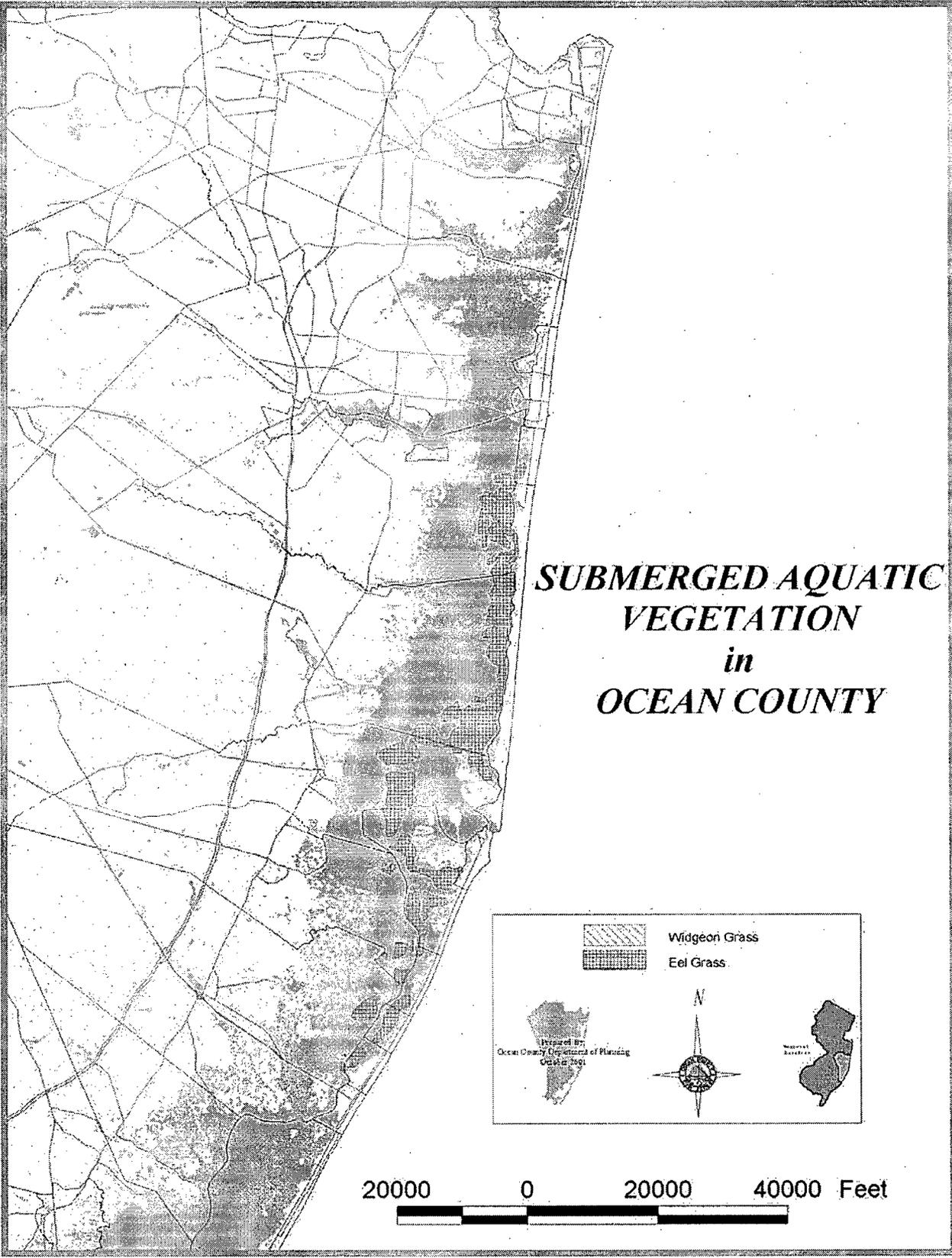


CHAPTER 9
Monitoring Program
Plan

Rutgers Institute of Marine and Coastal Science, Little Egg Harbor. PHOTO BY C. MINERS



9.1 Introduction

An effective monitoring program is an integral component of the CCMP. Monitoring is necessary to assess the status and trends in the health and abundance of the Barnegat Bay watershed's water quality, water supply, habitat and living resources, and opportunities for human enjoyment. Monitoring provides the scientific evidence of changes taking place within the Bay and watershed, either on a temporal or spatial scale. The results of such monitoring can validate the effectiveness of current and planned management strategies, leading to the achievement of goals, or can suggest where more concentrated attention should be placed.

This Monitoring Program Plan describes the existing and future monitoring efforts that will be taken within the bay and watershed. Monitoring is conducted by a variety of Program participants, from federal, state, and county agencies, to academic and research institutions and citizen volunteers. The Action Items contained within this Monitoring Program Plan both complement and support the Action Plans in Chapters 5 to 8 of this CCMP. For example, workshops called for in

the Monitoring Program Plan will help flesh out the monitoring component of Action Items in the Water Quality and Water Supply Action Plan, and ensure that progress in implementing those actions is measurable. The Monitoring Program Plan also helps to ensure that Action Items are implemented effectively and adjusted when necessary. By measuring environmental changes in association with Action Item implementation, the BBNEP will be able to evaluate the results of these actions and whether the goals and objectives of the Program are being met. The integration of the Monitoring Program Plan and Action Plan Action Items is indicated in Table 9-1.

Monitoring can be effective at different stages of the implementation process. Output monitoring measures programmatic progress and addresses CCMP implementation issues such as number of actions implemented within a given period of time. Outcome monitoring focuses on the results of actions, such as the changes in ambient environmental conditions, ecological functions, and biological populations and communities. Both kinds of monitoring are addressed by this Monitoring Program Plan.



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MONITORING PROGRAM PLAN

TABLE 9-1. Linkages between the Environmental Action Plans (Chapters 5 and 6) and the Monitoring Program Plan.

Water Quality/Water Supply & Habitat and Living Resources Action Plans: Action Items	Monitoring Needs of Action Items	Corresponding Monitoring Program Plan Actions	Description of Linkage
Action Items 5.1, 5.3, 5.4, 6.11-6.14	1) Implementation monitoring.	9.1—Conduct workshops on monitoring, modeling, and research needs.	Workshops will refine scope of the Action Items and identify specific data elements needed to satisfy monitoring needs.
	2) Database to track progress in stormwater management basin inventory, BMP basin retrofits, and municipality compliance with Phase II Municipal Stormwater rules.		BBEP will seek commitments from Management Conference members to implement TMDL development and monitoring. These members will implement this part of the EMP.
	3) GIS to reveal Barnegat Bay coastal zone boundary, impaired sub-watersheds, state lands, etc.	9.2—Develop and implement long-term data management strategy.	Implementation of the long-term data management strategy will facilitate the evaluation of data generated through the Action Items so that their effectiveness in reducing nonpoint source contamination can be assessed.
	4) Hydrologic monitoring to evaluate basin BMP retrofit performance.		The long-term data management strategy will include provisions for results of the monitoring that would be needed for the development of TMDLs and for results of monitoring that would be required to evaluate the effectiveness of TMDLs.
5) TMDL development and monitoring.			
6) Information tracking and dissemination.		9.3-9.4—Monitor CCMP objectives.	BBEP will conduct implementation monitoring to track Action Item implementation (Action Item 9.4), effectiveness monitoring to track resource values and concerns (Action 9.3), and disseminate information.

TABLE 9-1. (continued)

Water Quality/Water Supply & Habitat and Living Resources Action Plans: Action Items	Monitoring Needs of Action Items	Corresponding Monitoring Program Plan Actions	Description of Linkage
Action Items 5.5-5.13, 6.1-6.6, 6.8-6.10	1) Database to track information on developments, households, farms, golf courses, and municipalities participating in Action programs.	9.1—Conduct workshops on monitoring, modeling, and research needs.	Workshops will refine scope of the Action Items and identify specific data elements needed to satisfy monitoring needs.
	2) Database to track Canada Geese nuisance complaints.		BBEP will seek commitments from Management Conference members to conduct sampling.
	3) GIS database to track the amount of barren land and forest cover.	9.2—Develop and implement long-term data management strategy.	Implementation of the long-term data management strategy will facilitate the evaluation of data generated through the Action Items so that their effectiveness as source-control strategies can be assessed.
	4) GIS database to track populations of rare, threatened, and endangered wildlife.	9.3-9.4—Monitor CCMP objectives.	BBEP will conduct implementation monitoring to track Action Item implementation (Action 9.4), effectiveness monitoring to track resource values and concerns (Action 9.3), and disseminate information.
	5) Short-term sampling to identify sources of pesticide/fertilizer residues.		
	6) Information tracking and dissemination.		
Action Items 5.14, 5.15	No new monitoring needs other than implementation monitoring and information tracking/dissemination. Monitoring of point sources is coordinated under existing regulatory programs.		

TABLE 9-1. (continued)

MONITORING PROGRAM PLAN

Water Quality/Water Supply & Habitat and Living Resources Action Plans: Action Items	Monitoring Needs of Action Items	Corresponding Monitoring Program Plan Actions	Description of Linkage
Action Items 5.16-5.19	1) Database to track the number of sewage pumpout facilities installed, distribution of promotional materials, and results of usage surveys.	9.1—Conduct workshops on monitoring, modeling, and research needs.	Workshops will refine scope of the Action Items and identify specific data elements needed to satisfy monitoring needs.
	2) Database to track information on marinas and other boating facilities participating in "Clean Marinas" program.	9.2—Develop and implement long-term data management strategy.	Implementation of the long-term data management strategy will facilitate the evaluation of data generated through the Action Items so that their effectiveness as source-control strategies can be assessed.
	3) Information tracking and dissemination.	9.5—Monitor CCMP objectives.	BBEP will conduct implementation monitoring to track Action Item implementation and disseminate information.
Action Items 5.20-5.24, 6.7	1) Expand existing stream-gauging and saltwater monitoring networks.	9.1—Conduct workshops on monitoring, modeling, and research needs.	Workshops will refine scope of the Action Items and identify specific data elements needed to satisfy monitoring needs.
	2) Database to track information on users of weather station data, status of wastewater reuse demonstration project.		BBEP will seek commitments from Management Conference members to implement expansion of monitoring network.
	3) Data collection through shellfish resource survey.	9.4—Develop and implement long-term data management strategy.	Implementation of the long-term data management strategy will facilitate the evaluation of data generated through the Action Items so that their effectiveness in meeting goals can be assessed.
	4) Information tracking and dissemination.	9.4—Monitoring CCMP objectives.	BBEP will conduct implementation monitoring to track Action Item implementation and disseminate information.

TABLE 9-1. (continued)

Water Quality/Water Supply & Habitat and Living Resources Action Plans: Action Items	Monitoring Needs of Action Items	Corresponding Monitoring Program Plan Actions	Description of Linkage
Action Items 5.2, 5.25	1) Data collection required for completion of the Natural Resource Inventory (NRI).	9.2—Conduct workshops on monitoring, modeling, and research needs.	Workshops will refine scope of the Action Items and identify specific data elements needed to satisfy monitoring needs.
	2) Sanitary Survey and Intensive (land-based) Survey to support NJDEP Shellfish Waters and Bathing Beaches protection strategies.		BBEP will seek commitments from Management Conference members to implement NRI, Sanitary Survey, and Intensive (land-based) Survey.
	3) Information tracking and dissemination.	9.4—Develop and Implement Long-Term Data Management Strategy.	Implementation of the long-term data management strategy will facilitate the evaluation of data generated through the Action Items so that their effectiveness in providing baseline information required for other Action Items can be assessed.
		9.5—Monitor CCMP objectives.	BBEP will conduct implementation monitoring to track Action Item implementation and disseminate information.

MONITORING PROGRAM PLAN

9.2 EXISTING MONITORING PROGRAMS IN THE BARNEGAT BAY WATERSHED

9.2.1 WATERSHED-BASED MONITORING PROGRAMS

A number of ongoing monitoring programs have facilitated the development of the CCMP, and will continue to be useful during CCMP implementation. These monitoring activities also serve as the basis for the development of the Monitoring Program Plan. Summaries of these existing monitoring programs are presented below.

NATIONAL SHELLFISH SANITATION PROGRAM (NSSP)

This program was established by the U.S. Surgeon General in 1929 and is active in all coastal states involved in interstate shellfish harvest and sale. Its purpose is to regulate the harvest and sale of shellfish to safeguard the public health from the consumption of contaminated shellfish. The elements of this program that address nonpoint source (NPS) pollution concerns are the shellfish growing water classification requirements, which require shellfish producing states to classify their coastal waters according to their suitability for safe shellfish harvest. Classifications are based on three types of assessments: pollution source surveys, water quality monitoring, and hydrologic surveys. Barnegat Bay and its tributaries are divided into six Shellfish Growing Areas for monitoring of total coliform and fecal coliform bacteria. Sampling occurs at several hundred monitoring stations at least six times per year. This monitoring is conducted at a cost of \$154,000 per year.

FUNDING AGENCY: State appropriations.

MONITORING PARAMETERS: Total coliforms, fecal coliform, (temperature and salinity sampled in a subset of these stations).

STATIONS: 2500 stations statewide; Barnegat Bay is divided into 6 Shellfish Growing Areas.

FREQUENCY: Sampled between 5 and 12 times per year.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: MS Access, STORET (2001 or later), data prior to 1996-Legacy STORET.

ESTUARINE MONITORING PROGRAM

The NSSP is designed to monitor water quality for public health reasons. In the early 1980s, the "green tide" problems along the New Jersey coast highlighted the need to monitor parameters besides coliform bacteria that would provide information on the ecological health of the coastal waters as well. In response to this need, in 1989 the NJDEP Bureau of Marine Water Monitoring started the Estuarine Monitoring Program. It monitors parameters such as oxygen, salinity, nitrogen, phosphorus, secchi depth (turbidity), temperature, chlorophyll, and suspended solids. Samples are collected quarterly. There are approximately 200 estuarine monitoring stations in the Barnegat Bay watershed.

The monitoring data from this program are used to identify nitrate-impacted waters. Areas such as the upper end of Barnegat Bay show elevated nitrate levels relative to other estuarine waters of New Jersey. The apparent cause is NPS pollution.

FUNDING AGENCY: State appropriations.

MONITORING PARAMETERS: Oxygen, salinity, nitrogen, phosphorus, turbidity (Secchi depth), temperature, chlorophyll, suspended solids.

STATIONS: 260 stations statewide; ~ 40 stations in Barnegat Bay.

FREQUENCY: Quarterly.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: MS Access, STORET (2001 or later).

TOMS RIVER NONPOINT SOURCE STUDY

The Toms River Nonpoint Source Study is a cooperative effort between the NJDEP and the USGS with Section 319h funding from the USEPA. Its purpose is to establish the pollutant loads associated with land use. Four sites have been selected in sub-tributaries of the Toms River, each of which has a different predominant land use (commercial/high-density residential; moderate-density residential; undeveloped land; and mixed land use). This study is budgeted at \$75,000 per year.

Baseline conditions were characterized when the data were collected in 1994, the first year of the study. Nitrate and organic nitrogen were the predominant nitrogen species at the most highly developed site. Loads of nitrate and ammonia were greatest during storms (3 lbs. nitrate nitrogen per day per square mile and ammonia nitrogen per day per square mile) at this location. At the site with moderate development, nitrate was the predominant nitrogen species. This was especially true during base flow when loads ranged from 2.5 to 7 lbs. nitrate nitrogen per day per square mile. Organic nitrogen was the predominant nitrogen species at the site where there was little development. Fecal coliform loads were greatest at the highly developed and moderately developed land-use sites. Median values for fecal coliform loads ranged from 37 x 10¹² to 63 x 10¹² fecal coliforms per square mile.

A synoptic study was completed recently to characterize the geographic variability of water quality throughout the watershed. The participating agencies will build on this program to improve their understanding of NPS pollution. As originally planned, additional replicates of the land use factors (high-density commercial/residential, moderate-density residential, and undeveloped) are to be established, possibly in the adjacent Metedeconk River watershed and on the barrier island.

The next phase of the study will be to begin best management plan implementation in cooperation with local governments. Monitoring by the NJDEP throughout the best management plan (BMP) implementation phase will take place over the next few years to measure the effectiveness of those BMPs installed.

FUNDING AGENCY: State Corporate Business Tax (CBT) and state appropriations.

MONITORING PARAMETERS: Temperature, dissolved oxygen, pH, specific conductants, ammonia, suspended solids, nitrate/nitrite, total nitrogen, total phosphorus, orthophosphate, turbidity, E-coli.

STATIONS: Four stations along tributaries of the Toms River.

FREQUENCY: Sampling occurs during storm events.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: MS Access and submitted to USGS (not WATSTORE).

COOPERATIVE COASTAL MONITORING NETWORK

This network is operated to monitor the safety of New Jersey's coastal waters for bathing. Stations are located immediately adjacent to the shores where bathing occurs, and due to the purpose of the program, sampling is limited to the summer months. The OCHD is responsible for sample collection and the Ocean County Utilities Authority (OCUA) is responsible for sample analysis. Results are reported to the NJDEP and the New Jersey Department of Health. Samples are analyzed for fecal coliform and enterococcus bacteria. Other conditions noted at these locations include floatables and the presence of algae.

This network identifies areas with water quality concerns, initiating pollution source investigations that result in corrections to sewage and stormwater collection systems, such as those addressed in the Sewage Infrastructure Improvement Act.

FUNDING AGENCY: Coastal Protection Trust Fund.

MONITORING PARAMETERS: Fecal coliform and enterococcus.

MONITORING PROGRAM PLAN

STATIONS: 328 stations statewide; 184 ocean stations and 144 bay stations.

FREQUENCY: Sampled once per week from mid-May to mid-September (resamples taken daily until bacteria levels are within standards); samples also collected after storm events.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - May 1992 as amended and supplemented, and Chapter 9 of the State Sanitary Code for dip method.

DATA MANAGEMENT: MS Excel, STORET (2001 or later).

AMBIENT SURFACE WATER MONITORING NETWORK

This network was established with seven specific objectives on a statewide basis. Those objectives most relevant to the BBNEP are to determine status and trends of ambient surface waters, to work synergistically with the NJDEP Ambient Biomonitoring Network and atmospheric, groundwater, and coastal water-quality networks, and to measure non-point source contributions from major land-use areas, atmospheric deposition, and groundwater. There are five stations in the Barnegat Bay watershed, with a sampling frequency of four times per year. A wide variety of conventional parameters, such as field characteristics, nutrients, major ions, biochemical oxygen demand, organic pesticides, trace elements, VOCs and bed sediment contaminants, are monitored in this program. Metals, pesticides/VOCs and sediments are monitored on a reduced sampling frequency.

Network data are available from the following sources: the USGS computerized data system, WATSTORE; USEPA's computerized data system, STORET; and USGS's annual Water Resources Data - New Jersey reports. A major objective of this network is to coordinate water chemistry and biological databases. Completing that task supports priority initiatives, such as the National Environmental Performance Partnership System (NEPPS), in which biological databases are of increas-

ing importance. The increased monitoring at reference or background stations will support water quality standards development, a central component to water resources management, which is also covered by the NEPPS Agreement. Monitoring costs amount to \$45,000 per year.

FUNDING AGENCY: S106 Grant.

MONITORING PARAMETERS: Metals, pesticides/VOCs, sediments, chlorophyll, bacteria (during primary contact season).

STATIONS: 115 stations statewide; 4 stations in Barnegat Bay watershed.

FREQUENCY: Four times per year.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: WATSTORE, STORET, Water Resources Data-New Jersey reports.

AMBIENT GROUNDWATER QUALITY MONITORING NETWORK

The Ambient Groundwater Quality Monitoring Network is a cooperative program under the direction of the NJDEP and the USGS. The objective is to characterize groundwater quality. In the Barnegat Bay watershed, approximately eight stations are sampled once every five years during the month of August. Samples from the wells are analyzed for physical characteristics, major ions, nutrients, trace elements, organic constituents, and gross alpha and beta radioactivity. The Barnegat Bay watershed area was last sampled in the water year 2000.

Since the NJDEP initiated its watershed approach to water resources management, this monitoring network has focused its activities in watershed management areas under intensive review by the NJDEP. Meeting the groundwater subgoals/objectives of the NEPPS agreement requires data on groundwater concentrations of nitrates, metals, and VOCs, which are available from this program's database. Network data are available from the following

sources: the USGS computerized data system, WATSTORE; USEPA's computerized data system, STORET; and USGS's annual Water Resources Data - New Jersey reports.

FUNDING AGENCY: S106 Grant.

MONITORING PARAMETERS: Dissolved nutrients, dissolved elements (including metals), VOCs.

STATIONS: 150 stations statewide; 8 stations in the Barnegat Bay watershed area.

FREQUENCY: Annually on a statewide basis, each watershed area is sampled once every five years (Barnegat Bay watershed last sampled in August 2000).

Sample Collection: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: WATSTORE, STORET, Water Resources Data-New Jersey reports.

AMBIENT BIOMONITORING NETWORK

The NJDEP's Bureau of Freshwater and Biological Monitoring's Ambient Biomonitoring Network (AMNET) consists of sampling sites in the Barnegat Bay watershed. The program established sampling stations in every sub-watershed, where the health of in-stream benthic macroinvertebrate communities are evaluated using a USEPA-developed statistical methodology referred to as a Rapid Bioassessment Protocol (RBP). Under the program, drainage basins are sampled for benthic macroinvertebrates on a rotational schedule once every five years. The results of the program have been incorporated into the NEPPS as a primary environmental indicator of water quality impairment. AMNET reports of results are published annually by the Bureau. This program is budgeted at \$3,600 for a two-year period.

FUNDING AGENCY: S106 grant.

MONITORING PARAMETERS: Benthic macro invertebrates.

STATIONS: Over 800 stations statewide.

FREQUENCY: Once every five years.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: STORET, GIS.

ECOREGION REFERENCE STATION PROGRAM

The Ecoregion Reference Station Program (ERS) is used to support surface water quality and biological monitoring network activities of the Bureau of Freshwater and Biological Monitoring by providing a network of biologically nonimpaired reference stations. There are seven stations in the Barnegat Bay watershed. Originally introduced by the USEPA in the 1980s, the Ecological (Eco) Region concept operates under the premise that water bodies reflect the character of the land they drain, and that where sites are physically comparable, chemical and biological conditions should also be comparable. As such, reference sites within a given ecoregion can serve as benchmarks, or yardsticks, for all other stations within the same ecoregion. The reference stations are, therefore, powerful tools in assessing the results from both biological and chemical monitoring stations in the other networks conducted by the Bureau. Programs such as the 305(b) Watershed Initiative, and NEPPS are all supported by this network. Reference site selection is based upon a number of factors, including, but not limited to: good water quality, presence of pollution-intolerant benthic macroinvertebrate species, stable stream banks and channels, the absence of excessive suspended solids/siltation, and the absence of upstream point and non-point sources of pollution.

FUNDING AGENCY: State appropriations.

MONITORING PARAMETERS: Water quality, stable stream banks and channels, absence of excessive suspended solids/siltation, absence of upstream point and nonpoint sources of pollution, presence of pollution (intolerant benthic microorganisms).

STATIONS: 73 biological reference stations since 1989; 7 stations in Barnegat Bay watershed.

MONITORING PROGRAM PLAN

FREQUENCY: Not applicable.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: STORET, GIS.

