA responsible for the management and conservation of the state's fisheries and wildlife, including rare and endangered species.

**MDFW - Massachusetts Division of Fish and Wildlife:** a division within MDFWELE responsible for the management and conservation of the state's fisheries and wildlife.

**MDMF - Massachusetts Division of Marine Fisheries:** a division within MDFWELE responsible for management and conservation of the state's marine resources.

**MEPA - Massachusetts Environmental Policy Act** (MGL Ch. 30 §61 et seq.)

**MESA - Massachusetts Endangered Species Act** (MGL Ch. 131A)

**MET - Massachusetts Environmental Trust**

**MGL - Massachusetts General Laws**

**MHC - Massachusetts Historical Commission**

**NHESP - Natural Heritage and Endangered Species Program**

**MOA - Memorandum of Agreement:** A legal document between parties or agencies which specifies agreed upon action and who is responsible for those actions. For the New Bedford Harbor restoration, two MOAs are in effect: 1) between the Trustees; and 2) between the Trustees and the EPA.

**NCP - National Contingency Plan:** Part of the regulations which implement CERCLA, SARA,

CWA and OPA found at 40 CFR Part 300.

**NEPA - National Environmental Policy Act (42 USC §4321 et seq.)** : Passed in 1969, NEPA requires all proposed Federal actions significantly affecting the quality of the human environment to be accompanied by an environmental impact statement. Affected environments can include resources that are biological, cultural, historic, or aesthetically pleasing.

**Natural Resources:** Are defined in CERCLA as land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, appertaining to, or otherwise controlled by the United States, any State or local government.

**NBHTC - New Bedford Harbor Trustee Council:** The group of Federal and State natural resource Trustees responsible for restoring the New Bedford Harbor Environment.

**New Bedford Harbor Environment:** means New Bedford Harbor, Massachusetts, and the adjacent waters and shore areas containing natural resources which have been or may be injured, destroyed or lost as a result of releases of hazardous substances. This includes the New Bedford Harbor Superfund Site, located in portions of New Bedford, Acushnet and Fairhaven, Massachusetts, including New Bedford Harbor, the Acushnet River Estuary extending north to the Wood Street Bridge, and any adjacent marine waters and sediments and shoreline areas which are the subject of the United States Environmental Protection Agency's current Remedial Investigation and Feasibility Study, including at least Areas 1, 2 and 3.

**ng/L: nanograms/liter**

**NMFS - National Marine Fisheries Service:** An agency within NOAA which has been delegated Trustee responsibility for restoration of natural resources.

**NOAA - National Oceanic and Atmospheric Administration:** The agency within DOC that has been designated as a Federal Trustee.

**NRDA - natural resource damage assessment:** the process used to determine injuries to natural resources resulting from releases of hazardous substances.

**NPV - net present value**

**NWF - National Wildlife Federation**

**Operable Unit:** An action taken as one part of an overall Superfund site cleanup. A number of operable units can be used in the course of a site cleanup.

**PC - personal communication**

**PCB - Polychlorinated Biphenyl:** A group of organic chemicals used since 1926 in electric transformers as insulation and coolants, in lubricants, carbonless copy paper, adhesives and caulking compounds. PCBs are extremely persistent in the environment because they do not easily break down to new and less harmful chemicals. If ingested by humans, PCBs can be stored in fatty tissues. Exposure to PCBs can cause liver damage. PCBs have also caused cancer in lab animals and have adversely affected the survival rate and reproductive success of fish. EPA banned most uses of PCBs in 1977.

**PCSD - President s Council on Sustainable Development**

**ppm - parts per million**

**ROD - Record of Decision:** A legal document signed by EPA that describes the final cleanup action or remedy selected for a site, the basis for EPA s choice of that remedy, public comment on alternative remedies, and the cost of the remedy.

**Remediation:** Actions taken to stop ongoing, or prevent further, degradation of the environment.

**Restoration:** Actions taken to return an injured resource to its baseline conditions, as measured in terms of the resource's physical, chemical, or biological properties or the service it previously provided.

**Restoration Plan:** The document which describes the methodology proposed for restoring injured resources. This plan must be officially adopted by the affected agencies after adequate opportunity for public comment.

**RP/EIS - Restoration Plan/Environmental Impact Statement**

**SARA - Superfund Amendments and Reauthorization Act of 1986 (P.L. 99-499)**

**Settlement Agreement:** A legal document between plaintiffs and defendants specifying the terms (activities or payments) under which a lawsuit is settled.

**TAC - Technical Advisory Committee:** A Committee of the Trustee Council which provides scientific/technical advice to the Trustees.

