Buzzards Bay Project National Estuary Program 1999 Biennial Review

A summary of the successes of the Buzzards Bay Project in its efforts to facilitate the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan

Buzzards Bay Project National Estuary Program

April 30, 1999

Table of Contents

Preface

In 1985, Congress designated Buzzards Bay as an Estuary of National Significance, one of five estuaries so designated. The designation by Congress eventually led to the creation of the National Estuary Program in Section 320 of the reauthorized Clean Water Act of 1986. In 1987 the Buzzards Bay Project National Estuary Program formally became a U.S. EPA designated National Estuary Program.

Between 1985 and 1990, the Buzzards Bay Project funded water quality and living resource characterizations and assessments of Buzzards Bay. Based on these findings, the Buzzards Bay Project examined management options to address the identified problems and conducted financial assessments of these management solutions. These efforts culminated when the Buzzards Bay Project wrote the draft Buzzards Bay Comprehensive Conservation and Management Plan (CCMP) in 1989, the first NEP to do so. This Management Plan was approved by the then Massachusetts Governor Weld in September 1990, and by the US EPA in April 1991.

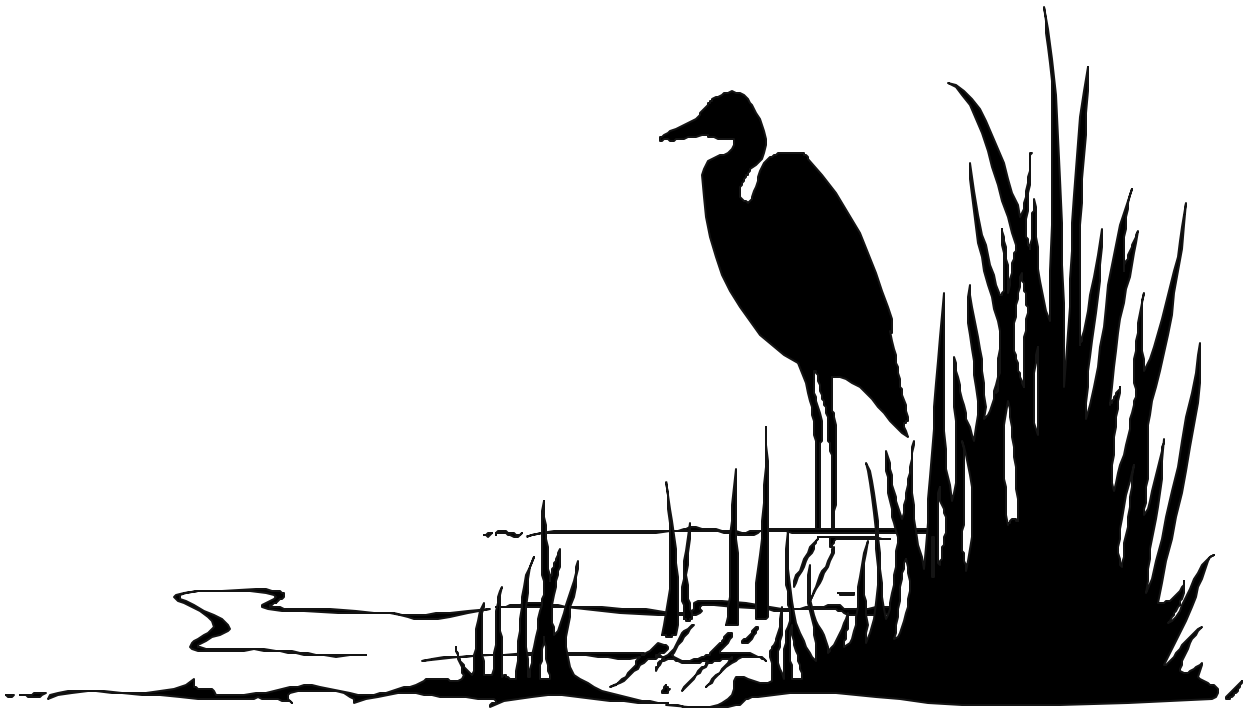
The Buzzards Bay CCMP was one of the country's first watershed plans and one of the first to focus so strongly on non-point source pollution and the cumulative impacts of development on water quality and living resources. The Buzzards Bay CCMP broke much new ground including a nationally acclaimed nitrogen management strategy. Also unique is the fact that nearly three quarters of the recommendations contained in the Buzzards Bay CCMP are directed at local government. This fact is a reflection that under Massachusetts' environmental regulatory framework, and because of "home rule" laws empowering municipalities, it is local government that has the greatest authority for dealing with cumulative non-point impacts in Massachusetts.

Since the Buzzards Bay Project completed the CCMP, it has transformed itself into a technical assistance and implementation program unparalleled in the National Estuary Program. Historically the Buzzards Bay Project has always been one of the smaller and less-well funded Estuary Programs. The Buzzards Bay Project adapted to its many unique features and transformed potential weaknesses into assets, and reformed itself into small, but highly effective program, with a remarkable track record at both getting things done and in securing state and federal funding.

These accomplishments were achieved despite some unconventional approaches, such as the complete abandonment of the Project's Public Outreach program in 1994, including elimination of the Project's newsletter. The Project made a strategic decision to rely on the outreach activities of two not-for-profit organizations - Coalition for Buzzards Bay, a citizen's group, and Buzzards Bay Action Committee, an association of municipal officials. Rather than focus on public outreach, the Buzzards Bay Project would instead seek to fulfill the environmental technical assistance needs of Buzzards Bay municipalities. This approach was feasible only because both nonprofits were also committed to the implementation of the Buzzards Bay CCMP, an unsurprising fact since both groups were created because of the dissolution of the Buzzards Bay Project's Citizen Advisory Committee in 1988. This triad partnership among the three Buzzards Bay organizations has helped ensure that the Buzzards Bay Project remains one of the most

successful National Estuary Programs.

SECTION I
Response to 1997 Biennial Review



Overview

In this section, we summarize the EPA's evaluation of the Buzzards Bay Project 1997 submission of its biennial review, including specific EPA recommendations, and what actions the BBP took to address those recommendations.

Findings to the 1997 Biennial Review

In response to our last Biennial Review submission, the US EPA found that the Buzzards Bay Project was making good progress in implementing its approved CCMP, and gave the BBP a "pass" grade. This approval enabled the BBP to receive an additional two years of Section 320 funding.

In particular, the EPA's reviewers were most impressed with the Buzzards Bay Project activities and progress in technical assistance to Buzzards Bay Municipalities. Cited were our grant writing assistance, implementation of specific projects such as the Spragues Cove Constructed Wetland Stormwater Remediation Project, the Toxic Use Reduction Program, SepTrack software program, and the Alternative Septic System Test Center. The reviewers also found that the BBP developed many innovative tools and initiatives that greatly assisting in building local capacity toward CCMP implementation. The BBP was also commended for our many valuable fact sheets and newsletters, along with numerous publications developed to provide the public and municipal officials with the information needed to make decisions on issues such as nitrogen loading, stormwater remediation and open space planning.

Regarding CCMP implementation, the EPA found that the Project had actively implemented the CCMP and made great progress in ensuring that projects were completed. The EPA acknowledged that the Project's success has been greatly helped by the strong ties the Project has with the local municipalities (primarily due to staff who are working on specific issues). The EPA was also "*very impressed with the Project's ability to leverage outside funding (non-Section 320 funds). The Project's strategy to aggressively go after Federal and State grant funds and securing staff positions on each proposal has been very successful. This approach has led to effective implementation of CCMP actions and continued technical assistance by the staff to the local communities.*"

EPA Recommendations and BBP response

The EPA's reviewers also identified several areas to which it felt that the BBP needs to provide some additional attention, or which pose particular challenges. These recommendations and BBP actions in response to these recommendations since the last biennial review are summarized below.

1) The BBP was criticized for its *"very limited participation and attendance ... at national NEP meetings and trainings."*

BBP Response and actions: Before 1997, the Buzzards Bay Project dedicated most of its tech transfer and outreach efforts to programs and meetings within our watershed and state. In response to the EPA's concerns, the Project began extensively and more comprehensively participating in national meetings of the NEP. We believe the BBP is now a model for other NEPs in the nation in this regard. Moreover, project staff have been participating in other national meetings relating to land use planning, non-point source pollution, and wetlands protection, not only extolling the successes of the BBP and its many partners, but the success of the National Estuary Program as a whole. In the last fiscal year, the Buzzards Bay Project well exceeded the $10,000 minimum required expenditure for national meetings and was one of only 15

NEPs (of 22) that were able to provide adequate documentation for subsequent funding of our national meeting travel allowance under Section 320.

2) With regards to BBP outreach, the EPA found: "Although the Project has been successful in providing technical assistance to the local community, there has been public confusion concerning the Project's identity. We understand that the decision was made not to fund an outreach coordinator or to continue the newsletter. However, we believe that it would serve to provide a clearer understanding of the program by the public, increase communication and cooperation between the public and many groups involved with the Buzzards Bay Project, would enhance continued progress in implementation of CCMP action plans, and would assist in transferring 'lessons learned' to other coastal watersheds if such a position were in place."

To help better communicate the mission of the Buzzards Bay Project and its distinct identity from other Buzzards Bay organizations, the BBP established a web site (www.buzzardsbay.org). This website clearly identifies the role and identity of the Buzzards Bay Project, and has links to other Buzzards Bay organizations. We believe this web site is one of the most comprehensive and detailed web sites among the NEPS. This web site has been one of the most effective outreach tools of the BBP and has greatly reduced staff time and project expense associated with sending out and copying reports, information, and fact sheets.

Regarding hiring an outreach coordinator, the BBP's Steering Committee does not support acquiring any new staff at this time, even for technical assistance programs. Instead, the BBP Steering Committee has been satisfied by current outreach activities by the citizens group, the Coalition for Buzzards Bay, the municipal group the Buzzards Bay Action Committee, and the Project's web site, fact sheets, and press releases as mechanisms for outreach. Moreover, the Buzzards Bay Project's Steering Committee has directed the BBP to use as little of our base funding ($300,000 per year) for staff to maximize grant funds for municipal mini-grants. Thus, Section 320 funds in our current grant only cover 92% of staff salary and indirect charges. The BBP must find other competitive grants (e.g., through sections 319 or 104b3) to make up these salary shortfalls. Should the Buzzards Bay Project be successful in exceeding our shortfall targets, more Section 320 funds may be dedicated to the municipal grant program.

3) EPA felt additional effort at monitoring is needed by the Project. In particular it was stated that *"A critical need for the Project is the ability to correlate environmental progress with action plan implementation. While the Project has access to data collected, there is insufficient overall coordination of the monitoring program (although the Project works in partnership with the Coalition for Buzzards Bay regarding citizen monitoring). The Project's ability to determine environmental trends and progress would be enhanced if the Project influenced the type of data monitored for by existing agencies."*

BBP Response and actions: The Buzzards Bay Project has felt the citizen-based water quality monitoring program to assess nitrogen impacts (now solely implemented by the Coalition for Buzzards Bay), and

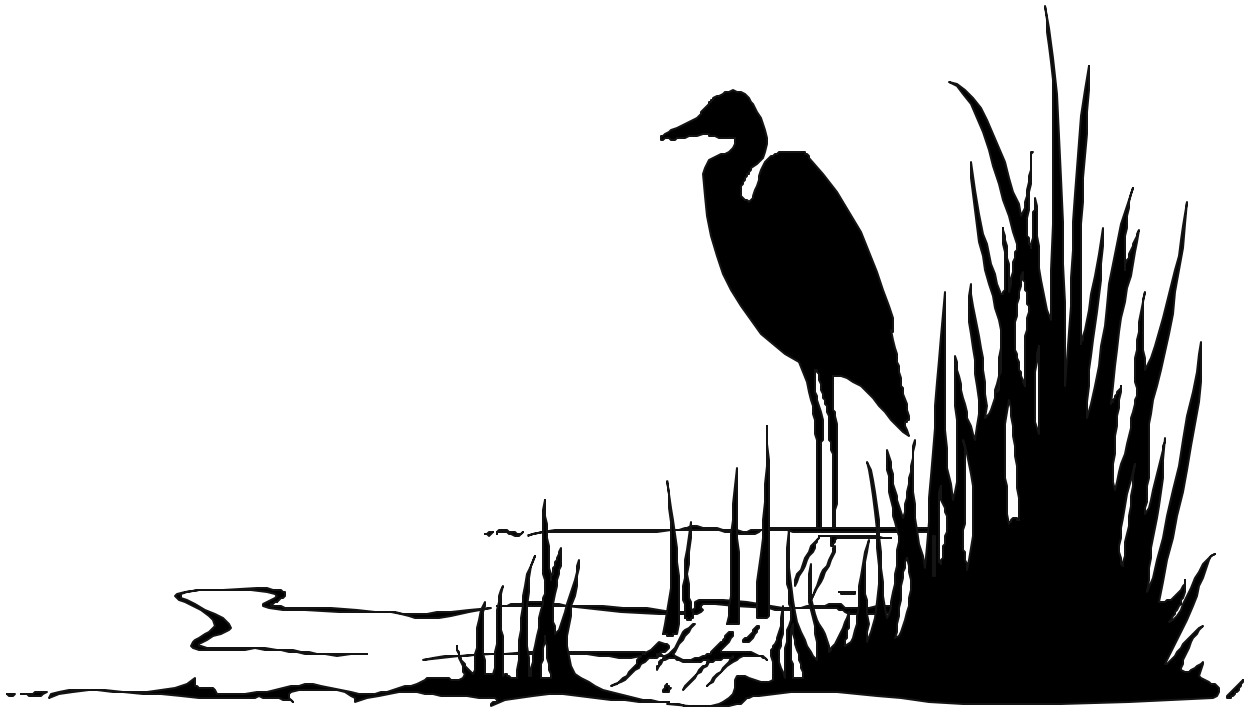
shellfish bed monitoring and closure statistics (collected by the Massachusetts Division of Marine Fisheries) were the cornerstones for any bay-wide assessment of ecosystem health, and were the best measures for evaluating most of the recommendations contained in the CCMP. In fact, in the Buzzards Bay CCMP Monitoring Plan states "The monitoring program will be coordinated with existing programs from other state and federal agencies. The BBP will not duplicate or substitute for any ongoing effort but will incorporate those efforts into this plan".

To compliment these water quality monitoring programs, the monitoring of programmatic actions (e.g., number of towns adopting local wetland or stormwater regulations, acres of open space protected, open space plans completed, number of boat pumpouts available, total boat waste collected, etc.) was the key charge to the Buzzards Bay Project to help it define the long term progress in CCMP implementation.

Nonetheless, the Buzzards Bay Project has selectively evaluated various data sets and included this information in this current review to document certain trends to evaluate the success of actions taken identified in the CCMP.

SECTION II

Status of CCMP Implementation and Analysis of the "Action Plans"



Overview

In this section, all goals, objectives, and recommendations for each "Action Plan" contained in the CCMP are quoted (*italicized text*). With each goal or recommendation we have added comments on our approach and degree of implementation. These sections are followed by an analysis and summary of our 1997-199 accomplishments.

Action Plan: Managing Nitrogen-Sensitive Embayments

CCMP Goals

1. Ensure that no beneficial water uses will be lost, nor will ecosystems be adversely affected by excessive contributions of nitrogen to any embayment within Buzzards Bay

2. Restore any beneficial water uses and ecosystems lost or impacted by the excessive contribution of nitrogen to any embayment within Buzzards Bay

Because of the overwhelming complexity and difficulty of the nitrogen issue, the BBP chose initially to focus on protecting relatively unimpacted valuable resource areas from future degradation. With time, however, the Buzzards Bay Project has begun to pursue efforts to restore degraded areas, especially those areas impacted by sewage treatment facilities through the establishment of TMALs (Total Maximum Annual Loads) for nitrogen.

CCMP Objectives

1. To control the amount of nitrogen entering Buzzards Bay as a whole.

2. To limit new additions of nitrogen entering nitrogen-sensitive embayments.

3. To reduce the amount of nitrogen entering nitrogen-impacted embayments.

Since Buzzards Bay as a whole is not degraded; the method of achieving Objective 1 was always believed to be succeeding at Objectives 2 and 3. Municipalities bear the primary burden for managing nitrogen to embayments principally affected by non-point source pollution. Local response to the nitrogen problem was weak during the first part of the decade, but with the continuing efforts of the Coalition's Citizens Water Quality Monitoring Program, the adoption of the BBP's nitrogen Management Strategy by the Coalition, and the use of the BBP's management strategy by Massachusetts DEP and EPA New England to establish Sewage Treatment Facility TMDLs for nitrogen, the program is now generating tremendous advances in addressing several degraded areas.

4. To develop and support the use of alternative technologies that achieve . denitrification of wastewater.

With the construction of the Massachusetts Alternative Septic System Test Center by the Buzzards Bay Project in the fall of 1998, and changes in the state onsite wastewater regulations in 1995, all five CCMP objectives under this Action Plan are now being met in appreciable ways.

5. To develop a monitoring program that can assess the effectiveness of management actions taken and determine changes in water quality and health of coastal ecosystems.

In 1991, the BBP through funding and technical assistance, and with collaboration of the Coalition for Buzzards Bay established the necessary citizen based water quality monitoring program. After funding cutbacks by the Project in 1996, the Coalition secured enough money to continue the Citizen Monitoring

Program. The Coalition met their financial need in part because of direct contributions by the municipalities, in 1997 and 1998, who felt that the data collected was of value.

CCMP Commitments:

Department of Environmental Protection:

1. DEP will adopt regulatory standards for nitrogen inputs to coastal embayments in its 1993 revision to State Water Quality Standards. (Target date: 6/93).

In 1995 DEP revised its strategy to instead put more emphasis on nitrogen management through the state's onsite wastewater regulations (Title 5), which in turn established a tougher nitrogen standard for well recharge areas and "nitrogen sensitive embayments" (a term created by the BBP) which were designated in the state's surface water quality standard regulations. Such a designation can be achieved either through designation by DEP, the Secretary of Environmental Affairs, or by local municipal nomination to the state. While such areas have not been officially designated, beginning in 1998, the DEP has defacto adopted a policy of considering certain embayments as "nitrogen sensitive" for the purposes of issuing surface water quality discharges for sewage treatment facility permit renewals. Although designations have yet to be fulfilled, with the process in place, DEP's commitment has been substantively completed. This effort will be the first step in the process to develop nitrogen criteria as call for in the Clean Water Action Plan.

2. DEP will actively promote the development and acceptance of cost-effective alternative technologies for wastewater denitrification by assigning additional personnel to overview pilot projects. (Target date: 12/91)

Status: In 1995, in part due to recommendation by the BBP, DEP adopted changes to Title 5 that made it easier for alternative technologies to be approved for use in Massachusetts. In addition, the BBP, in partnership with DEP and other organizations, sought funding from EPA in 1995 to build a facility to test and promote alternative technologies for onsite systems in Massachusetts. We succeeded in this endeavor and the **Massachusetts Alternative Septic System Test Center** was built on Cape Cod in late 1998. While the goals of this initiative have yet to be fulfilled, these two actions have allowed the DEP to substantively complete its commitment.

Environmental Protection Agency (EPA):

1. EPA, through its Near Coastal Waters Program, will construct and evaluate approximately four experimental denitrifying onsite wastewater disposal systems in Buzzards Bay municipalities.

These systems were built and tested and led to the eventual construction of the Massachusetts Alternative Septic System Test Center.

2. EPA will contribute a water quality specialist's skills in working on nitrogen issues within the context of DEP's Anti-Degradation Task Force. (Target date: Beginning 1991).

This initiative was never formally implemented by the EPA, but this action may no longer be needed in light of national EPA efforts to establish nitrogen Total Maximum Dailey Loads for coastal waters.