COASTAL PHYTOPLANKTON MONITORING

Every summer, from May to September, the Bureau of Freshwater and Biological Monitoring, in collaboration with the USEPA Region II, monitors phytoplankton populations in the waters along the 120 miles of New Jersey coastline and in major estuaries, including six stations in the Barnegat Bay watershed. Large-scale blooms of these organisms can produce unsightly and unhealthy water quality, conditions often referred to as red, green, or brown tides depending on the dominant varieties. When these algae die off, their decay uses significant amounts of dissolved oxygen in the water, sometimes reducing the bottom oxygen levels below the minimum necessary to sustain larger organisms, such as fish and shellfish. Some of the species that create algal blooms are known to have potentially harmful effects on humans, either through direct contact, or through ingestion of shellfish that have become contaminated with the microorganisms. Fortunately, New Jersey's harmful algal blooms have not been of the acutely toxic varieties.

The Bureau maintains a network of phytoplankton monitoring stations, sampled biweekly or as needed, in accord with the USEPA helicopter monitoring scheme. The monitoring results are used both to indicate potential blooms, and if they do occur, to provide an estimation of the extent and human health threat of the bloom. The historical data also contribute to our understanding of those species that chronically bloom, and the areas in which they bloom. This monitoring program incurs an expenditure of \$74,000 per year.

FUNDING AGENCY: State appropriations.

MONITORING PARAMETERS: Phytoplankton abundance (harmful algae species only).

STATIONS: 22 stations statewide; 6 stations in Barnegat Bay watershed.

FREQUENCY: Once every two weeks from the end of May to September.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: MS Access.

ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM (EMAP)

This is a nationwide program administered by the USEPA to assess the health of the country's estuaries. Measurements include basic water chemistry, inorganic and organic toxicants, sediment texture, and biodiversity. There are several EMAP sampling locations in the Barnegat Bay region. Sampling locations are not fixed, but instead vary from year to year to accommodate the stochastic sampling design. As of 2001, USEPA Region II is implementing a two-year R-EMAP, or Regional EMAP, study focused specifically on Barnegat Bay. This R-EMAP study will attempt to characterize the ambient conditions of Barnegat Bay using the same parameters as those used in the EMAP protocol.

COASTAL 2000 MONITORING

The Coastal 2000 project is an attempt to assess the condition of the Nation's estuarine waters through a rigorous and statistically valid sampling design. The USEPA is partnering with 24 coastal states, including New Jersey, to examine core indicators of coastal ecosystem health: fish and benthic community structure, sediment and water quality, sediment toxicity, concentrations of contaminants in fish and shellfish, and fish pathology. The New Jersey Marine Sciences Consortium (NJMSC) has been designated as New Jersey's participating agency in this multi-million dollar national coastal assessment project.

In cooperation with the NJDEP, Division of Fish and Wildlife, NJMSC scientists will assess the condition of all of New Jersey's coastal waters, including Barnegat Bay and its tributaries. Collecting the data on the core indicators will provide a valuable picture of the condi-

tion of coastal waters in Barnegat Bay and will provide additional tools to use in ecosystem condition monitoring work, which is aimed at managing and preserving the resources of Barnegat Bay and its watershed.

FUNDING AGENCY: EPA funds.

MONITORING PARAMETERS: Basic water quality (oxygen, salinity, etc.), sediment toxins (inorganic and organic), fish tissue analysis, fish pathology, species diversity (benthic organisms, fish), sediment texture.

STATIONS: 50 stations statewide; ~12 stations in Barnegat Bay (including Little Egg Harbor and excluding Great Bay).

FREQUENCY: First samples taken in August 2000 with a follow-up regimen in the summer of 2001.

SAMPLE COLLECTION: Per methods described in the New Jersey Field Sampling Procedures Manual - 1992, as amended and supplemented.

DATA MANAGEMENT: STORET.

NJDEP LAND USE MAPPING PROGRAM

This program was established by the NJDEP to map land use statewide. The state defines land use as how humans are using the land, including residential land, industrial land, commercial and service use, etc. The NJDEP has either contracted out or partnered with the USGS to have color-infrared aerial photography taken in statewide coverage on an approximately five to ten-year time cycle. This aerial photography has been further processed to produce digital ortho-photography. Based on this aerial photographic data, the NJDEP has contracted out the detailed mapping of land use.

The first land use mapping for the Barnegat Bay watershed is for 1986. This data set has been recently updated with 1995 photography. In addition to mapping land use type, the 1995 data include estimates of impervious surface cover. These two land use maps are

available in digital GIS form from the NJDEP on CD-ROM or directly downloadable through the Internet. The NJDEP has plans to update this data set in 2002-2003. The data set has several applications, including identification of trends in land use and impervious surface cover and identification of watersheds that have the highest potential for NPS pollution inputs to Barnegat Bay.

CRSSA LAND COVER MAPPING PROGRAM

The Rutgers University Center for Remote Sensing & Spatial Analysis (CRSSA) has an ongoing land cover mapping and monitoring program for the Barnegat Bay watershed and adjacent Jacques Cousteau National Estuarine Research Reserve (JCNERR). Land cover represents the biophysical material or features covering the land surface and includes such categories as high intensity development, grassland, and forestland. Greater detail as to the vegetation community or habitat type is also mapped (for example, pitch pine lowland).

Based on satellite imagery, CRSSA has mapped land cover at varying levels of detail for the Barnegat Bay watershed for the years of 1972, 1984 and 1995. CRSSA has plans to update the land cover for the Barnegat Bay watershed in 2001-2002. This data set has several applications, including: identification of trends in land use and impervious surface cover; identification of watersheds that have the highest potential for NPS pollution inputs to Barnegat Bay, and monitoring of habitat loss, alteration and fragmentation.



MONITORING PROGRAM PLAN

9.2.2 OTHER MONITORING PROGRAMS

The following monitoring programs will also provide additional data and/or information for measuring the effectiveness of the action items and for evaluating how well the objectives portrayed in each Chapter of the CCMP are being achieved.

STREAMFLOW MONITORING PROGRAM

As part of its statewide network, the USGS operates a number of sites in the Barnegat Bay watershed where streamflows are measured. These sites include three streamflow-gauging stations and two low-flow partial-record stations. At each of these sites, measurements are made at different intervals and for different purposes. In addition, historical streamflow data are available for three discontinued streamflow-gauging stations and a number of other miscellaneous sites in the watershed.

At streamflow-gauging stations, streamflow is measured continuously (every 15 minutes). Data for one of these sites is transmitted via satellite and is available in real time on the Internet.

Low-flow stations are established to periodically measure flow during conditions that are presumed to represent baseflow.

TIDE MONITORING PROGRAM

As part of its statewide coastal network, the USGS operates a number of sites where tides are measured in the Barnegat Bay watershed. These sites include four tidal crest-stage stations and four tide-gauging stations. At tide-gauging stations, the height of tides is measured on a continuous basis. Tidal crest-stage gauges are located in stream reaches that are affected by the tides and are established to measure the highest stage occurring between site visits.

The tide gauges are linked to the New Jersey Tide Telemetry System operated by the USGS, which con-

sists of tide gauges, tidal-crest-stage gauges, weather sensors, and computer base stations. The system was established to help minimize the extensive damage that can result from flooding in New Jersey's coastal regions and back bays. Also, as the populations of the coastal regions increase, large storms threaten developed areas and timely evacuation of residents is crucial. The telemetry system (electronic equipment that transmits measurements to a base station) that is connected to these gauges transmits measurements of tide levels, air and water temperature, rainfall, wind speed and direction, and barometric pressure directly to the National Weather Service, New Jersey State Police, New Jersey Department of Transportation, and county emergency management agencies. Tide levels are available in real time on the Internet.

GROUNDWATER LEVEL MONITORING

The USGS maintains a network of observation wells in New Jersey for the purpose of monitoring groundwater levels throughout the state. Twenty of these wells are located within the Barnegat Bay watershed. Changes in water levels reflect the general response of the groundwater system to natural climate changes, changes in recharge patterns, and groundwater withdrawals. Automatic water-level recorders are used on 8 of these 20 wells to obtain the continuous, long-term record that is needed to evaluate the effects of climate changes on the groundwater system, to develop a data base that can be used to measure the effects of development, to facilitate the prediction of future groundwater supplies, and to provide data for groundwater-resource management. Water-level extremes recorders are used on five of the wells to determine the highest and lowest water levels occurring between site visits. Periodic manual measurements are made at seven other wells in the watershed.

NEW JERSEY COASTAL PLAIN SYNOPTIC AND CHLORIDE NETWORK

In addition to monitoring short-term water level changes in these wells, the USGS has also documented

the spatial distribution of water levels in the confined aquifers of the New Jersey Coastal Plain on a regular basis since 1978. Every five years USGS personnel measure water levels in approximately 1,000 wells throughout the Coastal Plain over a four- to five-month period in late fall to assess the status of the water supply. Typically about 100 of these wells are located within the Barnegat Bay watershed. The USGS also obtains chloride concentrations from monitoring wells as well as public supply wells to use in mapping and monitoring the aquifer for status of and changes in the chloride concentration. Typically the contours of the 250 mg/l and half seawater concentrations are mapped and documented in the report as well as concentration changes over time at specific wells. Results of these studies have been used by the NJDEP to develop withdrawal regulations and to establish Water-Supply Critical Areas.

TMDL AND EXISTING WATER QUALITY MONITORING NETWORK

The existing USEPA regulations for administering the Total Maximum Daily Load (TMDL) provisions of the Clean Water Act require the state to develop "pollution budgets" or TMDLs for all waters impaired by nonpoint and point sources of pollution. Pollution reductions called for by a TMDL budget are designed to meet certain safe levels of pollutants that allow beneficial uses such as swimming or fishing as established in existing water quality standards. In the Barnegat Bay watershed the time line for the development of TMDLs is to establish these by June 30, 2006.

The water quality monitoring network will be used to supplement the TMDL program. This statewide network will monitor water quality at selected sites for each sub-basin (HUC-11 Areas) within a watershed. There are 15 such HUC-11 areas in the Barnegat Bay watershed. Quarterly sampling will be performed over a two-year period beginning in October 2002 and will run through September 2004. All freshwater and estuarine sites in the watershed will be sampled for specific conductance, pH, temperature, D.O., ammonia and TSS. Freshwater sites will also be monitored for flow and test for sulfate, chloride, TDS, total phosphorus, nitrite and nitrate and total kjeldahl nitrogen. The data will supplement the NJDEP/USGS stream

monitoring network data from approximately 100 sites statewide and aid in determining the parameters for developing TMDLs.

TMDLs for the 15 HUC-11 areas within the Barnegat Bay watershed will be developed through collaborative efforts using staff from the NJDEP and in conjunction with the watershed planning process, which will include input from existing Public Advisory Committees and Technical Advisory Committees.

COLONIAL NESTING WATERBIRD MONITORING

Barnegat Bay supports large and diverse breeding colonies of birds. Twenty species of colonial waterbirds nest within Barnegat Bay-Little Egg Harbor estuarine habitats, including ten species of long-legged wading birds, six species of terns, three species of gulls, and black skimmers. These avifauna are valuable bioindicators of environmental quality, notably the concentrations of chemical contaminants, levels of human disturbance, resource abundance, and habitat health in the system. They feed near the top of the food chain on numerous species of fish and invertebrates.

The New Jersey Department of Environmental Protection, Division of Fish and Wildlife has monitored nesting populations of colonial waterbirds through a combination of ground and aerial surveys for the past two decades. In addition, Dr. Joanna Burger of Rutgers University has conducted comprehensive investigations of colonial waterbird abundance over the same period of time. Regular censusing of shorebirds and seabirds has revealed important long-term changes in population abundance, as well as recent changes associated with the degradation of critical habitat areas. Declines in population abundance of some species during the past two decades have been attributed to the loss of habitat, increased human disturbance, and predation effects (e.g., from herring gulls and red foxes). In addition, the NJDEP regularly monitors other bird populations such as the osprey and the beach-nesting piping plover.

MONITORING PROGRAM PLAN

9.3 DEVELOPMENT OF THE MONITORING PROGRAM PLAN

The Monitoring Plan for the BBNEP will establish a framework to achieve the following objectives:

- Assess the current environmental health and future trends within the Barnegat Bay estuary and watershed project area;
- Assess the effectiveness of CCMP implementation; and
- Allow for re-evaluation of the program's priorities and actions (discussed further in Chapter 12, Implementation).

The Monitoring Plan includes actions to support these monitoring objectives and will determine appropriate environmental indicators and quantitative measures of effectiveness to accurately paint a picture of overall implementation progress. A final monitoring plan will be completed on the basis of monitoring workshops, which are described as an Action Item in this chapter. This and the other Action Items that follow form the underpinnings of a monitoring program in support of the BBNEP's CCMP.

ACTION 9.1

Prepare for and conduct workshops on monitoring, modeling, and research needs.

SIGNIFICANCE OF ACTION: Section 9.2 summarizes ongoing monitoring, modeling and research efforts and needs in New Jersey. These ongoing activities will assist in early implementation of the Environmental Monitoring Plan (EMP). The EMP will target a comprehensive set of environmental measurements (indicators), which the BBNEP would use to evaluate the success of CCMP action implementation:

- Identify any new areas of concern;
- Determine whether implementation has resulted in actual environmental improvements; and

- Provide information to help redirect and refocus the CCMP during implementation.

STATUS: Partial Commitment.

WHO: BBNEP STAC (Lead), NJDEP, USEPA, OCPD.

HOW: The first step in developing a monitoring program is to conduct a needs assessment with the end-users. The BBNEP, working through the STAC, will hold monitoring workshops involving appropriate scientists and managers to formulate a monitoring, modeling and research plan (i.e., the EMP) to address identified needs. At the first workshop, agencies that have responsibility for various environmental monitoring programs in the Barnegat Bay area will share information on their programs, as well as continuing unmet monitoring needs.

Following this first workshop and completion of a needs assessment, another workshop will be held to identify monitoring efforts and evaluate whether they can be part of an integrated monitoring program designed to meet the needs of the BBNEP. Discrete sampling and subsequent chemical analysis in the laboratory are the traditional mainstays of monitoring natural waters. However, a wide variety of monitoring efforts exist for Barnegat Bay that are conducted by myriad federal, state, and local agencies and institutions. These entities use different protocols, monitor for different parameters, and analyze and store their data using different methods and media. Thus, one of the objectives in capitalizing on existing monitoring efforts is to seek agreement on uniform procedures for data collection, analysis, and storage. Finally sampling design, technology and data management requirements must be developed to meet the needs of the user communities. Consequently, the monitoring program must be integrated with the Data Management Plan outlined in Chapter 10.

WHEN: Work on this action is underway and will be completed in spring 2002.

COST ESTIMATE: Approximately \$50,000 for the initial series of workshops.

FUNDING SOURCES: NEP funding, others to be developed.

In addition, the NJDEP has committed to expanding the existing water quality monitoring system to include monitoring stations within each area sub-watershed and to enhance the monitoring to include additional biological and chemical parameters.

ACTION 9.2

Develop and implement a long-term data management strategy.

SIGNIFICANCE OF ACTION: Data management is an important component of a monitoring strategy and plan. The BBNEP will hire a Data Management Coordinator. The BBNEP is seeking commitments from agencies and institutions to help implement the EMP, including data management and hiring of the Coordinator.

A central authority is needed to take charge of data management and oversee input, storage and updating of data from various sources. (See Chapter 10 of the CCMP for details about the Data Management Goals.) This action is intended to identify the entity that will archive key data sets in a manner to facilitate future use.

The data management system should provide:

- Rigorous documentation of data set contents and quality assurance/quality control (QA/QC) procedures. Standardized sampling, analytical methods, and QA/QC protocols should be adopted to ensure that monitoring information collected by the various partners in this effort are of high quality and are directly comparable.
- Easy downloading of data.

A Data Management Coordinator is needed to complete data entry, prepare a report documenting the data sets entered, including a description of the data sets, costs to enter the data sets, and an evaluation of additional data sets to be considered for entry in the chosen system, including costs.

STATUS: Recommendation.

WHO: BBNEP STAC (Lead), NJDEP, USEPA, OCPD.

HOW: The STAC will hold a data management workshop to evaluate data management options that the BBNEP can use to implement a long-term data management strategy. One key part of the data management options evaluation will be a conceptual model of long-term data management, describing how various options relate and how they could be implemented in a step-wise fashion (See Chapter 10).

The BBNEP has begun to identify the long-term data management needs. *These include:*

- Support reporting on the program of CCMP implementation.
- Provide for storage, retrieval, editing, and QA/QC of relevant environmental data, including physical, chemical, and biological data.
- Provide access to all data to the USEPA, NJDEP, other agencies and investigators.
- Provide appropriate tools to users, including a data entry package, statistical package, GIS interface, and STORET (USEPA's data system) interface.
- Provide a full description of data sets, including QA/QC information.
- Provide collections of relevant reference materials at accessible locations (i.e., existing libraries and other locations to be identified).
- Conduct all activities at low cost and with adequate degree of user friendliness.

WHEN: Work on this action will commence upon final approval of the CCMP, or upon commitment by a sponsoring entity, and will be completed within one year.

COST ESTIMATE: Approximately \$20,000 for the workshop.

MONITORING PROGRAM PLAN

ACTION 9.3

Monitor CCMP implementation.

FUNDING SOURCES: Not yet identified.

SIGNIFICANCE OF ACTION: The Clean Water Act (CWA) Section 320(b)(6) specifies that each National Estuary Program (NEP) Management Conference shall "... monitor the effectiveness of actions taken pursuant to the plan," with the following two primary goals:

- Measure the effectiveness of the management actions and programs implemented under the CCMP.
- Provide essential information that can be used to redirect and refocus the CCMP during implementation.

The first primary goal is environmental in nature, and focuses on changes in ambient conditions, ecological functions, and biological populations and communities. The second primary goal is programmatic in nature and addresses CCMP implementation issues. To effectively evaluate the success of the CCMP, it will be necessary to track both the extent to which the actions laid out in the CCMP are being implemented and the environmental effects, or lack thereof, of those implemented actions. This Action Item addresses the environmental monitoring component. Action Item 9.4 will address the programmatic element.

STATUS: Commitment.

WHO: NJDEP (Lead), OCPD, and other technical participants in the Management Conference.

HOW: Participants will monitor the effectiveness of implementation based on achieving the goals, targets, or measures of success defined in the CCMP.

Effectiveness monitoring answers broader ecological questions:

- Is the ecological integrity of the bay and watershed changing?
- Is water quality improving or getting worse, and by

how much?

- Are there any emerging issues not anticipated by the CCMP?
- Are there any new areas of concern (threats) that need to be tracked?

Effectiveness monitoring lends itself more toward an assessment of success in attaining CCMP goals and objectives than to the implementation of specific actions. This type of monitoring requires a statistically sound analysis of environmental data of known quality and confidence.

The environmental monitoring component of the CCMP is designed to utilize monitoring data collected and assessed by participating agencies, so that this information can be directly compared to quantifiable objectives. It builds upon recently conducted characterization studies and existing monitoring efforts. It seeks to promote cooperation among agencies and stakeholders by incorporating and coordinating efforts into an integrated monitoring plan, increasing the scope and resolution of existing efforts, improving the timeliness of data analysis, and making the results available to a diverse group of agencies and stakeholders in a timely manner.

The fully developed monitoring plan will incorporate existing and planned monitoring efforts, or elements from those programs; identify critical information gaps; and attempt to standardize and coordinate future monitoring efforts. This will minimize duplication of effort among agencies, reduce the cost of monitoring, and provide integrated results to the scientific, regulatory, and stakeholder communities in an efficient and timely manner.

PROCESS FOR MONITORING EFFECTIVENESS:

1. Identify use impairments related to water quality and NPS pollution. This can be done using monitoring to document the magnitude of an environmental problem.

2. Trace a water quality problem back to its source. This is accomplished with monitoring on a more localized, targeted, and intensive manner.
3. Correct the problem at its source and monitor effectiveness. Use evaluation monitoring to measure pollution control.
4. Using the monitoring systems described in 1, 2, and 3 above, trace the water quality improvement back to the removal of the use impairment.

This process has already been used with success at certain locations in New Jersey (Navesink River and numerous bathing beaches). Once pollution sources have been identified (for example, through the Natural Resources Inventory (NRI)), there must be the ability to monitor the management measures taken. The NJDEP is preparing an inventory of NPS pollution management measures being implemented throughout the state. This is an important tool that will enhance coordination among the planning, monitoring, and watershed characterization functions in the BBNEP. The type of monitoring program used will depend on the type of management measure.

STRATEGY FOR MONITORING IN BARNEGAT BAY WATERSHED:

1. The NJDEP prepares a listing of impairments (303(d) list) as candidates for NPS monitoring. These are ranked according to severity of impairment.
2. The NJDEP and BBNEP investigate and identify sources and decide on NPS management strategies to address the impairments.
3. The NJDEP's Water Monitoring Management staff reviews the list to determine the type of monitoring that will be necessary to measure effectiveness and the potential cost of monitoring.
4. If the necessary level of monitoring exceeds the existing monitoring programs, funding sources are identified for the new monitoring needs.

5. BMPs are implemented with continued monitoring. Monitoring program results are reviewed annually.

WHEN: Ongoing. Modifications to existing monitoring programs will be initiated following development of an approved monitoring plan and final approval of the CCMP.

COST ESTIMATE: Funding will come from existing program budgets. Modifications to existing programs will be scoped out as necessary.

FUNDING SOURCES: State and federal agency monitoring budgets.

ACTION 9.4

Track CCMP Action Item Implementation.

SIGNIFICANCE OF ACTION: Programmatic implementation monitoring (i.e., tracking progress of Action Items) is the second component of comprehensive BBNEP monitoring, and will help to keep managers informed regarding the implementation status of various programs and the degree to which programs are or are not achieving their intended outcomes. With this information, managers can make needed modifications to the CCMP or to the actions taken to achieve the desired outcomes outlined in the Plan. Where appropriate, resources can be redirected to ensure that desired outcomes are achieved.

Implementation, or programmatic, monitoring is designed to answer such questions as:

- Is the CCMP being implemented at the level of commitment specified in the CCMP goals, targets, and measures of success?
- Was the action taken?
- What were the specific results?
- Was the action able to be implemented?
- Are the actions in the Plan having the desired effects?
- Does the Plan need to be changed?

MONITORING PROGRAM PLAN

Many actions in the CCMP lend themselves to this type of administrative monitoring. Implementation monitoring establishes accountability on the part of the designated lead organizations for specific actions outlined in the CCMP. It can also be used to verify whether an educational outreach program has reached its target audience.

STATUS: Commitment.

WHO: The BBNEP Program Office (Lead), OCPD.

HOW: The CCMP Tracking System is intended to track action items scheduled for implementation. The tracking will occur by priority issue, specifically: (1) Water Quality/Water Supply; (2) Habitat and Living Resources; (3) Human Activities and Competing Uses; and (4) Public Outreach and Education. Users of the system will be involved in providing reports to the Barnegat Bay Program Office. The reports will provide the basis for annual and triennial reporting by the Program Office.