**U.S.C. - United States Code**

**USFWS - United States Fish and Wildlife Service:** The office within DOI that has been designated as a Federal Trustee.

**USGPO - US Government Printing Office**

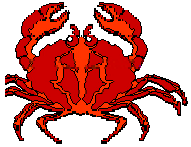
**VHB - Vanasse, Hangen, Brustlin, Inc.**

**Watershed:** The entire surface drainage area that contributes water to a lake, river, groundwater supply, or coastal waterbody.

**WHALE - Waterfront Historic Area League**

**WWTP - wastewater treatment plant**

## **Appendix B**



## **THE NEW BEDFORD HARBOR TRUSTEE COUNCIL'S COMMUNITY RESTORATION ADVISORY BOARD**



***Do you care about the future of New Bedford Harbor?***

***Do you know that \$20 million has been set aside to help restore the health of the Harbor,  
which was damaged by PCBs?***

***Do you want to help make sure that the views of the community are heard  
during the restoration process?***

***IF SO, THEN READ ON . . .***

### ***What Is the New Bedford Harbor Trustee Council?***

The New Bedford Harbor Trustee Council is responsible for restoring the natural resources that were injured by the PCBs and metals that were released into the Harbor and Buzzards Bay. This work will be funded by the \$20 million paid to the Trustees by area electronic manufacturers as part of a legal settlement. The Trustee Council is asking the communities of Dartmouth, New Bedford, Acushnet, and Fairhaven to help develop a plan to select projects that will "restore, replace, or acquire the equivalent" of the natural resources injured by the contamination. Representatives of the Massachusetts Executive Office of Environmental Affairs, the U.S. Department of Interior, and the U.S. Department of Commerce are the Trustees. The Trustee Council wants and needs to know what people in the community are thinking about the restoration. This is where the Community Restoration Advisory Board (CRAB) comes in!

### ***What Is the Trustee Council's Community Restoration Advisory Board?***

CRAB will be made up of 15 people from the affected communities who will advise the Trustee Council on which restoration projects the communities are interested in having the Council funding. CRAB members will represent different groups, such as fisherman, homeowners, and businesses. Their role will be to seek the views of people in the community and advise the Trustee Council on public opinion. They will make sure that the views of the communities are heard throughout the process of developing a plan to restore injured natural resources. CRAB members will also work with the Trustee Council to implement the selected restoration projects.

### ***Who Should Join the Community Restoration Advisory Board?***

Anyone who has the time to talk to their neighbors and friends and has a commitment to the future of the Harbor.

### ***How Often Will This Group Meet and Where Will the Meetings Be?***

The frequency of CRAB meetings will depend on what actions, ideas, and proposals the Trustee Council is considering, but, on average, CRAB will meet once a month, and each CRAB member will serve a two-year term. CRAB meetings will rotate among the four towns.

### ***How Do I Join?***

If you are interested in joining, call Ivo Almeida, the New Bedford Harbor Trustee Council's Public Outreach Coordinator at (508) 984-0062 **by December 1** and he'll add your name to the list of people interested in joining CRAB.. He can also answer your questions about CRAB and the Trustee Council. CRAB members will be selected from the list of interested people. Each town will be represented and members will be chosen to reflect the different groups who live and work near the Harbor.

# **THE NEW BEDFORD HARBOR TRUSTEE COUNCIL'S COMMUNITY RESTORATION ADVISORY BOARD (CRAB)**

## **Purpose of CRAB**

1. Act as a link between the Trustee Council and the community.  
Report the Trustee Council activities to groups and individuals in the community that each member may have contact with.  
Inform the Trustee Council on the positions and opinions of these groups and individuals.  
Participate in outreach efforts by being a "spokesperson" during events, such as: slide shows, exhibits, etc.
2. Review and make recommendations on the design and implementation of the Outreach Plan for the Trustee Council.  
Review and make recommendations on all potential outreach materials such as: pamphlets, videos, fact sheets, etc.
3. Review and make recommendations to the Trustee Council:  
During the request for restoration ideas process, during the emergency restoration determination process, during the environmental impact statement process, and at other appropriate times.
4. Assist the Trustee Council in implementing restoration projects.

## **Responsibilities of CRAB Members**

1. Attend meetings regularly.
2. Act as a liaison between the community and the Trustee Council.
3. Recognize and meet Federal and State ethics requirements.
4. Actively contribute your thoughts to the process.
5. Work toward an understanding of the issues related to the restoration process.
6. Encourage community involvement in the restoration process.
7. Acknowledge the value of both short term and long term planning and problem solving for the community's future.
8. Work cooperatively with other CRAB members.