Buzzards Bay Municipalities:

1. Bourne, Plymouth and Wareham have adopted an intermunicipal overlay district around Buttermilk Bay. Completed in 1991

2. Dartmouth will pursue development of a nitrogen loading strategy for the Apponagansett Bay Watershed.

In 1993 the Town of Dartmouth began efforts to evaluate nitrogen reductions needed to restore Apponagansett Bay which is an impacted embayment. In 1996, as a result of the BBP's SepTrack software program implemented in Dartmouth, the Board of Health discovered that up to 300 homes near the edge of the bay that were supposedly sewered more than a decade ago, were never tied in to the sewer system. The Board of Health's efforts to tie this homes in will result in water quality improvements. A broader comprehensive strategy has not yet been achieved.

3. Westport will pursue a nitrogen loading strategy for the Westport Rivers. (Target date: 9/91-9/92.)

Because of funding and technical assistance from the BBP and increased public awareness through the Westport River Watershed Alliance and CBB efforts, the Town has initiated a nitrogen management evaluation for the Westport River. In 1999, the Buzzards Bay Project completed an open space plan for the Town of Westport and City of Fall River (which includes the upper Westport River watershed) that focused on protecting open space to prevent further degradations of water quality. An overall remediation solution for the watershed, which is dominated by agricultural and dairy inputs has remained elusive.

Other Recommended CCMP Actions:

1. Municipalities should adopt nitrogen-loading bylaws, subdivision regulations, or health regulations to implement nitrogen-management programs around appropriate embayments. Target dates: technical basis, 9/92; community action, as appropriate.

Because of funding and technical assistance from the BBP and increased public awareness through the CBB water quality monitoring efforts, the municipalities have initiated nitrogen management actions for several watersheds including: West Falmouth Harbor, Little Bay (Fairhaven), and the Wareham River Estuary.

2. The Cape Cod Cranberry Growers' Association (CCCGA) in cooperation with the Plymouth County Conservation District should be encouraged to continue implementation of its Water Quality Protection Initiative.

The CCCGA has continued technical assistance for bog operators, but in 1996, the CCCGA argued to DEP against funding the BBP for implementation of a program to inventory flow-through bogs in the Buzzards Bay watershed because in its view the effort would be counter productive to their activities. As a result, DEP withdrew funding for this project.

Analysis

The Buzzards Bay Project identified the management of excessive nitrogen loading to small coastal embayments as a major component of its CCMP. Unlike other east coast estuaries such as Long Island Sound and Chesapeake Bay, central Buzzards Bay fortunately did not suffer from the impacts of excessive nitrogen loading. However, nitrogen inputs were identified in the CCMP as one of the greatest threats to the health of the Bay's more than 30 shallow, often poorly flushed, coastal embayments. Starting with a well-conceived strategy, the BBP has gone on to become a national leader in nitrogen management. Protocols developed by the BBP were transferred to other National Estuary Programs as well as to neighboring Cape Cod where the Cape Cod Commission has adopted and applied the BBP's nitrogen management methodology as part of its overall regulatory program. An earlier significant success was the Buttermilk Bay Tri-town Nitrogen Overlay District (the first of its kind in the country) which was approved by town meetings in Plymouth, Wareham and Bourne in 1991,

1997-1999 Accomplishments

1) In 1997 a flushing study was completed for 5 embayments in Dartmouth (Allen's Pond), Fairhaven (Little Bay), Mattapoisett (Eel Pond), Wareham (Onset Bay), and Bourne (Pocasset River and Hen Cove). These flushing studies were critical toward developing nitrogen management watershed plans for each respective embayment.

2) The BBP used the flushing study above to develop a nitrogen management strategy for Little Bay and final report was sent to the Town in 1999. The Little Bay watershed nitrogen report is posted on our web site.

3) The Project has used funding through its Municipal Grant Program to encourage the acquisition of parcel level GIS data that is being used for our buildout analyses. Some towns, such as Wareham, have even initiated efforts to fund hydraulic flushing or water quality assessments to better refine acceptable nitrogen limits using the BBP's TMAL nitrogen methodology.

4) BBP utilized Section 104(b)(3) funds and completed four open space plans (Fall River, Westport, Mattapoisett, and contribution towards Wareham's plan as part of a program to protect water quality through open space and wetlands protection. This program has been so successful that municipalities continue to ask BBP for assistance in the development and refinement of their open space plans.

5) The Buzzards Bay Project is near completion on its $85,000 319 grant titled Managing Nitrogen Sensitive Embayments through Land Conservation working in the Slocums River (Dartmouth and New Bedford) and Onset Bay (Wareham) watersheds. This grant had a $29,000 cash match from Massachusetts Environmental Trust. Funds have been largely used to pay for appraisals for properties to be purchased for permanent open space protection. Most notably, the BBP paid for surveying work on a 650 acre parcel on the Slocums River for acquisition by the Dartmouth Natural Resources Trust.

6) Most nitrogen analysis work has been completed for West Falmouth Harbor, and our principal

objectives have been achieved. DEP is requiring a nitrogen loading analysis for the watershed, and the town has agreed to develop a facility plan that addresses nitrogen loading impacts for the entire West Falmouth Harbor watershed where the facility is located. The Project continues to work behind the scenes on follow-up of previous reports.

7) Allens Pond Alternative Septic System with a wetland treatment system was constructed by the BBP at Mass Audubon facility in cooperation with Town of Dartmouth. The system was monitored for two seasons, additional monitoring proposed. The results will be posted on our web site in 1999.

8) The EPA and MA DEP have begun reviewing nitrogen loading impacts for both the Wareham and Fairhaven sewage treatment facility upgrades in accordance with limits recommended in the Buzzards Bay CCMP. The BBP has been preparing nitrogen loading evaluations at the request of the agencies for these projects, and projects outside the watershed. This represents not only a major shift in actions by these regulatory agencies but a major success in the implementation of the Buzzards Bay CCMP.

9) Completed a nitrogen loading assessment for the Town of Marion (relating to their wastewater treatment facility) at request of the Board of Selectmen.

10) The BBP conducted a revised nitrogen loading analysis for New Bedford Harbor

11) Currently reviewing data of the Buzzards Bay Citizens Monitoring Program for incorporation of a manuscript.

Action Plan: Managing On-site Wastewater Disposal Systems

CCMP Goal

1. Prevent public health threats and environmental degradation from on-site wastewater disposal systems

CCMP Objectives

1. To enforce the provisions contained in Title 5 regulations.

2. To upgrade pre-Title 5 systems suspected of contaminating groundwater or surface waters.

New regulations and policies by DEP, better local training, expertise, and local awareness has improved Title 5 enforcement and the subsequent replacement of failed systems. Another factor has been the creation of "betterment" programs (enriched at the local level because of action by the BBAC in providing enabling legislation (in 1995), and by DEP for creating a state program in 1997). The betterment programs have eliminated many financial obstacles preventing septic system upgrades by the homeowner. The most important improvement however, was a new requirement by DEP in the 1996 Title 5 regulations to have septic systems inspected at property transfer. This single change has resulted in a tremendous compliance of failed septic systems to new Title 5 standards. Perhaps most remarkably is the fact that this process is now self driven through the bank financing process.

3. To address the inadequacies of Title 5 through Board of Health regulations

Several towns have adopted regulations that supplement Title 5.

4. To improve the Title 5 Code through recognition of nitrogen impacts, virus transport, and sensitive areas.

Title 5 code revisions in 1996 by DEP, with suggestions from the BBP, went a long way toward addressing these concerns (see nitrogen action plan). The regulation of on-site systems however, cannot solve the N loading problem alone.

5. To promote innovative technology that will reduce nitrogen

The Alternative Septic System Test center described in Nitrogen Action Plan accomplishes this objective.

CCMP Commitments:

Buzzards Bay Municipalities

1. Falmouth, Bourne, Wareham, Marion and Westport will pursue amending their Board of Health regulations to allow for better treatment and removal of viruses from on-site wastewater. Target date: 1991-1992.

Only Falmouth adopted such regulations. The 1996 Title 5 changes for high percolating soils is felt, by many, to address some of these concerns.

Other Recommended CCMP Actions:

1. DEP should amend the Title 5 Code so that it becomes a more comprehensive environmental regulation. Target date: 1992.

New regulations were completed in 1995 and promulgated in 1996.

2. DEP should elevate the priority of the Title 5 Program. Target date: 1992.

Completed in 1995 with regulatory changes. The Title 5 program became very elevated because of various public controversies on proposed regulatory changes.

3. All boards of health should employ a full-time qualified health agent. Target date: 1992-1994.

Completed by 1995.

4. All boards of health should adopt a series of regulations that address the placement of septic systems in special resource areas. Target date: 1991-1993.

Not Done, but some limited local successes. Overall Title 5 changes in 1995 addressed most of these issues.

5. All boards of health should amend their regulations by increasing the setback distance required between on-site wastewater disposal systems and resource areas or requiring adjustments to the system design and application rate to account for virus transport. Target date: 1991-1993.

Accomplished by Falmouth Conservation Commission, and addressed partially by new Title regulations in 1995. In addition, the passage in 1997 of the Rivers Protection Act by the Massachusetts Legislature provided a 100 foot setback from most streams. The actions have made it less pressing for municipalities to adopt local regulations.

Analysis

In 1992, when the BBP was beginning its implementation efforts, many bay watershed municipalities did not have a health professional on staff to oversee inspection of existing septic systems or the siting of new systems. To meet this basic need, the BBP, through its municipal grant program funded a cooperative effort between the towns of Marion, Rochester, and Acushnet to create the first ever Regional Health District among the three towns, and provided funding for the first year to hire a shared Health Agent for the District. This cooperative effort was an important accomplishment for the BBP as intermunicipal cooperation was a key goal of the CCMP. The District remains in effect today and was the basis for the creation of a similar position a few years to serve New Bedford, Acushnet, and Rochester. With the increased management responsibilities under the wastewater disposal regulations, "Title 5", the District concept should be

expanded to provide for full-time health agents in all Bay communities.

The Buzzards Bay Project has been very active in working with local Boards of Health toward improving local health regulations to address inadequacies in the Title 5 Code. Viral transport rates in groundwater were found, through studies compiled for the CCMP, to far exceed the required 50-foot setback distance from septic system leachfields to waterbodies and wetlands. To address this, the BBP worked with bay towns to increase the setback distance in local health regulations to a minimum of 100 feet and adjust wastewater application rates to better protect against viruses. Today, only the bay town of Acushnet retains a 50-foot setback.

The revisions to Title 5 in 1994 accomplished many changes to the code recommended in the CCMP for the siting and design of septic systems. As noted above, the one area that did not receive adequate attention was the setback of leachfields to wetlands and waterbodies. Changes in the system design and loading rates in the code did however result in partial improvements to virus transport concerns expressed in the CCMP. Nitrogen impacts were included in the code but no specific nitrogen sensitive embayments or special wastewater disposal standards for these areas were defined. A very positive result of the revisions, as they relate to enhanced nitrogen removal, was the code's new procedures for the development and acceptance of alternative/innovative septic system technologies. This action directly addresses the Department's CCMP commitment to promote such systems to provide cost-effective nitrogen removal alternatives.

The BBP took an important step to assist local Boards of Health in the upgrade of failing or poorly functioning septic systems and the proper long term maintenance of septic systems through the development of SepTrack. SepTrack was a septic system tracking computer program conceived of by the Buzzards Bay Project and jointly developed by the Buzzards Bay Project and Kyran Research Associates through a contract with Massachusetts Coastal Zone Management. This software was developed for municipalities within the Buzzards Bay watershed to help Boards of Health in tracking the operation, maintenance and permitting of septic systems and other health related issues. To support the implementation of SepTrack, the Buzzards Bay Project, through its municipal grant program, also purchased computers for each area Board of Health. Finally, an intern was hired by the BBP to set up and install historic septic system information and current Assessor's data in each of the Bay towns.

1997-1999 Accomplishments

1. Denitrifying On-site Septic Systems

Following on the success of denitrifying on-site septic system technologies installed by the BBP in 1994 and 1995, the BBP proposed and received funding for the Massachusetts Alternative Septic System Test Center in partnership with Massachusetts DEP, Barnstable County, and UMass Dartmouth CMAST. Despite construction delays, unexpected costs, and funding issues, the test center finally came to fruition when construction was completed in the Fall of 1998. Since opening, a conventional septic system and three alternative design systems have been installed (in triplicate), and two more are pending. Equally important, the BBP has negotiated a program with the National Sanitary Federation of Michigan to test systems for national approval at our test center.

This facility is providing an opportunity to test and evaluate performance of proprietary and non-proprietary innovative septic systems in a consistent, controlled environment. It is providing incentives to small businesses that are developing new technologies to have their products tested free of charge within a state sanctioned process. The facility will also establish a location where local, state and federal officials, system designers and installation professionals, and other interested individuals will have the opportunity to view many different technologies at a single location. The Center will also provide a statewide repository for performance information on alternative on-site systems. (See fact sheet in Appendix A).

2. Project Review, Training, and Tech support.
The Buzzards Bay Project has continued to work with Boards of Health and Conservation Commission on the permitting and placement of septic systems. The Project also continues to provide technical support for municipalities using SepTrack. In early 1999, the Buzzards Bay Project, through MCZM and the Cape Cod Community College provided an intern to assist town's interested in upgrading data contained in the SepTrack data base in their towns. In addition, the Buzzards Bay Project will soon provide funding and technical support to municipalities to overcome a Year 2000 error in the SepTrack software program.

3. The BBP initiated a $70,000 grant to the town of Dartmouth for an innovative sewage pumping system to eliminate wastewater overflow contributing to shellfish bed closures in Clarks Cove.

4. The BBP awarded a $30,000 grant to the Town of Falmouth : Hydrogeologic investigations & report preparations for design of New Silver Beach Community Waste Water Facility.

Action Plan: Protecting and Enhancing Shellfish Resources

CCMP Goal

1. Increase availability of shellfish resources for recreational and commercial uses

This goal is achievable with a combination of reclassification of shellfish areas to either open or rainfall conditional closures.

CCMP Objectives

1. To keep open all shellfish areas that have not closed and open priority areas that are closed.

Achievable with considerable diligence and effort by municipalities and state, progress being made.

2. To enhance efforts to manage shellfish resources at both the state and local levels.

Title 5 changes, DMF collaborations with municipalities, increased public awareness, betterment programs, additional monitoring, and improved municipal staffing and enforcement are helping achieve this objective.

3. To increase the capacity and commitment of municipalities to remediate identified pollution sources and to assist in conducting the sanitary survey program.

Status: Local participation in sanitary surveys has occurred, local action on sanitary survey reports has been slow, but improving.

4. To increase the ability of DMF to carry out the sanitary survey program and provide technical and financial assistance.

BBP helped with this effort in the early 1990's, DMF remains somewhat hamstrung by staffing and funding limitations. Local efforts and participation have helped.

5. To expand use of conditionally approved classification for shellfish areas

This has been one of the best successes of the recommendations contained in this action as shown in the environmental indicators section. This effort remains a priority with DMF.

CCMP Commitments:

Division of Marine Fisheries (DMF):

1. DMF will work to train individuals in each Buzzards Bay town in shoreline surveys and strive to develop long-term cooperative arrangements that ensure consistency of town participation and supplements limited state personnel with local manpower. (Target date: 1991-1993.)

Status: Implemented in policy, and implemented in practice with many towns on an ad hoc basis. Could be expanded if more towns commit manpower and resources and if DMF also has more manpower (funding) to commit.

2. DMF will encourage Buzzards Bay towns to work cooperatively with them to expand the number of conditionally approved shellfish areas. (Target date: 1991-1993.)

Same as #1

Department of Environmental Protection (DEP):

1. DEP will take enforcement action against significant illegal discharges identified by DMF's sanitary surveys. Target date: 12/93

Status: Not done. Enforcement of this problem is a de facto low priority given DEP staff shortages and emphasis on case backlogs. Moreover, DEP believes municipal Boards of Health should be taking the first step, calling the agency if additional assistance is needed. Certain discharges remain unabated.

Buzzards Bay Municipalities:

1. Falmouth, Bourne, Mattapoisett, and Dartmouth have initiated coordinated efforts within their towns to identify and set priorities for illegal discharges that may be affecting shellfish beds.

All town's have done this to varying degree around Buzzards Bay. Most have focused on discharges from public roads in order to take advantage of state and federal grant money to remediate nonpoint source pollution.

2. Falmouth, Bourne, Wareham, and Fairhaven have designated individuals with public health jurisdiction to assist DMF in classifying shellfish areas within their jurisdiction.

Done on an ad hoc basis during early 1990s.

3. With DMF assistance, Fairhaven and Dartmouth will pursue conditionally approved shellfish areas within their towns. (Target date: 1991)

Dartmouth, New Bedford, Westport, Wareham, and Fairhaven now have conditionally approved areas.

Other Recommended CCMP Actions:

1. All other coastal municipalities should correct identified sources of coliforms and pathogens entering the Bay. (Target date: immediately)

This is a very long term process that could only be started "immediately". Evidence of progress from 319 grants, MCZM Coastal Pollution Remediation grants (CPR), and ongoing municipal Public Works efforts.

2. EOEA should increase funding to carry out the Shellfish Sanitation Program. Target date: July, 1992. Cost: an additional $400,000 annually.

This did not occur. However, BBP grants, MCZM CPR grants, and DEP 319 grants was able to provide

funds for some of the needed monitoring to establish remediation priorities and justify conditional closures.

3. All other coastal communities should designate an individual with public health responsibility to assist DMF in classifying shellfish areas within their jurisdictions. Target date: 1992. Target date: begin immediately.

DMF no longer feels this is necessary. Occurs on an ad hoc basis or when town pursue conditional closures.

4. EPA and FDA should develop a new indicator or suite of indicators to replace fecal coliform as an indicator of human health risk.

Research will continue, but a new indicator is unlikely for another 10 years, and is beyond the scope of the Buzzards Bay CCMP.

5. The Massachusetts Legislature should pass legislation to improve financial assistance for shellfish grant program at the local level. Target date: 1992. Suggested funding level: $400,000 annually.

Never occurred.

6. DMF should develop standard methods for towns to report commercial and recreational shellfish catch data as a first step in monitoring resource utilization or losses. Target date: 1993.

Recommendations given to towns but data still not standardized.

Analysis

In 1991 when the Buzzards Bay CCMP was completed, degradation of water quality due to pathogen contamination represented a serious and growing human health risk and economic loss to the Bay's historically strong shellfishery. In that year, the Bay saw 13,816 acres closed - the greatest number of bed closures in history. This figure had grown quickly moving from only 4,358 acres closed in 1970 and doubling to 8,052 acres by 1980. Throughout the 60s, 70s, and 80s, shellfish beds in Buzzards Bay were being closed due to fecal coliform contamination at ever increasing rates, and these closings were one of most pressing concerns with area residents.

By the end of 1996, however, the Bay had regained over 4,000 acres of shellfish harvest area, returning the Bay to a closure figure that had not been seen in the Bay since 1984. This improvement is due to both real improvements in water quality and increased use of conditional closures in many areas along the Bay's coastline. The most striking achievement was the reopening of 700 acres of shellfish beds in Clark's Cove in April 1992.

While the Buzzards Bay Project contributed to this turn around, the real credit belongs to by the State Division of Marine Fisheries (DMF) and numerous municipal officials who have worked together to identify and remediate pollution sources. The Project however helped form the wave of new thinking on what the

problems and solutions were to the shellfish bed closure problem. In fact, the Project's emphasis on stormwater as the principal source and conveyance of fecal coliforms in many embayments and harbors would result in new state programs to help towns fund solutions to the stormwater problem and spawned similar initiatives in the Project's sister NEP, the Mass Bays Program.