General capabilities:

- Priority Action Item tracking
- Dates
- Deliverables
- Payment schedule
- Budget tracking
- Program budget
- Other sources of funding
- Link to BBNEP Web site and partner Web sites

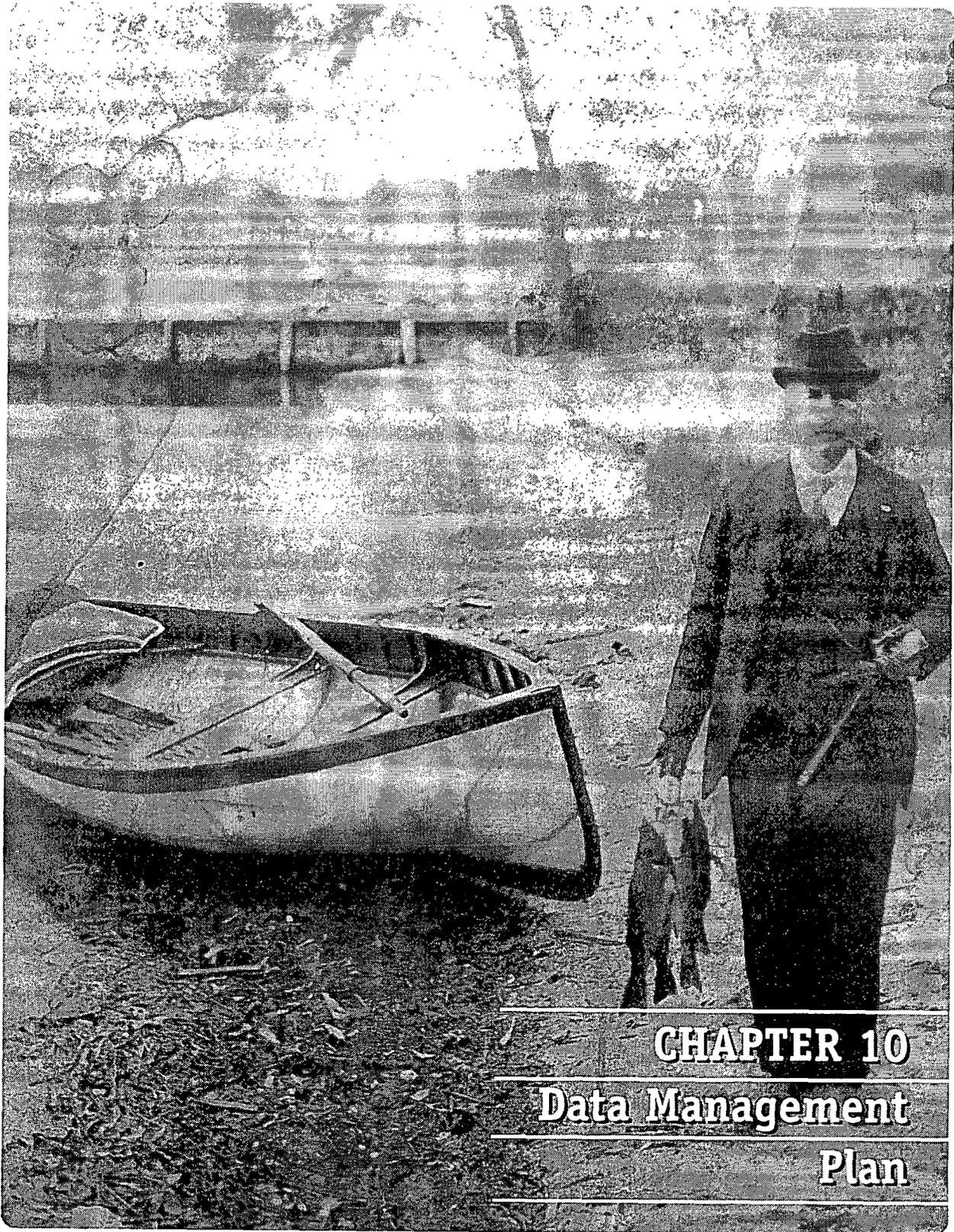
WHEN: Work on this action will commence upon final approval of the CCMP.

COST ESTIMATE: \$20,000 is budgeted for initiation of work.

FUNDING SOURCES: NEP program funding.

A more detailed and updated addendum to the *Monitoring Program Plan (2003)* can be found at our website, www.bbep.org or by calling the Barnegat Bay National Estuary Program office.





CHAPTER 10
Data Management
Plan

PHOTO COURTESY OF THE TOMS RIVER SEAPORT SOCIETY.

All streams flow into the sea,
yet the sea is never full.
To the place the streams come from,
there they return again.

--Ecclesiastes 1:7

10.1 DATA MANAGEMENT

Residents and visitors to Barnegat Bay represent many diverse interests, each of which have different information needs. These groups include but are not limited to:

- Homeowners;
- Local elected officials;
- Federal, state, and local watershed managers;
- Academia;
- Pre-college educators and students;
- Visitors and vacationers;
- Special-interest groups; and
- Business and industry.

Although substantial information exists on the ecology and resources of Barnegat Bay, much of this information is scattered, exists in many diverse forms or formats, and is not generally accessible to the groups listed above. The objective of the Data Management Action Plan for Barnegat Bay is to archive diverse data sets and make these data available in easily accessed computer format via the Internet and the Ocean County library system.

This data management system will be used to inform, guide, and improve local decision making, foster stewardship of the bay, raise environmental awareness, enrich educational programs, support the public outreach effort, and implement the Barnegat Bay CCMP. Where possible, the data management system will build upon the existing capacities of large-scale data management programs and will include historical, cultural, and socioeconomic information, as well as data on the estuary's physical and biological resources. As funding permits, the data management system will include an interactive multimedia component that enables users to access frequently updated information from remote sites.

10.2 DATA MANAGEMENT GOALS

As a result of a needs assessment, five goals for a suitable data management system for Barnegat Bay have been identified. They are:

- Develop a comprehensive database that enables user groups to readily access information that can be used to support BBNEP management goals and objectives.
- Link information management with the BBNEP public outreach effort to promote interaction among bay user groups and to disseminate information broadly.
- Manage and classify information from many sources and formats.
- Identify the equipment needs, delivery systems, personnel requirements, and a dedicated funding source that ensures broad public dissemination of Barnegat Bay information.
- Support an environmental monitoring program for assessing water quality and living resources of the bay.

10.3 SYSTEM ELEMENTS

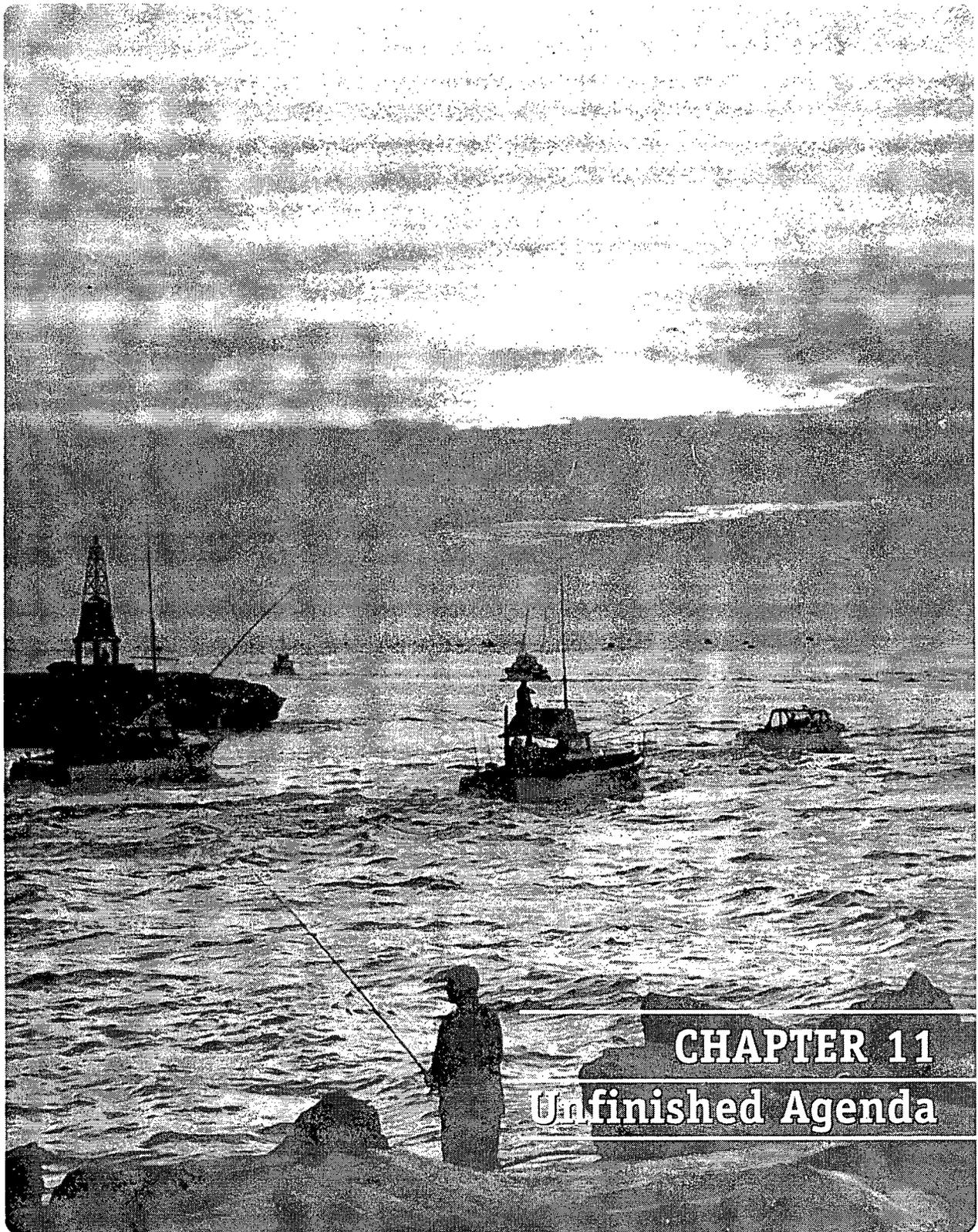
This data management system is designed to put different types of relevant information into an accessible location for many users and, where appropriate, present users with information that describes the quality or utility of the data.

A key feature of the Barnegat Bay Information System and Resource Guide will be its capacity to provide data spatially and temporally from disparate data sets. The data system will include a data server connected to the Internet with World Wide Web access, file transfer protocol (FTP), e-mail, and bulletin boards. Local storage of data sets and programs also must be accommodated and is described in more detail on the following page:

- **World Wide Web access for the public** – The site will have links to data sets stored on a BBNEP server and to non-local data sets. The site will also have links to sites at the NJDEP, USEPA, Grant Walton Center for Remote Sensing and Spatial Analysis at Rutgers University, USGS, and Ocean County. Multimedia capacity will allow use of a full range of data visualization for both technical and non-technical users. Hot links also will be available to relevant sites, such as the BBNEP homepage.
- **Computer bulletin boards to foster information exchange** – Bulletin boards will be organized by topic, and will enable users to electronically disseminate their work on the estuary and watershed.
- **FTP** – Establishment of File Transfer Protocol (FTP) capabilities will enable easy transfer of documents and files between Internet users.
- **E-mail** – E-mail capability will permit the convenient exchange of information among users who will be able to interface with the Web site in order to communicate with the Web manager and other data sources.
- **On-line data sets and information files** – Where necessary, data sets developed during the BBNEP characterization and synthesis phase will be stored on-line.
- **Information sources index and index of on-line and off-line files** – This index will provide brief descriptions of estuary and watershed data, including the temporal and spatial ranges of data sets, information on how to obtain files, data sources, and metadata.
- **Geographic Information System (GIS)** – Geographic information on land use, land cover, water resources, and living resources will be presented in a GIS format.
- **Distributed Data System** – A distributed data system will be constructed to access data sets that have various formats and are at various locations, eliminating the need to modify the disparate formats.

10.4 NEXT STEPS

Following the completion of the final Monitoring Plan, the BBNEP STAC will hold a data management workshop to evaluate options for a long-term data management strategy. The purpose of the workshop is to gather technical input and recommendations from stakeholders. The results of the workshop will ultimately be used to fully develop and implement the data management plan, which will be contingent on appropriate funding to maintain the system.



Fishing the estuary, circa 1940s. PHOTO COURTESY OF TOMS RIVER SEAPORT SOCIETY.

CHAPTER 11
Unfinished Agenda

We're all downstream.

*--Margaret and Jim Drescher,
Windhorse Farm, Nova Scotia*

11.1 INTRODUCTION

The BBNEP Management Conference members recognized that scientific and policy issues that would emerge, both during the characterization phase and the development of CCMP action plans, would have to be addressed after the CCMP was completed. It was also recognized that new issues would be identified during the CCMP public review process. There are a number of issues that are potentially significant in terms of maintaining the water quality and living resources of Barnegat Bay and its watershed, but that are insufficiently documented to justify specific actions to address them. The purpose of this Unfinished Agenda chapter is to lay out these remaining issues, which will be addressed by the BBNEP and the Program Monitoring Plan after the publication of the CCMP.

11.2 DATA GAPS

Significant gaps in the scientific understanding of the Barnegat Bay estuary and its watershed and its response to environmental stressors have been identified by the Management Conference. Information is lacking on certain basic estuarine processes as well as on the cumulative environmental effects of pollutant loadings on these processes. A recommendation for additional research and policy initiatives emerged over the last four years as the Management Conference evaluated concerns, resource and funding needs to adequately carry out certain actions, and current and future priorities.

The Science and Technical Advisory Committee (STAC) identified the following projects to address data gaps for the Barnegat Bay estuary and watershed.

**FISH AND FISHERY RESOURCES OF
BARNEGAT BAY: A Plan for Long-Term
Data Gathering**

Recently, few assessments have been undertaken to evaluate the status of fishery resources in Barnegat Bay. Given the declining status of many fisheries, and the lack of information to support informed fishery

management programs, it is necessary to assess the seasonal availability, species composition, and habitat use patterns associated with finfish and blue crab resources in Barnegat Bay in order to develop an appropriate strategy for fishery resource management.

**PREDATOR-PREY INTERACTIONS BETWEEN
BLUE CRABS AND HARD CLAMS in the
Little Egg Harbor Portion of Barnegat Bay**

Hard clam abundance has declined significantly in Barnegat Bay since the 1960s. Potential reasons for this decline range from reduced larval settlement, the closure of shellfish grounds because of poor water quality, to an increase in predation. To ensure a sustainable stock of clams, this proposal aims to determine the array of natural predators that juvenile clams face and the factors governing predator-prey interactions.

**BAY SCALLOP RESTORATION AND
ENHANCEMENT in Barnegat Bay**

The bay scallop is a common and often abundant member of shallow marine communities along the Atlantic and Gulf coasts. Bay scallops recruit to seagrasses and use them as attachment sites, so the decline of seagrass habitat has severely limited bay scallop populations in some areas, such as Barnegat Bay. Although eelgrass has recovered in Barnegat Bay from a previous low point, bay scallop densities remain low. This proposal aims to reseed selected sites throughout Barnegat Bay with bay scallops to determine the potential for restoring this fishery.

SEDIMENT CONTAMINATION/TOXICITY

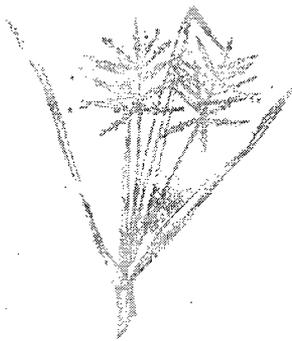
Little is known about the distribution, concentration, or toxicity of sediments throughout Barnegat Bay. Such information is needed for future bay management if sediment contamination or toxicity is found to be significant. This proposal aims to analyze benthic infaunal communities as an indicator of sediment toxicity.

UNFINISHED AGENDA

BROWN TIDE INCIDENCE AND DEVELOPMENT in Barnegat Bay

Brown tides, caused by the minute alga, *Aureococcus anophagefferens* have been recurring since 1995 in the Barnegat Bay and other coastal bays in New Jersey. While there are no known human health effects, brown tide blooms may cause significant negative ecological impacts to shellfish and sea-grasses. Elevated concentrations of brown tide blooms may cause cessation of feeding in hard clams, mussels and bay scallops and cause a reduction in growth and/or mortalities and recruitment failure in shellfish. Prolonged blooms of greater than one month may produce enough shading to damage eelgrass beds.

In June 1999, a massive brown tide bloom was reported in Little Egg Harbor and southern Barnegat Bay. Because of limited data on brown tide blooms, the NJDEP's Division of Science, Research and Technology established the Brown Tide Assessment Project in 1999. Systematic monitoring for brown tides began in 2000 and continued in 2001 to assess the spatial and temporal distribution of brown tide blooms. Recently, the NJDEP has begun to analyze the brown tide data using a newly developed Brown Tide Bloom Index, and has found that the highest cell concentrations are found in Little Egg Harbor, Great Bay (the next coastal bay to the south), and southern Barnegat Bay. The results to date indicate that additional monitoring, assessments and research are needed to more comprehensively document the negative impacts of brown tide blooms on natural resources. Continued monitoring of selected stations is also needed, but not yet funded, to assess brown tide concentrations and the water quality/environmental factors that may promote and sustain brown tide blooms in the Barnegat Bay, Little Egg Harbor and other coastal bays.



ESTABLISHMENT OF A SUBAQUEOUS SOIL CLASSIFICATION SYSTEM FOR EFFECTIVE MANAGEMENT OF SHALLOW-WATER HABITAT in Barnegat Bay

The purpose of this study is to develop information on the properties of subaqueous and tidal soils in order to enhance the re-establishment of emergent and submerged vegetation. Emergent and submerged vegetation provide nutrients and shelter for finfish and shellfish, and help to mitigate shoreline erosion.

SEDIMENTS AND GEOMORPHOLOGY of Barnegat Bay

Barnegat Bay is comprised of a variety of sediments and sedimentary features that support diverse habitat assemblages. A detailed characterization of these features can be used to develop a better understanding of habitat value and its relationship to water quality, and to prepare a sea level rise curve for the bay.

NONPOINT SOURCE TOXICS in Barnegat Bay and the Surrounding Watershed

The lack of data on toxic chemical compounds in groundwater and streams contributing freshwater inflow to Barnegat Bay could be improved by expanding ongoing efforts aimed at quantifying nonpoint source contaminants. Current studies focus on the evaluation of nutrients, sediment, and bacteria in surface waters that originate from nonpoint sources. Additional samples could be analyzed for volatile organic compounds, pesticides, and/or trace elements.

ECONOMIC VALUATION of Barnegat Bay Resources

Very little information is available on the natural resource value of Barnegat Bay and its surrounding watershed. Data do exist on the economic impact of activities occurring throughout the bay, such as boating, fishing, and tourism. However, the resources upon

which these activities rely – open space, habitat quality, and water quality – are not easily quantified. Efforts are needed to define the value of the bay's natural resources in terms that can be used to support informed decisions on the future character of Barnegat Bay.

EFFECT OF ATMOSPHERIC POLLUTANT LOADINGS on Barnegat Bay and Watershed

Airborne pollutants reach coastal New Jersey from continental, regional, and/or local origins. Understanding patterns of deposition from vehicular, industrial, and agricultural operations, and the proportional influence of local and out-of-state atmospheric sources, is essential for developing a comprehensive watershed-based management strategy for Barnegat Bay.

The New Jersey Atmospheric Deposition Network includes nine sites where concentrations of organic, metal, and nutrient constituents are measured in wet and dry deposition. Designed by university scientists, the air-monitoring stations have been operating for several years. Preliminary results suggest that atmospheric deposition (precipitation, air-water and air-soil/vegetation exchange, as well as dry particle deposition) may be important pollutant sources to the region's coastal waters. These efforts provide evidence of seasonal and spatial variations in concentration, deposition, and exposure, and serve as the basis for characterizing sources and source strengths, and sub-regional, regional, and long-range transport.

The atmosphere is an important pathway for pollutants entering the coastal zone. Results of previous studies suggest that dry deposition by aerosol particles and wet deposition via precipitation are both important atmospheric deposition mechanisms. These studies also verify that air emissions of toxic compounds from urban/industrial centers enhance the atmospheric deposition fluxes to nearby coastal waters such as the Barnegat Bay and its watershed.

Current studies under way in New Jersey are designed to characterize atmospheric inputs of metals, organics, and nitrogen to New Jersey coastal waters, including:

- Fluxes of polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH), and chlordanes across the air-water interface of the Hudson River Estuary;
- Atmospheric deposition of mercury, trace metals, and nitrogen to the New York-New Jersey Harbor/Bight;
- Atmospheric nitrogen deposition to Barnegat Bay;
- Air-sea exchange of PCBs and PAHs in New Jersey coastal waters; and
- Estuarine eutrophication; that is, seasonal cycles of the contribution of dissolved organic nitrogen from nonpoint and point sources.

In coastal ecosystems like Barnegat Bay, which are experiencing rapid development, atmospheric emissions may result in increased deposition of toxic and nitrogenous species. Diffusive air-water exchange of persistent pollutants may be an important process contributing to, and sometimes dominating, the input, output, and control of, aquatic concentrations in freshwater, estuarine, and marine components of the bay-watershed complex.

The research under way, and concurrent collection of atmospheric deposition data at a regional network of monitoring stations, will ultimately be used to address the question: Are atmospheric loadings a significant proportion of inputs to the watersheds and estuaries of New Jersey? If the answer is yes, then management strategies to reduce the adverse effect of these loadings will become an important part of future contaminant reduction schemes.

The air emissions data will ultimately be incorporated into multimedia models developed to estimate waste load allocations for dischargers into coastal waters; to support long- and short-term dredged material management planning efforts; and to track down significant sources of airborne pollutants. For Barnegat Bay, answers to the following questions must be sought:

- What is the state of current knowledge regarding the significance of airborne pollutants and their impacts on Barnegat Bay?

UNFINISHED AGENDA

- What are the substantive gaps in knowledge concerning the effects of airborne pollutants on the bay?
- How can the data be used to develop science-based management tools?
- How can the data be placed into a regulatory framework?

Eventually, the collected air data must be made available in a form that environmental managers can use in decision-making.

