CHAPTER 4: ALTERNATIVES - ANALYSIS AND CONSEQUENCES

Chapter Outline:

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

Alt #	TITLE	Restores injured resources	Within harbor environ-ment	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	O	☆	●	●	O	O	●	●	●				4-3
1	A living machine for water purification and habitat restoration in New Bedford Harbor	●	☆	O	☆	●	●	O	O	O	●	●	?	4-28
2	Restoration of Padanaram Salt Marsh, Dartmouth, MA	☆	☆	O	☆	☆	☆	☆	☆	☆	☆	☆	☆	4-14 P
3	Restoration of Nonquit Salt Marsh, Dartmouth, MA	☆	☆	☆	☆	☆	☆	☆	☆	☆	●	☆	☆	4-16 P
4	Restoration and management of tern populations[1]	☆	O	☆	☆	O	☆	☆	☆	●	●	●	☆	4-54 P
5	Removal of Native American artifacts	●	☆	●	●	O	●	●	O	O	●	●	●	4-61
6	Stock assessment of shellfish and predators in New Bedford, Fairhaven and Dartmouth, and market research for the products[1]	●	☆	●	●	☆	O		O	O	☆	☆	S	4-45 P
7	Long-term monitoring and restoration of shellfish habitats	O	☆	●	O	☆	O	●	☆	●	●	●	S	4-60
8	Fisheries restoration for Dartmouth Areas II and III[1]	☆	☆	O	☆	☆	O	O	☆	☆	☆	☆	?	4-45 P
9	Upper Sconticut Neck/Priest's Cove shellfish restoration and sewer work	☆	☆	O	O	☆	O	O	☆	☆	●	●	?	4-31
10	Bayview sewer project	●	O	●	O	☆	●	O	O	●	●	●	?	4-31
11	Sol-E-Mar area sewer project	●	☆	O	O	☆	☆	☆	☆	O	●	●	?	4-32

[1] Combined with other alternatives

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											CRAB	TAC	Legal	
12	Rogers Street/Clarks Cove storm drain	●	☆	O	O	O	☆	O	O	●	●	●	?	4-32
13	Padanaram Harbor dredging	●	☆	●	O	☆	●	●	O	O	●	●	●	4-62
14	Rogers Street boat ramp	O	☆	O	●	O	☆	O	☆	☆	●	●	?	4-24
15	Constructed reefs for lobster and fish habitat enhancement	●	O	O	☆	☆	☆	●	☆	O	●	●	☆	4-42
16	East Clarks Point pumping station[1]	●	O	O	●	☆	O	O	0	●	●	●	?	4-33
17	Cove Road pumping station[1]	O	☆	☆	O	☆	O	O	0	●	●	●	?	4-33
18	Taber Park	O	☆	O	☆	☆	O	O	☆	☆	☆	☆	MA ☆ / Fed ?	4-20 P
19	Restoration and management of the New Bedford area shellfishery[1]	☆	☆	O	☆	☆	O	O	☆	☆	☆	☆	☆	4-45 P
20	New Bedford/Fairhaven harbor master plan	●	O	●	●	☆	●	O	0	☆	☆	●	S	4-59
21	Removal & disposal of PCB contaminated grit from main interceptor (from Pearl Street to Cove Street)	O	☆	O	O	☆	☆	O	0	●	●	●	●	4-33
22	New Bedford Police Department Harbor Unit	●	☆	O	O	☆	O	O	☆	O	●	●	●	4-62
23	Restoration management/visualization model of New Bedford harbor ecosystem	●	O	●	●	☆	O	O	O	O	●	●	S	4-61
24	Land conservation - Sconticut Neck marshes and coastline	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	4-39 P
25	Eliminating toxic chlorine discharge from Fairhaven wastewater treatment plant	●	☆	●	●	☆	O	●	O	●	●	●	●	4-33