The Buzzards Bay Project's efforts began in 1989 with a series of Project workshops that brought together scientists, agency staff, municipal officials and citizens to discuss the ever increasing shellfish bed closures in the Bay. The workshops were meant to both educate and to formulate recommendations for the Management Plan.

These early meetings made clear that the increasing shellfish bed closures in Buzzards Bay were not the result of municipal wastewater plants, but rather the result of cumulative impacts of local land uses. So called "non-point sources" of pollution like failing septic systems, stormwater discharges, farm animal wastes, agricultural sources, boat discharges, pets, and even waterfowl (especially where populations were encouraged by human feedings) were the more likely culprits. Of these sources, water quality monitoring had shown that in many embayments, stormwater was often the major conveyor and source of fecal coliforms causing these closures.

These findings prompted several important recommendations in the CCMP. First, towns should adopt the goal of allowing no further direct discharges to surface waters and wetlands. Second, those discharges contributing to shellfish closures should be prioritized for remediation. Finally, the Division of Marine Fisheries should work with area municipalities to allow "rainfall conditional openings." That is, DMF should allow shellfishing during dry periods, in areas where it has been demonstrated that fecal coliform concentrations are low enough so that shellfish are safe to consume.

The first challenge to keeping shellfish beds open in Buzzards Bay occurred in 1989 when new monitoring and sanitary survey requirements imposed by the US Food and Drug Administration could not be met by the DMF because of insufficient manpower and laboratory capacity. In the face of potential widespread management closures of the Bay, the Buzzards Bay Project supported a DMF proposal to upgrade area laboratories to handle the additional water sampling needed. Specifically the project gave $35,000 in grants to the City of New Bedford and Barnstable County Health Department to upgrade their laboratories and to pay for the analysis of extra samples collected by DMF. To meet federally imposed deadlines, DMF staff also trained local officials to assist with the sanitary surveys in their communities.

The upgrade of area laboratories and the closer coordination between DMF and municipal officials were to have long-term benefits for Buzzards Bay. Most important, by 1991 DMF could begin implementing a rainfall conditional closure strategy for selected Buzzards Bay embayments.

Conditional Closures

The expanded use of the Conditional Closure by the Division of Marine Fisheries has been responsible for most of bed openings since 1991. Defined as one of the primary goals in the Buzzards Bay CCMP,

conditional openings recognize that elevated bacteria counts in many of the Bay's embayments are directly related to surface runoff during rain events. Shellfish beds in the Westport River, Clark's Cove, and Little Bay in Fairhaven have all been moved from closed to conditional in the past five years. This management technique establishes a rainfall threshold unique to each embayment by which the local shellfish warden raises a red flag adjacent to the shellfish beds alerting fishermen that the area is closed.

In support of this reclassification and remediation effort in the Westport Rivers, the Buzzards Bay Project has provided $10,000 to the Town of Westport Board of Health in cooperation with a local watershed organization to establish a detailed bacterial monitoring program in the Rivers - one of the Bay watershed's most historically productive shellfisheries. Westport was the first Bay community to begin the use of conditional closure management in 1990. Funding from the BBP worked to support the expansion of both cleanup and bed management activities by creating a certified laboratory operated by the town Health Director to focus on regular and detailed bacteria testing. The data generated by the town of Westport continues to target hot spots for remedial activities along the rivers shoreline.

The interconnectedness of each of the Buzzards Bay CCMP's Action Plans is not exhibited anywhere better than in the Project's goals regarding shellfish resources. The work of the Buzzards Bay NEP in this area has been undertaken largely under the umbrella of bacteria focused water quality restoration efforts through stormwater remediation, onsite wastewater management, and managing boat wastes. The restoration of the Bay's abundant shellfish habitats for harvest is a product of many of the initiatives undertaken by the Project in the past five years.

Clark's Cove Reopened to Shellfish Harvest after nearly a Century of Closure

Clark's Cove is a located on the western shore of Buzzards Bay between the town of Dartmouth and the City of New Bedford. Regular discharges of raw sewage from New Bedford's antiquated sewer system had closed all of the City's shellfish harvest area. Beginning in the late 1980s, the City's Wastewater Division began extensive work on the Combined Sewer Overflow (CSO) system and by the early 1990s had stopped all dry weather CSO flows to the Cove.

This work was supported by three Buzzards Bay Project awards to the City totaling $77,500. First, Estuary Program funds were provided for enhanced water quality sampling and analysis in Clark's Cove to accurately define when and where the Cove was experiencing pathogen contamination. This Sanitary Survey support documented real water quality improvements in the Cove and laid the groundwork for a shellfish harvest management strategy protective of public health. To meet the goal of reopening as much of the Cove as possible, The Buzzards Bay Project also funded the repair of a CSO Sluice Gate as well as in depth investigations and remediation of illegal residential sewer cross connections to stormdrains discharging to the Cove.

The resulting improvements to dry weather fecal coliform counts as a result of the City's efforts prompted the Massachusetts Division of Marine Fisheries to allow for the upgrading of the Cove from Prohibited status to Conditional Approval after 91 years of closure. Within five months of reopening, Clark's Cove yielded approximately $364,000 in quahogs employing more than two dozen full time fishermen. Applying a conservative multiplier to this figure, the ripple effect on the local economy from this harvest amounts to over $1.5 million.

1997-1999 Accomplishments

Most of the BBP's efforts to open or protect

shellfish beds are contained in the following **Controlling Stormwater Runoff** action plan and are not included here to avoid redundancy.

Action Plan: Controlling Stormwater Runoff

CCMP Goals

1. Prevent new or increased untreated stormwater flows to Buzzards Bay that would adversely affect shellfish harvesting areas, swimming beaches, water quality, and wetlands.

2. Correct existing stormwater runoff problems that are causing or contributing to water quality degradation or shellfish bed closures in Buzzards Bay.

The first goal is extremely difficult to achieve, but progress is being made by more towns adopting stormwater regulations. Considerable funding on the second goal has been realized, but many discharges in Buzzards Bay remain, and will require at least $20 million in additional local, state, and federal funds.

CCMP Objectives

1. To institutionalize at the local level (through education and regulation) the use of Best Management Practices (BMPs) for stormwater control in newly developed areas.

The model BBP-SCS stormwater local regulations have been adopted by several town boards. This local work is complimented by new state stormwater guidance promulgated in 1997.

2. To develop a regional and local program to execute appropriate mitigation measures for existing stormwater discharges. The program would include construction, operation, and maintenance of stormwater control structures.

MCZM implemented the Coastal Pollution Remediation grant program to address this issue, and the Buzzards Bay Project coordinates town and state collaborations, but these programs and efforts are on an ad hoc basis.

CCMP Commitments:

Department of Environmental Protection (DEP):

1. DEP will work cooperatively with EPA to develop a policy including criteria to determine when permits for stormwater discharges are required. DEP will include these criteria in its State Water Quality Standards. DEP will also consolidate its regulatory authority for controlling stormwater runoff. (Target date: 6/93).

The DEP accomplished much of this through stormwater remediation policy adopted in 1996. EPA's Phase II Stormwater Permit Program will assist greatly in meeting this commitment.

Buzzards Bay Municipalities:

Bourne, Wareham, and Marion will pursue adoption of subdivision rules and regulations that require best management practices for stormwater runoff. Target date: 1992

Boards in the towns of Rochester, Marion, Falmouth and Fairhaven have adopted parts or all of the BBP regulations, other towns (Bourne) are working with the project.

Other Recommended CCMP Actions

1. All other Buzzards Bay communities should adopt subdivision bylaws that require that best management practices for stormwater runoff be incorporated into any new *development plans. Target date: 1994.*

Municipal Planning Boards completed: Fairhaven, Marion, Rochester

2. Each Buzzards Bay community should implement best management practices for storm drains that are contributing to shellfish-bed closures. Target date: beginning immediately, as funds allow.

All town's are undertaking this task to a varying degree, requires a long term commitment.

3. The Commonwealth, through the Executive Office of Environmental Affairs, should provide funding for local stormwater remediation projects. Target date: 1993.

The Buzzards Bay Project was successful in securing $250,000 from the state Transportation Bond in 1995 and 1996. This program was so successful, the state made the program state wide and called it the MCZM "Coastal Pollution Remediation" program.

4. The State Legislature should not continue to exempt bridge work and road widening by the state DPW from review by local conservation commissions. Target date: 1992.

Not done, but beginning about 1996, the newly named Mass Highway Department (MHD) began making courtesy filings with local conservation commissions, and began hiring environmental engineers to work with towns and coordinate with state agencies.

5. SCS should institute a program for implementing best management practices on agricultural lands in the Buzzards Bay area. Target date: 1991.

This program was in place in the early 1990s.

Remediation of Existing Stormwater Discharges

By far, the greatest amount of federal and state financial resources associated with Buzzards Bay Project implementation efforts, and Project technical assistance, was spent on remediation of existing stormwater discharges contributing to shellfish bed closures and water quality degradation throughout the bay watershed. Funding for these projects was provided by the Buzzards Bay Project through its EPA funded Municipal Grant Program, by the Massachusetts Department of Environmental Protection through the federal 319 program, and by the Massachusetts Office of Coastal Zone Management's Coastal Pollutant Remediation Program. The Buzzards Bay Project staff continues to help local officials in the identification of funding sources and the development of successful projects. This allowed the BBP and local communities to leverage Estuary Program funds far beyond their limits. Rough estimates on the remediation of all of the Bay's untreated discharges were estimated at $10 million in the CCMP Financial Plan.

The Project was greatly helped in this work through a partnership with the USDA Natural Resources Conservation Service in which NRCS staff works with the Buzzards Bay Project in design and review of various forms of stormwater remediation facilities. These projects included such varied forms of stormwater

BMPs as traditional stormwater infiltration structures, innovative constructed wetland systems, improved agricultural management practices, and urban sewer/stormwater cross connection remediation.

Besides structural solutions to urban runoff, the BBP also provided public education funding to the citizens' volunteer organization, the Coalition for Buzzards Bay, to stencil stormwater catch basins throughout the Bay watershed with the message, "Don't Dump, Save Our Bay" in 1993. In portions of New Bedford with a large bilingual population, the message was printed in Portuguese. In addition to the stenciling work, the Coalition also coordinated a BBP funded mapping project by interns from the Massachusetts Maritime Academy to locate and describe all stormwater catch basins, conveyance piping, and discharges in most of the Bay area. This information is being refined and digitized by the Town of Wareham onto a Geographic Information System (GIS) through a grant from the BBP. Plans to convert this data baywide into a GIS format are under development by the BBP.

The project has also extensively worked in assisting town boards have adequate regulations to address new and existing stormwater discharges, and our "unified stormwater regulations for all boards are included in Appendix B. Below are highlights form just a few of stormwater remediation projects facilitated by the Buzzards Bay Project.

Buttermilk Bay

Extensive work in Buttermilk Bay at the northeast corner of the Bay between the towns of Wareham and Bourne early in the CCMP development process revealed a total of 20 stormwater discharges (see map) which were delivering the majority of bacterial and other pollutant loadings to the embayment. As a result, large portions of Buttermilk Bay were closed to the harvest of shellfish. After nearly a decade of work, all but the most minor discharges to Buttermilk Bay have or are currently being remediated. Due to availability of sandy soils along the shores of Buttermilk, infiltration of stormwater was the preferred alternative at all of the sites. Stormwater remediation has proved more difficult in the western portions of the Bay watershed where soil impermeability and high groundwater have ruled out infiltration as a viable alternative.

FUNDING BUTTERMILK BAY

- Electric Avenue, Wareham $100,000 (EPA)
- Buttermilk Bay Stormwater 319, Bourne $144,000 (MA DEP 319 Nonpoint Pollutant Remediation Program)
- Red Brook, Wareham $65,000 (EPA)
- Indian Mound Beach, Wareham $111,562 (MCZM Coastal Pollutant Remediation Program)

  * Grant awards represent Federal and State funding support and do not include local contributions.

Onset Bay

Driven in large part by a $1.9 million investment by the Town of Wareham to extend municipal sewer service to portions of Onset village, the Buzzards Bay Project assisted town managers in pulling together

funding and technical assistance toward coordinating the installation of stormwater BMPs in conjunction with planned sewer installation. The result was a comprehensive remediation of all wastewater and stormwater flows contributing to the closure of 111 acres of shellfish harvest beds in the East River, Broad Cove, and Muddy Cove. Muddy Cove was classified as Prohibited to harvest and East River/Broad Cove was Seasonally Approved for partial harvest of shellfish. Once complete, this work will have addressed all primary pollution sources to the Coves and is expected to reopen much of the area to harvest.

- Riverside & Oneset Design, Wareham $15,000 (BBP Municipal Grant Program)
- Riverside & Oneset Construction, Wareham $100,000 (BBP Municipal Grant Program)
- Point Independence Construction, Wareham $71,600 (MCZM Coastal Pollutant Remediation)
- Point Independence Design, Wareham $15,000 (MCZM Coastal Pollutant Remediation Program)

  * Grant awards represent Federal and State funding support and do not include local contributions.

Case History: Sprague Cove Constructed Wetland for Stormwater Treatment

Sprague Cove is on the western side of Sippican Harbor in the Town of Marion. The Cove's shellfish beds, immediately adjacent to the town's only public bathing beach, were closed due to bacterial contamination from stormwater runoff. Two stormdrain systems discharged into Sprague Cove, the largest of which drained a 64 acre area of roads and driveways in the densely developed lower portions of Marion village.

In 1991, the Town of Marion and the Buzzards Bay Project began exploring options for treating this stormwater runoff prior to discharge. The result was the design (provided by NRCS) and construction of a 3 acre manmade wetland system to treat the "first flush" of stormwater entering the Cove. Stormwater contaminants such as bacteria, sediments, and nutrients are removed through natural physical and biological processes within the staged wetland and open water system. Along with the water quality benefits, the Sprague Cove stormwater wetland provides enhanced wildlife and fish habitat and replaces a filled parking area that was formerly a saltmarsh.

The system was constructed in 1995 with funding from the Buzzards Bay Project, an EPA/DEP 319 Nonpoint Source Pollution grant, the Town of Marion, US Fish and Wildlife Service, and private contributions. Once the construction was completed, a large citizen effort was mobilized to plant the system with a variety of wetland species such as cattail, bulrush, and lily in order to make the system function like a wetland to remove contaminants. The Sprague Cove Project has been and continues to be not only an extremely successful stormwater remediation project but an equally important community environmental education and wetlands restoration effort. Initial water quality monitoring during the summer of 1996 has revealed large reductions in fecal coliform bacteria by the system.

Improving Management of Stormwater in New Development

Preventing new direct untreated discharges to surface waters was one of the most important goals outlined in the Buzzards Bay CCMP. It was common sense when considering the high cost of remediating existing discharges; it is simply true that an ounce of prevention is worth a pound of cure. At the time of completion of the CCMP, all of the towns surrounding Buzzards Bay had regulations on the books addressing the construction of new stormwater conveyance systems to control flooding or stormwater volume. Often these rules required that stormwater be delivered as quickly and as directly as possible to the nearest water body or wetland without any attention paid to the quality of the stormwater and its effect on water resources and shellfish habitat. Only if both stormwater quantity and quality are addressed can a town expect to prevent new problems with shellfish bed closures and water quality degradation. Another problem the BBP observed was that requirements among town boards were not consistent and sometimes even contradictory. To address these problems, the Buzzards Bay Project developed a model stormwater management regulation entitled, Unified Rules and Regulations for Stormwater Management for use by Planning Boards, Boards of Health, and Conservation Commissions, which was released in January 1996. These rules were the result of two years of review and modification and include specific design standards for various forms of stormwater treatment as well as a Permit Applicant checklist. Once released the Buzzards Bay Project completed work with the towns of Rochester and Marion in incorporating these rules into local regulations. Both towns adopted the BBP model in early 1996. To support the successful implementation of these rules, Buzzards Bay Project and NRCS staff have been actively involved in assisting the towns in reviewing stormwater management in new subdivision plans. Three additional towns - Westport, Fairhaven, Wareham - were working on amending their existing rules based on the BBP model.

1997-1999 Accomplishments

1) The BBP participated on many stormwater remediation projects including all phases of design, permitting, review, and funding.

2) Our work on our 319 grant for Buttermilk Bay stormwater remediation , Phase II, is approaching the construction phase, and designs have been completed and reviewed by NRCS for six stormwater discharge sites. We produced an educational flyer and display (for Bourne Town Hall).

3) Our work on Broad Marsh River, Wareham, another 319 grant by the Buzzards Bay Project, has been completed, an educational flyer was distributed to residents, a display set up in Town Hall and library, and our final report to DEP was posted to our web site. This work was an overwhelming success and actually resulted in the opening up of shellfish beds.

4) The BBP provided planning and technical assistance to the town of Bourne for a stormwater remediation of a stormwater discharge at Barlows Landing. The town of Bourne obtained the grant from the MCZM CPR grant program with assistance by the BBP. This project involved three remediation sites and one discharge. We completed the final design review for CZM.

5) The BBP provided planning and technical assistance to the town of Wareham for a stormwater

remediation project at Indian Mound Beach, Wareham. The Town of Bourne obtained the grant from the MCZM CPR grant program with assistance by the BBP. This project involved several remediation sites, four discharges. We completed the final design review for CZM.

6) Worked with several municipalities on stormwater regulations. We developed model stormwater regulations-adopted by the Town of Rochester. At the urging of the Buzzards Bay Project, the Wareham Planning board adopted the DEP's stormwater guidance as part of their local subdivision regulations. Town of Falmouth Conservation Commission also adopted the BBP's stormwater regulations

7) Our ISTEA grant for $136,255 to conduct an inventory of stormwater discharges in Buzzards Bay, set priorities (with DMF and town participation), and award grants to design solution for top five problems was delayed until late 1998. We are finally creating the GIS database of all catch basins, conveyance pipes, and discharge pipes for Buzzards Bay towns (see samples in Appendix BA).

8) Other Stormwater Projects completed during 1997-1999:
A) Point Independence, Wareham (CPR): Several remediation sites for densely developed area. Completed final design review for CZM.

B) Wareham Municipal Complex (BBP/CPR): Involved several remediation sites, three discharges. Completed final design review for CZM.

C) Red Brook, Wareham EPA: 3 remediation sites, one discharge. BBP completed final design review for the EPA.

D) Raymond Street, Fairhaven BBP: Involved two remediation sites, one discharge, final design review for the EPA

E). Riverside-Oneset Heights, Wareham BBP grant: A densely developed site with densely developed, 14 discharges

F) Eel Pond, Bourne BBP, six remediation sites, one discharge

G) Gifford Road, Westport BBP: gave assistance to a local dairy farmer in conjunction with road runoff remediation project.

Managing Sewage From Boats

CCMP Goal

Eliminate the discharge of wastewater from all boats in Buzzards Bay embayments

CCMP Objectives

1. To build more pumpout facilities and to promote their use by educating boaters, making facilities more accessible, and enforcing the regulations

Essentially complete regarding pumpout availability but use and enforcement require additional effort.

2. To develop financially self-sustaining pumpout programs at the town level

Pump-outs are either privately or publicly owned and are essentially self sustaining.

3. To designate embayments in Buzzards Bay as No-Discharge Areas (NDA).

Done? See Analysis

CCMP Commitments:

1. DEP, using its Chapter 91 permitting authority, will require new marinas or expansions of existing marinas (greater than 10 additional slips) to have adequate pumpout facilities. Target date: Beginning 12/92.

Done. Policy adopted about 1992.

2. DEP will implement a policy ensuring adequate management and treatment for sewage pumped from boats. Target date: Beginning 1992.

Done. Policy implemented about 1992 based on BBP work.

3. DEP will implement a policy to eliminate toxic additives in marine sanitation devices. Target date: 1991.

Done.