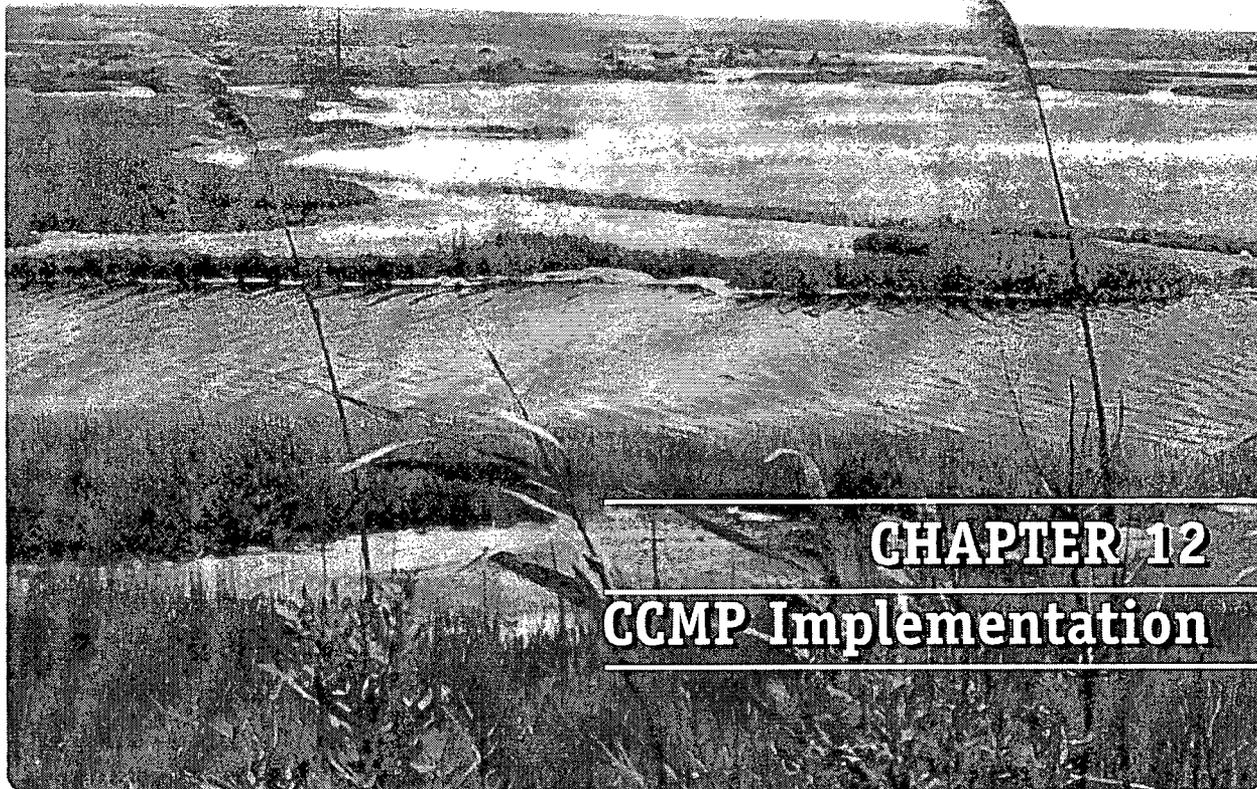
11.3 ADDITIONAL RESEARCH NEEDS

Additional data gaps to be addressed include:

- Periodic updating of the BBNEP data synthesis report.
- Identification of the source of phosphorous inputs to Barnegat Bay.
- Conducting a toxics assessment for Barnegat Bay.
- Quantification of riverine inputs to Barnegat Bay.
- Identification of factors controlling turbidity in Barnegat Bay.



Elgrass harvest goes to market. PHOTO COURTESY TUCKERTON SEAPORT, A PROJECT OF THE BARNEGAT BAY DECOY AND BAYMEN'S MUSEUM, INC.



CHAPTER 12
CCMP Implementation

Clam beds seen from Seven Bridges Road, spring 2001. PHOTO BY C. MINERS

Water and air, the two essential fluids
on which all life depends,
have become global garbage cans.

--Jacques Cousteau (1910-1997)

12.1 OVERSIGHT OF THE CCMP

The Management Conference (see Appendix D for Management Conference membership) considered several options for implementation of the CCMP. One of the key questions addressed was: "What form of CCMP oversight authority is appropriate and necessary to coordinate implementation, evaluate progress, and revise the CCMP as new information and priorities emerge?"

The functions that the Management Conference considered to be the most important for the BBNEP to undertake in the implementation phase are to:

- Prioritize and oversee progress toward implementation of each Action Plan.
- Facilitate integration of various portions of the CCMP into policies, plans, budgets, laws, regulations, and actions of each participating agency or organization.
- Coordinate ongoing evaluations of the effectiveness of the CCMP and corrective actions in improving the environmental quality of the Barnegat Bay watershed.
- Provide a forum for public participation and education on CCMP implementation and progress.
- Consider and address future estuary/watershed needs and emerging environmental issues.
- Develop annual work plans and budgets to support the post-CCMP organizational structure and to implement CCMP actions.

The following options for a post-CCMP implementation organization were:

- **The N.J. Department of Environmental Protection (NJDEP) as Lead Entity** - The NJDEP Division of Watershed Management would continue its current responsibility for staffing BBNEP, taking on the additional role of overseeing CCMP implementation.
- **Ocean County as Lead** - Ocean County would manage CCMP implementation. Due to the CCMP's regional scope, Ocean County would be favorably inclined to coordinate the full range of implementa-

tion actions through agreements it would make with other agencies.

- **Retain the Current BBNEP Management Structure** which was in effect when the draft CCMP was released in May 1999. This structure consists of a Policy Committee, a Management Committee, and a Program Office housed in the Ocean County Planning Department. Program staff consisted of a Program Director, who was an NJDEP employee, and program staff, who were contractors.

After consideration of these options, and upon approval of the CCMP, Ocean County will become the lead agency for day-to-day CCMP implementation. The Management Conference structure selected is illustrated in Figure 12-1. The Policy Committee will continue in its present form to oversee implementation progress, the Management Committee will be renamed the Estuary and Watershed Advisory Committee, and the Program Office will be housed in Ocean County. A more detailed discussion follows.

Ocean County is well equipped to support CCMP implementation because it can provide:

- Contacts with the public, private, and non-profit agencies;
- Central office space for BBNEP staff;
- Financial and legal resources;
- Secretarial and printing services; and
- A central mailroom with mail services.

PRIMARY ACTIVITIES OF OCEAN COUNTY WOULD INCLUDE: "housing" the Barnegat Bay Program Office; supporting a full-time Program Director, a Public Outreach Coordinator, and Program Associate; and other essential activities. Ocean County has obligated \$250,000 as an initial commitment to the BBNEP CCMP implementation. It will be the responsibility of the Program Director to work with the Chairs of all committees and agency representatives to achieve the goals of the CCMP. The Director will regularly brief the Advisory and Policy Committees on Program progress and problems, and receive guidance from them. The subsequent sections in this chapter more fully discuss the implementation structure.

CCMP IMPLEMENTATION

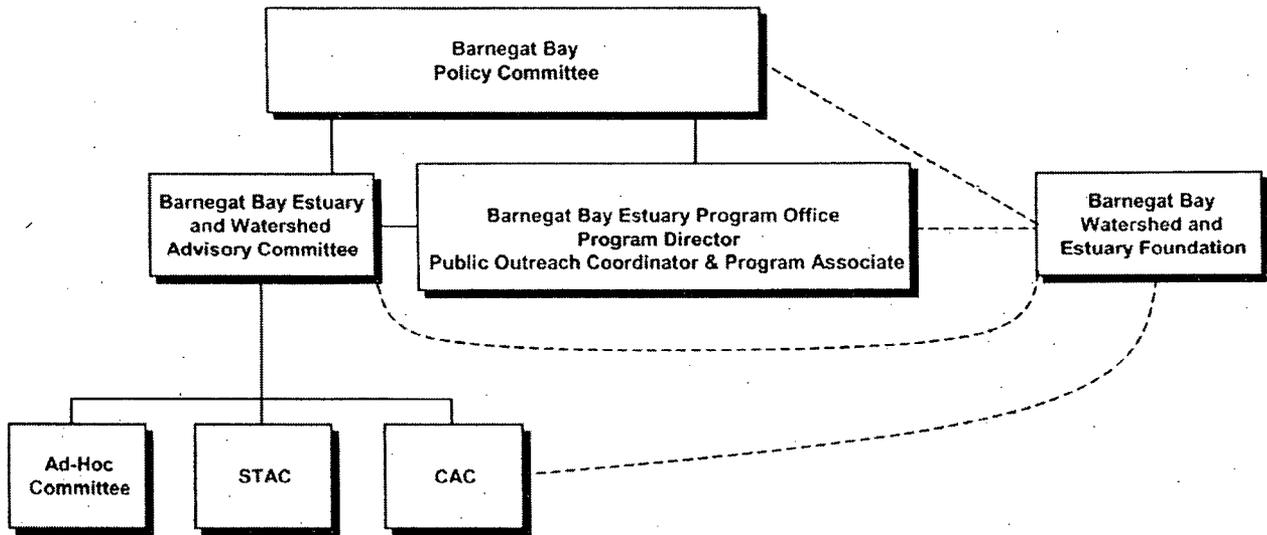


Figure 12-1. Barnegat Bay National Estuary Program Implementation Organizational Structure.

NOTE: The Barnegat Bay Watershed and Estuary Foundation, a 501(c)(3) non-profit, is an independent entity that can interact with any other part of the Implementation Structure. The CAC has not remained active beyond the completion of the CCMP. The Program will work with the Barnegat Bay Watershed and Estuary Foundation to ensure the necessary input from the general public on implementation activities.

12.2 IMPLEMENTATION MEETINGS

The Management Committee will be renamed the Barnegat Bay Estuary and Watershed Advisory Committee and will meet on a quarterly basis to review progress of Action Plans, identify issues requiring resolution, and introduce new initiatives. A chair will be selected by the committee membership, which will retain the same representation as during the planning phase.

A Policy Committee representing the U.S. Environmental Protection Agency (USEPA), NJDEP, Ocean County freeholders, local governments, and citizens will meet yearly, or more often as needed, to assist in resolving issues in contention, approve annual budgets and work plans, and to review progress. The same entities as these represented during CCMP development will be represented in the implementation phase.

The Science and Technical Advisory Committee (STAC), Citizens Advisory Committee (CAC), and work groups will meet, as necessary, to fulfill their responsibilities to implement and oversee actions within their purview. The BBNEP will formally report to the USEPA and the

public on CCMP progress, and will update the CCMP on an annual basis. Every two years, an expanded report will be delivered to USEPA, as per National Estuary Program requirements.

12.3 AGENCY PARTICIPATION

The CCMP identifies a wide range of entities, both public and private, to implement specific actions. Some actions already have firm commitments for implementation; others are still at the recommendation stage. As the process moves from plan development to plan implementation, it is essential that those entities identified with significant implementation responsibilities be represented on the Advisory Committee. The Advisory Committee would review its membership to identify those entities with implementation responsibility that are not adequately represented on the Management Conference and solicit their active participation.

The best way to ensure efficient operation of government is to increase the coordination and cooperation of existing agencies. Each agency should fulfill its responsibilities without duplicating the efforts of other agencies. Rather than creating another layer of government, the BBNEP will take advantage of existing resources and staff and establish connections between public and private interests and all levels of government. It will guide the implementation process to ensure the highest level of cooperation and coordination among interested parties.

12.4 WATERSHED-BASED PLANNING AND IMPLEMENTATION

Since the geographic scope of the Barnegat Bay system is very large, the BBNEP would develop and implement programs at the lowest appropriate level, from municipal to regional.

- The BBNEP will review other state, regional, and local plans, and identify opportunities to work with sponsoring entities wherever collaboration could benefit the Barnegat Bay watershed.
- The BBNEP will identify the need for additional watershed-based plans and seek appropriate local sponsors.

12.5 BARNEGAT BAY WATERSHED AND ESTUARY FOUNDATION

The BBNEP will support the Barnegat Bay Watershed and Estuary Foundation in its funding efforts to implement appropriate recommended CCMP actions. The Foundation, comprised of a broad representation of interests, will be responsible not only for raising and expending funds for specific activities during BBNEP implementation, but also for providing technically based assessments of CCMP implementation actions. In addition, the Foundation will be apolitical in the sense that it will not be subject to the changes in public sector support that could come about as the result of electoral and political appointment processes.

12.6 BBNEP POST-CCMP IMPLEMENTATION STRUCTURE

Ocean County will have the primary responsibility for coordinating CCMP implementation actions and facilitating a long-term effort to protect Barnegat Bay and its watershed. After final approval of the CCMP, Ocean County will initiate coordination of program activities. Ocean County will consult with the Policy Committee before hiring program staff.

The Citizen Advisory Committee will be convened on an ad hoc basis, and will work together with the Barnegat Bay Watershed and Estuary Foundation and the BBNEP Public Outreach Coordinator.

12.6.1 BBNEP PROGRAM OFFICE

In order to reinforce the autonomy and separate identity of the BBNEP Management Conference and ensure continuing staff support, the BBNEP Program Office will be "housed" at Ocean County College, but will not be directed by the College.

Staffing will consist of a full-time Director, a Public Outreach Coordinator, and Program Associate. The Director will provide the Policy and Advisory Committees with regular briefings on Program progress and problems. Other support staff may also be recommended by the Advisory Committee.

The following are the responsibilities of the BBNEP Program Office:

- Assure autonomy and visibility of the Program Office.
- Develop and update agreements among implementing parties to ensure political and funding support and implementation schedules, and to ensure federal agency consistency with the CCMP (see Appendix E for the Federal Consistency Review).
- Oversee progress toward implementation of the Action Plans.
- Work with other agencies and organizations to facilitate integration of appropriate portions of the CCMP into policies, plans, budgets, laws, regulations, and actions of each agency or organization.

CCMP IMPLEMENTATION

- Coordinate ongoing evaluations of the effectiveness of CCMP actions in improving the quality of the Barnegat Bay and its watershed, and recommend corrective actions as needed.
- Provide a public forum for public participation and education. The BBNEP will conduct public education, outreach, and involvement programs targeting the region's estuarine and watershed resources.
- Consider and address future needs and emerging issues with respect to the Barnegat Bay watershed's balanced use, protection, and where possible, restoration.
- Develop an annual workplan and budget to support implementation of the CCMP Action Plans.
- The BBNEP will develop a strategic financial long-term CCMP funding.
- Support the efforts of the Barnegat Bay Watershed and Estuary Foundation to implement various actions in the CCMP.
- Prepare the implementation review report to the USEPA.
- Develop indicators to monitor success and track implementation of CCMP actions.

12.6.2 PROGRAM DIRECTOR

The Program Director will take guidance and general direction from the BBNEP Management Conference and will supervise staff in the Program Office. Responsibilities will include:

- Evaluate and report progress toward CCMP implementation.
- Set up and coordinate agenda development for the Barnegat Bay Estuary and Watershed Advisory Committee meetings and Policy Committee meetings. Work with the Chairs of these committees to facilitate implementation of the CCMP and to resolve obstacles which would impede progress.
- Oversee administration.
- Assist the Barnegat Bay Watershed and Estuary Foundation to raise funds and develop grant proposals.

- Develop and implement public information and education programs, and coordinate public relations.
- Act as liaison to Ocean County, its municipalities, and others on environmental issues associated with Barnegat Bay and its watershed.
- Prepare triennial implementation reviews on behalf of the Program.
- Prepare an annual workplan and budget to ensure NEP and other funding is incorporated into the BBNEP budget.
- Serve as an advocate for the NEP and resource for the NEP approach to other neighboring watersheds.

12.6.3 POLICY COMMITTEE

Responsibilities for the Policy Committee include the following:

- Approve annual budget and workplan.
- Develop new action items or policy initiatives that develop during program implementation.
- Ensure commitment among implementing authorities for action implementation and scheduling.
- Assist in securing long-term funding commitments.
- Promote the BBNEP to a statewide and nationwide audience.
- Mediate issues of disagreement among BBNEP participants.

12.7 TRACKING INFORMATION

Reporting on the status of CCMP implementation, and redirecting effort as needed, is crucial to its successful implementation. CCMP progress or success will be measured two ways.

- Review of Action Items to determine whether CCMP commitments have been met.
- Measure effectiveness of actions in meeting program goals.

- Review of progress using appropriate environmental indicators to determine whether Barnegat Bay and its watershed are responding as expected to pollution controls, and whether unanticipated environmental problems are emerging.

12.7.1 FRAMEWORK

The CCMP provides a framework for tracking progress and success:

- Each Action Item in the CCMP identifies what is to be done, by when, and by whom. The BBNEP would review these commitments periodically and recommend mid-course corrections as needed.
- The Environmental Monitoring Plan (Chapter Nine) includes a process to periodically measure and report on a number of environmental indicators of the success of CCMP implementation. This activity will be the responsibility of the Program Director, with data provided by the partnership of participating agencies.

This activity will be the responsibility of the Program Director, with data provided by the partnership of participating agencies.

12.7.2 IMPLEMENTATION REVIEW

On a regular schedule determined by the EPA, the BBNEP will augment the annual progress report to include a full account of the status and effectiveness of CCMP implementation, measured by the environmental outcomes tracked through implementation of the BBNEP's Environmental Monitoring Plan. As in the annual progress report, the implementation review submission would include commitments for redirection of efforts as needed; these will be subject to public review.

12.7.3 ANNUAL PROGRESS REVIEW

The most critical stage of the Barnegat Bay management program is implementation. Without carefully planned and monitored implementation, the goals of the management plan may not be achieved. A progress

review will allow Ocean County, or any interested party, to comment on the implementation process. It also allows corrections or changes to be made as necessary. The annual progress review will help Ocean County to assess the effectiveness of the CCMP. This review will determine if CCMP goals are being met in a manner that is proactive, cost effective, and equitable.

There are two critical steps in the progress review process:

- Each participating agency, institution, and organization will submit annual reports evaluating the progress made in implementing CCMP recommendations and the success of implementation strategies. The BBNEP members would report on progress made by their agencies, institutions, and organizations. They will then assess the success of the implementation strategies based on the recommendations of the implementing organizations.
- An annual progress report will be developed by the BBNEP and will include the success of the implementing organizations. The report will be distributed to the public and any adjustments to the strategy or structure necessary to improve success will be made.

12.7.4 ASSESSMENT OF ESTUARINE/WATERSHED HEALTH

Assessing the success of the implementation of the CCMP also requires monitoring of the environment and a thorough evaluation of the results. The CCMP must be flexible to adapt to changes in watershed conditions. Data gathered on the state of water quality, habitats, and fisheries may be used to adjust strategies as necessary.

The critical steps in the environmental health assessment are:

- The Scientific and Technical Advisory Committee will report on monitoring efforts such as water quality monitoring from the NJDEP and the U.S. Geological Survey, monitoring of fish stocks and habitats by the National Oceanic and Atmospheric Administration (NOAA), and other activities by other appropriate agencies. Information and

CCMP IMPLEMENTATION

environmental trends developed by these agencies will be presented to the BBNEP for review and integration into its annual assessments.

- Data obtained by monitoring reports will be used by the BBNEP to assess the effectiveness of management actions and identify target areas requiring further action.
- Ocean County will support and enhance public outreach and education efforts on the BBNEP implementation progress as outlined in the public outreach strategy (Chapter 8).

12.8 FINANCING THE BBNEP

The NEP provides funding of the development of CCMPs under Section 320 of the Clean Water Act. The EPA will provide \$300,000 (subject to long-term funding availability) per year to Ocean County to support BBNEP program staff, BBNEP office expenses, and other implementation needs. Ocean County has committed at least \$250,000 annually to support the BBNEP Program Office. When appropriate, the BBNEP will in turn encourage the Barnegat Bay Watershed and Estuary Foundation to carry out unfunded CCMP actions, as they are mutually supported. The ability of the BBNEP to achieve its goals and objectives, and the pace at which progress is made, will clearly be a function of the availability of additional funding from state and other sources, including a non-profit foundation.

In recognition of the substantial public and private interest in the protection and restoration of Barnegat Bay and its surrounding watershed, the BBNEP supports implementation through a combination of strategies involving existing programs that are already funded, as well as additional resources, including funding and in-kind donations for project implementation and program enhancement.

12.8.1 FINANCIAL STRATEGY

The cost of ongoing and proposed CCMP actions will be significant. This section presents an overview of the BBNEP plan for financing. Funding to cover the costs of restoration and protection efforts must be provided primarily by federal, state, and local governments, in

partnership with the private sector. The CCMP includes the costs of Plan implementation as follows:

- **ACTION PLANS** - The Action Plans (Chapters 5-8) describe detailed committed or recommended actions and associated costs and funding sources for each individual Action Item.
- **FINANCIAL PLANNING** - This section provides specific information on existing funding sources which are available to underwrite current and future Action Items (Chapter 12).
- **BASE PROGRAMS** - This section describes existing federal and state programs and their role in funding and implementing the CCMP.

The primary objective of this section of the CCMP is to recommend that:

- Federal, state, and local environmental programs continue to be funded at current levels (at a minimum). The NJDEP is involved in more actions, by far, than any other agency. Therefore, it is particularly important to continue base program funding for this agency at current levels (at a minimum).
- The BBNEP seeks additional funds for project implementation and program enhancements. The BBNEP will work with other partner agencies to seek implementation-funding commitments.

There are a number of continuing funding programs that can be tapped to fund individual actions in this CCMP. Since funding availability is often determined by annual appropriations, however, and the funding sources are not exclusively for the use of BBNEP implementation, or even necessarily for Ocean County, firm commitments for funding multi-year actions through these sources cannot be made immediately. The BBNEP will work with sponsoring implementing agencies to secure the necessary funds and track the progress through programmatic monitoring and periodic reports. Where possible, each Action Item contains associated implementation costs and identifies a committed or recommended funding source to support action implementation. The BBNEP, in cooperation with the USEPA and the NJDEP, will continue to develop and update this management plan based on updates of the CCMP and any changes in funding sources. The finan-

cial plan includes a specific focus on the opportunities for local governments to play a lead role in implementing improvements. The State of New Jersey is committed to providing technical and financial assistance to local governments in this effort.

To fund implementation and special projects, the BBNEP, in cooperation with the USEPA and the NJDEP, will recommend the funding of specific projects using special legislative authorizations and appropriations and statutes, such as:

- N.J. Corporate Business Tax
- N.J. Clean Vessel Program
- CIBA Fund
- Trust for Public Land
- Ocean County Natural Lands Trust
- Barnegat Bay Ecosystem Restoration Project
- 319(h) Nonpoint Source Management
- 604(b) Planning
- Other funding sources outlined later in this chapter.

12.8.2 COSTS SUMMARY

The CCMP includes commitments and recommendations for enhancements to base programs which entail additional funding. Firm commitments to fund some of these actions exist. Other actions are called recommendations because the responsible entities require additional resources to implement the action. The BBNEP will work to make these additional resources available.

While the proposed CCMP was undergoing public review, there was a concurrent review by the entities that have implementation responsibilities. This resulted in the confirmation or addition of many commitments. Through program implementation, the BBNEP will work with appropriate entities to confirm commitments to the actions specified in this document and, to the extent possible, to turn recommendations into commitments. In preparing the final CCMP, many estimated costs and target dates for the completion of commitments and recommendations were refined by the BBNEP Management Conference. The BBNEP will continue to refine this information.

Total CCMP Implementation costs are summarized below.

- Commitments for enhanced program funding total about \$9,000,000 over the next four to six years.
- Recommendations for enhanced program and new project funding are approximately an additional \$8,000,000 over ten years.

12.8.3 CURRENT FUNDING

Current funding opportunities for actions within the CCMP are presented below.

BASE PROGRAM FUNDING

Base programs are those program actions that can be funded within the existing programmatic support of the implementing entity. In many cases, these actions are ongoing elements of agency work plans; in other cases the actions can be accomplished by refocusing agency activities without identifying funding. The BBNEP has not estimated costs for individual base program actions since these actions are accomplished within existing programs and work plans. The CCMP includes numerous commitments on behalf of USEPA, NJDEP, Ocean County, other federal, state and county agencies, local governments, and other implementing entities to continue the implementation of ongoing programs. These commitments assume that base programs continue to be funded, at a minimum, at current levels. The BBNEP recommends that federal, state, county, and local governments continue to fund agency programs at current levels. USEPA and NJDEP are committed to many of the actions in this plan. It is therefore particularly important to continue base program funding for these agencies, at a minimum, at current levels.