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26	Massive seeding of large juvenile bay scallops in New Bedford harbor area	O	☆	O	☆	O	O	●	O	O	●	●	☆	4-51
27	Hatchery startup assistance with Taylor Seafood	●	☆	●	●	●	●	●	O	O	●	●	●	4-51
28	Build a dam at the I-95 bridge with possible dewatering pump	●	☆	O	☆	O	O	☆	☆	☆	●	●	●	4-63
29	Wetlands restoration planning and implementation: New Bedford Harbor Environment	O	☆	O	☆	O	O	☆	☆	☆	●	☆	S	4-59
30	Design and development of the New Bedford Aquarium complex	●	☆	O	☆	☆	●	O	☆	☆	☆	●	●	4-61
31	Acushnet aquafarm development	☆	☆	O	☆	O	☆	●	☆	O	●	●	☆	4-52
32	Shellfish restoration Town of Acushnet[1]	O	☆	☆	☆	●	●	●	☆	☆	●	●	●	4-45 P
33	Herring run restoration[1]	☆	☆	O	☆	☆	☆	☆	☆	☆	☆	☆	☆	4-47 P
34	Amos Pratt - House 1810	●	☆	●	●	☆	O	O	O	O	●	●	●	4-63
35	Wood Street - North	O	☆	☆	☆	☆	O	☆	☆	☆	●	●	?	4-64
36	New Bedford hurricane barrier eastern box culvert	O	☆	O	O	☆	☆O	O	☆	☆	☆	☆	☆	4-27 P
37	Relocation of Fairhaven sewerage outfall: hurricane barrier modification	●	☆	●	●	☆	O	O	O	●	●	●	●	4-34
38	Bubble curtain installation: New Bedford barrier gate opening	O	☆	O	O	O	O	●	O	●	☆	●	●	4-29
39	Terrestial ecological restoration habitat inventory, categorization and mapping project	●	●	●	●	☆	●	☆	O	●	●	●	S	4-60

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40	Herman Melville Shipyard clean up	●	O	O	☆	O	●	☆	☆	O	●	●	●	4-64
41	Artificial reef creation using abandoned fishing vessels	●	☆	O	☆	O	●	☆	☆	O	●	●	☆	4-42
42	Riverside Park Belleville Avenue recreational marine park	☆	☆	☆	☆	☆	O	☆	☆	☆	☆	☆	☆	4-22 P
43	City of New Bedford - from brownwaters to green	●	O	●	●	☆	●	●	●	O	●	●	S	4-61
44	Buzzards Bay tern restoration and stabilization project[1]	☆	O	☆	☆	☆	☆	☆	☆	☆	●	☆	☆	4-54 P
45	New Bedford harbor avian monitoring and restoration project	O	☆	O	☆	☆	☆	O	●	☆	●	●	S	4-60
46	Salt marsh restoration	●	☆	●	●	O	●	O	O	O	●	●	S	4-59
47	Eelgrass habitat restoration	☆	☆	☆	☆	☆	☆	☆	☆	O	●	☆	☆	4-37 P
48	Pumpout vessel for marine sanitary devices	●	☆	☆	●	☆	O	O	O	O	●	●	●	4-30
49	Boat ramp, fishing pier, parking area (Dartmouth)	O	☆	O	☆	☆	☆	O	☆	☆	●	●	☆	4-23
50	Sportfishing piers (Dartmouth, Fairhaven, New Bedford)	O	☆	O	☆	☆	O	O	☆	☆	●	☆	☆	4-25
51	Artificial reef	O	O	O	O	☆	O	●	●	O	●	●	☆	4-42
52	Acushnet River recreation/preservation district	O	☆	☆	☆	☆	●	☆	☆	☆	●	●	☆	4-43
53	Anadromous fish restoration on the Weweantic River	☆	●	O	☆	☆	☆	●	●	O	●	●	☆	4-52
54	Planning for nitrogen removal from the Fairhaven wastewater treatment plant	●	O	●	●	O	O	●	●	●	●	●	S	4-60

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											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 coment, 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 11/2 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 theses 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 coment, 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 determnation.

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 assesssment 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 visting 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 coment, 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 coment, 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 wil 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 fule 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 Harborfrom 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 Harborand 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 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 to 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 coment, 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 Harborfrom 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 sewered 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, Massachusett, 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 Harborfrom 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, he 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 in 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 affect 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 imporve 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 coment, 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 the in 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 coment, 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, uncomtaminated 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, occuring 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 coment, 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, ion 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 occassional 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 harrassment, destruction of gull nests, trapping, chemical control, and shooting. Following initial ternery restoration, predator control on Penekese Island would be on an occassional 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 coment, 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 coment, 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 coment, 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 associaed 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 Ecosytem

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 proscriptive 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 signicant adverse impact to the environment provided that in removing the artifacts, minimal sediment resupension 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 icreased 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 signicant 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 signicant 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.