4. DEP will review problems of treating and disposing of boat sewage. Interim Action: DEP, with assistance from EPA, will continue to provide technical assistance and oversight to the town of Marion in developing advanced boat sewage treatment technology now being tested at a pilot project at the town's wastewater treatment facility.

Pilot project completed in Marion with mixed success.

Coastal Zone Management Office (CZM)

1. CZM and DEP will develop a program that ensures adequate pumpout facilities for all harbor areas. Target Date: 12/92.

With Chapter 91 and Clean Vessel Act (CVA) funding this was achieved. MCZM also included pump-out funding in their CPR municipal grant program to address gaps in pump-out coverage.

2. CZM and the U.S. Environmental Protection Agency (EPA) will assist Buzzards Bay municipalities to develop a strategy for designating EPA "no discharge areas" within coastal embayments. The Buzzards Bay Project and the Buzzards Bay Action Committee will work with municipalities to encourage construction of boat pumpout facilities as well as the delineation of no discharge areas in Buzzards Bay. Target date: 1992

Formal process was not necessary. The overall programs success led to the Governor's state-wide nomination in 1998.

3. CZM, under its Coastal Facilities Improvement Program, will give serious consideration to eligible projects that propose to construct municipal marine pump-out facilities where needed and appropriate. Target date: 1991

CFIP was not funded for several years. Clean Vessel Act funding, established in part because of support from the Massachusetts Congressional delegation and testimony by Buzzards Bay municipal officials, began providing the necessary funding in 1994.

Environmental Protection Agency (EPA)

1. EPA, under the Clean Water Act, will designate an embayment in Wareham as a no-discharge area. Target date: 12/91

A town-wide designation was made in 1991.

Buzzards Bay Municipalities:

1. Dartmouth, Westport, Marion, Mattapoisett, and Fairhaven, with grants from the Buzzards Bay Project, will provide mobile or land based boat pumpout facilities and develop management plans for ensuring their use. Target date: 7/91

Completed by 1994.

Other Recommended CCMP Actions

Boards of Health and Harbormasters should enforce the use of pumpout facilities by all boaters using Type III MSD's or portable toilets in Buzzards Bay embayments. Target date: 1993.
Not Done. Enforcement mechanisms and manpower shortages remain a problem.

Analysis

At the time of CCMP completion in 1992, only 11 publicly available boat pumpout facilities existed in the entire Bay and they were significantly underutilized. Research conducted by the BBP during CCMP development and elsewhere in the US showed that water quality surrounding marinas often showed

elevated fecal coliform bacteria during peak periods of boat usage. The Buzzards Bay Project endeavored quickly to remedy this situation by both establishing more pumpouts and raising public awareness of the convenient and cheap (often free) availability of them. Buzzards Bay Project funding was awarded to most towns to establish or upgrade pumpout facilities throughout the Bay.

In 1992, the Town of Wareham had the first marine no-discharge area on the East Coast. The Town of Westport followed in 1995. In 1994, the federal Clean Vessel Act (CVA) began providing states and local coastal communities with grants for the construction of pumpout facilities. The creation of the CVA grant program allowed the Buzzards Bay Project to refocus its limited Municipal Grant Program funding to other CCMP tasks while still providing a mechanism to provide adequate, well-distributed pumpout facilities in all corners of the Bay. In Massachusetts, the CVA Program is administered by the Department of Fisheries, Wildlife, and Environmental Law Enforcement in cooperation with MCZM. The program is funded by part of the fuel and equipment tax paid by boaters. With BBP and CVA funding assistance, Buzzards Bay boaters in 1996 are never far from available public pumpout facilities. The Bay now has full pumpout coverage with a total of 24. Groundwork by the BBP in identifying the needs of Buzzards Bay municipalities was key in ensuring that Buzzards Bay received a large share of CVA money in Massachusetts, and in Massachusetts being one of the first states to tap into the CVA funds.

1997-1999 Accomplishments

By 1997, there were adequate boat pump-out facilities in each town around Buzzards Bay (with the exception of the Island municipality of Gosnold) to enable a baywide no-discharge designation. Because of this situation, the Buzzards Bay Action Committee, in partnership with the BBP, began the process of putting together a baywide nomination package. This process was halted in 1998 when the Governor nominated all of Massachusetts as a no-discharge area. This process has been stalled however because of inadequate facilities around parts of the Massachusetts Coast. Later this year the BBP and BBAC will reassess the situation to decide whether a Buzzards Bay nomination should once again be advanced.

The Coalition for Buzzards Bay has provided a valuable boater education component to this effort through regularly updated boat pumpout guides and fact sheets. Boater education to expand the usage of the pumpouts will remain an ongoing effort by all Buzzards Bay partners.

Managing Sewage Treatment Facilities

CCMP Goal

1. Achieve Water Quality Standards and Protect Natural Resources at all POTW Discharge Points

CCMP Objective

1. To improve POTW efficiencies by setting limits on chlorine residual discharges and monitoring for effective effluent disinfection, encouraging industrial pollution prevention and pretreatment efforts, and reducing nitrogen inputs.

Chlorine limits have been reduced or eliminated for Sewage Treatment facilities in Buzzards Bay. The Buzzards Bay Toxic Use Reduction Program and especially the City of New Bedford pretreatment program at the new wastewater facility have had exceptional results (see also Toxic Action Plan.

CCMP Commitments:

Department of Environmental Protection (DEP)

1. DEP will designate all existing aquatic Areas of Critical Environmental Concern (ACECs) as outstanding resource waters subject to the highest level of protection under the Antidegradation provisions of the Clean Water Act.

Done, but enforcement action unclear.

2. DEP will work with the Buzzards Bay Project, Coastal Zone Management, and the Cape Cod Commission to determine if additional areas within the Buzzards Bay watershed should be designated as ACECs. Target date: 1992

Not done. The ACEC mechanism appears to have lost momentum.

Environmental Protection Agency (EPA)

1. EPA will conduct evaluations of Dartmouth, Wareham and Fairhaven municipal discharges. Using the ten criteria established under Section 403(c) of the Clean Water Act, EPA will ensure that these discharges are not having an adverse impact on coastal water quality and ecosystems. Target date: 9/91

Not originally completed but beginning in 1997, EPA began using nitrogen loading limits developed by the BBP to establish nitrogen TMALs.

Other Recommended CCMP Actions:

1. The state management framework for protecting the quality of surface water should be made more comprehensive to address nitrogen from existing and future sewage treatment facilities. In particular, DEM should enforce the Ocean Sanctuary Act.

Beginning about 1997, DEP began using the BBPs nitrogen loading TMAL limits in its permit decision making process.

> *2. Communities should develop and implement plans to reduce effluent volume. These plans should include strategies to reduce groundwater infiltration and stormwater inputs, as well as to promote water conservation by individuals and businesses.*

New Bedford has done a remarkable job, reducing flow by more than 40%. Falmouth, Wareham, and Marion all with some success.

> *3. Communities should develop and implement programs of industrial pretreatment and industrial and household hazardous waste reduction where appropriate.*

New Bedford is doing a excellent job and controls its own pretreatment program. Other facilities do not have pretreatment programs, but also lack the industrial base.

> *4. Future sewage treatment facilities and outfalls should be sited so that they minimize pathogen contamination, nitrogen impacts, and threats to human health and marine ecosystems.*

No outfalls have been sited, but in 1994 the Massachusetts Military Reservation sewage treatment facility groundwater discharge was sited 7 miles from the treatment site near the Cape Cod Canal according to BBP and others recommendations, specifically to prevent causing nitrogen loading problems in Falmouth's poorly flushed coastal ponds.

There are six Publicly Owned Treatment Works (wastewater treatment facilities) in the Buzzards Bay drainage basin. One of these facilities discharge to groundwater (Falmouth); the others discharge to surface waters. Since 1991, no new discharges have been pursued. The New Bedford and Dartmouth facilities discharge to the open waters of the bay while the Fairhaven, Marion, and Wareham facilities all discharge to shallow embayments. Nitrogen management at these facilities was of primary concern to the BBP when it began its implementation efforts.

The Marion Wastewater Treatment Plant discharges to Aucoot Cove through a small freshwater stream at the head of the cove. In 1991, the Buzzards Bay Project funded a comprehensive water quality monitoring study by scientists at the Woods Hole Oceanographic Institution to assess nutrient related impacts from the Marion POTW on Aucoot Cove. The results of this study showed that nitrogen loading relative to the depth and circulation characteristics of the cove was not having a significant effect on water quality. In addition to nitrogen related work in Marion, the town ceased use of chlorine for disinfection - an important part of the Buzzards Bay CCMP's objectives for POTWs - in exchange for ultraviolet disinfection. Similarly at the Dartmouth Wastewater Treatment Plant, the town's completed upgrade of its facility included the use of UV disinfection.

Both the Wareham and Fairhaven Wastewater Treatment Plants discharge to tidally restricted, shallow embayments. Neither plant has discontinued use of chlorine for disinfection, nor have they completed adequate evaluations of nitrogen related impacts from their discharges on the Wareham River estuary

and inner New Bedford Harbor respectively. Both embayments continue to exhibit eutrophic conditions as evidenced in water quality monitoring results produced as part of the Buzzards Bay Citizens Water Quality Monitoring Program. During the past year, the situation has changed, and the Buzzards Bay Project is currently participating in a review of the discharge permit for both the Wareham and Fairhaven facilities with federal and state regulators who are considering establishing nitrogen limits for both discharge.

The Falmouth Wastewater Treatment Plant serves the densely developed town center and village of Woods Hole and discharges this waste via groundwater in the West Falmouth Harbor drainage basin. Therefore, the facility delivers pollutant loadings to the harbor more than what watershed land uses produce. This has resulted in the early signs of eutrophication in the upper reaches of West Falmouth Harbor where nitrogen is entering the Harbor through a concentrated groundwater plume. In 1995 the Buzzards Bay Project partially funded a water quality analysis and detailed flushing study of West Falmouth Harbor and continues to participate in the development of nitrogen management strategies for the West Falmouth Harbor watershed in cooperation with town officials and Cape Cod Commission staff. Since then, the Buzzards Bay Project has produced several reports outlining nitrogen management needs for the West Falmouth Harbor watershed and these documents are expected to change discharge limits for the 1999 permit renewal as well as other changes in how Falmouth manages non-point sources of nitrogen.

Finally, the greatest improvement in wastewater treatment in Buzzards Bay occurred during the summer of 1996 with the completion of a $100 million Secondary Treatment Plant in the City of New Bedford. Mandated under a Consent Decree filed under the Clean Water Act, plant construction began in 1994. The Buzzards Bay Project has supported wastewater treatment initiatives in New Bedford through its ongoing efforts to reduce and prevent toxic industrial inputs to the collection system through its Toxic Use Reduction Program (discussed in Reducing Toxic Pollution section). In addition, Bay Project staff helped in the review of the plant's discharge for possible nitrogen related impacts in 1993.

Buzzards Bay POTWs and Improvements since CCMP completion

Town	**Capacity**	**Pop. Served**	**Treatment**	**Improvements since CCMP**
Dartmouth	2.8 MGD	10,000	Secondary	Ultraviolet Disinfection
Fairhaven	5.0 MGD	15,000	Secondary	permit under review, N TMAL exp.
Falmouth	0.8 MGD	1,500	Tertiary	permit under review, N TMAL exp.
Marion	0.6 MGD	2,100	Secondary	Ultraviolet Disinfection
				BBP Aucoot Cove N-management study
New Bedford	30 MGD	102,000	Secondary	Upgrade from Primary Treatment
				N-management study of outfall
Wareham	1.8 MGD	10,000	Secondary	permit under review, N TMAL exp.

1997-1999 Accomplishments

The work of the Buzzards Bay Project has largely been limited to our successful effort (cited in the

nitrogen action plan section) to work with state and federal regulatory agencies to establish nitrogen Total Maximum Annual Loads (TMALs) for the three wastewater facilities cited above.

Reducing Toxic Pollution

CCMP Goal

Protect the public health and the bay ecosystem from the effects of toxic contamination entering Buzzards Bay.

CCMP Objectives

1. To reduce the amount of toxic contamination entering Buzzards Bay.

2. To reduce hazardous leachate from landfills and to minimize other nonpoint sources of toxic contaminants to the Bay.

3. To meet all state, federal, and local action levels for water and seafood.

Broad changes in state policies, the enactment of the Toxic Use Reduction Act, and stricter state enforcement on the discharge of toxic materials has had a tremendous impact on the use and discharge of toxic materials. The BBP Toxics Use Reduction Program made great strides in assisting businesses in the New Bedford area become aware of state regulations and technical assistance programs. The New Bedford Wastewater Treatment Facility's pretreatment program and elimination of dry weather discharges have had a tremendous impact on toxic discharges to Buzzards Bay. Containment of the PCB hot spot in New Bedford harbor has also helped reduced migration of toxics into Buzzards Bay.

Objectives:

1. To reduce the amount of toxic contaminants entering Buzzards Bay.

2. To reduce hazardous leachate from landfills and to minimize other nonpoint sources of toxic contaminants to the bay.

3. To meet all state, federal, and local action levels for water and seafood.

The BBP has not worked on objectives #2 or #3.

Recommended CCMP Actions:

1. Municipalities should establish and implement a program of toxic-waste reduction for industries that discharge directly into receiving waters or sewage treatment facilities. Target date: 1993.

The Commonwealth passed, in 1994, a Toxic Use Reduction Act that required a 50% reduction of hazardous wastes by the year 1997. This goal was exceeded. Unfortunately, in the case of New Bedford, increasing water costs and downturn of the economy caused manufacturing plant closings, but other industries adapted and implemented water savings toxics reduction programs.

2. DEP should reduce oil entering the environment through enforcement of adequate collection regulations. Target dates: Oil strategy policy enforcement, immediately; legislative action on refundable tax, 1992; boat waste collection regulations, 1993.

Automobile waste oil has been handled well, but no action has been taken on boat waste oil.

3. Buzzards Bay municipalities should collect and properly dispose of household hazardous waste on a continual basis. Target dates: DEP household hazardous waste permitting by 1992; bans on organic degreasers by 1993; funding by 1993.

Most towns now have periodic toxic waste pickup days, degreasers were banned, but funding for program expansion has not appeared.

4. SCS and the Cooperative Extension Service should develop and implement strategies to minimize the use and potential off-site impact of agrochemicals. Target dates: 75% implemented by 1995.

SCS (now NRCS) has an ongoing technical assistance program. However, action on implementing BMPs from flow-through cranberry bogs (that is, bogs where pesticide runoff cannot be adequately managed), has been hindered by industry resistance.

5. EOEA should establish sediment criteria that are protective of the ecosystem and of human health for selected contaminants. Target date: Draft PAH policy by September 1991; final by 1992; sediment criteria by 1994.

Draft policy proposed but not finalized?

6. EOEA should coordinate with the Massachusetts Department of Public Health to review the current seafood-testing program and develop recommendations for future actions. Target date: 1992.

No action.

Analysis

Issues related to the New Bedford superfund site are addressed largely in the New Bedford chapter. The Buzzards Bay Project's work on toxic pollution has been limited to two areas: 1) the indirect benefits of our stormwater remediation program, which, although focused on fecal coliform bacteria, also reduces the discharge of many toxic contaminants. 2) a toxic use reduction program for businesses in the greater New Bedford area.

The only other activity has been the Buzzards Bay Project's implementation of the "Buzzard Bay Project Toxics Use Reduction Program" (BBP/TUR) with four years of support from the EPA through a competitive TURA program. The focus of the program was to educate and make known the availability of technical resources to local manufacturers and service industries that contribute to the waste stream processed by the New Bedford Publicly Owned Treatment Works (POTW). This initiative helped both the public and private sector become aware of the significant environmental improvements in New Bedford and has educated the city's industrial community to the concepts of toxic use reduction and the positive impact pollution prevention makes upon the environment.

In December of 1993 an advisory committee for the toxic use reduction was formed that included

members that a wide range of state and local officials. The program carried out 15 different workshops to local industries designed to address the toxic use reduction needs of industry. Workshops topics included Materials Management and Chemical Reporting, Sustainable Manufacturing, Impacting Water Use, Clean Air Conference for Dry Cleaners, Metals Recovery and Abatement, Fats, Oils and Greases in the Waste Stream, Making Compliance Work for You, Pollution Prevention for Marinas and Boat Repair Facilities, Pollution Prevention Day, Solvent Degreasers, Wastewater Treatment in New Bedford and BOD Discharge into the Waste Stream for Fish Processors.

The TUR program also created brochures aimed at making area industries aware of award opportunities for toxic use reduction. Beginning with the creation of a repository of EPA and State environmental agency documents, we have as well publicized the Governor's Award for Toxic Use Reduction and we were successful in the fact that several companies we encouraged actually were the recipients of the award. Area companies were also made aware of innovative toxic use reduction strategies through our monthly newsletter Options. Businesses were particularly enlightened about grant programs and award opportunities.

For example, in 1996, the BBP/TUR program was instrumental in facilitating the award of a NICE^3 United States Department of Energy grant for $425,000, to Brittany Dye in New Bedford. The grant helped the company in starting a major process modification necessary to carry out innovative textile finishing. The grant allowed for the modernization of processes enabling them to reduce their energy consumption by half and even though they will be able to increase the amount of cloth they process, all at the same time of decreasing the amount of toxics discharged into the municipal collection system.

In 1997, the BBP ended its Toxic Use Reduction program due to cutbacks in federal funds.

1997-1999 Accomplishments

In 1999, the Buzzards Bay Project is proposing to work with the city of New Bedford wastewater facility to develop a grant proposal to enable a pretreatment program to be put in place to focus on two problem areas the new wastewater facility confronts: high biological oxygen demand (BOD) materials from fish processors and gas and oil discharges from gas station operators.

Preventing Oil Pollution

CCMP Goals

1. Reduce the amount of petroleum hydrocarbons entering Buzzards Bay
2. Minimize the occurrence of oil spills in Buzzards Bay, large & small
3. Minimize the environmental effects from oil inputs to Buzzards Bay
Appreciable action has been taken in meeting all three goals.

CCMP Objectives

1. To promote a regional strategy for preventing and managing oil spills.
BBAC mutual aid agreement which was supported by the Buzzards Bay Project as grants to municipalities for oil spill containment equipment. In 1997 regional oil spill coordinators began to meet quarterly and began annual oil spill training exercises.

2. To implement a source-reduction plan for chronic inputs of PAHs to Buzzards Bay.
Upgrades to the New Bedford Sewage Treatment Facility, improved stormwater treatment, elimination of New Bedford dry weather CSO discharges, the stenciling of storm drains by the Coalition for Buzzards Bay, weekly Coast Guard inspections of New Bedford Harbor, and stricter air emissions have all contributed to reduced PAH inputs to Buzzards bay, but the reductions have not been quantified.

3. To provide adequate facilities for the collection of waste oil from cars and boats.
Waste Oil collection facilities for autos are well established throughout Buzzards Bay municipalities and the state. Waste oil collection from boats was begun by the Seafood Coop during the early 1990s, but this process collapsed with the failure of the Seafood Coop due to fishing industry declines and hardships. Coast Guard inspections of the harbor are believed to some to be resulting in more boat engine oil being dumped at sea instead of the harbor.

4. To take enforcement actions against the illegal discharge of oil.
The Coast Guard's aggressive inspection and enforcement of oil dumping laws in New Bedford harbor has resulted in a dramatic improvement of water quality there (coupled with the elimination of dry weather discharges from CSOs). Source reduction and waste oil permitting enforcement has not been undertaken by DEP.