- **Dedicated Federal Funding for Implementation Start-up.** USEPA's intent is generally to provide several years of post-CCMP funding to each NEP; this is contingent upon sufficient annual funding and adequate progress in implementing actions described in annual work plans. The BBNEP will receive at least \$300,000 per year in NEP funds each year, subject to availability of funds in USEPA appropriations during implementation, based on progress made in CCMP implementation. An annual workplan developed by the Management Conference (or its successor) must be submitted to the

CCMP IMPLEMENTATION

USEPA to support the annual funding allocation. These funds require a 50 percent non-federal match. Priorities for the use of these funds include support of the BBNEP office (or its successor), state and county staff support, and education/outreach actions.

- **Federal Statutes Other Than the Federal Clean Water Act.** Federal programs, other than the Clean Water Act, can provide sources for financial and technical support of CCMP actions. Funding specific Actions under non-Clean Water Act statutes, such as the Coastal Zone Management Act, the Clean Vessel Act, the TEA-21, and others.
- **Public Sector Funding for Program Enhancements and Projects.** Additional government agencies at all levels may be able to provide funding/resources to implement CCMP actions. The BBNEP will seek government agency funding for program enhancements and projects mentioned in this CCMP. The BBNEP will develop a list that matches CCMP recommendations with mission/authorities of various government agencies.
- **New and Existing Non-Profit Organizations to Fund Implementation Actions.** Funding for proposed CCMP actions need not always be provided by government agencies. There are individuals and corporations interested in making contributions to implement estuary and watershed protection, preservation and restoration efforts. Non-profit organizations under section 501(c)(3) of the Internal Revenue Code are ideally suited to receive such contributions and disburse funds for the purposes of furthering their missions as well as the BBNEP mission. The Barnegat Bay Watershed and Estuary Foundation has been incorporated specifically to help support implementation of the BBNEP CCMP. The Barnegat Bay Watershed and Estuary Foundation is an outgrowth of the Barnegat Bay Watershed Association, which represented the environmental interests of the public within the watershed. The Foundation has restructured the previous Watershed Association by diversifying its Steering Committee membership to include all stakeholder groups and by adopting 501(c)(3) status. The missions of some other existing non-profit organizations overlap that of the BBNEP, and these organizations are actively engaged in estuary

protection efforts. BBNEP will encourage all non-profit organizations to help fund appropriate CCMP actions.

To accomplish this, the BBNEP will:

- Identify CCMP actions that may be appropriate for funding by non-profit organizations. Examples include research studies, environmental monitoring, and educational programs.
- Identify existing non-profit organizations with missions that overlap with the BBNEP.
- Develop interest from non-profit organizations to work in partnership with the BBNEP to identify those actions they can implement.
- Work with interested non-profit organizations to develop a coordinated strategy to further mutual goals, including: soliciting private sector funds; funding appropriate CCMP actions; and including non-profit organization activities in CCMP updates.

501(c)(3) non-profit organizations can be important partners in implementing CCMP actions. The BBNEP will: (1) identify actions suited for funding by non-profit organizations, identify existing non-profit organizations with missions that overlap BBNEP's and seek expressions of support from them, and work with interested organizations to further mutual goals and solicit private sector funding; (2) support the Barnegat Bay Watershed and Estuary Foundation (BBWEF) as a means to administer funding of specific Barnegat Bay Estuary Program activities. The ultimate intent is to develop significant support for CCMP implementation through corporate and foundation funding.

IDENTIFY ADDITIONAL FUNDING SOURCES

Many actions in the CCMP are recommendations. Implementation of these actions is crucial to achieve the BBNEP's goals and will require resources beyond those currently identified by the USEPA. The BBNEP's strategy to identify potential funding sources and to seek additional funding is described on the next page.

Because of the important role local governments may have in implementing many of the actions in this CCMP, the BBNEP continues to consider the ability of

local governments to pay for projects prior to their implementation. The BBNEP and participating agencies will:

- Assure that local governments are effectively involved in the Management Conference and aware of CCMP actions that may impact them.
- Actively work with local governments to assure their understanding, and gain their support, of the environmental benefits of proposed projects.
- Continue to develop cost estimates for project implementation, and refine and update cost estimates as necessary.
- Actively work with local governments to identify and obtain funding.
- Foster the development of low-cost approaches to address environmental problems and implement such approaches whenever possible. (For example, encouraging non-structural, low-tech, and low-maintenance means to reduce runoff and pollutant inputs.)

12.8.4 ADDITIONAL FUNDING OPPORTUNITIES

THE NEW JERSEY CLEAN WATER STATE REVOLVING FUND

The New Jersey Clean Water State Revolving Fund (CWSRF) is a financing tool available to coastal managers and NEPs to implement water quality projects. Though traditionally used to offset the costs of wastewater treatment improvements, the CWSRF is intended to fund all types of water quality projects. Eligible loan recipients include communities, counties, sewage and utility authorities, individuals, citizen groups, and non-profit organizations. Nationally, the CWSRF program issues about \$3 billion per year. The New Jersey CWSRF programs are set up like a bank, using federal and state contributions to issue low-interest loans, allowing funds to be repaid over periods of up to 20 years, and recycling the money back to support other water quality improvement projects. The Clean Water State Revolving program's primary mission is to promote improvements in water quality. In addition to financial savings, loan recipients can realize significant environmental benefits, including protection of public health and conservation of

local watersheds. Loans for such infrastructure projects also tend to stimulate local economies by encouraging commercial development and construction.

Many county and local water quality officials are more familiar with grants and, consequently, may not be utilizing this valuable financial resource. The benefits of the low or no-interest loan are:

- *Little or no cash up front.* Most grant programs require significant cost shares of as much as 40 percent or more. A CWSRF loan can cover 100 percent of project costs with no cash up front. While a loan could be for as little as a few thousand dollars, program experience indicates that capital expenditures of \$200,000 or more are best suited for this loan program.
- *Significant Cost Savings.* CWSRF loans provide significant cost savings over the life of the loan. A CWSRF loan at 2.5 percent interest will cost approximately 25 percent to 30 percent less than the same project funded at the market rate of 5.5 percent to 6 percent. A major benefit for municipalities and other loan recipients is the substantial savings they can realize. When funded with a loan from this program, a project's financing costs are much lower than if funded through the bond market. Combined projects are possible.
- *Streamlined Federal Requirements.* Financing a project with a CWSRF loan means fewer federal requirements than most federal grant programs. Plus, the CWSRF program staff is experienced in helping applicants through the loan application process. Loan funds may be used to better the quality of watersheds through a wide range of water-quality related projects; loans may also be used for the protection of groundwater resources.

Projects or activities listed in the approved CCMP are eligible for funding under the CWSRF. Nonpoint source and other estuary protection projects/activities eligible for funding include:

- Structural erosion controls.
- Septic system upgrades or replacements.
- Stormwater and runoff management facilities.

CCMP IMPLEMENTATION

- Water body restoration.
- Runoff control (urban, rural, and agricultural).
- Stream stabilization.
- Storm sewer maintenance equipment.

Eligible nonpoint source projects include virtually any activity that a state has identified in its nonpoint source management plan. Estuary management projects may also include providing marine pumpout facilities.

SOURCES OF LOAN REPAYMENT: Many users of the CWSRF have demonstrated a high level of creativity in developing sources for their loan repayment. The source need not come from the project itself. Some possible sources include:

- Stormwater utility fees (fees charged per household for stormwater system use);
- Fees paid by developers on other lands;
- Dedicated portion of local, county, and state tax fees;
- Property owner's ability to pay;
- Donations or dues made to nonprofit groups and associations;
- Stormwater management fees;
- Wastewater user charges.

CONTACT:

New Jersey CWSRF Program at:
Municipal Finance and Construction Element
New Jersey Department of Environmental Protection
P.O. Box 425
East State Street
Trenton, New Jersey 08625
Att: Mr. Nicholas Binder, Assistant Director
(609) 292-8961
www.state.nj.us/dep/

THE TEA-21 TRANSPORTATION ENHANCEMENT PROGRAM

The Federal Highway Administration (FHWA) administers program grants pertaining to the new TEA-21 legislation and is responsible for evaluating applications for eligibility. To be considered eligible for funding, a project must

fall into one or more of the following categories:

- Scenic or historic highway programs and provision of tourist and welcome center facilities.
- Landscaping and other scenic beautification.
- Mitigation of water pollution due to highway runoff.
- Environmental mitigation to reduce vehicle-caused wildlife mortality while maintaining habitat connectivity.

Also, all improvements funded through this program must be available for public use.

Sponsors from one of the three categories must submit applications:

- County, municipality, city, town, or village in New Jersey;
- Another state agency (other than N.J. Department of Transportation);
- An Authority (this includes, by extension, other public and quasi-governmental agencies that have the authority to enter into a binding contract (agreement) with the State of New Jersey.).

Applications for funding may be developed by a non-profit incorporated group, for example, a historic preservation society. All applications, however, must be sponsored by one of the three groups mentioned above.

FUNDING PROCESS: The TEA-21 Transportation Enhancement Program is a federal reimbursement program, not a grant program. The program also requires the project teams to share in the cost of each project by providing a minimum-matching share of at least 20 percent of the total project cost. To lessen the financial burden of this requirement, FHWA is allowing alternative sources of funding to augment the matching share. These are:

- Sponsor/project team cash.
- Private donations of cash to the team.
- Public or private donations of right-of-ways that are an integral component of the project.
- Other federal funds (non-FHWA).
- Other state funds or other agency or legislative initiatives (member items).

SPECIAL PROJECT CATEGORY: Mitigation of Nonpoint Source Water Pollution Due to Highway Runoff

This category is limited to facilities and programs to minimize pollution from stormwater runoff from roadways that have a functional classification other than local roads, and that are in addition to current requirements and procedures for such mitigation. Eligible activities in this category include the development of programs to mitigate highway runoff pollution and the planning, design, and construction of the mitigation facilities themselves. The preferred type of facility uses natural systems for treatment, is self-maintaining, is aesthetically pleasing, and ecologically valuable.

Eligible activities in this category are:

- Environmental restoration and pollution abatement projects (including the retrofit or construction of stormwater treatment systems) to address water pollution or environmental degradation caused or contributed to by transportation;
- Creation of wetland(s), adding vegetated ditches, detention basins, or other permanent filtering systems to filter highway runoff in a sensitive area;
- Planning, design, and construction of mitigation facilities;
- Installation of drainage facilities to restore original drainage patterns to wetlands degraded by highway excavation and fill;
- Installation of a berm or closed drainage in close proximity of drinking water wells to prevent salt intrusion.

CONTACT:

New Jersey Department of Transportation
Bureau of Environmental Services
609-530-2824

NEW JERSEY CLEAN VESSEL ACT PROGRAM

The federal Clean Vessel Act of 1992 was passed to provide funds to states for the construction, renovation, operation, and maintenance of pumpout stations and dump

stations and for implementation of boater education programs. Funding for the Clean Vessel Act comes from the Sport Fish Restoration Account of the Aquatic Resources Trust Fund, commonly referred to as the Wallop-Breaux Fund. This fund results from an excise tax on fishing equipment, a tax on electric trolling motors and sonar fish finders, a portion of the federal motorboat fuel tax, and import duties on fishing tackle and pleasure boats.

Studies conducted in New Jersey in the mid-1980s documented the need for additional dockside disposal facilities for boat sewage. The Clean Vessel Act has allowed New Jersey to deal with this concern by providing funds to develop an updated assessment of the need for additional facilities. This includes implementation of a plan for the construction, renovation, operation, and maintenance of pumpout stations, waste reception facilities, and sewage pumpout boats, as well as the implementation of a boater education program related to vessel-generated wastes.

Funding for the New Jersey Clean Vessel Act Program is being provided by the U.S. Fish and Wildlife Service (USFWS) and the NJDEP. The program is administered as a partnership between the USFWS, the NJDEP Division of Fish, Game, and Wildlife, the New Jersey Marine Sciences Consortium, the New Jersey Sea Grant Marine Advisory Service of Rutgers Cooperative Extension, the Marine Trades Association of New Jersey, and other interested public and private entities.

In New Jersey, the Clean Vessel Program provides 100 percent of the costs to install sewage pumpout facilities. Seventy-five percent of this funding comes from the federal Clean Vessel Act, and twenty-five percent comes from the state's "Shore-to-Please" license plate fund.

CONTACT:

NJDEP
Division of Fish, Game, and Wildlife
New Jersey Clean Vessel Program
609-748-2020

New Jersey Marine Sciences Consortium
732-872-1300

New Jersey Marine Trades Association
732-206-1400

CCMP IMPLEMENTATION

OCEAN COUNTY NATURAL LANDS TRUST FUND PROGRAM

The voters of Ocean County approved a referendum in November of 1997 to preserve natural lands, open space, and farmland. The program would be funded through a 1.2 cent assessment per \$100 of equalized real property value. The referendum was approved in each of the county's 33 municipalities. The Ocean County Board of Chosen Freeholders subsequently established the Natural Lands Trust Fund (NLTF) Program and appointed a nine-member advisory committee to prepare an open space plan and advise on the acquisition of property. The Ocean County Planning Department (OCPD) administers the NLTF program. The program is used to acquire undeveloped lands for the purposes of preserving and protecting environmentally sensitive areas, natural areas, open spaces, and farmland. The benefits of the program include the protection of stream corridors, water supply areas, natural lands, agricultural uses, buffer areas, and aquifer recharge areas.

The NLTF Advisory Committee began work on an open space plan during the spring of 1998. The resulting Program Document was adopted by the Board of Chosen Freeholders on September 2, 1998. The document establishes the guidelines for the acquisition of natural parcels and farmland development easements.

Lands acquired through the program essentially remain in their natural states. They must be free of any significant disturbance or contamination. Proposals that include the restoration of certain disturbed natural areas are also considered.

Only passive, low-intensity activities are permitted on acquired parcels. Public access and limited development opportunities are allowed to support permitted activities consistent with the conservation value of the property. These activities include, but are not limited to, trail development and maintenance, installation of benches and trash receptacles, and the construction of limited parking areas. Approval from the local municipal governing body is required before any parcels are acquired under the Natural Lands Program. All parcels purchased exclusively with NLTF funds will be owned by Ocean County. However, the program can be used

to provide matching funds for the acquisition of parcels by other agencies or organizations. The future monitoring and management responsibilities for all parcels will be determined prior to acquisition.

Farmland will be preserved through the acquisition of development easements. Farmland will remain in private ownership and no public access will be afforded through this program. All nominations for the preservation of farmland must first be submitted to the Ocean County Agriculture Development Board for review and recommendation.

Nominations to the NLTF Program can be submitted at any time. A completed nomination form is required to formally start the process. However, the OCPD staff can provide an initial assessment of a parcel's eligibility prior to the submittal of a nomination form.

The NLTF Committee usually meets monthly. The meetings are advertised in advance and open to the public.

CONTACT:

Ocean County Planning Department
732-929-2054

FUNDING THROUGH THE WATERSHED PROTECTION AND MANAGEMENT ACT OF 1997

In 1998 Governor Christine Whitman signed the "Watershed Protection and Management Act of 1997." This Act dedicates the equivalent of 4 percent of the revenues annually generated by the New Jersey Corporation Business Tax for financing the costs of hazardous discharge site remediation, upgrading hazardous underground storage tanks, water quality point and nonpoint source pollution monitoring, watershed-based water resource planning and management, and non-point source pollution prevention projects. This Act stipulates that of the 4 percent dedicated for these purposes, a minimum of one-sixth, or a minimum of \$5,000,000, whichever is less, is annually dedicated for the purposes of water quality point and nonpoint source pollution monitoring, watershed-based water resource planning and management, and nonpoint source pollution prevention projects.

Chapter 12

The NJDEP Division of Watershed Management currently administers the state's water quality planning, monitoring, permitting, and enforcement programs, as part of the department's watershed initiative, which links these programs to the watershed-based planning approach.

Watershed management activities can include funding for projects undertaken by the department, the New Jersey Pinelands Commission, or a "Watershed Management Group" to improve the condition or prevent further degradation of a watershed. This can include, but need not be limited to, the following:

- Public meetings to discuss and exchange information on watershed issues;
- Establishment and operation of a stakeholders advisory group or groups dedicated to preserving and protecting a watershed;
- Monitoring, water quality modeling, or assessment of the condition of a watershed;
- Development of projects designed to enhance or restore a watershed;
- Development, in consultation with the NJDEP, of a watershed management plan, or the reassessment of a management plan that has been completed and is being implemented.

The Barnegat Bay watershed is identified as Watershed Management Area Number 13 (WMA-13) by the NJDEP. A Watershed Management Area means a geographic area in the state, as designated by the NJDEP, within which may be found one or more watersheds.

A Watershed Management Group means a group recognized by the NJDEP as the entity representing the various interests within one or more watersheds located in a Watershed Management Area and whose purpose is to improve the condition or prevent further degradation of a watershed or watersheds. A Watershed Management Group is eligible to receive Corporate Business Tax funding (through the Watershed Management Fund) to carry out implementation of its management plan.

The Watershed Management Fund will be established as a non-lapsing, revolving fund in the NJDEP. The fund is

credited annually with all monies appropriated pursuant to the requirements of the law. Any interest that accrues on monies in the fund shall be credited to the fund. Monies in the fund can be used for activities associated with implementation of watershed management plans. Through this fund, the NJDEP has established a loan and grant program to assist Watershed Management Groups in the funding of watershed management activities. A Watershed Management Group may apply to the department for a loan or grant. The application shall state the objectives of the group, including the watershed activities proposed and which loan or grant monies are requested.

PURPOSE OF FUNDING: To provide grants to implement best management practices, innovative measures, and other nonpoint source controls to guide the development of nonpoint source water quality improvement efforts within the 20 watershed management areas in New Jersey.

SOURCE OF FUNDING: The Watershed Management Act of 1997 provides approximately \$100,000 per year. Section 319(h) of the Clean Water Act also provides funding. Available federal funds are approximately \$950,000 and are dependent upon the annual federal appropriations.

STATUTORY CITATION: 1987 federal Clean Water Act and the 1990 Coastal Zone Act Reauthorization and Amendments.

WHO IS ELIGIBLE: Regional comprehensive planning or health organizations and coalitions (formal or informal) of municipal and county governments and/or local and county environmental commissions, watershed and water resource associations and non-profit organizations 501(c)(3), including, but not limited to, the following: municipal planning departments or boards, health departments or Boards, county planning departments, designated water quality management planning agencies, state and regional entities entirely within New Jersey, state government agencies, universities and colleges, federal government, interstate agencies of which New Jersey is a member, and intrastate regional entities.

QUALIFICATIONS REQUIRED FOR CONSIDERATION: Applicant must submit a project that meets the objectives and project criteria as outlined in the "Request for Proposals."

CCMP IMPLEMENTATION

GRANT LIMITATIONS: Limited to eligible costs as defined in the Request for Proposals. Applicant must provide matching funds in an amount equivalent to at least 20 percent of the total project amount requested. This may be cash or in-kind services. A 25 percent cash match is required for projects on private lands. Grant money is paid out quarterly upon submittal of project update.

APPLICATION PROCEDURES: Announcement to receive the Request for Proposals published in the New Jersey Register and Watershed Focus Newsletter, and mailed to all municipalities.

APPLICATION DEADLINE: As published in the New Jersey Register with the notification of the application period.

NOTIFICATION DATE: No later than June 30.

CONTACT:

Kimberly Cenno
Division of Watershed Management
PO Box 418
Trenton, NJ 08625-0418
Telephone: (609) 292-2113
e-mail address: kcenno@dep.state.nj.us

COASTAL BLUE ACRES GRANTS AND LOANS

PURPOSE OF FUNDING: To acquire storm-prone land and storm-damaged property for storm protection and recreation and conservation purposes.

SOURCE OF FUNDING: 1995 Green Acres Bond Act Program is administered by the Green Acres Program.

STATUTORY CITATION: P.L. 1995, C. 204.

WHO IS ELIGIBLE: Municipalities and counties located in the state's coastal area as defined and delineated in P.L. 1973, C.185 (C.12:19-4). Projects limited to certain coastal areas.

QUALIFICATIONS REQUIRED FOR CONSIDERATION: Must submit a complete application. Applications are evaluated based on ranking criteria established by the bond act.

GRANT LIMITATIONS: 75 percent grant/25 percent loan for a pre-storm project. 50 percent grant/50 percent loan for a post-storm project.

APPLICATION PROCEDURES: There is an established application process. Technical assistance by program staff is available upon request.

APPLICATION DEADLINE: October 31, annually (depending on available funds for pre-storm projects). Post-storm projects based on coastal storm event.

NOTIFICATION DATE: Spring of following year for pre-storm projects.

CONTACT:

Gary Rice, Chief
NJDEP-Green Acres Program
Bureau of Green Trust Management
PO Box 412
Trenton, NJ 08625-0412
Telephone: (609) 984-0570

COUNTY ENVIRONMENTAL HEALTH ACT GRANTS

PURPOSE OF FUNDING: To support environmental health services undertaken by certified local health agencies on behalf of the NJDEP pursuant to the County Environmental Health Act, *N.J.S.A. 26:3A2-21*, et seq.

SOURCE OF FUNDING: Dependent upon state appropriation funds made available to the program.

STATUTORY CITATION: P.L. 1977, c.443, as amended by P.L. 1991, c.99. *N.J.S.A. 26:3A2-21*, et seq.; *N.J.A.C. 7:1H-1*, et seq.

WHO IS ELIGIBLE: Certified local health agencies only.

QUALIFICATIONS REQUIRED FOR CONSIDERATION:

Applicant must have the NJDEP certification pursuant to P.L. 1977, c.443 (*N.J.S.A. 26:3A2-21*, et seq.) and have approved workplan pursuant to *N.J.A.C. 7:1H-1*, et seq.

GRANT LIMITATIONS: Calendar year grants are awarded annually; 50 percent match required. Grants awarded for pilot projects do not have a match requirement.

APPLICATION PROCEDURES: Certified local health agencies must attend the annual fall grant conference and submit a grant application.

APPLICATION DEADLINE: December 1, annually.

NOTIFICATION DATE: April 1 of the following year.

CONTACT:

Deborah M. Pinto, Chief
NJDEP-Enforcement Coordination
Office of Local Environmental Management
PO Box 422
Trenton, NJ 08625-0422
Telephone: (609) 292-1305

SHORE PROTECTION GRANTS AND LOANS

PURPOSE OF FUNDING: To protect existing development from sea-level rise and shoreline migration through dune creation and maintenance, beach fill projects and repair of existing shore protection structures.

SOURCE OF FUNDING: Beaches and Harbor Fund and Shore Protection Fund. Funds have been provided by Shore Protection Bonds issued in 1977 and 1983 and by state appropriation in 1988. Recent funds have been appropriated through the Shore Protection Fund of 1992. Contact program administrator for details.

STATUTORY CITATION: *N.J.S.A. 13:1D-1*, et seq. Shore Protection Bond Act. Appropriations under specific chapters 356, P.L. 1983; c. 103, P.L. 1984; c. 103, P.L. 1985; and c. 94 P.L. 1986; *N.J.S.A. 13:19-16.1* Shore Protection Fund.

WHO IS ELIGIBLE: Municipalities and counties; local cost share 25 percent. Loans available for the 25 percent local share.

QUALIFICATIONS REQUIRED FOR CONSIDERATION:

A ranking list has been prepared based on need; the N.J. Shore Protection Master Plan, 1981; damage from the December 10, 1992 storm, and U.S. Army Corps of Engineer (USACE) studies and projects.

GRANT/LOAN LIMITATIONS: Amount varies upon need. Grantee must match 25 percent/75 percent.

APPLICATION PROCEDURES: Contact program administrator.

APPLICATION DEADLINE: None.

CONTACT:

George Caporale, Manager
NJDEP-Engineering and Construction
Bureau of Coastal Engineering
1510 Hooper Avenue
Tomis River, NJ 08753
Telephone: (908) 255-0767

1992 DAM RESTORATION AND INLAND WATER PROJECTS LOAN PROGRAM

PURPOSE OF FUNDING: Low-interest loans to assist in the funding of dam restorations, flood control projects, water pollution control projects, and water-related recreation and conservation projects.

SOURCE OF FUNDING: 1992 Dam Restoration and Clean Water Trust Fund.

STATUTORY CITATION: Green Acres, Clean Water, Farmland and Historic Preservation Bond Act of 1992, P.L. 1992, c. 88. Program Rules, *N.J.A.C. 7:24A-1.1*, et seq.

WHO IS ELIGIBLE: Local government units, private lake associations or similar organizations, and owners of private dams as co-applicants with a local government unit.

QUALIFICATIONS REQUIRED FOR CONSIDERATION:

Applicant must have a project that meets the objectives of the program as defined in the program rules.

LOAN LIMITATIONS: Limited to eligible costs as defined in the program rules.

APPLICATION PROCEDURES: Application periods will be established from time to time. Notification will be published in the *New Jersey Register*. Contact the Dam Safety Section for more information and application forms.

CCMP IMPLEMENTATION

APPLICATION DEADLINE: As published in the *New Jersey Register* with the notification of the application period.

CONTACT:

NJDEP-Engineering and Construction
Dam Safety Section
PO Box 419
Trenton, NJ 08625-0419
Telephone: (609) 984-0859

GREEN ACRES GRANTS AND LOANS

PURPOSE OF FUNDING: To acquire and/or develop municipal or county land for public recreation and conservation purposes.

SOURCE OF FUNDING: 1983, 1987, 1989, 1992, and 1995 Green Acres/Green Trust bond issues (revolving fund). Available funding varies each year based on loan repayments and interest payments.

STATUTORY CITATION: *N.J.S.A.* 13:8A, et seq.

WHO IS ELIGIBLE: Any municipality or county.

QUALIFICATIONS REQUIRED FOR CONSIDERATION: Must submit a completed application. There must be no outstanding compliance problems. Applicant must meet technical eligibility requirements (program specific).

GRANT/LOAN LIMITATIONS: Differ from year to year depending on funds available and total applications received.

APPLICATION PROCEDURES: There is an established application process. Technical assistance by program staff is available upon request.

APPLICATION DEADLINE: October 31, annually.

NOTIFICATION DATE: Spring of the following year.

CONTACT:

Gary Rice, Chief
NJDEP-Green Acres Program
Bureau of Green Trust Management
PO Box 412
Trenton, NJ 08625-0412
Telephone: (609) 984-0570

1996 BOND ACT/ LAKES RESTORATION PROGRAM

PURPOSE OF FUNDING: To improve the water quality of New Jersey lakes.

SOURCE OF FUNDING: "Port of New Jersey Revitalization, Dredging, Environmental Cleanup, Lake Restoration and Delaware Bay Economic Development Bond Act of 1996." A total of \$5 million is available.

STATUTORY CITATION: P.L. 1996, C. 70.

WHO IS ELIGIBLE: Municipal, county, regional, and state government agencies, or private lake owners with a local government unit as a co-applicant.

QUALIFICATIONS REQUIRED FOR CONSIDERATION: Public lakes must be owned, leased or managed by a local government agency. Private lakes need a local government agency as a co-applicant. State-owned lakes are also eligible.

GRANT LIMITATIONS: Up to 50 percent funding available for Phase I Diagnostic-Feasibility Project and up to 75 percent funding available for Phase II Implementation Projects.

APPLICATION PROCEDURES: Application consists of a Project Workplan for either a Phase I Diagnostic-Feasibility Project, or a Phase II Implementation Project.

APPLICATION DEADLINE: Two rounds of funding are anticipated. The deadline for the first round of funding is 30 days after final adoption of *N.J.A.C.* 7:9-2. The deadline for the second round of funding is December 31.

NOTIFICATION DATE: Thirty days after completed application is submitted.

CONTACT:

Bud Cann, Supervising Environmental Specialist
Division of Science and Research
PO Box 427
Trenton, NJ 08625-0427
Telephone: (609) 292-0427

PINELANDS INFRASTRUCTURE TRUST FINANCING PROGRAM

PURPOSE OF FUNDING: To provide funding for wastewater treatment facilities needed to accommodate existing and future needs in the 23 designated Pinelands Regional Growth Areas. Funding is available for the construction of new collection systems, interceptors, and the expansion and/or upgrading of wastewater treatment facilities.

SOURCE OF FUNDING: The Pinelands Infrastructure Bond Act of 1985 provided \$30 million as a source of funding for such projects. Projects certified generally receive a grant for 40 percent of the allowable project cost and a loan of 20 percent of the allowable project cost in accordance with project cost estimates contained in the Pinelands Infrastructure Master Plan. Planning and design costs are also eligible for funding under this program.

STATUTORY CITATION: P.L. 1985, c. 302.

WHO IS ELIGIBLE: Local government units, including municipalities and regional sewerage or utility authorities, may be eligible for assistance.

QUALIFICATIONS REQUIRED FOR CONSIDERATION: Eligibility to receive funding is determined according to the ranking criteria presented in the Pinelands Infrastructure Master Plan.

GRANT/LOAN LIMITATIONS: Local unit must provide for ineligible cost and may be required to provide that portion (typically 40 percent) of the allowable cost, which the grant/loan does not cover.

APPLICATION PROCEDURES: Eligible entities should contact the N.J. Pinelands Commission in order to have a potential project included in the Master Plan. Provided the project is of high priority and funds are available, the applicant will then be required to satisfy the NJDEP-established requirements.

APPLICATION DEADLINE: Varies from funding cycle to funding cycle.

NOTIFICATION DATE: Varies.

CONTACT:

Nicholas G. Binder, Assistant Director
NJDEP-Municipal Finance and
Construction Element
PO Box 425
Trenton, NJ 08625-0425
Telephone: (609) 292-8961

RECYCLING EDUCATION GRANTS

PURPOSE OF FUNDING: To provide community education and promotional programs on recycling.

SOURCE OF FUNDING: This is a revolving fund. The Recycling Tax expired December 31, 1996. The amount available will be based on the distribution of the fund balance.

STATUTORY CITATION: N.J.S.A. 13:1E-96, et seq. (P.L. 1987, c. 102).

WHO IS ELIGIBLE: County governments, nonprofit organizations, and state colleges and universities.

QUALIFICATIONS REQUIRED FOR CONSIDERATION: All counties are eligible.

GRANT LIMITATIONS: Awards are based on county census.

APPLICATION PROCEDURES: Program announcement and procedures are sent to the counties and to previously funded non-profit organizations.

CCMP IMPLEMENTATION

APPLICATION DEADLINE: Grant deadlines are published in program announcements and are sent directly to applicants.

NOTIFICATION DATE: Varies.

CONTACT:

Guy J. Watson, Chief
NJDEP-Division of Solid and Hazardous Waste
Bureau of Recycling and Planning
PO Box 414
Trenton, NJ 08625-0414
Telephone: (609) 984-3438

MATCHING GRANTS FOR LOCAL ENVIRONMENTAL AGENCIES

PURPOSE OF FUNDING: Assist local environmental commissions and soil conservation districts with funding for a variety of community education projects as well as environmental resource inventories; beach monitoring and management projects; environmental trail designs; lake rehabilitation studies; stream and water quality testing; wellhead delineation; GIS mapping projects; NEPPS indicator projects; and surveys of threatened and endangered species.

SOURCE OF FUNDING: State appropriation for FY99: \$165,000.

STATUTORY CITATION: Environmental Aid Act, *N.J.S.A. 13:1H-1*, et seq. Program rules: *N.J.A.C. 7:5-1.1*, et seq.

WHO IS ELIGIBLE: Municipal environmental commissions and joint environmental commissions established pursuant to *N.J.S.A. 40:56A-1* et seq., soil conservation districts, and county environmental commissions.

QUALIFICATIONS REQUIRED FOR CONSIDERATION:

Applicant must be an eligible entity as described above and must use funds for a project having the purpose described above. Eligible projects and costs may be found in the ESP Matching Grants Program Guide and Application Package.

GRANT LIMITATIONS: The maximum annual grant is \$2,500. Applicant must agree to match at least 50 per-

cent of the total cost of the project. ESP grant money is paid upon completion of project.

APPLICATION PROCEDURES: Contact the Environmental Services Program for an application package. Applications are mailed annually to local government officials, environmental commission chairs, and soil conservation districts in early September.

APPLICATION DEADLINE: December 1, annually.

NOTIFICATION DATE: On or about April 1 of the following year.

CONTACT:

Joseph C. Rogers, Program Manager
NJDEP-Office of Business & External Affairs
Environmental Services Program
PO Box 402
Trenton, NJ 08625-0402
Telephone: (609) 984-0828

THE TRUST FOR PUBLIC LAND:

BARNEGAT BAY ENVIRONMENTAL GRANT FUND

The Trust for Public Land's Barnegat Bay Environmental Grant Fund ("The Bay Fund") Advisory Board approves grants of up to \$25,000 per year from a \$500,000 fund made available to the Trust through a donation from Ciba-Geigy Corporation to the NJDEP. The Trust for Public Land was designated as the administrator of The Bay Fund. Grants are to be made with approval of the Barnegat Bay Environmental Grant Fund Advisory Board to nonprofit organizations having an Internal Revenue Service 501(c)(3) exemption status and conducting local or regional projects that will have a direct benefit to the Barnegat Bay and its watershed area.

The Trust accepts proposals for grants to support local or regional environmental projects that will have direct benefit to Barnegat Bay and its watershed area. Eligible projects may include, but will not be limited to, environmental education, planning, monitoring, research, or land stewardship.

The Bay Fund is one component of the Trust for Public Land's Barnegat Bay Initiative – a long-term protection strategy for the bay, including public education, scientific research, land planning, and acquisition of critical properties. Since 1988, the Trust has assisted the USFWS in protecting more than 2,300 acres of critical habitat lands as part of the Edwin B. Forsythe National Wildlife Refuge. It has also worked with the State of New Jersey to protect more than 5,800 acres of critical wildlife habitat and recreational land in the bay region. The NJDEP recognized the Trust's work in this area with a \$500,000 grant, which is available to fund awards under the Barnegat Bay Environmental Grant Fund. The Bay Fund encourages support of groups working to protect the bay. The William Penn Foundation also provides supplemental funding to the Trust for Barnegat Bay project.

APPLICATION PROCESS: Interested organizations should submit nine copies of a brief (no more than three pages) description of the proposed project by the spring of each year. Applications should include a time line for the project's completion, project budget, brief background on the organization, and the description must be accompanied by proof of the organization's federal tax exempt status under Section 501(c)(3) of the Internal Revenue Code and a copy of the organization's Articles of Incorporation, Constitution, or Bylaws. All applications will be reviewed by the Advisory Board, and awards will be announced Memorial Day weekend.

APPLICATION GUIDELINES:

- Grants will be awarded for activities that promote environmental education, planning, monitoring, research, or land stewardship in Barnegat Bay and its watershed.
- The Bay Fund will accept proposals solely from non-profit organizations that have an Internal Revenue Service 501(c)(3) exemption. Grants are likely to range from \$500 to \$5,000.
- Proposals must demonstrate that the activity will benefit Barnegat Bay.
- Proposals that include matching funds or in-kind services from other sources are strongly encouraged.
- Consideration will be given to project cost, geographical setting, technical feasibility, and need in terms of the overall protection and enhancement of Barnegat Bay.
- Proposals will be evaluated on the basis of appropriateness, clarity of objectives, a plan for achieving the objectives, and the qualifications of the organization to carry out the project activities.
- Grants will not ordinarily be awarded for: (a) land acquisition; (b) endowments; (c) individuals; (d) building campaigns; (e) capital construction activities, such as structural erosion control measures; (f) annual giving; (g) an organization's general operating budget, including direct salary, benefits, or overhead. Staff costs for project-related work will be considered eligible expenses and should be included in the budget.
- The Bay Fund will not entertain proposals from government entities (i.e., municipalities, planning boards, environmental commissions, or schools). Non-eligible entities may "partner" with a non-profit organization that: (a) meets with requirements under this program; and (b) serves as applicant to The Bay Fund.
- Grants will not be made for fund-raising purposes.
- No part of any grant may be used for entertainment expenses.
- Grants will cover a 12-month period except in special circumstances.
- The Bay Fund should not be relied upon as a long-term source of funds; applicants may be requested to demonstrate how ongoing programs would be sustained.
- Grant recipients will be required to certify program expenses to the Trust by filing a summary report within 30 days of project completion.
- The Bay Fund will not support lobbying or activities that advocate political solution.

CCMP IMPLEMENTATION

12.9 WATER QUALITY MANAGEMENT PLANNING

The Water Quality Management (WQM) planning program, sometimes referred to as the "208 Program," was developed to ensure that states provide for the future planning and management of their water resources. It is a nationwide program, with its requirements specified in the Water Pollution Control Act (P.L. 92-500), which was later amended by the Clean Water Act of 1977 and the Water Quality Act of 1987. The state's requirements are contained in the N.J. Water Quality Planning Act (*N.J.S.A. 58:11A-1, et seq.*). The federal laws required that WQM plans be prepared by agencies designated for that purpose by the Governor of each state. For areas that did not have a designated agency, the state would serve as the WQM planning agency.

All of New Jersey is divided into 12 WQM planning areas. Of the 12 initial WQM plans that were prepared approximately 20 years ago, 7 were prepared by designated agencies and 5 were prepared by the NJDEP.

The above cited laws required that the WQM plans address a variety of subject areas. These included:

- Identification of treatment works necessary to meet anticipated municipal and industrial waste treatment needs;
- Establishment of construction priorities for such treatment works;
- Establishment of a regulatory program addressing waste treatment management;
- Identification of those agencies necessary to construct, operate, and maintain facilities required by the plan;
- Identification of measures necessary to carry out the plan;
- The economic, social, and environmental impact of carrying out the plan;
- A process to identify, if appropriate, agriculturally and silviculturally related nonpoint sources of pollution;

- A process to identify, if appropriate, mine-related sources of pollution;
- A process to identify construction activity-related sources of pollution;
- A process to identify, if appropriate, saltwater intrusion into rivers, lakes, and estuaries;
- A process to control the disposition of residual waste which could affect water quality;
- A process to control the disposal of pollutants on land or in subsurface excavations to protect ground and surface water quality.

For a fuller discussion of the specific requirements, see Section 208 of the Clean Water Act.

Due to the differing needs and priorities of New Jersey's 12 WQM planning areas, the resultant initial plans differed somewhat in the extent to which some of these subjects were addressed.

12.9.1 WQM PLANNING IN OCEAN COUNTY

The Ocean County Board of Chosen Freeholders was designated in May of 1975 as the agency responsible for conducting WQM planning in all of Ocean County, as well as that portion of southern Monmouth County that is within the drainage basins of the Toms River and the Metedeconk River. The area of Monmouth County that is in the Ocean County WQM Planning Area includes portions of Freehold, Howell, and Wall Townships.

The stated goal of the Ocean County WQM Planning Program is the protection of the area's water resources from potential growth-related sources of pollution. Both groundwater and surface water are of great importance to Ocean County, as groundwater is the primary source of potable water for area residents. The protection of surface water was also deemed essential, as the Atlantic Ocean, Barnegat Bay, and the area's inland waterways provide a primary source of recreation for the area's residents and visitors.

The Ocean County WQM Plan was prepared by technical staff hired for that purpose. A few consultants were hired for technical water quality analysis and for legal and institutional aspects of the plan. Also actively involved in the preparation and review of the plan were committees. These included a Policy Advisory Committee (PAC), a Citizens Advisory Committee (CAC), as well as a Technical Review Committee. The committees were most active during the preparation and review of the initial WQM Plan; however, they still occasionally meet on an as-needed basis.

12.9.2 UPDATE OF THE INITIAL OCEAN COUNTY WQM PLAN

The initial Ocean County WQM Plan was certified by the Governor on August 11, 1980, and approved by the USEPA on September 15, 1980. The Ocean County WQM Plan included nine reports. These reports are:

- Surface Water Quality Assessment;
- Groundwater Management Planning;
- Wastewater Flows and Sewerage Facilities for the 208 Study Area;
- Stormwater Management;
- Population, Land Use, and Environmental Resources;
- Implementation of an Areawide Water Quality Management Program in Ocean County;
- Regulatory Program Associated with Areawide Water Quality Management in Ocean County;
- Executive Summary, Ocean County "208" Water Quality Management Planning Project; and
- Public Participation in "208" Water Quality Management Planning, Ocean County, New Jersey.

In the years since the plan was approved, the Ocean County WQM Plan has been modified and updated through formal amendments and revisions. Those modifications were primarily to provide for new or expanded wastewater treatment plants or to modify sewer service areas.

The WQM Plan amendment and revision requirements and procedures are specified in New Jersey's Water Quality Management Planning regulations (*N.J.A.C. 7:15-3.4 and 3.5*). The amendment procedures include the need to publish a public notice and to provide the opportunity for the interested public to comment on the proposed actions. Potentially affected entities, such as municipal governments and sewer authorities, are requested to provide resolutions of consent for the proposal. Designated agencies, such as the Ocean County Board of Chosen Freeholders, have a vital role, as their approval of amendment proposals is generally required before the state may approve an amendment. Revision procedures vary somewhat based on the nature of the revision. Mere correction of a WQM plan is handled by the NJDEP; however, a revision of a more significant nature, such as the transfer of sewer service area from one wastewater treatment agency to another, requires that potentially affected entities be invited to comment on the proposal.

12.9.3 WASTEWATER MANAGEMENT PLANS

As a general rule, the most significant and far-reaching WQM Plan amendments are Wastewater Management Plans (WMPs). WMPs are subject to the same amendment review and processing requirements as other amendments; however, they differ from individual amendments in the geographic scope and variety of subjects addressed. Generally, individual amendments are prepared for a single wastewater treatment facility or housing development; WMPs are prepared for one or more municipalities. Sometimes, a WMP may be prepared for a sewer authority's district or for an entire county.

Among the items that are addressed within a WMP are discussions and maps of the locations of wastewater treatment facilities (domestic as well as industrial), current and 20-year projected populations to be served by each wastewater treatment facility, current and 20-year projected wastewater flows to each wastewater treatment facility, maps of current and future wastewater service areas, maps of environmental features, and other subjects.

The WMPs that have been approved for the Ocean County WQM Planning Area include: Barnegat Township WMP, Jackson Township WMP, Little Egg Harbor WMP, Manchester Township WMP, Northern Planning Area WMP, Ocean County Utilities Authority's Central Service

CCMP IMPLEMENTATION

Following are the amendments and revisions that have been adopted since the initial Ocean County WQM Plan was approved.

OCEAN COUNTY WATER QUALITY MANAGEMENT PLAN AMENDMENTS/REVISIONS AND DATES OF ADOPTION	
Ocean County Utilities Authority Central Service Area July 3, 1989	Little Egg Harbor Township March 23, 1990
Ocean County Utilities Authority Northern Service Area January 6, 1983 August 27, 1998 April 10, 1999	Manchester Townshihp December 28, 1987 February 10, 1992
Barnegat Township October 28, 1987	Plumsted Township February 28, 1990 July 30, 1993
Jackson Township December 28, 1987 June 28, 1990 May 18, 1992 August 19, 1992 October 28, 1994 January 31, 1996 April 10, 1999	Stafford Township January 25, 1990 March 31, 1989 August 4, 1992 April 4, 1993

Area WMP, Plumsted Township WMP, and Stafford Township WMP.

12.10 COMPLIANCE WITH NATIONAL AND STATE HISTORIC PRESERVATION LAWS AND THE ENDANGERED SPECIES ACT WHEN IMPLEMENTING THE CCMP

While this Comprehensive Conservation and Management Plan in and of itself will not have any

effect on historic and prehistoric resources, there is the potential that individual actions of this plan that are subsequently implemented might. In compliance with Section 106 of the National Historic Preservation Act, if any Federal undertaking performed as part of the CCMP has the potential to have an effect on prehistoric or historic resources as a result of ground-disturbing activities, the EPA will evaluate the need for the performance of an initial Stage IA cultural resources survey (CRS) and any necessary additional stages of survey, prior to project implementation, to identify areas sensitive for the discovery of prehistoric

and historic resources. Coordination of any further cultural resources investigations will be carried out by the appropriate federal agency. To the extent that such actions are state undertakings, the NJDEP (State Historic Preservation Office) will be the lead in addressing historic preservation requirements.

Informal consultation pursuant to Section 7 of the Endangered Species Act has been initiated with the U.S. Fish and Wildlife Service (FWS) and the National

Marine Fisheries Service (NMFS). While the EPA believes that the CCMP, as a programmatic plan, will not have a negative impact on federally listed or proposed threatened and endangered species or their habitats, it is possible that some action items of the CCMP may. Consequently, informal consultation will be carried out by the appropriate federal agency with the FWS and the NMFS at that time when the nature of such action items and their source(s) of funding become more defined.



Today our continuing progress is restricted not by the number of fishing boats
but by the decreasing numbers of fish;
not by the power of pumps but the depletion of aquifers;
not by the number of chainsaws but by the disappearance of primary forests.

While living systems are the source of such desired materials as wood, fish, or food,
of utmost importance are the services that they offer,
services that are far more critical to human prosperity than are nonrenewable resources.

A forest provides not only the resource of wood,
but also the services of water storage and flood management.

Humankind has inherited a 3.8 billion year store of natural capital.
At present rates of use and degradation, there will be little left by the end of this century.
This is not only a matter of aesthetics, it is of utmost practical concern to society and all people.