CCMP Commitments:

The Coastal Zone Management Office (CZM)

1. *CZM will provide technical assistance to Buzzards Bay communities developing contingency plans in each municipality. Target date: Beginning 1991.*

Done in Westport. Baywide plan synopsis collated by BBAC. Coast Guard contingency plan

completed but revision process is on going.

2. Encourage the satisfactory completion of oil spill contingency plans by each municipality. Target date: Beginning 1991

Done as above with support from the BBAC.

The Buzzards Bay Action Committee (BBAC)

1. BBAC will ensure that each municipality appoints an oil spill coordinator responsible for overseeing maintenance and deployment of equipment and for directing response activities. Target date: 1991

Done by 1993.

2. BBAC will develop a mutual aid protocol that will govern the purchase and use of oil spill equipment by the towns. Target date: 4/92

Done by 1994.

3. BBAC will develop model regulations that will: a) require all boatyards and marinas to maintain oil containment and cleanup equipment on site; and b) manage the appropriate fueling of vessels. Target date: 2/92

Done. Legislation is now pending based on BBAC recommendations.

The U.S. Coast Guard

1. Coast Guard will conduct training sessions on the use of oil spill equipment and other contingency plan activities for all Buzzards Bay towns once a year. Target date: Beginning 1991.

Done in 1997 as part of BBP funded training through Massachusetts Maritime Academy. Coast Guard completed a classroom course in 1999.

2. Coast Guard will review and approve each municipality's contingency plan and utilize those plans in the event of a spill. Target date: Beginning 1992.

Not done. Instead coast guard is folding information from municipalities into its own contingency plan.

3. Coast Guard will advise municipalities on the appropriate spill equipment that should be maintained. Target date: Beginning 1991

Status: done, through the BBP and BBAC; DEP has also adopted a policy on the use of dispersants in Buzzards Bay

Buzzards Bay Municipalities

1. Falmouth, Bourne, Wareham, Marion, Mattapoisett, Fairhaven, New Bedford, Dartmouth, and Westport have appointed oil spill coordinators, some of whom are developing local contingency plans.

2. Marion (through its Marine Resources Commission) is working with the boatyards and marinas to ensure they maintain adequate oil response equipment.

Believed done.

3. The Coalition for Buzzards Bay will continue to work with state legislators to refile a bill in December 1991 that addresses oil spill prevention including: pilot accountability language, better pilot testing and training including recertification on a regular basis, and pilotage requirements in the upper portions of Buzzards Bay and the Cape Cod Canal. An early version of the bill was filed in December 1990 but was not voted upon.

Legislation finalized in 1995.

Other Recommended CCMP Actions:

1. To reduce the impact of future spills, DEP should coordinate annual regional oil spill response drills for Buzzards Bay communities on land, to ensure preparedness and proper interface between themselves and local personnel. Target date: Beginning 1992.

Unknown.

2. All other communities should require all boatyards and marinas to have specified response equipment on site. Target date: 1993

Not done.

3. All levels of government should adopt a policy to minimize or reduce oil entering the Bay. Municipalities should require performance standards for catch basins that remove oil and grease and implement a maintenance program. Target date: 1992-1994.

Not done.

4. Enforcement Task Force of the Executive Office of Environmental Affairs should enforce proper storage and disposal of oil. Target date: Immediately.

Not done.

Buzzards Bay communities should adopt regulations managing fueling of vessels; regulations should include a provision requiring booms and absorbent material available at all fuel loading facilities. Target date: 1993.

Not done.

5. *The state should develop a policy and criteria for the use of dispersants in Buzzards Bay during oil spills. Target date: 1992.*

Policy adopted after the Argo Merchant oil spill in Rhode Island.

6. DEP should adopt a policy for treating stormwater by requiring oil and gas traps,

absorbent pads, and regular catch-basin maintenance. Target date: 1992

Elements addressed in stormwater guidance document.

7. The Coast Guard should install a more effective navigational system at the western entrance of the Cape Cod Canal. Target date: 1992

Completed as a result of the Coalition working with the Coast Guard and area legislators pushing passage of pilotage bill.

Buzzards Bay is a major transit route for small tanker and barge traffic transporting heating and industrial oil and gasoline into greater Boston and northern New England markets. Between 1969-1989, it is estimated that more than 1600 tons of petroleum entered Buzzards Bay from oil spills.

Buzzards Bay has been the site of several catastrophic oil spills. The second largest spill occurred in 1969 when approximately 155,000 gallons of #2 fuel oil spilled when the barge Florida ran aground off West Falmouth. The largest spill occurred in 1974 when 165,000 gallons of #2 fuel oil spilled when the tanker Buchard 65 struck bottom near Cleveland Ledge. In recent years, improvements to navigation and more rigorous pilotage requirements are believed to be minimizing risks of future spills in Buzzards Bay. Nonetheless, smaller spills from barge and vessel groundings in the bay have continued during the 1980s and 1990s. One of the more memorable of these was the grounding of the Queen Elizabeth II in 1993. Most recently, the January 1996 grounding of the barge North Cape off Moonstone Beach in Rhode Island has raised concerns of local officials about oil preparedness.

> "Without the Buzzards Bay Project the coordination between the towns to purchase compatible oil spill response equipment would never have gotten off the ground. " Gary Sherman, Westport Shellfish Warden ,and Oil Spill Coordinator.

In 1994 12 Buzzards Bay watershed municipalities signed an Oil Spill Mutual Aid Agreement to share equipment and personnel in case of an oil spill. This was an important goal in achieving improved local response to oil spills. Simultaneously, the Buzzards Bay Project committed CCMP implementation funding to provide oil spill response equipment to each municipality. The goal of the grants was to allow individual towns to protect their most critical coastal resources and complement the response activities of federal and state agencies responding to a catastrophic spill. Today, the Bay Project is actively working with the US Coast Guard and NOAA officials to provide response training and additional oil spill equipment.

In 1997, the Buzzards Bay Project awarded an additional $25,000 to Buzzards Bay municipalities ensuring that each town had the minimally required number of survival suits, street drain covers, and boom or other equipment. In the spring of 1997, the Buzzards Bay Action Committee provided basic HAZWOPER training to area municipal officials and volunteers and during this summer and fall the Buzzards Bay Project will provide $5,000 in training courses to bolster municipal training experience and coordination.

With regards to reducing risks of spills, in the early 1990s, the Coalition for Buzzards Bay aggressively lobbied for and was successful in initiating new pilotage legislation by Massachusetts, and also encouraged policy changes by the USCG. The Coalition also fought to keep a key navigation beacon in place in Buzzards Bay that was initially proposed for elimination by the Coast Guard. These changes now ensure qualified pilotage and safer transit through the Cape Cod Canal and Buzzards Bay. In 1997, MCZM is promoting new state legislation more carefully regulating barge transport in Massachusetts coastal waters, and this legislation is pending.

It is difficult to determine the effectiveness of the pilotage and navigation changes. Clearly Buzzards Bay has not had the large spills that seemed to have occurred more frequently in the 1960s, 70s and 80s. Improved municipal training will also be difficult to judge in the absence of a large spill but with regards to smaller spills, Buzzards Bay municipalities have already put the BBP funded equipment and their new training to work.

With regards to collection of waste oil from boats and cars nearly every municipality now has a facility and most have hazardous waste drop-off events once or twice per year. Most municipalities with wastewater treatment plants and large industrial components have pretreatment programs in place to reduce inflows of oils, PAHs and other toxic compounds. The effectiveness of these programs can be documented through contaminant concentration trends in effluent discharges. New Bedford has been highly successful in this regard and its sludge has been reclassified from Class 3 to Class I, enabling its use for fertilizer and soil amendments in public areas.

Boat oil waste is only an issue in New Bedford Harbor, a commercial fishing port. Some policy changes by the City such as pursuing harbor dumpers has resulted in increased volume of waste oil collected in the Harbor, but much presumably is still dumped at sea. The Project has renewed calls to the City to provide adequate facilities and provide further incentives for the collection of oil.

1997-1999 Accomplishments

1. In 1997, the Buzzards Bay Project is set up a $5,000 contract with Massachusetts Maritime Academy to provide training for two or three coordinators from each Bay municipality to attend two training courses. The first was a field exercise in Marion involving boom deployment. The second was a classroom course in the spring of 1998 municipal coordinator training on regulatory agency response and coordination. In 1999, the BBP was a cosponsor of a coast guard workshop held in Buzzards Bay, and the BBP plans on funding additional course for the oil spill coordinators because the previous exercises were so well received.

2. Begun initiating discussions on needs for new training courses.

Protecting Wetlands and Coastal Habitat

CCMP Goal

Long-term increase of high-quality wetlands and coastal habitat in Buzzards Bay.
The BBP's stated goal **preceded** similar pronouncements at the state and federal level!

CCMP Objectives

1. To protect existing wetlands.
Considerable progress on all fronts

2. To encourage restoration of wetlands (and allow replication as a last resort).
DEP and the Massachusetts Wetland Restoration and Banking Program has adopted this objective as policy. The BBP's recently completed draft Atlas of Tidally Restricted Salt Marshes will open the door to considerable state and federal wetland restoration funding.

3. To improve enforcement of wetlands laws.
BBP's technical assistance program to municipalities, funding of conservation agents, behind the scenes collaboration with state and federal wetland authorities, and selective confrontational strategies as in cases in Mattapoisett and Acushnet has gone a long way toward improving enforcement of wetland's laws in the Buzzards Bay watershed.

4. To upgrade the capability of local conservation commissions.
Ongoing technical assistance program and seed money for Conservation Agent has helped realized this goal.

5. To encourage non-permitting options as a supplement to the issuance of permits whenever possible.
The BBP's effort since 1997 on open space planning and assisting in open space acquisition, conservation easement, and watershed planning has enabled the BBP to comprehensively tackle this issue.

6. To protect and restore habitat used by threatened, rare and endangered coastal species and anadromous and catadromous fish.
The principal effort of the BBP has been with the restoration of herring runs and protecting the Roseate Tern habitat at Bird Island.

CCMP Commitments:

Department of Environmental Protection (DEP)

1. DEP has identified Buzzards Bay as a priority area for implementing the Wetlands Conservancy Program. Mattapoisett and Westport were included in the program during

1990 and 4 additional towns are scheduled for 1991. DEP's goal is to ultimately include all Buzzards Bay towns in the Conservancy Program. Target dates: Implementation in Mattapoisett and Westport - 1993, Implementation in 4 additional towns - 1993-1995.

Completed on schedule.

DEP will use its water quality certification authority under Section 401 of the Clean Water Act and in conjunction with the Wetlands Protection Act to:

2. Require analysis of alternative strategies and options before wetlands are allowed to be destroyed or altered and only allow destruction under extreme circumstances or in projects with an overriding public purpose.

Policy implemented.

3. Require restoration or replication, at a ratio of at least 1:1, of any wetlands that are allowed to be altered or destroyed.

Policy adopted.

4. Require the same level of analysis and protection for isolated vegetated wetlands and intermittent streams as for other wetland areas. Target date: 1991

Not done, but 1994 revised wetland regulations enhanced the protection of isolated BVWs.

5. DEP will establish criteria for designating wetlands as waters of the Commonwealth using water quality standards, and subjecting these areas to stringent controls under the Antidegradation provision of the Clean Water Act. Target date: 1992.

Done, including the ability to designate nitrogen sensitive embayments for purpose of Title 5, but "stringent controls" are subjective in this instance.

Buzzards Bay Project

1. The Buzzards Bay Project staff will develop criteria for determining the appropriate size of a buffer area. Target date: 1991.

The BBP has established buffer recommendations and criteria in Falmouth Conservation Commission recommendations.

Buzzards Bay Municipalities

1. Dartmouth will pursue watersheet zoning on a limited basis as part of its Harbor Management Plan. Target date: 1992

Not implemented?

Other Recommended CCMP Actions:

1. DEP should amend the regulations to the Wetland Protection Act to better protect wetlands in order to achieve and exceed the Commonwealth's no net loss policy. Target date: 1993. The following recommendations address current weaknesses in the Act:

a) When wetlands are allowed to be altered or destroyed, require restoration and/or replication at a ratio of at least 2:1.

DEP adopted a 1:1 ratio.

b) *Stipulate specific limits on the total area of wetlands that can be destroyed by limited projects.*

Not done.

c. If discretionary destruction of BVWs is allowed, it should be in accordance with the above recommendations.

Not done

d. Define performance standards for the 100-ft buffer zone around wetlands.

Not done, except under the requirements of the 1997 Rivers Bill.

e. Require mandatory attendance by conservation commission members at Wetland Protection Act training courses.

Not done.

f. Enhance protection of marine habitat and resources contained in lands under the ocean.

No change.

2. Conservation commissions should upgrade their ability to protect wetlands. Target date: 1991-1994.

All towns except one have conservation agents. Continued progress through BBP training, workshops, and BBP requested technical review and wetland delineations.

3. Town boards and local environmental organizations should assist in protecting wetlands. Target date: 1991-1994.

Coalition has put considerable effort is raising public awareness on selected projects.

4. Communities (selectmen, conservation commissions, land trusts, etc.) should fully utilize nonregulatory wetlands protection techniques wherever possible. Target date: 1991-1994.

BBP efforts on open space planning, open space acquisitions, and conservation restrictions have gone far to meet this recommendation.

5. DEP should prohibit the issuance of permits to chronic violators of the Wetlands Protection Act. Target date: 1992.

This may not be legal, and may need to be rejected as a CCMP recommendation.

6. All municipalities should adopt embayment or harbor management plans that identify watersheet uses for their entire coastline. Target date: 1994.

Only little progress.

Analysis

One of the major themes of the Buzzards Bay CCMP is to achieve better wetlands and habitat protection. In Massachusetts, because of the "home rule" provisions of the state constitution, it is the municipal Conservation Commissions that are the "first line of defense" and principal authority in implementing the state's wetland regulations or more stringent local bylaws. Unfortunately, like many municipal boards, Conservation Commissions members are unpaid volunteers that receive little training in either interpreting wetland regulations or in identifying wetland boundaries. Conservation Commissions are also an appointed board, subject to local political pressures. It is for these reasons the Buzzards Bay Project has spent a considerable amount of time in providing training and technical assistance to Conservation Commissions.

In 1993, the Buzzards Bay Project initiated a wetlands technical assistance program. Since then, the Buzzards Bay Project has conducted more than 100 training workshops to improve the expertise of local officials. At the request of the municipalities and concerned residents the Project has conducted many site visits and reviewed dozens of engineering plans. Project staff have also provided legal testimony at Wetland Adjudicatory hearings. Also, as part of the state match to the Project's federal funding, in 1991 the Project pushed to have the Buzzards Bay basin one of the first areas of the state to have "core wetlands" mapped as part of the state's then newly renewed "Wetlands Conservancy Program." These maps have proved invaluable in identifying areas where core wetlands are found and where wetlands have been altered.

Restoration of Anadromous Fish Runs

Anadromous fish species like alewives (Alosa pseudoharengus) and blueback herring (Alosa aestivates) have declined dramatically during the past century in Buzzards Bay. Not only are these fish historically important as a fishery in Buzzards Bay, they are also an important food species for many fish, whales, and coastal birds such as the roseate tern (*Sterna dougallii*), a US endangered species whose largest colony in North America resides in Buzzards Bay.

Today, many of the herring runs in Buzzards Bay support only a fraction of their estimated maximum annual population. Reduced herring populations in any particular river or stream system can be caused by many factors including physical obstructions to migration, overfishing, poor water quality, or inadequate spawning habitat. Of these, physical constraints in the form of dams, roadway construction, and other water control structures are by far the greatest impediment to herring migration in Buzzards Bay rivers.

The Buzzards Bay Project has invested considerable effort in helping to improve herring runs in the Bay's most productive river systems and continues to work closely with the Massachusetts Division of

Marine Fisheries (DMF) to identify where anadromous fish improvements are needed and will provide the most benefit. Together the Project and DMF have identified two river systems in the Buzzards Bay watershed as priorities for herring restoration - the Mattapoisett and Weweantic.

The Mattapoisett River

The Mattapoisett River, which begins at Snipatuit Pond in Rochester and flows 20 miles south to its discharge into Mattapoisett Harbor, has historically contained the Bay watershed's most productive and abundant herring populations. At its peak at the turn of the century, the river had an estimated annual sustainable yield of 3000 barrels, or approximately 1.4 million fish, with the total fish stock estimated at 1.8 and 1.9 million fish per year. During this century, the fish stock has drastically declined until the fishery was almost extinguished. Local efforts, starting in the mid 1980's, have allowed the herring fishery to begin a slow recovery and the total fish stocks for 1989, 1990, and 1991 were 43,000, 51,000, and 65,000 herring, respectively. Although the population is increasing, the total stock is still less than 3% of the former population.

Near the river's headwater spawning area in Snipatuit Pond, five culverts beneath Snipatuit Pond Road were small in diameter (30") and submerged. Because herring typically migrate during daylight hours and lighted passages are required for migration, these long darkened culverts presented a significant obstacle to their upstream migration. The solution to the problem was the replacement of the small culverts with a single large box culvert, which would allow for more light to reach the interior of the culvert and eliminate the existing obstacle to migration. The Buzzards Bay Project funded this project and construction was performed by the Rochester Highway Department.

Near the river's mouth at the Route 6 dam, additional problems were impeding fish passage on the Mattapoisett. The fishway at the dam restricted upstream passage of alewives as it was both too steep and too turbulent. In addition, water elevations at the dam, which are controlled for municipal water supplies, required better management during normal operating conditions and during herring run season (March through May). To accomplish these connected goals of improving the fish ladder and improving water management, the towns of Mattapoisett, Marion, Rochester, and Fairhaven joined together to seek funding for the project. Improvements to the dam structure were funded by the Commonwealth of Massachusetts with local support from each town. Additional funds for the fishway were provided by the Buzzards Bay Project. The new fish ladder is a denil-type structure and was installed at the dam in December 1996.

1997-1999 Accomplishments

1) The Buzzards Bay Project received a $15,000 grant from Massachusetts EOEA/DEP to prepare an Atlas of tidally restricted salt marshes in Buzzards Bay. The Draft Atlas of Tidally Restricted Salt Marshes was completed in March 199. This inventory also included a prioritization for remediation of these areas. The atlas included all altered or potentially impacted coastal wetlands, culverts restricting flows, and the nuisance introduced invasive species *Phragmites* (bull rush) areas, which are the targets

of restoration. WRBP provided the funding, and DEP hired an intern to work out of the BBP office. Production of this atlas is creating special opportunities that will arise out of this effort with the US Army Corps of Engineers and the US Fish and Wildlife grant programs.

2) In 1997 the Buzzards Bay Project received a 319 grant for $45,000 for the restoration of a herring ladder and dam sluice gate as part of a broader attempt by the Buzzards Bay Project to restore a herring run on the Weweantic River. This Project has been delayed because of property owner and water issues.

3) The BBP continues a very popular wetland technical assistance program that includes wetland delineations, workshops, regulation development, and project review. In 1998 we helped in wetland delineations and wetland delineation training in Carver and Plymouth, two inland towns that previously had not requested assistance from the BBP.

4) At the request of the Mattapoisett Bike Path Committee, the Buzzards Bay Project delineated wetlands for town use to lay out their proposed bike path. This work was completed in 1998.

5) In 1997 we helped the Town of Falmouth adopt the first District of Critical Planning Concern regulations on Cape Cod through the Cape Cod Commission. In 1998 we completed the rewrite of the Town of Falmouth Conservation Commission wetland regulations. These are found on our web site.