--Paul Hawkin, Amory Lovins, L. Hunter Lovins, *Natural Capitalism*

APPENDIX A
References



Fishing on the Toms River, PHOTO COURTESY OF THE OCEAN COUNTY HISTORICAL SOCIETY



Picking in the Pines. PHOTO COURTESY OF THE OCEAN COUNTY HISTORICAL SOCIETY

REFERENCES

APPENDIX A

- AMERICAN OCEANS CAMPAIGN. 1996.
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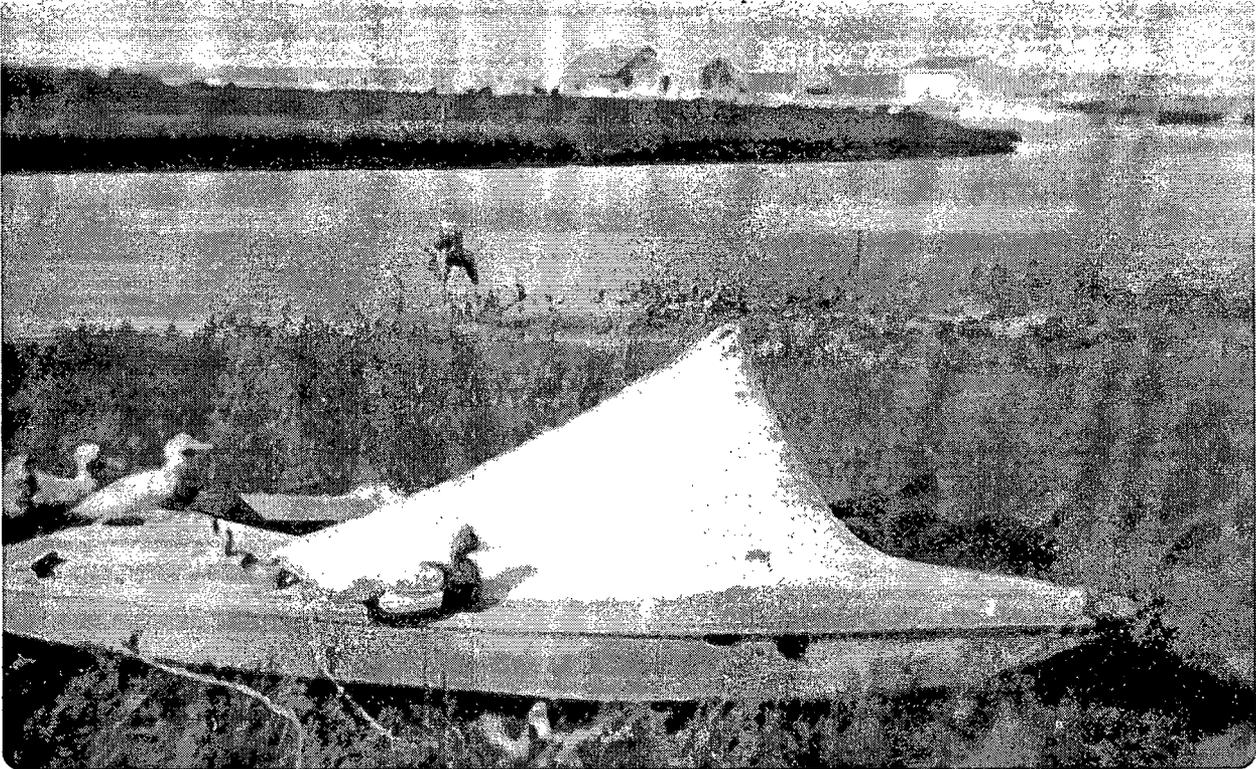
Don't throw away the old bucket
until you know
whether the new one holds water.

--*Swedish Proverb*

APPENDIX B
Public Responsiveness
Document

BARNEGAT BAY ESTUARY PROGRAM
PUBLIC RESPONSIVENESS DOCUMENT
TO THE DRAFT
COMPREHENSIVE CONSERVATION
AND MANAGEMENT PLAN

August 31, 2001



Barnegat Bay hunting sneakbox.
PHOTO COURTESY OF THE TUCKERTON SEAPORT, A PROJECT OF THE BARNEGAT BAY DECOY AND BAYMEN'S MUSEUM, INC.



The Menhaden Fish Factory, Crab Island, Little Egg Harbor, circa 1970.
PHOTO COURTESY TUCKERTON SEAPORT, A PROJECT OF THE BARNEGAT BAY DECOY AND BAYMEN'S MUSEUM, INC.

INTRODUCTION

The Comprehensive Conservation and Management Plan (CCMP) for the Barnegat Bay National Estuary Program (BBNEP) is the culmination of an interagency planning process which was begun on April 16, 1996, as part of the National Estuary Program (NEP). The NEP is authorized by Section 320 of the Clean Water Act (CWA) Amendments of 1987, and has as its general goals the protection and improvement of water quality and the enhancement of living resources in estuaries of national significance. Participation in the BBNEP planning process included federal, state, county, and local agencies, commercial interests, academia, and the interested public. The BBNEP Draft Final CCMP has undergone a period of public review, and comments are being incorporated into a Final CCMP for submission to, and approval by, the U.S. Environmental Protection Agency (USEPA) Administrator and the Governor of New Jersey. Upon final approval, the CCMP will pass from the preliminary planning phase to active implementation under a continuing committee structure.

The Draft CCMP for BBNEP was released for public review at a BBNEP Policy Committee Meeting held at the NJ Museum of Boating in Point Pleasant, New Jersey, on May 16, 2000. Copies of the draft document were subsequently made available at the annual Barnegat Bay National Festival on May 20, 2000. During the same week, 120,000 copies of a multi-page newspaper supplement that summarized the content of the CCMP were distributed in the Sunday, May 14, 2000, issue of the Ocean County edition of the *Asbury Park Press*. The newspaper supplement included a mail-in comment box for those interested in making comments to the CCMP.

Distribution of the Draft CCMP was made to the following:

- Members of all committees of the BBNEP Management Conference;
- Ocean County offices;
- Ocean County municipal offices and four municipalities in Monmouth County that lie within the Barnegat Bay watershed;
- All 20 branches of the Ocean County Library, and two branches of the Monmouth County Library;
- Press offices within Ocean County;
- The interested public, upon request;
- The BBNEP Web site (<http://www.bbnep.org>);
- The Ocean County Mayors Association; and
- Federal and state legislators with districts within the watershed.

Following public release of the BBNEP Draft CCMP, six public meetings, three each in the afternoon and evening, were scheduled at three venues placed throughout Ocean County, New Jersey, to solicit comments to the draft document. The meeting schedule follows:

- Municipal Building, Stafford Township, Manahawkin, New Jersey - June 6, 2000;
- Municipal Building, Jackson Township, Jackson, New Jersey- June 8, 2000;
- Municipal Building, Brick Township, Brick, New Jersey - June 14, 2000.

A total of 46 people attended the meetings and commented to the draft document. Mail-in comments to the Draft CCMP were accepted until July 17, 2000, and 21 mail-in comments were received.

PUBLIC RESPONSE

The following pages summarize the comments received on the Draft CCMP along with the BBNEP's responses. Appropriate revisions to the draft document were made in light of these comments and are reflected in the Final CCMP. Comments and responses are organized according to general topics as follows:

1. General Comments/Introductory Chapters;
 2. Governmental Support;
 3. Water Quality/Water Supply (Chapter 5);
 4. Habitat and Living Resources (Chapter 6);
 5. Human Activities and Competing Uses (Chapter 7);
 6. Public Outreach and Education (Chapter 8).
-

1. GENERAL COMMENTS/INTRODUCTORY CHAPTERS

Comment: Why was Barnegat Bay chosen for the NEP?

Response: Barnegat Bay meets the definition of an estuary of national significance that is threatened with declining water quality and ecological health. Strong local support and a nomination request by the Governor in 1995 elevated the problems of the bay to the attention of USEPA. Under the authority of Section 320 of the CWA Amendments of 1987, Barnegat Bay was accepted into the NEP and a Management Conference was convened to develop a CCMP.

Comment: A person inquired about the total cost of implementing the Program.

Response: The individual action items state the estimated cost for implementation. The Draft CCMP did not include costs for all of the action items, but the final document lays out a more comprehensive estimate for costs, which total more than \$9 million.

Comment: One commenter disapproved of the consensus process used in this Program, citing it as undemocratic since a single interest could stop an issue from being brought to resolution.

Response: The commenter, who did not participate in the BBNEP Management Conference, misunderstands the concept of consensus building. It is important to engage all stakeholders in a discussion to address a particular issue in order to arrive at a mutually agreeable resolution. Not all stakeholders will have a similar point of view on a particular issue or problem, but through the consensus process common ground can be identified, which serves as the basis for an agreement that all can support and facilitate action. The notion that a single interest can hold up resolution to an issue is a misreading of the consensus process, and suggests that the process itself is misapplied. Now as we all proceed beyond the command and control mode of regulatory enforcement to continue our drive towards clean water and a productive estuary, it becomes all the more important to engage diverse interests in arriving at environmental solutions that satisfy a multitude of purposes and outlooks.

Comment: One letter provided specific comments to passages in the introductory chapters of the CCMP:

1. The Mission Statement should include as part of its education focus the ecology and biological resources of the bay and its watershed.
2. Chapter 1 should acknowledge the importance of recreational fishing as an economic mainstay of Barnegat Bay.
3. Chapter 1 should elaborate on the value of estuaries in order to demonstrate the importance of this Program.

Response: Appropriate revisions have been made in the Final CCMP.

2. GOVERNMENTAL SUPPORT

Comment: Legislators in attendance inquired as to the legislative needs of the Program. In a related vein, a question arose regarding the financial limitations of the Program.

Response: Governmental support at every level is needed to help implement the CCMP, including sustained commitments of financial assistance. A number of options to develop financial commitments are being pursued, including funding assistance programs at all government levels, and are detailed in the document. No new regulatory approaches are being proposed at present, but regulatory options are being actively considered to address identified problems related to such water-related activities as boating and personal watercraft use.

Comment: One commenter was concerned that the various levels of government will not reach resolution to proceed on implementing the action items.

Response: The Management Conference of the BBNEP includes all of the interested stakeholders within the watershed, including the agencies within all levels of government: federal, state, county, and local. Regulatory programs which mandate action are already being implemented, or are being initiated, to fully protect and conserve water quality and other environmental resources. It will require a cooperative approach among the various levels of government to take further action. The consensus approach used within the Management Conference has produced a suite of actions in the CCMP whereby governmental agencies will take the necessary steps outside the regulatory arena to achieve Program goals. As such actions are taken and the successes of those actions documented, reaching agreement on taking other action steps will be easier to achieve.

Comment: Two comments questioned New Jersey's commitment and level of support to the Program.

Response: In order for the CCMP to be approved by the Administrator of USEPA, the Governor of New Jersey must provide documentation of the state's support for implementation of the Plan. New Jersey has been an active participant in the Program, starting with the formal submittal of the nomination of Barnegat Bay to the NEP. New Jersey has ensured the commitment of 25 percent non-federal matching funds to the development of the CCMP, and will have available continuing funding sources that may be used to support CCMP implementation actions. The NJ Department of Environmental Protection (NJDEP) is coordinating the CCMP with its watershed management plan for the Barnegat Bay watershed, which is identified as Watershed Management Area #13, thus integrating the CCMP into the state's administrative structure for environmental protection.

Comment: Several comments centered on the role of Ocean County as lead agency in the CCMP implementation structure. One commenter thought that Ocean County is not the appropriate agency, while others supported Ocean County in the lead role.

Response: The Barnegat Bay estuary and watershed are located primarily in Ocean County. The Management Conference considered a number of options and concluded that, on balance, Ocean County is best situated to track and oversee the implementation of CCMP actions. This decision does not put the burden of action implementation or enforcement directly on Ocean County; rather, the County will monitor the progress of the Program as individual actions are implemented by the specifically identified lead agencies. Recognizing the dominant role to be played by County agencies and local government, not to mention giving credit to the ongoing commitment of the County to the Program, the Management Conference agreed that Ocean County, as overall lead agency within the implementation management structure, would offer the best likelihood for success for the Program. Ocean County has been an active player in the development of the CCMP from the onset of the Program. The County has provided free office space for the Program and has acted on a resolution to provide substantial funding (\$250,000) each year for implementation of the Plan.

PUBLIC RESPONSE

Comment: Several people questioned the commitment of local governments to the Plan. In their opinion, the lure of increased tax revenues makes regulating development difficult, and the influence of the development community often outweighs other interests.

Response: The Management Conference has taken steps to increase the participation of local governments in this Program. Other actions are cited within the Action Plans to increase local government outreach and participation. In New Jersey, development is regulated by the Municipal Land Use Law (MLUL) (*NJSA 40:550D-1, et seq.*), which allocates planning and regulatory authority to municipalities. The MLUL establishes the broad context and procedural framework for how local governments plan for the future. Several planning tools related to this authority are proposed to help local governments better evaluate the economic and social effects of development, including the cross-acceptance process of the Ocean County Master Plan, and a build-out analysis showing the effect of full development under current municipal land use zoning. The Management Conference embraces all stakeholder interests in the estuary and watershed, and works through the consensus process to reach resolution that is acceptable to all concerned. During Plan implementation, all of these same interests will continue to be heard, avoiding undue influence by any single interest or group of interests.

Comment: A specific recommendation to ensure local government action was to add mandatory requirements for environmental measures to municipal land use plans.

Response: Mandatory elements for municipal master plans are specified as part of the Municipal Land Use Law (MLUL). One of the purposes of the MLUL is to enhance preservation of the environment. Adding more detailed mandatory components to incorporate environmental considerations would require action by the state legislature. The Management Conference will take this comment under consideration, and refer any recommendations through the appropriate state channels.

3. WATER QUALITY/WATER SUPPLY (CHAPTER 5)

Comment: Two comments noted the high turbidity of Barnegat Bay waters, particularly during the summertime. They recommended that additional inlets be cut through the barrier island chain to increase flushing of the bay waters to the ocean.

Response: Increasing the flushing of Barnegat Bay is one way to address the water quality problems that are being experienced there, but opening new inlets is a drastic measure that would have a multitude of environmental and economic effects, and it would necessitate a detailed feasibility study before it could be considered a viable option.

Much of the water quality degradation in Barnegat Bay derives from nonpoint source (NPS) pollution draining from the watershed, including excess nutrients that stimulate summertime algae concentrations. Reducing this nutrient input into the bay, as many of the water quality actions cited in the CCMP are meant to do, will help to alleviate the cause of summer water quality degradation and improve water clarity in the bay without drastically changing the existing hydrological conditions of the bay. The Management Conference believes that this approach, reducing the nutrient load to the bay, is the better immediate approach for addressing Barnegat Bay's water quality problems.

Comment: One commenter suggested that the Program address the issue of brown tide, visible blooms of microscopic algae that harm molluscan shellfish and reduce water clarity to the detriment of eelgrass beds in Barnegat Bay.

Response: Brown tide has been identified as a project in the Program's unfinished agenda (Chapter 11). Brown tide is a fairly recent phenomenon in the bays of the Mid-Atlantic region, and studies to date have failed to fully define the how and why of problem algal bloom occurrences. The Science and Technical Advisory Committee (STAC) of BBNEP recommends a course of action to collect long-term information on brown tide blooms to help reach a better understanding of the factors that lead to such blooms and to help suggest ways that they may be mitigated, and the state of New Jersey is backing up this proposal with a commitment for monitoring.

Comment: One person questioned the effectiveness of the new stormwater management regulations.

Response: The new Phase II Stormwater Regulations promulgated by USEPA will address contaminated discharges from stormwater systems not already covered under existing point-source discharge regulations and will apply to many, if not most, municipalities within Ocean County. Regulation of point source discharges, primarily from municipal sanitary sewer systems, has shown good performance in Ocean County. There has been a demonstrable improvement in bay water quality since the 1980s when Ocean County regionalized its municipal sanitary sewer systems and discharged the treated wastewater effluent through ocean outfalls. The main inputs of contaminants that lead to water quality degradation in the bay now come from stormwater and unregulated nonpoint sources. The stormwater regulations will address these inputs and further reduce the contaminant load to the bay.

Comment: One local official who handles stormwater management for his township expressed frustration that there were inconsistencies in applying stormwater rules between the CAFRA area (state coastal zone boundary) and Pinelands National Reserve and Pinelands Protection Area zone (inland and upper watershed region); one jurisdiction specifies one set of standards while the other specifies a different set.

Response: It's true that the two regulatory areas, which both occur in about a dozen of Ocean County's municipalities, have somewhat different rules for stormwater management, but these rules are set in law. To resolve any contradictory elements in these rules would require action by the state legislature. The Management Conference will follow up on this comment to identify any particular problems in the implementation of these regulations, and refer them to the state as appropriate.

Comment: Comments were raised that the Program should address siltation in the watershed. Another person commented that the bay was losing open water area due to emergent vegetative growth.

Response: The Program had not previously identified siltation as a problem in the watershed, and has not developed an action specifically addressing it. Indirectly, siltation and sediments will be controlled through actions taken to implement best management practices (BMPs) for stormwater control. Sedimentation is often a localized problem and can be addressed with localized remedies. The Program can address such problems as they are identified during Plan implementation.

PUBLIC RESPONSE

Comment: One commenter questioned how the Program was addressing flooding in low-lying areas. He suggested that engaging local municipalities in the flooding aspects of stormwater flow would facilitate their involvement in other areas of water resources management.

Response: The best way to avoid flooding impacts is to protect floodplains from development through watershed-based planning. Onsite retention of stormwater in developed areas can also reduce flooding impacts to areas downstream. The Program will explore all avenues to ensure cooperative participation by all stakeholders within the Barnegat Bay watershed. At present, groundwater depletion due to overpumping by a number of municipalities appears to be an opportunity to engage local governments in Plan actions that will also address specific local concerns.

Comment: A number of concerns were raised with regard to toxic pollution in Barnegat Bay, particularly with regard to boat fuel and fuel additives, such as MTBE.

Response: Toxic pollution has not been identified as a major problem in Barnegat Bay, but it is also an issue that is poorly studied. Monitoring projects to sample toxic pollution are being developed in order to close existing data gaps, and they will help the Program better understand the relative importance of this issue and the need to take action. Currently, USEPA Region 2 is conducting a synoptic monitoring study of Barnegat Bay (R-EMAP), partly directed at characterizing the Bay's waters in terms of specific toxic contaminants.

Comment: One commenter asked about the Oyster Creek nuclear power plant and its overall effect on the Bay.

Response: Oyster Creek is the largest point-source discharger in Barnegat Bay, and is regulated through its state discharge permit. The largest impact is the thermal discharge of its cooling water stream. The power plant is required to submit an annual monitoring report documenting that the plant is in compliance with its permit requirements. The CCMP includes an action whereby the Program Office will review the annual report in order to keep up-to-date on the status of the plant's emissions.

Comment: Multiple comments touched on the issue of residential landscaping and paving, requesting information, promoting public education, questioning public acceptance of environmentally preferred alternatives, and promoting stricter regulations on pesticides.

Response: The CCMP includes a number of actions that promote public education, awareness, and participation in reducing the risks of NPS pollution related to pesticides and fertilizers used in home landscaping. As public awareness grows, and as demonstration projects show acceptable alternatives to intensively manicured lawns, the Program believes that the impacts of residential runoff carrying nutrients and pesticides can be reduced.

Comment: Several people identified trash and floatable litter as a major problem in beach communities. Others cited dog litter as a persistent problem.

Response: Individual beach municipalities have addressed these problems through local ordinances that prohibit discharge of these kinds of waste in the storm sewers, and prescribe appropriate disposal practices and trash pick-up schedules to accommodate the transient summer population. Volunteer groups in areas such as Long Beach Island sponsor periodic trash cleanups to improve the aesthetic appearance of their local communities.

The Management Conference believes this kind of local activism is the appropriate response to these sources of pollution, and will continue to facilitate adoption of these measures by municipalities that do not already have them.

Comment: One comment suggested adding another pumpout boat and pumpout stations at marinas to reduce boat sewage discharged to Barnegat Bay.

Response: The Program has been active from the outset in improving sewage pumpout capability in Barnegat Bay. Through the Clean Vessel Act and other funding sources a number of pumpout stations have been installed and Barnegat Bay's first pumpout boat was commissioned. These facilities have been operating for about three years, and additional facilities are being planned. In addition, New Jersey has submitted a No Discharge Zone application for Barnegat Bay to the EPA that, if approved, would prohibit direct discharge of sewage of any kind into Barnegat Bay. These initiatives are described in a number of actions within Chapter 5 of the CCMP.

4. HABITAT AND LIVING RESOURCES (CHAPTER 6)

Comment: Two comments expressed concern regarding changing practices on mosquito ditching in tidal wetlands to control health and aesthetic problems.

Response: Action 6.4 promotes the management of the mosquito problem using the Open Marsh Water Management (OMWM) procedure. Instead of using a static grid system of mosquito ditches that is overlain on a tidal marsh, OMWM involves ditching that follows the individual contours of the marsh area, providing access throughout the marsh to mosquito-eating fish while reducing impacts to the marsh that result from straight ditching.

Comment: Several comments remarked that the CCMP fails to address the most significant problem in the watershed, namely the rapid population increase in Ocean County and its associated development. Without restrictions on development, no environmental measures will be able to reverse the trends of continuing environmental degradation.

Response: The Management Conference of the BBNEP includes viewpoints of all interested stakeholders within the watershed. The comment expresses one viewpoint that is represented in the Management Conference. It must also be understood that land use planning, a tool used to regulate development density, is primarily a responsibility of local governments via the MLUL and the Management Conference cannot override local government authority. It is through actions in the CCMP and coordinating with local government (to secure environmental protection within the scope of their land use planning authority), that the Management Conference can play a substantial role in addressing development impacts.

The Program has been conducting an analysis of the full build-out of Ocean County under the existing Ocean County Master Plan. This analysis is helping to forecast the physical and environmental condition of Ocean County under the full build-out scenario. With this understanding, Ocean County and its municipalities will be better able to foresee their future situation with increased development and the attendant environmental impacts. This knowledge will help Ocean County and the municipalities appreciate the tradeoffs of additional development and to plan more intelligently for the kind of future that they desire.

PUBLIC RESPONSE

5. HUMAN ACTIVITIES AND COMPETING USES (CHAPTER 7)

Comment: One person expressed a concern that the Program will result in excessive restrictions on the public's use of the bay and its resources.

Response: The purpose of the Program is not to place undue restrictions on the enjoyment of the bay; rather, the Program addresses identified problems that are generally recognized among the bay and watershed's various stakeholders. Only those actions that are necessary to alleviate an identified problem are being proposed as part of the Plan. Issues that have not been resolved among the competing interests will require further discussion before agreeable solutions are found. The large population and the differing constituencies that all want to make use of the bay's limited resources require prudent steps to ensure that the enjoyment of the bay is maximized among this divergent group.

Comment: Strong comments from several sources dwelt on the issue of personal watercraft (PWC) use in Barnegat Bay. They generally criticized the noise, environmental disturbance, and hazards to others that PWC can present. Suggestions for remedies included bans and zone restrictions for such craft, as well as stepped-up enforcement of regulations for vessel operation. Kettle Creek and Silver Bay, two semi-enclosed reaches in northern Barnegat Bay bordered by shoreline development, were two areas identified where the PWC problem is most acute.

Response: The Barnegat Bay Watershed Association (BBWA), now undergoing a transition to a non-profit foundation known as the Barnegat Bay Watershed and Estuary Foundation (BBWEF), early in the Program represented citizen interests and recognized PWC as a prime element of the issue of competing human uses. The BBWA conducted an interdisciplinary workshop of the PWC issue, and is making progress through consensus building in developing a satisfactory resolution. This deliberation will continue as the non-profit foundation participates in the implementation phase of this Program. It is well to note that legislative remedies are also under consideration at the state level in Trenton, New Jersey. Action 7.1 in Chapter 7 of the CCMP addresses this issue in detail. A conservation zone designation, targeted at PWC, for the Sedge Islands in Island Beach State Park appears to have been effective in reducing noise and disturbance impacts to sensitive coastal habitats.

Comment: A number of people commented on a general lack of enforcement of boating regulations, which magnifies the nuisance problem and the conflicts among water users. One person cited Florida as an example of good enforcement of boating regulations.