6) A 319 grant awarded to the Buzzards Bay Project in 1997 has been withdrawn by DEP. The grant, titled the "Buzzards Bay Cranberry Bog Initiative" was meant to address, in a non-regulatory manner, pesticide runoff in about 10 to 15% of cranberry bogs in the Southeastern Massachusetts that are "flow-through" systems. In these bogs, where there is no separation of the bog growing area and surface waters, it is difficult for the grower to comply with state and federal pesticide application regulation requirements for water impoundment. The two main tasks in the proposal were to inventory these "flow through" bogs in Southeastern Massachusetts, and to do a demonstration on a bog owned by the Falmouth Conservation Commission, owners of the largest flow-through bog in Massachusetts. The improvements on the Falmouth bog would have also separated EDB contaminated Coonamessett River water from the bog operation. The DEP canceled the grant for two reasons. First, when the EDB-Superfund issue became known, it raised questions as to whether this part of the 319 grant should proceed because of the uncertain future viability of the bog. The BBP proposed finding another alternative demonstration site, but representatives of the cranberry industry said that they did not support the initiative because they felt that the inventory developed by the Buzzards Bay Project would be viewed as a list of polluters by the general public, or as a list of enforcement targets by regulators. They also stated that they felt that the local Extension Service had been making adequate progress on this issue during the past decade. For these and other reasons, DEP withdrew funding to the BBP for this initiative.

7) The BBP helped a Marion Planning Board member implement a conservation restriction on one property and donate a conservation land gift in a second property to the town.

8) The BBP prepared an EPA "5 star" proposal for a wetland restoration project in Fairhaven near our other project in Winsegansett Marsh. In April 1999 we learned that we received funding for the project and that NOAA would join in and contribute funds to the effort.

9) Assisted Town of Marion in writing Wetland Restoration grant application for enlarging a culvert to a salt marsh. The grant was funded in March of 1999.

10) Currently assisting the Kittansett Golf Club with 25 acre salt marsh restoration program. The BBP initiated this work by prompting action by the Golf Course which owned several obstructed salt marsh areas. The Golf Club agreed to do this work totally at their expense and follow BBP restoration recommendations. They have already completed the first phase of the project: removal of 50 feet of stone wall at the intertidal zone. This work, currently the largest salt marsh restoration in Massachusetts, is being overseen by the BBP wetland specialist.

Chapter: Pollution Remediation Projects in New Bedford

Goal

Support the ongoing projects designed to remediate pollution in New Bedford Harbor and to restore habitats and use to the greatest extent possible.
Progress has been slow but continuous in New Bedford.

Recommended Actions:

Superfund Cleanup and Restoration

1. EPA and DEP should continue to move forward on adoption and implementation of a remediation plan.

EPA and DEP moved too fast for public support that subsequently delayed the hot spot cleanup.

2. Trustees (EOEA, DOI, and NOAA) should oversee development and implementation of a restoration plan that benefits those who have been most affected by lost use of the resource.

After many years of delay, now fully underway.

Treatment Facility and CSO Recommendations

1. The City of New Bedford should continue to meet deadlines for the planning efforts (as outlined in its draft Facilities Plan) to upgrade its treatment facility to secondary treatment. The City of New Bedford is preparing a Final Facilities Plan which will incorporate comments from state and federal agencies and the general public. The Facilities Plan includes all the technical and design details, requirements and schedules related to constructing and operating the plant. Siting the treatment facility and outfall and securing finances to proceed with construction are major issues to be resolved.

The City completed facility in 1995, ahead of schedule, under budget. The facility is performing exceptionably well.

2. The City of New Bedford, with DEP and EPA, should carefully coordinate CSO and sewage treatment facility upgrades so that benefits from CSO remediation can be realized as soon as possible.

Elimination of dry weather discharges opened Clarks Cove to shellfishing in 1994. New funding initiatives by Fall River and New Bedford with Congressional delegation should prompt new efforts to upgrade CSO infrastructure and eliminate more discharges.

3. The City of New Bedford should implement approved plans for CSO upgrades. Target dates: Ongoing, with project-specific times according to the various plans.

As in #2

Chapter: Land Use Management

CCMP Goal

1. To manage and direct growth so that critical resource areas are protected from cumulative impacts

Recommended Actions:

Local Actions

1. Each town in the Buzzards Bay area should conduct a buildout analysis to determine its maximum potential use under current zoning and subdivision bylaws. The results of a buildout analysis will allow land-use plans to be developed as a first step in implementing a program. This may ensure the protection of critical resource areas.

The Buzzards Bay Project has done this for selected subwatersheds, and for entire towns in the case of Marion.

2. Each town in Buzzards Bay should adopt a strategy of using existing rules and regulations and provide for project oversight or tracking. Under the current management framework the most effective approach to land-use management combines adoption of compatible zoning bylaws, subdivision rules, health regulations and nonregulatory techniques. This strategy provides a comprehensive approach that takes effect at all levels of land permitting and development.

No formal process exists, but de facto progress toward the goal.

3. Towns should be aggressive in using the full authority of their local boards to carefully regulate land-use activities so that the most valuable and sensitive areas receive full protection. Boards of health, in particular, have extensive powers and authority to expand their historic role of protecting public health and the environment. Under current legislation, boards of health are probably best suited to protect critical resource areas from the cumulative effects of growth and development, although planning boards and conservation commissions have authority to implement regulations protective of natural resources.

Modest and piecemeal progress.

4. Towns should preserve and enhance the viability of existing cranberry bogs through appropriate land use management regulations. Cranberry and surrounding uplands, when properly managed, have less impact on the environment than the same land used for residential or commercial development and for these reasons, should be preserved.

No action required-reconsider recommendation.

5. Towns should establish buffer zones around cranberry bogs through the use of cluster zoning or other appropriate land use techniques. Residential structures should not be constructed within 200 feet of a bog. This would create a buffer zone to protect cranberry bogs from the adverse effects of development and also protect the public from exposure to pesticide applications on bogs.

No action or political support.

Regional Actions

1. Regional planning agencies (RPAs) should provide technical assistance to communities in conducting buildout analyses and planning for land-use management. RPAs should encourage the creation of management plans for areas that extend beyond community boundaries. They should also work with all communities around Buzzards Bay and provide effective management tools for regulating land-use activities. Performance standards, such as nitrogen-loading bylaws, are particularly valuable.

Limited progress in Buzzards Bay through CCC in Falmouth and Bourne. BBP has been major leader in setting standards, establishing priorities for action, and in developing buildout analyses for management decision making.

2. RPAs should be aggressive in protecting critical resources. When they comment on development projects through the MEPA process, RPAs should focus attention on the protection of critical resource areas. Moreover, the regulations and management tools that will be developed by the newly formed Cape Cod Commission (CCC) should be used as models by other regional agencies. The CCC will be establishing guidelines for regulating developments of regional impact, i.e., extremely large projects and projects that will affect critical resource areas that cross town boundaries. Regional agencies are the appropriate bodies for coordinating these types of inter-municipal projects.

CCC has adopted BBP's nitrogen management strategy

3. RPAs should work to establish uniform regulatory controls for the Cranberry Industry for use by towns to minimize confusion and allow for efficient compliance.

No, implausible, reconsider recommendation.

State Actions

1. Massachusetts should take a leadership role in land-use management by adopting the recommendations of the Special Commission on Growth and Change and incorporating that report into comprehensive legislation.

No political support, new initiatives, (land banks, etc., have risen in priority.

2. The Executive Office of Environmental Affairs should develop guidelines for ACEC management plans and require that towns and regions develop and adopt plans. This

concern can be addressed through broadening and strengthening the ACEC program. The Executive Office of Environmental Affairs should be aggressive in nominating and designating ACECs, and then mandating local and regional management plans as required. Management plans should contain specific provisions that will adequately protect the resource areas.

No action.

3. The Environmental Protection Agency and the Department of Environmental Protection should codevelop a policy on antidegradation as it relates to nutrient (especially nitrogen) inputs to embayments and other pollutants. Projects that are reviewed through the MEPA process should be addressed in terms of the cumulative effects from excessive levels of nitrogen. Permits should not be issued for development projects that exceed the critical limits of any pollutant in a sensitive embayment.

DEP and EPA have begun employing the BBP's TMAL nitrogen management strategy.

4. Massachusetts should create agricultural incentive zones, similar to an ACEC, to protect intensive farm areas from encroachment by development projects.

Has not occurred.

Open Space Planning Assistance

Population in the Buzzards Bay drainage basin increased nearly 49% between 1950 and 1986 and is still growing. Between the years 1970 and 1995, population growth slowed slightly but continued to support a very large increase in residential development. Most of this development has and continues to occur in low and medium density areas, indicating a move towards suburban sprawl and away from more established urban centers. The ability of the Bay environment to sustain its relatively healthy water quality and resources is being threatened as growth expands into these previously undeveloped forests and coastal areas.

These recently developed areas are contributing new pollutant loads to the Bay ecosystem from increased runoff from roads and lawns and increased wastewater disposal through onsite septic systems or increased loads to municipal wastewater treatment facilities. Imprudent development will ultimately impact coastal systems by providing pollutants such as bacteria, viruses, heavy metals, hydrocarbons, and nutrients with pathways to the Bay. Development in flood zones, near wetlands, and on barrier beaches threatens the Bay's natural abilities to attenuate pollutants and reduces habitat for both marine and terrestrial wildlife.

The Buzzards Bay Comprehensive Conservation and Management Plan (CCMP) recognizes the importance of land conservation and community open space planning in protecting the Bay watershed's most sensitive water resources and critical habitats from inappropriate development. Such resource areas include coastal and freshwater wetlands, river and stream corridors, and watersheds to nitrogen-sensitive embayments and public drinking water supplies.

In December 1994, the Buzzards Bay Project applied for and was awarded funding through Section 104(b)(3) of the Federal Water Pollution Control Act to initiate a technical assistance program to assist a minimum of three Bay watershed municipalities in developing comprehensive Open Space Plans. The focus of the Buzzards Bay Project's involvement under this grant would be to help develop Open Space Plans that enhance wetlands and water quality protection. This application was based on the Buzzards Bay Project's experience in assisting the Town of Marion with an update of their Open Space Plan in 1993.

In early 1996, the Buzzards Bay Project released a Request for Planning Assistance to Buzzards Bay communities to fulfill their Open Space Planning needs. While the response was overwhelming, the Project was only able to offer assistance to five communities. While the end result of each of these plans is based largely on the individual community's natural resources and public input process, development of each of the plans involves a detailed examination and mapping of presently protected areas, an assessment of environmentally sensitive areas within the town deserving of conservation protection, public opinion surveys or workshops to determine the communities open space needs, and most importantly, the translation of these needs into a concrete strategy for targeting and acquiring sensitive lands for conservation.

Profiles - Communities working with Buzzards Bay Project on Open Space Planning

Fall River: With the BBP's help, the City of Fall River completed its first ever Open Space Plan. While the majority of the city is heavily urbanized and drains to Mount Hope Bay; the eastern, largely undeveloped, part of the City lies within the Buzzards Bay drainage basin. Fall River's Plan focuses on preservation of this area as well as coastal and recreational access within the city's main population centers.

Westport: An agricultural community whose landscape is dominated by the Westport River system. Westport's plan focuses on preservation of working farmland. Protection of the Westport Rivers, which suffer from non-point source runoff, is also a prominent feature in the Plan.

Mattapoisett: Mattapoisett's residential atmosphere and summer beach communities are only part of this town's landscape which includes vast forested tracks. The Mattapoisett River Valley covers the western portions of the town and supplies drinking water to the town and two nearby municipalities. Mattapoisett's Open Space Plan focuses on protection of river watershed lands.

Wareham: The Town of Wareham had already begun work on updating their Open Space Plan when the Buzzards Bay Project was asked to assist the town in mapping and definition of their Implementation Goals. Open space goals focus on protection of water quality and habitat in the town's major river systems - the Weweantic and Agawam.

Plymouth: Like Fall River, only a portion of Plymouth lies within the Buzzards Bay drainage basin (the remainder of the town drains easterly to Massachusetts Bay). The Project provided Geographic Information System (GIS) mapping assistance to Plymouth of all

permanent and temporarily protected land parcels.

The Massachusetts Division of Conservation Services, a state agency under the Executive Office of Environmental Affairs, approves Open Space and Recreation Plans for five year intervals making the town eligible for grant funding to purchase land for conservation under the Commonwealth's Self-Help and Urban Self-Help Programs and the Federal Land and Water Conservation Fund. In the Spring of 1996, a $300 million Open Space Bond Bill was passed in the Massachusetts legislature. Communities with accepted Open Space Plans are eligible for funding to support local land acquisition initiatives. The Buzzards Bay Project's Open Space Planning Initiative has better enabled Buzzards Bay municipalities to take advantage of these funds.

Geographic Information Systems (GIS)

The Buzzards Bay Comprehensive Conservation and Management Plan (CCMP) identified local governments within the Bay watershed as having the primary responsibility for the implementation of land use and natural resource management measures necessary to protect and restore water quality and living resources in the Bay. Comprehensive watershed planning, growth management, as well as natural resource protection and utilization efforts all require access to accurate information in formats that can be related to one another for analysis. In the Bay watershed, most towns did not have adequate inventories of coastal and inland natural resources or the baseline parcel ownership information in formats that could be interpreted together. In response to this need, the Buzzards Bay Project made available funding from its Municipal Grant Program to encourage the development and expansion of town and regional computerized Geographic Information Systems (GIS).

GIS enables the user to organize, maintain, visualize, analyze, and disseminate maps and spatial information. Going beyond digital representation of maps, GIS systems allow for the analysis of this map data by referencing spreadsheet or tabular information connected to individual features on a map. For example, town parcel maps can be linked to assessors data on a particular parcel making information such as lot size, owner, assessed value, and land use code available to anyone working with the parcel map coverage. Similar links can be made with town building permit, septic system upgrade, or any other database with references to town parcels. Environmental monitoring data can be similarly linked to natural resource features such as surface waters, wetlands, and living resources.

Municipal GIS systems have proven valuable tools for communities to improve town land use inventories, mapping, and data management capabilities. From the Buzzards Bay Project's coastal water quality planning perspective GIS meets a number of important planning needs. Build-out analysis and other parcel level calculations are greatly aided by using GIS. Once GIS hardware and software are in place within the town, digitized town parcel data can be used to identify watershed development densities, characterize natural features and pollutant loadings, locate undeveloped areas or areas serviced by sewer or town water within a defined boundary, and numerous other forms of information useful in the development of informed landuse decisions.

In 1993, the Buzzards Bay Project provided $24,000 to the Town of Dartmouth to pioneer a shoreline GIS mapping project. The project was designed to map parcels near the coast, shellfish areas by type and status, coastal wetlands, sewer lines, public access points, and protected open spaces. A similar project was funded by the Buzzards Bay Project in West Falmouth that same year. The interest generated by these projects among other towns prompted the City of New Bedford and the Town of Fairhaven to join together the following year to extend the Dartmouth mapping effort up the coast to the Mattapoisett border. Again, this work was supported by a $19,000 grant from the Buzzards Bay Project's Municipal Grant Program. Other towns within the Bay watershed soon recognized the value of GIS and requested that the Project focus $80,000 of its 1996 Municipal Grant budget toward expanding basic GIS coverages for the remainder of the drainage basin.

In response to computer equipment and training requests, the Buzzards Bay Project devoted $4,500 to each town developing GIS capabilities to purchase a computer workstation. The Project also provided a two day training course in ArcView™ GIS software to 30 municipal planning, health, and conservation staff from throughout the Bay watershed in August 1996.

The towns of Westport, Acushnet, Fairhaven, Rochester, Marion, and Wareham all responded to the Buzzards Bay Project's Request for GIS Mapping Proposals in early 1996. Of these, each town was seeking development of its parcel and wetlands data coverages as the basis for all future data development. GIS mapping work was completed independently of this initiative in Wareham, Bourne, and Falmouth. Completion of these new town projects in June 1997 will result in near complete parcel and wetlands coverages in the Buzzards Bay watershed.

The Buzzards Bay Project has developed and reproduced the first in a series of CD-ROMs containing all GIS data available in the Buzzards Bay watershed. Working together with MassGIS and the Cape Cod Commission, this compact disk consolidates this information in one easy to use format. Coverages included on the disk include data developed by the BBP such as baywide eelgrass coverages and subwatershed boundaries, MassGIS data selected for the area, shellfish classification areas from the Division of Marine Fisheries, plus the Dartmouth, New Bedford, Fairhaven coastal zone mapping projects discussed above. The first issue of the Buzzards Bay Watershed GIS CD was released in December 1998. The BBP will follow up the new data with a new edition to be issued late in 1999. This new edition will include all data currently under development in Bay towns such as town-wide Assessors parcel and Wetlands Conservancy Map data for Westport, Dartmouth, Acushnet, Fairhaven, Rochester, Mattapoisett, Marion, Wareham, Bourne, Falmouth, and (this data was included in the first edition). Massachusetts Military Reservation. Image data of bay watershed aerial photographs shot in 1995 will also be included on Vol. II.

1997-1999 Accomplishments

1) The Buzzards Bay Project completed, in late 1997, its 104(b)(3) EPA grant to protect water quality and wetlands in Buzzards Bay through the development of environmentally focused Open Space Plans.

This grant was a major success with many spinoffs. We completed comprehensive Open Space and Recreation Plans for three Buzzards Bay communities - City of Fall River, Westport, and Mattapoisett, and contributed sizably to the Town of Wareham's and Plymouth's. All bay watershed towns now have updated plans making them eligible for state and federal funding to acquire important land for conservation. Our efforts helped the city of Fall River secure $170,000 in state funds. These plans have come up for renewal every three years. Two towns that we have not their open space plans--the City of New Bedford and the Town of Acushnet--have asked the BBP for technical assistance.

2) A baywide land trust network known as the Bay Lands Center was established by the Buzzards Bay Project. Coordinated regional Buzzards Bay Land Trust Network to strengthen and improve communication and regional cooperation among bay watershed land conservation organizations. The BBP designed and printed 1998 Buzzards Bay Landscapes Calendar as part of our outreach. The Buzzards Bay Project also held workshops for citizens on land conservation benefits, including tax breaks for landowners using conservation easements on their properties. In 1998, the Bay Lands center was transferred to the Coalition for Buzzards Bay under the guidance of their new Executive Director, Mark Rasmussen, formerly the Buzzards Bay Project's Land Use Planner.

3) Our Open Space Plans and other efforts, together with collaborations by the Coalition for Buzzards Bay prompted the acquisition of several important parcels including 248 acres of the upper Westport River watershed in the City of Fall River, and 212 acres of one of the last large sections of wild undeveloped coastal land important coastal habitat lands in the Buzzards Bay watershed.

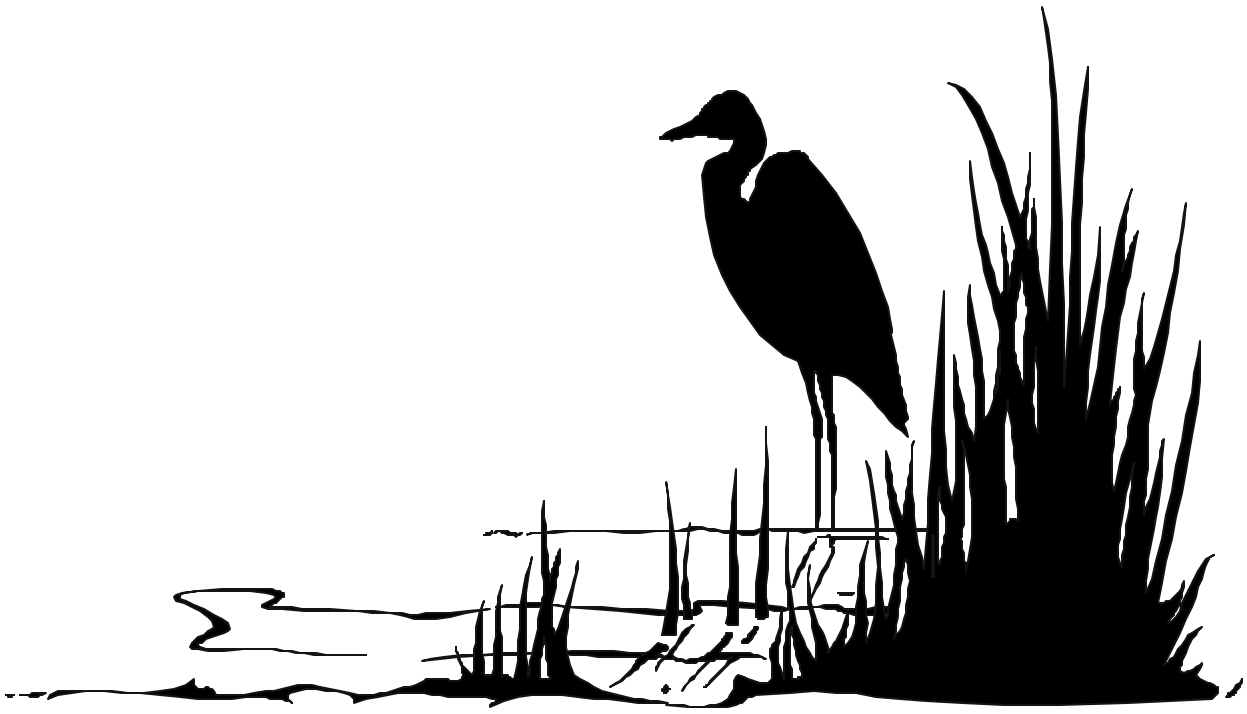
4) Completed Geographic Information Systems (GIS) mapping projects in Wareham, Rochester, Acushnet, Mattapoisett, Marion, Fairhaven, Dartmouth, and Westport to map and digitize land parcel ownership and Wetland Conservancy Maps for use in land use planning and resource protection. In January, 1999, the BBP produced a Buzzards Bay GIS CD of parcel level data and issued it to all the towns in the BB watershed.

5) Other items:

- Previous Town GIS grants completed in 1998
- Awarded to Rochester/Acushnet - $8,500 grant for the Creation of GIS parcel data and training in ArcView for town officials
- Westport - $11,000: Development of GIS data layers of parcels and wetlands
- Assisting Marion Planning Board on several planning initiatives they are working on. Mapped out the ancient ways, performed a build out analysis, and mapped lots in the velocity zone for the Board.
- Assisted Fall River and Mattapoisett with development of Self Help Applications for acquisition of land for conservation in cooperation with Open Space Plan work.

SECTION IV

Environmental Results



General Approach

To document "environmental results," that is, to measure whether actions are resulting in improved habitat, living resources, or water quality, the Buzzards Bay Project relies both on direct environmental assessments such as measures of water quality or acres of shellfish bed closures. For other environmental assessments, such as increased use of boat pump-out facilities, the Project relies on documentation of human behavior (i.e., number of gallons pumped) instead of water quality. This is necessary in this instance because it has been well established that illegal dumping of raw sewage by boats, while representing an important health risk, is very difficult to document through routine fecal monitoring programs.

For the most part, the Buzzards Bay Project relies on existing monitoring programs, and this approach was outlined in the BB CCMP Monitoring Plan. For example, even with the upgrade of the New Bedford wastewater treatment facility to secondary wastewater treatment, nitrogen loading is still an important issue. The City of New Bedford has agreed to Buzzards Bay Project requests to continue monitoring nitrogen discharges so that the Project can adequately document loadings to the bay.

Similarly, concerning the PCB Superfund cleanup in New Bedford, requirements for monitoring water, sediments, and animals before and after the cleanup are expected to meet CCMP monitoring recommendations.

Regarding the management and reduction of fecal coliform loadings, monitoring of swimming beaches by municipal boards of health, and the monitoring of shellfish beds by Massachusetts Division of Marine Fisheries will be adequate to document whether management action is making a difference.

With the preparation of the state Wetlands Conservancy maps as part of the state's match to the BBP in 1992 and 1993, core wetlands have been mapped and new wetland losses can now be documented with these maps and through the permit process. More importantly, the BBP's efforts to upgrade the GIS capabilities of most towns in the watershed not only means that even finer resolution of wetland coverages can be followed over time, but efforts by towns to protect open space and special habitat areas can now be monitored for the first time.

The joint Project-Coalition citizen's monitoring program was a vital ingredient for documenting progress or lack thereof on nitrogen management. While project and agency funding support have been strong during the past five years, EPA funding cutbacks threaten this program, and the Project and Coalition were unable to meet all funding goals for the first time, and significant monitoring elements were cut back. Nutrient monitoring was conducted in 1997 only in the five embayments where the Project is working with municipalities on nitrogen management plans. Because changes in nitrogen loading and ecosystem response tend to be gradual over several years, biennial monitoring of some embayments can be justifiable in terms of both scientific analysis of the problem and in light of fiscal restraints.

Eelgrass Bed monitoring, funded by the Project in the early 1980's is now being updated by the state

DEP and NOAA, and this data too will be a vital part of the effort to interpret environmental changes resulting from changes in nitrogen loading. At this time there are no specific goals for eelgrass coverage in Buzzards Bay, but once the latest eelgrass coverages are complete, the Project will compare the 1980s and 1990s data and develop specific eelgrass targets for selected embayments that appear to be impacted by nitrogen loading.

Concerning data management, the Buzzards Bay Project maintains and makes available data from the Citizens Monitoring Program (kept in Quattro, but exportable into any standard spreadsheet format). GIS data is maintained by the Buzzards Bay Project which has become a repository for watershed data. This GIS data is being archived onto CD's in the format of the widely used ArcView software package. The Buzzards Bay Project also collates and analyzes state data, like the MA DMF information to create the Buzzards Bay summaries. Below we provide added detail on our two main monitoring concerns, nitrogen loading and shellfish bed closures.

Nitrogen Loading

In 1990, the Buzzards Bay Project developed nitrogen management recommendations to protect and restore water quality and living resources in more than 30 coastal embayments in Buzzards Bay. The recommended strategy to manage point and non-point sources was empirically based on a synthesis of previous studies and embayment comparisons of nitrogen loading versus ecosystem response. Existing nitrogen loads to the Buzzards Bay embayments were based on land use data contained in a Geographic Information System, and a well-defined set of nitrogen loading assumptions for different kinds of land use and sewage disposal. Drainage basins to each embayment were delineated by either land surface topography or groundwater elevations as appropriate. Recommended embayment loading limits (expressed as Total Maximum Annual Loads or TMALs) were established with a tiered system that incorporated embayment area or volume and hydraulic turnover time, depth, and existing regulatory water quality classifications so that embayment specific TMALs were established.

Because the appropriateness of these recommended nitrogen loading limits was in question by some state and local environmental regulators, a citizen based water quality monitoring program was established in 1992 to better document existing conditions in each embayment. This program, which was a partnership between the Project and the Coalition for Buzzards Bay, would also establish baseline data for trend assessment, enable comparisons among embayments around Buzzards Bay, and ultimately enable the evaluation of the Buzzards Bay Projects methodology.

In 1999, Coalition for Buzzards Bay issued a new atlas summarizing the findings of the Citizens Water Quality Monitoring Program over a seven year period. This poster size map is currently available (attached), and a report will soon be available through the Coalition.

One important finding from the data contained in this report is the fact that average summertime total nitrogen concentrations and a Eutrophication Index scores (an indicator developed by the Buzzards Bay Project) show a good correlation with estimates of nitrogen loading derived from land use data and

supported the Buzzards Bay Project's characterization of loading in its subwatershed nitrogen evaluation (see Appendix B). Some findings were unexpected, and these are expected to result in the Project revising components of its nitrogen management strategy in the Fall of 1997.

The 1996 "Baywatchers" report showed that water quality was very variable in the embayments around Buzzards Bay, with some embayments clearly more eutrophic than others. Only a few embayments showed improved water quality (notably Clarks Cove), most others showed annual variability without clear trends, but some clearly showed declining water quality. Some of these latter embayments such as Wareham River and West Falmouth Harbor have been receiving increased loading from municipal wastewater treatment plants and the Buzzards Bay Project is working on identifying the appropriate nitrogen discharge limits for each wastewater treatment facility.

The shallowness and bathymetry of an embayment are two of the most important factors in defining an embayment's response to nitrogen loading. Appreciable declines in eelgrass distribution and production have been documented in Buzzards Bay and the south shore of Cape Cod in response to nitrogen loading. Concurrently, accumulations of unattached "drift algae" have been documented in many eutrophic embayments.

While eelgrass decline has been documented in many Buzzards Bay embayments during the 1970s, 80s, and 90s, one embayment, Clarks Cove, has bucked this trend, and for good reason. Clarks Cove is a deep well flushed embayment surrounded by a highly urbanized watershed. The Cove receives many sizable pollution discharges, including seven combined sewer overflows (CSOs). It also contains one of the most significant quahog fisheries in Buzzards Bay and contains two extensively used public beaches (Dartmouth's Jones Beach and New Bedford's West Beach).

During the past six years, the City of New Bedford has made remarkable progress in eliminating dry weather discharges from its CSOs. This effort has resulted in Clarks Cove being reopened to shellfishing in 1992 for the first time in nearly eighty years. The elimination of the CSO dry weather discharges has apparently resulted in a reduction of nitrogen loadings as well.

Most of the dry weather discharge elimination occurred between 1991 and 1993. Unfortunately the citizens monitoring program examined all parameters only in 1994 and 1995. In these years, the inner portions of Clarks Cove showed very good and improving water quality. However, anecdotal information from the City's shellfish warden indicate that the upper portions of the Cove have shown dramatic improvements in water transparency since the dry weather discharges were eliminated in the early 1990s. More over eelgrass beds have made a dramatic increase in abundance colonizing areas where they have not been for more than 30 years. In the 1980's, eelgrass beds were documented by the Buzzards Bay Project to have been restricted to the clearer waters at the tip of Clarks Point on the New Bedford side and south of Ricketsons Point on the Dartmouth side are now spreading throughout the Cove. Now these beds are spread to both Clarks Cover and the outer portions of New Bedford Harbor.

In 1996, New Bedford's new advanced secondary Treatment Facility was completed and came on line. This facility is expected to further improve water quality around New Bedford in terms of both fecal and nitrogen loading. The town of Dartmouth, which shares the coats of Clarks Cove with New Bedford, is also managing stormwater discharges to the cove and their efforts are also expected to further reduce nitrogen and fecal loadings to the Cove. Inner New Bedford Harbor (Acushnet River) continues to have poor water quality, in part because of discharges from the Fairhaven Wastewater treatment facility. In the coming year the Project will meet with state DEP and Fairhaven officials about the appropriate loading limits for that wastewater facility to help improve water quality there.

Shellfish Bed Closures

As noted earlier in this report, in 1991 when the Buzzards Bay CCMP was completed, degradation of water quality due to pathogen contamination represented a serious and growing human health risk and economic loss to the Bay's historically strong shellfishery. In that year, the Bay saw 13,816 acres closed - the greatest number of bed closures in history. This figure had grown quickly moving from only 4,358 acres closed in 1970 and doubling to 8,052 acres by 1980. Throughout the 60s, 70s, and 80s, shellfish beds in Buzzards Bay were being closed due to fecal coliform contamination at ever increasing rates, and these closings were one of most pressing concerns with area residents.

At the end of 1996, however, the Bay has regained over 4,000 acres of shellfish harvest area, returning the Bay to a closure figure that had not been seen in the Bay since 1984. This improvement is due to both real improvements in water quality and increased use of conditional closures in many area along the Bay's coastline. The most striking achievement was the reopening of 700 acres of shellfish beds in Clark's Cove in April 1992.

While the Buzzards Bay Project contributed to this turn around, the real credit is deserved by the State Division of Marine Fisheries (DMF) and numerous municipal officials who have worked together to identify and remediate pollution sources. The Project however helped form the wave of new thinking on what the problems and solutions were to the shellfish bed closure problem. In fact the Project's emphasis on stormwater as the principal source and conveyance of fecal coliforms in many embayments and harbors would result in new state programs to help towns fund solutions to the stormwater problem and spawned similar initiatives in the Project's sister NEP, the Mass Bays Program.

SECTION V

Resources

Current Approach

The Buzzards Bay Project has had a highly effective municipal grant program in place since 1990. This program has been funded through EPA Section 320 demonstration project funds, Congressional Add-on funding through section 320, state match programs like the Coastal Facilities Improvement Program, and State Transportation Bond Issues. The Project has also been highly successful in securing state and federal competitive grants that have been either directly awarded to the municipalities or reissued by the Buzzards Bay Project in a competitive grant program. Our current round of municipal grants will be awarded this summer.

The financing of implementation activities and leveraging CCMP actions was the result of an aggressive strategy by the Buzzards Bay Project to tap into various state and federal financial and technical assistance. The effectiveness of this strategy is illustrated in the graph below. It is clear from this figure that modest federal "base funding" through the NEP has paid big dividends for Buzzards Bay. With funding of project staff secure, the Buzzards Bay Project was able to focus its grant proposal writing on securing funds for municipalities, or specific implementation initiatives. However, with base funding in recent years becoming insufficient to maintain project staff, the Buzzards Bay Project has begun a strategy of securing a portion of relevant staff on each new grant proposal received. In the future, it is projected that 25% of project staff funding will derive from outside competitive grants, exclusive of Section 320 funds from EPA. The following is a list on outside federal and state funding acquired by the Buzzards Bay Project for specific town implementation projects.

Beginning in 1996, the Buzzards Bay Project has made a new collaboration with the MASSACHUSETTS ENVIRONMENTAL TRUST, a quasi-public environmental philanthropy established by the Massachusetts legislature in 1988 through the settlement of a federal lawsuit over the pollution of Boston Harbor. The Trust funds environmental restoration and education projects focusing on coastal issues. Recognizing the value of the Commonwealth's two National Estuary Programs - the Buzzards Bay Project and the Massachusetts Bays Program - the Trust established a challenge fund to provide match funding for federal grants pursued by the NEPs for implementation activities. In the first year of the agreement, the Buzzards Bay Project has utilized Trust funding to match successful federal s.319 and ISTEA awards for land conservation and stormwater remediation projects.

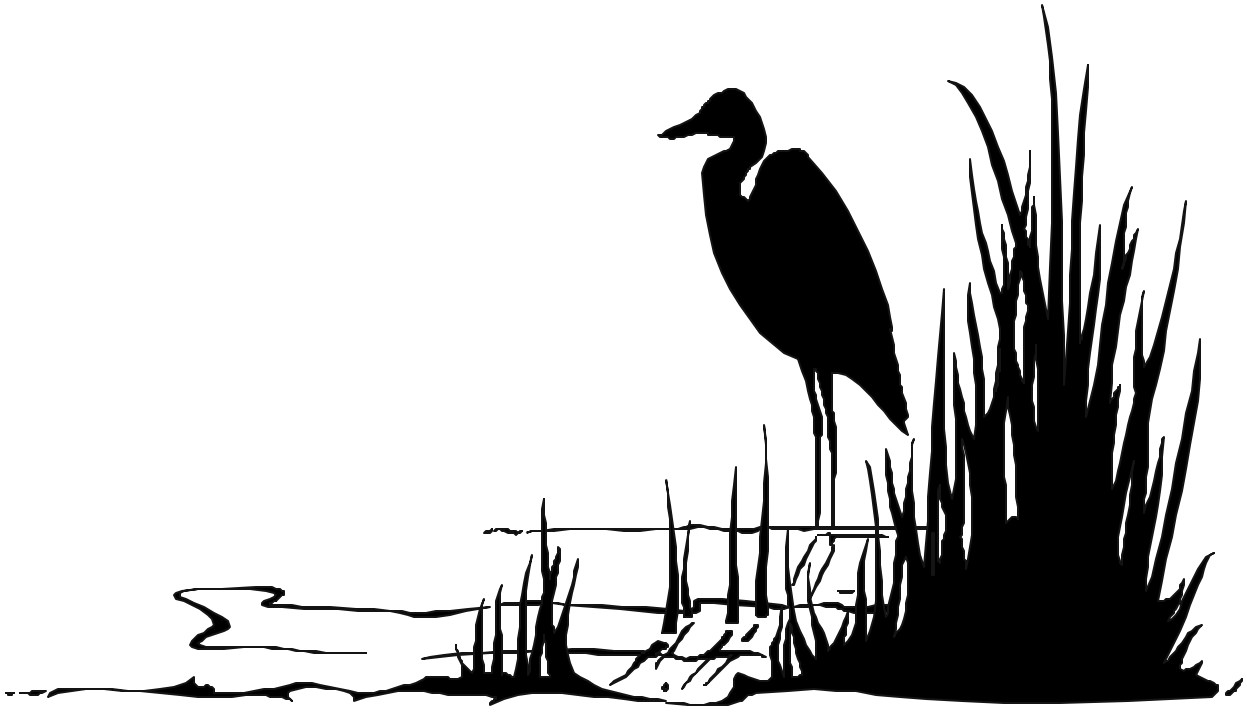
The Future

The Buzzards Bay Project expects continued success in securing state and federal competitive grants, Massachusetts Environmental Trust funding, and state bond moneys to fund specific implementation projects. Moreover, state and federal agencies are increasingly willing to dedicate their own limited internal resources to help implement the recommendations contained in the CCMP.

> "The Buzzards Bay Project has provided valuable resource to my office and the constituents I represent in promoting water quality and natural resource protection affecting Buzzards Bay. "
> State Representative William M. Straus

SECTION VI

Institutional Coordination and Public Participation



Buzzards Bay Project staff (BBP) have successfully forged strong institutional arrangements with local, state and federal stakeholders. The emphasis however, has been on fostering partnerships with town regulatory boards because most CCMP actions are directed at local government. The staff's focus has been on providing technical assistance to planning boards, boards of health and conservation commissions. This assistance takes the form of bylaw development, workshops, open space planning, septic system tracking, stormwater treatment designs, GIS capability and other useful implementation tools. Since CCMP approval in 1992, BBP staff have had the opportunity to work in all 11 major Buzzards Bay towns to varying degrees. The expertise that the staff has been able to provide has strengthened local capacity and accelerated CCMP implementation. Besides technical assistance, the BBP has helped local grant writers with proposals, and secured highly competitive state and federal funds that were probably otherwise out of reach.

An excellent example of the BBP's ability to strengthened local capacity and facilitate CCMP implementation can be seen with the deployment of SepTrack. SepTrack is a specialized software package designed by the BBP to allow communities to better manage information related to onsite septic systems. SepTrack was initiated because local boards of health typically lack the ability to efficiently and effectively monitor septic system permits and inspection and maintenance information due to inefficient staffing and information processing equipment and systems. The BBP helped relieve this problem by providing computers and the specialized software to 11 boards of health in the watershed. Now, SepTrack is allowing these boards to be more productive and responsive, and freeing staff for much-needed field inspections, enforcement and pressing health and environmental issues.

Buzzards Bay Action Committee's (BBAC) monthly meetings have also been effective in furthering local partnerships. These sessions have allowed discussions that both promote the BBP's activities and provide and opportunity to hear from town representatives about community needs. The BBAC has used these exchanges to help establish the BBP's funding priorities and to ensure that the municipal perspective is integrated into the overall yearly agenda.

Beyond establishing strong local relations, the BBP has also developed a solid working arrangement within state government. This starts with the Project being housed within the Massachusetts Coastal Zone Management Office (CZM) which provides a special institutional advantage. The project has used the prestige of CZM and the expertise of key staff to further the accomplishment of many program priorities within the Buzzards Bay watershed. CZM also provides valuable administrative support to the project.

Because nitrogen management is a key component of the CCMP, the BBP has concentrated much of its focus on increasing the state's profile in nitrogen-related issues. The BBP was instrumental in assisting the Massachusetts Department of Environmental Protection (DEP) to incorporate nitrogen management issues into its rewrite of the state onsite septic system code in 1994. The project is also working close with DEP in the review of nitrogen issues involving sewage treatment upgrades in Buzzards Bay and other coastal watersheds. DEP is utilizing the Buzzards Bay nitrogen methodology and is planning a

workshop with BBP and EPA-New England to standardize this application. This arrangement has elevated the state's ability to manage nitrogen, and gone a long way toward helping CCMP implementation.

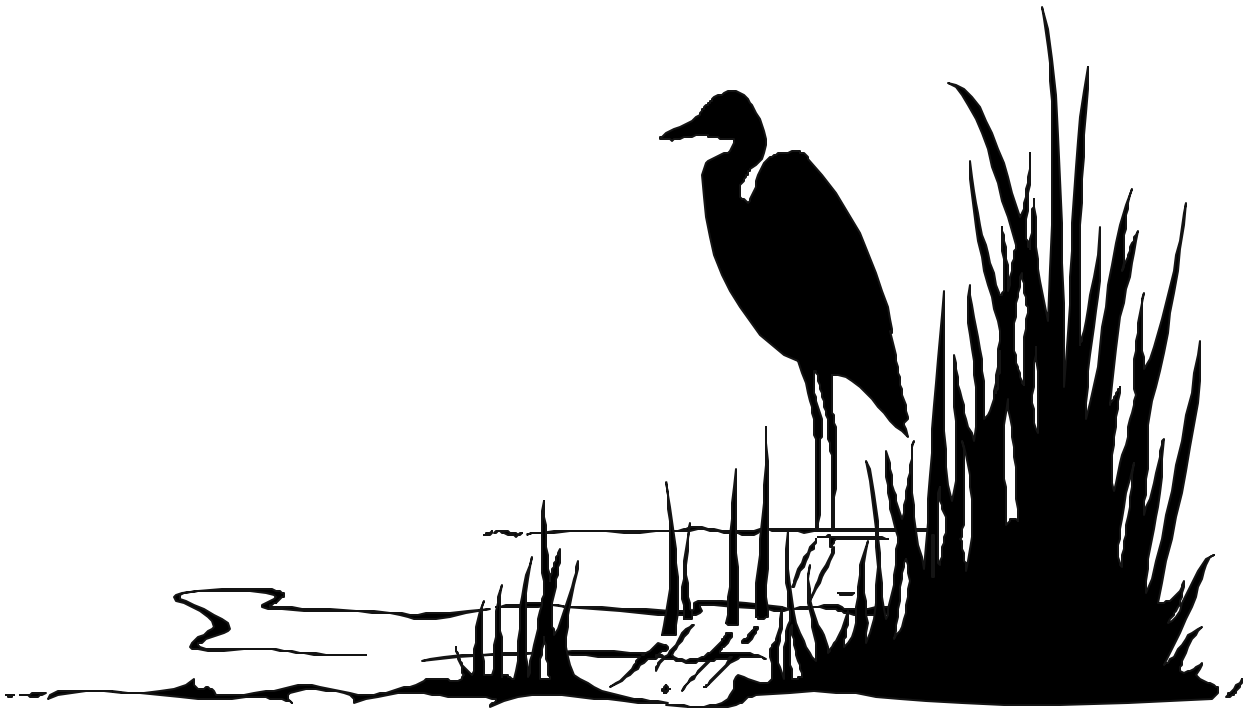
The BBP and DEP have also combined as partners in the development and implementation of the Alternative Septic System Test Center. While the BBP secured funding for the project through an Environmental Technology Initiative grant, both organizations will capitalize on it. The purpose of the center is to evaluate and promote new onsite technologies with an emphasis on nitrogen removal. This will help with CCMP implementation, as the widening use of de-nitrifying systems is a major action called for in the CCMP. It will also serve DEP by providing state program managers with consistent testing protocols and a high level of confidence in the effectiveness of new technologies prior to permitting. The center will accelerate the regulatory process and allow for more alternative systems sooner.

At the federal level, the project has also institutionalized close working relationships with two key federal agencies, EPA and the Natural Resources Conservation Service (NRCS). The EPA Project Officer for the BBP was detailed for several years to the project office in Marion to help with CCMP implementation. This allowed for the closest possible association with EPA-New England and enabled the BBP to better leverage EPA resources in support of the CCMP. This very close relationship continues today. In addition, an NRCS employee has been situated in the first the Marion office then the Wareham office of the BBP for the past six years to help the communities with stormwater problems. Through this arrangement, the Project has concentrated much attention and funding on stormwater issues, one of the major water quality concerns highlighted in the CCMP. This accommodation has also enabled the project to develop an excellent relationship with NRCS, particularly important because the BBP has drawn on that agency's expertise in nonpoint source pollution.

Finally, the BBP receives overall policy direction and budget approval from its five member Steering Committee. Members represent EPA- New England, CZM, BBAC, the Coalition for Buzzards Bay (a citizen activist organization), and the Southeastern Regional Planning and Economic Development District. The committee provides the proper blend of federal, state, regional, and local government, as well as citizen representation. It makes the difficult funding decisions implicit with a shrinking resource base, but allows the project director and staff the necessary management flexibility to administer the details of ongoing projects.

SECTION VII

Technical Assistance & Technology Transfer



The goal of the Buzzards Bay Project (BBP), as described throughout this report, is to provide technical assistance to those local agencies that must be relied on to carry out the CCMP. This is demonstrated by such actions seen in the development of model bylaws such as the comprehensive stormwater management bylaw that was individually designed to complement the regulatory responsibilities of planning boards, boards of health and conservation commissions. This bylaw has been made available not only to Buzzards Bay communities, but has been presented in statewide and New England-wide forums as well.

Besides stormwater, the other two areas where BBP staff have concentrated technical assistance are nitrogen management and wetlands protection. The BBP has developed an embayment ranking system concerning current and future nitrogen impacts made available to Buzzards Bay municipalities so they can better assess those embayments that require management attention. In several cases such as Buttermilk Bay, Onset Bay and West Falmouth Harbor, BBP staff have provided concentrated technical assistance and have guided the work of local boards in controlling nitrogen loading. This innovative Buzzards Bay methodology is the centerpiece of the BBP's nitrogen strategy, and it has been transferred to many other embayments outside Buzzards Bay including Cape Cod and the South Shore portion of Massachusetts Bay. The BBP office receives several requests each year from embayments throughout New England that are interested in receiving the nitrogen management methodology.

Wetlands Protection is another area in which technical assistance receives a heavy emphasis. The BBP's wetlands specialist conducts approximately 10-15 workshops each year for local regulators. These include workshops in wetland delineation, plant identification and soils identification. In addition, the specialist makes an average of 20 visits per year to local conservation commissions to work with them on both stormwater regulations and wetland regulations, as well as covering the details of specific sites that are of concern to the commissions. The specialist has also designed user friendly handbooks that can be easily used in the field for identifying plants, soils and drawing wetland delineation lines.

Because the Buzzards Bay watershed is relatively small, the BBP has concentrated most of its technical assistance in on-site efforts and through local workshops. Emphasizing hands-on training and assistance and very specific and focused workshops. However, BBP staff have regularly made presentations in nitrogen management, stormwater control and alternative on-site septic systems. Venues for these presentations include the annual Massachusetts Association of Conservation Commissions, The New England Environmental Conference coordinated by Tufts University, the annual New England Interstate Water Pollution Control Commission's eight state nonpoint source meeting, and the New England Soil Scientists Conference.

Although the BBP no longer produces a newsletter, it has used other mechanisms to compensate for its outreach responsibilities. BBP staff attend the monthly meetings of the Buzzards Bay Action Committee, comprising representatives from each bay town, and give a lengthy report on all Project activities with emphasis on those areas that could be useful to local government. In addition, the BBP works closely

with the Coalition for Buzzards Bay and uses that organization's newsletter to get the word out on key issues affecting the bay. The Project also uses press releases to local newspapers to herald major accomplishments and report on grant money received by the BBP, and those funds passed through to the communities. Finally, the Buzzards Bay Project launched a web site in 1998 that now incorporates a wealth of data, reports, and press releases from the Buzzards Bay Project. We believe that this web site has overcome many (but not all) of the public outreach limitations that we face.

The BBP has produced dozens of fact sheets on all aspects of its program and regularly distributes them to the towns. Additionally, the BBP has produced informational booklets for all its stormwater construction projects and distributed them in the geographic areas surrounding the projects so the neighborhoods could understand all the aspects of the project from general information about stormwater to the specific management practice being utilized. In particular, the BBP has used the wetlands restoration/stormwater treatment project at Spragues Cove as a learning laboratory for the entire town of Marion. It has been included as the foremost Section 319 success story for Massachusetts.

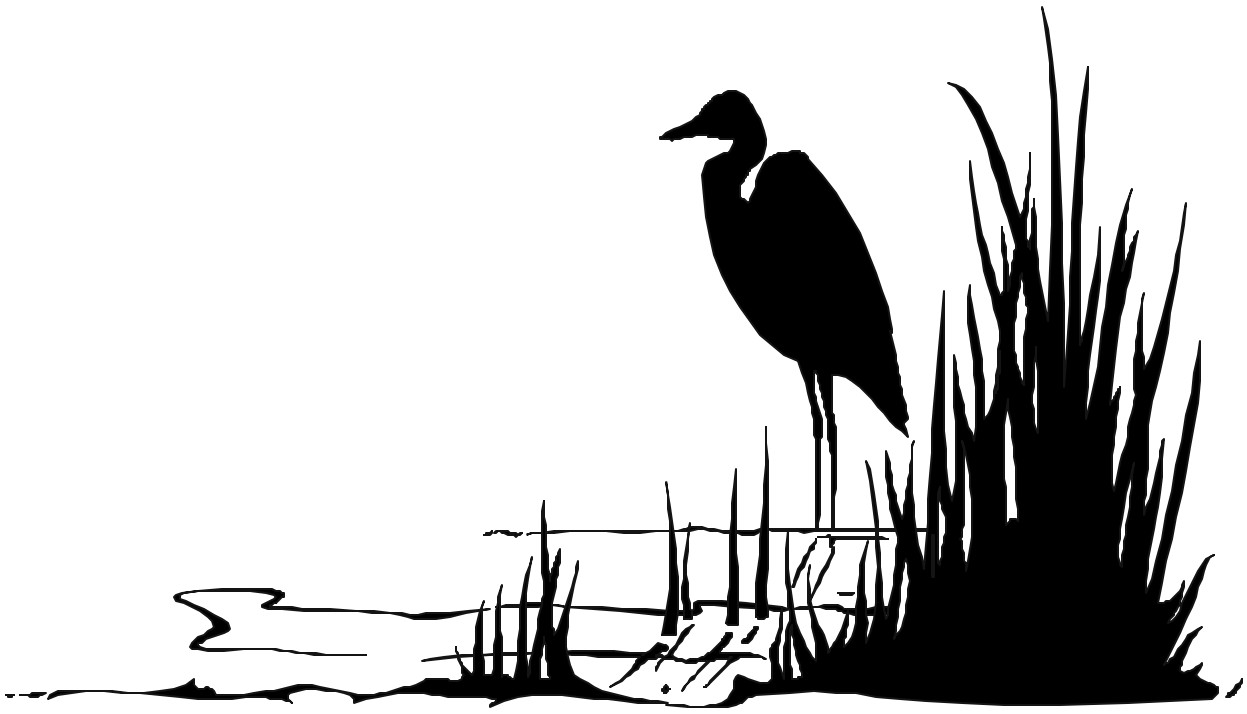
The work of the BBP has been highlighted in three tech transfer pieces appearing in Coastlines, the newsletter of the National Estuary Program. Coastlines described the innovative approach to stormwater management undertaken in Buttermilk Bay, and the development of the ground-breaking septic system software package known as SepTrack. Because of this notoriety, the BBP has received many calls from around the country for additional information. SepTrack, in particular, has generated phenomenal interest as a desirable management tool. In addition, the web site has been highly effective at reducing BBP staff time in responding to routine request for reports, data and information.

In an innovative Tech Transfer experiment, the Buzzards Bay Project detailed its Wetlands Specialist John Rockwell to the Puget Sound Water Quality Action Team for two weeks to learn more about the operation of the PSWQAT and its work on stormwater and wetland protection strategies. We found the information gained by Mr. Rockwell on PSWQAT differing management approaches, governmental authorities, and stormwater remediation strategies illuminating and educational.

Finally, the BBP staff have been exemplary in attending national NEP and other meetings of NOAA, wetland scientists, and land use planners. We believe these endeavors are effectively demonstrating the successes of the BBP and the benefits of the EPA's National Estuary Program, and transferring our lessons learned to other programs.

SECTION VIII

Overall Program Strengths & Limitations



The Buzzards Bay Project's (BBP) major strengths have been touched on in previous sections, but are worth summarizing here. The single greatest asset that the BBP possesses is its talented and hard-working staff, combined with an ability to produce useful management tools and directed technical assistance. This has resulted in local capacity building that is critical to CCMP implementation. The BBP staff excels in applying scientific principles to program management, which translates to taking recommended CCMP activities and demonstrating how to accomplish them. This was approach was achievable because technical staff were hired to fill specific needs of the watershed municipalities.

Such a focused strategy was in part achievable because the watershed has only 15 municipalities, making it feasible for Project staff to develop the close working relationship with many municipal officials and town boards. The six years of implementation activities by the Buzzards Bay Project have made it recognized resource for elected and appointed officials and the staff of many municipal boards around Buzzards Bay.

Another strength is an ability to secure grant funds outside the Section 320 program. This includes: federal Clean Water Act grants under Sections 104(b)(3), s.319, and 604(b); an EPA Pollution Prevention grant; an Environmental Technology Initiative grant; Massachusetts Transportation Bond funds; funding from the Massachusetts Environmental Trust; and enhancement funds through the Intermodal Surface Transportation Efficiency Act. In addition, the project could sufficiently impress its congressional delegation with accomplishments, to garner an additional $1.2 million in add-on funding. The total of all these funding sources is greater than $2.5 million, a truly staggering figure for a program the size of Buzzards Bay. The combination of technical assistance provided by the staff, with the use of these additional grant dollars for remediation and other implementation activities has been a powerful one-two punch.

Besides its overall technical assistance program, a few special initiatives (all discussed in more detail earlier) deserve mention. These include: the Toxics Use Reduction program that went a long way toward completing the Toxics Action Plan; establishment of the Tri-town Buttermilk Bay Nitrogen Overlay District, the first such designation in the country; the Alternative On-site Septic System Test Center; and the implementation throughout Buzzards Bay of SepTrack, the septic system tracking system that is rapidly becoming a national model.

Due to a shrinking resource base, in 1994 the BBP made the conscious decision several years ago to abandon the position of outreach coordinator, and instead fund the position of wetlands specialist. This was done to further emphasize CCMP implementation and bolster an area that was not receiving adequate attention. Buzzards Bay communities had a very mixed record in wetlands protection to that point, and the Steering Committee was unanimous in its belief that a wetlands position was a critical need. Another reason for going this route was the understanding that the Coalition for Buzzards Bay's (CBB) outreach program could partially mitigate the project's diminished public outreach effort.

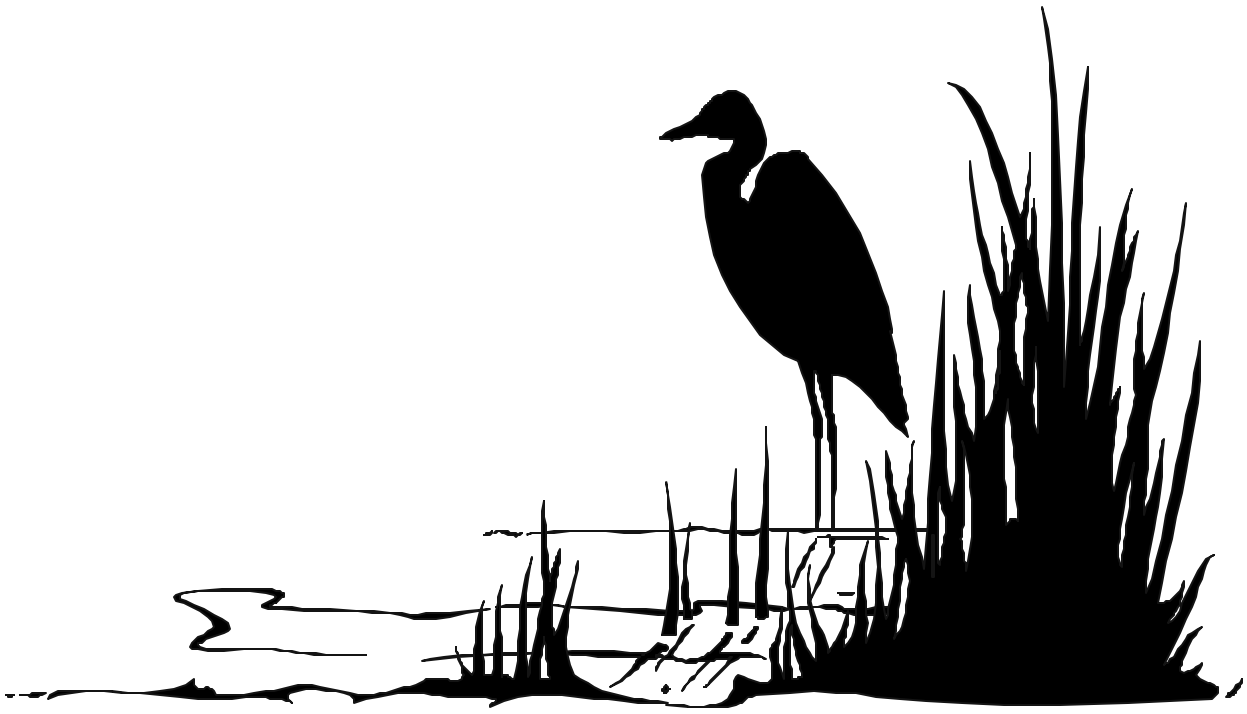
Confusion of the Project's identity with the two collaborative non-profit organizations, the citizen-group

Coalition for Buzzards Bay and the municipal official group Buzzards Bay Action Committee still occurs, but we believe the existence of our web sites is helping correct the problem.

Perhaps the biggest problem now faced by the BBP is that with only four technical staff and so many projects we have spread ourselves too thinly, and we have yet to realize our goal of fully communicating all our many successes.

SECTION VIII

Feedback to EPA on CCMP implementation



EPA Headquarters

The BBP has been very pleased by the role of EPA headquarters in facilitating national meetings for the NEP's and bringing the directors together to discuss the most pressing issues facing EPA and the National Estuary Program. The BBP has also very much appreciated the opportunity to impart its experiences to junior members of the NEP family, and we have received many compliments for our participation. We also commend the efforts of headquarters to use the Association of National Estuary Programs as a forum to exchange ideas and discuss problems.

EPA Region I.

The BBP has had an exceptionally good relationship with EPA Region I. Most notably, Buzzards Bay Project officer Bruce Rosinoff has been an ardent advocate of the Buzzards Bay Project, and helped the program in many ways. Mr. Rosinoff, who was detailed to the Buzzards Bay Project in the late 1980's and early 1990s as the Buzzards Bay Project's CCMP writer, went on to become not only our EPA project officer, but the EPA's Massachusetts 319 Coordinator, and EPA's Representative on the Buzzards Bay watershed team at EOEA. In his various capacities, he has worked hard to ensure that EPA and the Commonwealth of Massachusetts continue their commitment and support of the goals and objectives of the Buzzards Bay CCMP. Mr. Rosinoff is one of the great unsung heros of the Buzzards Bay Project, and he has been an important factor in our success during the past decade.