Response: Boating infractions or disturbances are often due to a lack of understanding by those who take part. A "Boater's Guide to Barnegat Bay" has been completed and helps to meet the public education and outreach goal of the Program. As stated in Action 7.2 of the CCMP, this guide will be part of an effort to ensure better boater behavior and better protection of the bay's water quality and natural resources. Enforcement of boating regulations is the responsibility of the New Jersey State Marine Police. New Jersey is committed to an adequate enforcement presence in its marine waters. As competing use problems are better defined and quantified, statewide measures can be applied that will extend benefits to the particular circumstances of Barnegat Bay.

6. PUBLIC OUTREACH AND EDUCATION (CHAPTER 8)

Comment: A number of participants voiced the need to continue funding public awareness efforts, and, considering the large seasonal population of visiting tourists, noted that these efforts should extend beyond the watershed boundaries of Barnegat Bay.

Response: The CCMP cites a number of actions that continue public outreach and education activities that began with the inception of the Program. The active participation of the NJDEP and Ocean County in this Program will facilitate spreading the message of watershed management and water quality protection beyond the watershed boundaries to all areas of New Jersey.

Comment: Two comments at the public meetings recommended using local cable TV as part of the Program's public outreach strategy.

Response: The BBNEP has explored all options in implementing its public outreach and education effort, including cable TV outlets. The Program will pursue this option whenever it is appropriate.

7. USEPA HEADQUARTERS COMMENTS

A revised CCMP was completed in October 2000, incorporating comments made in the public review period. USEPA Headquarters gave the revised document a preliminary review and submitted comments in December 2000. A subsequent revised CCMP was completed and approved by the Policy Committee in January 2001. The document was published with a date of February 2001, and given detailed review by USEPA Headquarters. Comments were submitted in April and July 2001. This final CCMP reflects the comprehensive response of the Barnegat Bay National Estuary Program to this series of iterative comments by USEPA Headquarters.

The following discussion summarizes the major comments and concerns expressed by USEPA Headquarters, and the responses of the Barnegat Bay Estuary Program to the revision of the CCMP.

CCMP Goals and Objectives

Comment: Action Plan Objectives are clearly stated but are not clearly related to individual action items. Most of the objectives lack measurable standards of progress.

Response: The CCMP has been significantly revamped to focus individual action items on the achievement of Program Goals and Objectives. Measurable standards for meeting goals and objectives are identified, and targeted milestones for incremental progress are identified where possible. See Tables 5-2, 6-2, 7-2, and 8-2 for a schematic relating indicators and measurable standards to applicable monitoring programs.

PUBLIC RESPONSE

Action Plans

Comment: The Action Plans lack prioritization, and many individual action items remain poorly defined. Many actions are missing important information, particularly the cost of implementation and identified funding sources. Many actions also appear to lack a sense of commitment.

Response: The Management Conference engaged in a widespread discussion to reach consensus on action priorities. This is reflected in a revised Section 4.3 (Action Plan Priorities) and Tables 4-1 through 4-4 in Chapter 4. Each of the Action Plan tables also includes a column denoting action item priority.

Poorly defined action items were revamped, deleted, or consolidated in order to strengthen the overall Action Plans. More specificity was added to each of the action items by providing cost estimates, time lines for implementation, potential sources of funding, and structured steps for action implementation. A greater number of action items now have firm commitments for implementation and/or secure funding sources. Actions that lack firm commitments are clearly identified as to their relative priority. No major elements of the Action Plans were eliminated in the revisions, and the Program believes that a more coherent presentation of its environmental goals and objectives is the result.

Monitoring Program Plan

Comment: The Monitoring Plan as presented is deficient and needs significant work. Identified monitoring programs should be more clearly presented, and the monitoring strategy should be linked to the objectives for each of the action plans.

Response: The Monitoring Plan was revised as much as possible to respond to USEPA Headquarters comments. The linkage of monitoring strategies to objectives is presented in Tables 5-2, 6-2, 7-2, and 8-2 of the Action Plan chapters. A first order priority for Program implementation is the scheduling of monitoring workshops to complete preparation of a final Monitoring Program Plan. One of these workshops is scheduled for October 2001. The Program believes this demonstrates a good faith effort to comply in full with Section 320 requirements.

Base Program Analysis

Comment: The Base Program Analysis presents an inventory of existing programs, but does not present an evaluation of program effectiveness or recommendations for addressing program gaps and expanding strengths.

Response: The Base Program Analysis has been revised to expand coverage of topic areas deemed deficient by USEPA Headquarters. See Appendix G for the revised presentation.

Finance Strategy

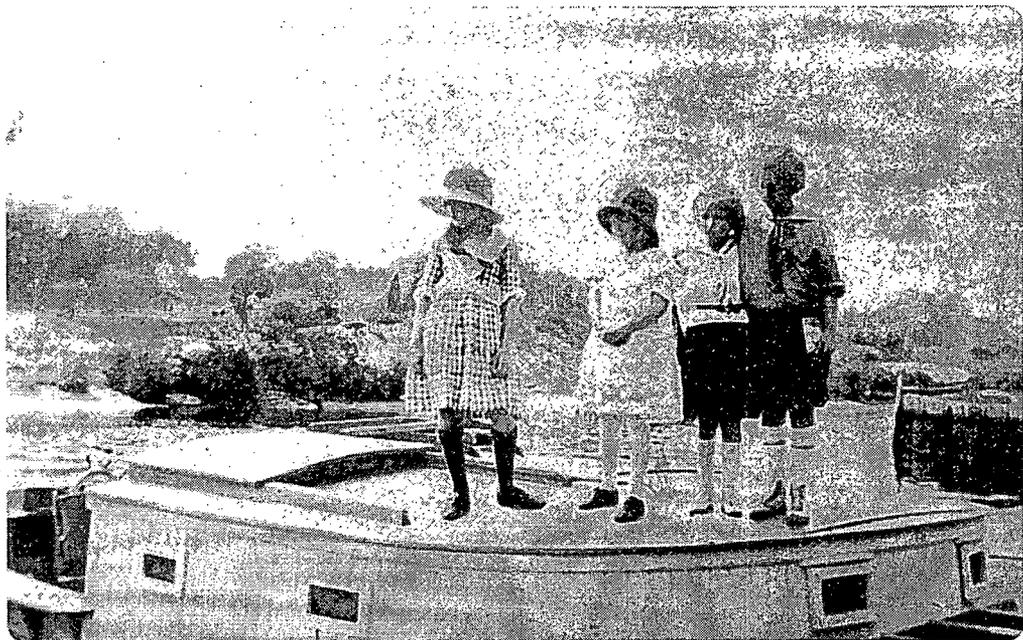
Comment: The CCMP identifies potential sources of funding, but does not link these sources to specific actions.

Response: Revisions to the final CCMP include stronger linkages between specific actions and sources of funding. In addition, Chapter 12 includes a more comprehensive discussion of the Program's Finance Strategy. The Program has also made progress in establishing a non-profit foundation to secure corporate and other sources of funding to support Program implementation. This entity is the Barnegat Bay Watershed and Estuary Foundation.

General Editing Comments

Comment: Many passages are unclear in presenting the rationale of the program, identifying priorities, and substantiating the importance of individual action items.

Response: Language revisions have been incorporated into the final CCMP in order to more clearly present the work of the Management Conference, the development of the Action Plans, and the goals and objectives of the Program.



*Children of Tuckerton Creek, PHOTO COURTESY OF TUCKERTON SEAPORT,
A PROJECT OF THE BARNEGAT BAY DECOY AND BAYMENS' MUSEUM, INC.*

We abuse land because we regard it
as a commodity belonging to us.
When we see land as a community
to which we belong,
we may begin to use it with love and respect.

—Aldo Leopold, (1887 - 1948) U.S. Forester

APPENDIX C

**Early Action
Results and Summaries**



**Harvesting Barnegat Bay Clams. PHOTO COURTESY OF THE TUCKERTON SEAPORT,
A PROJECT OF THE BARNEGAT BAY DECOY AND BAYMEN'S MUSEUM, INC.**

YOU ARE IN THE
BARNEGAT BAY WATERSHED

HELP KEEP
OUR WATERS
CLEAN



TO REPORT
ENVIRONMENTAL CRIMES
609-292-7172 (24 HOURS)

FOR ESTUARY EDUCATION
CALL RUTGERS
COOPERATIVE
EXTENSION 732-505-3671



APDP FUNDS AWARDED ROUND 1: \$75,000

PROJECT: **ECO-TOUR OF A BARRIER ISLAND - TRAIN THE TRAINER**

Description: The Alliance for a Living Ocean (ALO) Eco-Tour of a Barrier Island teaches responsible citizen action in a shore environment. This program was expanded by offering ALO's services to act as a trainer for other shore communities that might mirror ALO's program, thus teaching their citizens good nonpolluting practices.

Cost: \$5,000

Start Date: 12/8/97

End Date: 8/24/99

Status: Complete

Recipient: **Alliance for a Living Ocean**

Lessons Learned: The original purpose of this project was to train teachers and other professionals about environmental actions to protect Barnegat Bay. They would then take their new teaching skills and environmental information back to their school districts or other community organizations. Little response was received from teachers in 1998, so ALO then focused on training high school and college students who may become teachers or environmental educators in the future. This proved to be very successful. Fifteen tours were given during April, May and June in 1999. Four of the eco-tours were conducted for seventh graders from the Medford Memorial School, Medford, New Jersey. These teachers have supported classroom work with the field trips.

ALO also attended the Barnegat Bay Environmental Education Roundtable on April 29, 1999. A brief field trip was led on the beach front and a lesson plan which included interdisciplinary activities was distributed to the teachers.

Contact Person: Carol Elliot
Alliance for a Living Ocean
PO Box 95
Ship Bottom, NJ 08008
(609) 492-0222

PROJECT: **WATERSHED SIGNS POSTING AT PUBLIC ACCESS POINTS**

Description: The purpose of this project was to post watershed signs at public access points (boat ramps, parks, beaches, etc.) to increase the awareness of the Barnegat Bay watershed.

Cost: \$9,289

Start Date: 12/8/97

End Date: 4/99

Status: Complete

Recipient: **Barnegat Bay Watershed and Estuary Foundation**

Lessons Learned: Fifty colorful signs featuring "Barnie the Crab" and other aquatic resources asking citizens to "Help Keep Our Waters Clean" have been posted at public access points in the Barnegat Bay watershed. The signs included telephone numbers for watershed education,

EARLY ACTION RESULTS AND SUMMARIES

Watershed Signs Posting at Public Access Points (continued)

information and environmental crime reporting. Ocean County will provide approximately \$10,000 of funding in 2001 for additional signs throughout the watershed.

Contact Person: Angela Anderson
Barnegat Bay Watershed and Estuary Foundation
1508 Waverly Ave.
N. Beach Haven, NJ 08008
(609) 294-3111

PROJECT: ENVIRONMENTAL EDUCATORS' ROUNDTABLE

Description: The purpose of this project was to convene a series of meetings to focus, coordinate, and promote educational activities on Barnegat Bay and nonpoint source pollution prevention. This project would help coordinate the various players within the County that have a role in environmental education and pollution prevention. A directory would be developed that would give information on who is best positioned to take the lead on particular outreach or educational activities. The long-term goal is to provide educators in Ocean County with a Barnegat Bay watershed-specific activity guide that will be consistent with and correlated to the New Jersey Core Curriculum Standards.

Cost: \$16,000

Start Date: 12/8/97

End Date: 5/25/00

Status: Complete

Recipient: Ocean County Soil Conservation District

Lessons Learned: OCSCD convened two Environmental Educator Roundtable meetings to focus, coordinate, and promote educational activities on Barnegat Bay and nonpoint source pollution prevention. The purpose of the first meeting was to encourage networking, sharing and coordination among the educators within our ecologically significant watershed. The second meeting featured an array of hands-on and interactive field trips and activities to motivate teachers to incorporate Barnegat Bay Watershed topics into their curriculum. A directory of local, state, and national environmental educators and activities was also produced. NJDEP and the Barnegat Bay Estuary Program have awarded OCSCD with funds to develop a Barnegat Bay watershed-specific activity guide. Ocean County will provide some funding to continue the Educators Roundtable, Outdoor Classrooms, and implementation of the watershed-specific activity guide.

Contact Person: Kerry Jennings
OCSCD
714 Lacey Road
Forked River, NJ 08731
(609) 971-7002

PROJECT: PUBLIC DEMONSTRATION OF MARINE PUMPOUT VESSEL

Description: Conducted "show me" demonstrations of the marine pumpout boat's operation.

Cost: \$15,000

Public Demonstration of Marine Pumpout Vessel (continued)

Start Date: 12/8/97
 End Date: 3/99
 Status: Complete
Recipient: Pete McLain
 Lessons Learned: Four in-water demonstrations were provided for the public. Also, a pumpout boat color slide program was presented to a joint meeting of the Barnegat Bay Estuary Program committees. Reporters from four newspapers were taken on tours of the pumpout boat and accompanied the captain during regular pumpout operations. The pumpout boat serviced 466 boats, removing 7,045 gallons of sewage. The sewage was transferred to a sanitary sewer line and treated at the Ocean County Utilities Authority Central Treatment Facility.
 The popularity of the pumpout boat during its first three years of operation has resulted in the purchase of a second pumpout boat, operated by Tuckerton Seaport.

Contact Person: Pete McLain
 10 Cedar Drive
 Toms River, NJ 08753
 (732) 349-6418

PROJECT: BARNEGAT BAY ECOSYSTEM RESTORATION AND PUBLIC OUTREACH

Description: The purpose of this project was to encourage, educate, and demonstrate the significance of plant diversity in protecting valuable coastal bay beaches. A major effort was to work with boaters to inform them about the benefits of maintaining coastal vegetation and to encourage designated areas as footpaths for access to boats to minimize the loss of vegetation. Also, because of its location and visibility, the site serves as an excellent demonstration area for tourists to learn about the benefits of plant diversity in the restoration of coastal beaches on Barnegat Bay. The site also demonstrates improved restoration techniques to landowners and municipalities.

Cost: \$29,720
 Start Date: 12/8/97
 End Date: 12/31/99
 Status: Complete
Recipient: Ocean County Soil Conservation District
 Lessons Learned: Four sites along Bayview Avenue in Seaside Park were selected for restoration: 12th to 13th streets; 6th to 8th Streets; 1st to Island Streets; and a small area north of I Street. Plants native to bay coastal beaches and back dune areas were selected. Students from Seaside Park Elementary School helped with some of the plantings. A sign was installed at each site to inform and educate the public about the project. In order to protect the newly planted vegetation and help to stabilize the dunes, the Borough of Seaside Park has adopted an Ordinance which restricts the storage of boats along Bayview Avenue. The Borough has also been active in installing fence around the plantings.
 OCSCD also co-sponsored a Coastal Restoration Workshop, "Understanding, Enhancing and Controlling Erosion Along River, Bay and Ocean Shorelines" in the fall of 1998.

Contact Person: David Friedman
 OCSCD
 714 Lacey Road
 Forked River, NJ 08731
 (609) 971-7002

EARLY ACTION RESULTS AND SUMMARIES

APDP Funds Awarded Round 2: \$75,000

PROJECT: **PLAN FOR DREDGED MATERIAL DISPOSAL & RESTORATION**

Description: The primary product of this project will be a detailed written plan for dredge material disposal and waterbird habitat creation and enhancement within the project area covering the next 20-25 years. Maps will be included in the plan depicting all proposed disposal sites and identifying species associated with each site. Specific recommendations for regulatory changes to appropriate agencies will be provided in the plan. The plan will also include a section on the resource and user benefits of the Barnegat Bay and Little Egg Harbor Estuary.

Cost: \$10,567

Start Date: 6/1/99

End Date: 12/31/00

Status: Interim Progress Report received 9/25/00

Recipient: **NJDEP**

Lessons Learned: The interim report indicates that all of the initial mapping of nesting sites, vegetation coverage and bird nesting areas has been completed. The data on bird nesting has been synthesized and summarized. All sites were visited to determine current nesting status, particularly by long-legged wading birds. A great deal of information on dredge disposal history and future needs has been collected. The NJDEP is still collecting this information for some sites, especially for privately maintained sites. The primary remaining tasks include some minor additional data collection, additional data synthesis, and plan formulation.

Contact Person: C. David Jenkins, Jr.
NJDEP, Div. Fish, Game, and Wildlife
Endangered and Nongame Species Program
PO Box 400
Trenton, NJ 08625-0400
(609) 628-2103

PROJECT: **PUMPOUT BOAT PROGRAM**

Description: The purpose of this project was to continue the 1998 pumpout boat program by updating the pumpout boat brochure and conducting an extension service for Ocean County by providing guidance, educational materials, and information on boat operations and acquisitions to Ocean County municipalities. Brochures and a slide show were available at boat shows, to boating and yacht clubs, and other locations where boaters gather.

Cost: \$15,000

Start Date: 6/1/99

End Date: 3/14/00

Status: Complete

Recipient: **Jersey Shore Audubon Society**

Lessons Learned: As a result of discussions with municipalities about pumpout boats and the recent applications for a No Discharge Zone for the Navesink and Shrewsbury Rivers and the Barnegat Bay, a second pumpout boat has been acquired for Tuckerton Seaport and one has been purchased for the Navesink River. A proposal for another pumpout boat in Barnegat Bay has been submitted (for a total of three). Also in 2000, there were approximately 8,000 gallons of sewage pumped out at Tices Shoal. Thousands of brochures were distributed at festivals, boat shows and boating and yacht clubs.

Pumpout Boat Program (continued)

Contact Person: Pete McLain
 10 Cedar Drive
 Toms River, NJ 08753
 (732) 349-6418

PROJECT: MANAGING OUR ENDANGERED SPECIES HERITAGE

Description: The goal of this project was to develop management plans for selected plant and animal species in a portion of the Forked River Mountain area which may be readily demonstrated to municipalities, county or state agencies, or other interested groups.

Cost: \$9,996

Start Date: 6/1/99

End Date: 7/31/00

Status: Complete

Recipient: Forked River Mountain Coalition

Lessons Learned: The Forked River Mountain Coalition held conferences and workshops to select an area in which endangered species occur in the Forked River Mountain Preserve, select species for the development of individual management plans, and to develop management/recovery plans for the selected species. Two floral and two faunal species were selected: Bog Asphodel, Pine Barren Gentian, Northern Pine Snake, and Pine Barrens Treefrog. Fact sheets were developed for each species that described the species, its appearance, habitat requirements, threats, and management techniques to protect these species.

Contact Person: Kerry Jennings, President
 Forked River Mountain Coalition
 PO Box 219
 Forked River, NJ 08731
 (609) 971-7002

PROJECT: LOCAL GOVERNMENT OUTREACH PROGRAM

Description: The purpose of the Municipal Outreach and Recognition Project (MORP) was to find successful examples of actions being taken by municipalities that demonstrate Best Management Practices and protect the environment of the Barnegat Bay and watershed.

Cost: \$7,372

Start Date: 6/1/99

End Date: 8/3/00

Status: Complete

Recipient: Barnegat Bay Watershed and Estuary Foundation

Lessons Learned: The MORP highlighted five municipalities: Lacey, Jackson, Plumsted, Lakewood, and Millstone. The five townships highlighted are all upstream from the Barnegat Bay where the connection to the Bay is less obvious. A Community Connections Newsletter will be presented to the municipalities as a way of weaving together the concepts of the entire MORP project as it relates to them. The watershed municipalities will begin to receive the tools necessary to initiate activities of other communities.

EARLY ACTION RESULTS AND SUMMARIES

Local Government Outreach Program (continued)

This grant made it possible to begin to introduce some transferable watershed projects to the communities within the Barnegat Bay watershed. This grant project has opened the door to further watershed projects and for the Barnegat Bay Watershed and Estuary Foundation to continue to develop the watershed recognition concept.

Contact Person: Angela Anderson
Barnegat Bay Watershed and Estuary Foundation
1508 Waverly Ave.
N. Beach Haven, NJ 08008
(609) 294-3111

PROJECT: NERRS COASTAL DECISION-MAKING RESEARCH CENTER

Description: The Jacques Cousteau National Estuarine Research Reserve (JCNERR) will develop a Coastal Repository at the new Coastal Training Center in Tuckerton. This Coastal Repository will support Coastal Decision-Maker training programs offered by the Reserve in the Barnegat Bay Watershed by offering visual and written resources on watershed planning strategies, protective site design principles, best management practices, and model environmental ordinances.

Cost: \$16,995
Start Date: 6/1/99
End Date: 12/31/00
Status: Interim report submitted 8/15/00.

Recipient: JCNERR

Lessons Learned: The interim report indicates that planning and development of the Coastal Repository is under way and the new facility that will house the Repository has been completed. Materials for Repository have not been purchased yet.

Contact Person: Lisa Weiss, Watershed Coordinator
Jacques Cousteau National Estuarine Research Reserve
130 Great Bay Boulevard
Tuckerton, NJ 08087
(609) 812-0649

PROJECT: WATERSHED DEMONSTRATION GARDEN

Description: OCSCD developed this project to demonstrate to municipal officials and residents how to improve and manage landscapes utilizing low input techniques. The District worked closely with Lacey Township's Department of Public Works to design, plan and implement demonstration gardens throughout the township. Each of the gardens was designed utilizing best management practices suitable to that particular site. Two signs were installed at each site. The first describes the purpose of the garden and identifies project partners. The second provides a site-specific diagram accompanied by a planting list and key.

Watershed Demonstration Garden (continued)

A workshop and tour of the Demonstration Gardens was also conducted as part of this project. A draft brochure was prepared for the workshop and is currently being revised. The brochures will be available to visitors of the gardens in a flip box at each site.

Cost: \$12,000
 Start Date: 6/1/99
 End Date: 8/14/00
 Status: Complete

Recipient: Ocean County Soil Conservation District

Lessons Learned: OCSCD was able to install five Demonstration Gardens in Lacey Township. This was accomplished, in part, by leveraging funds from this project with other ongoing projects containing similar tasks. This project was successful because all the gardens are in highly utilized and visible locations and will be maintained by the township. The gardens will remain long after the initial project has been completed.

Contact Person: Dave Friedman
 OCSCD
 714 Lacey Road
 Forked River, NJ 08731
 (609) 971-7002

PROJECT: ADOPT-A-STORM DRAIN

Description: The purpose of this project was to extend and continue the Adopt-a-Storm Drain program on Long Beach Island as well as throughout mainland communities along the Barnegat Bay. This program was an expansion of the Alliance for a Living Ocean's (ALO) Crab Connection storm drain stenciling public education campaign. This program addresses nonpoint source pollution and the consequential water quality degradation in the Barnegat Bay estuary, as well as the coastal issue of flooding and the importance of properly functioning storm drain systems facilitating proper drainage.

Cost: \$3,070
 Start Date: 6/1/99
 End Date: 7/26/00
 Status: Complete

Recipient: Alliance for a Living Ocean

Lessons Learned: During 1999, ALO mailed more than 7,650 pieces of Adopt-a-Storm Drain materials to property owners on Long Beach Island and Ocean Township. These mailings included an introductory letter, a drain location/adoption sheet, the Crab Connection flyer explaining nonpoint source pollution, and an ALO brochure. As of 1999, 252 storm drains were adopted according to the mid-season summary. For the remainder of the year, 50 storm drains were adopted.

Contact Person: Carol Elliot, Project Director
 Alliance for a Living Ocean
 PO Box 95
 Ship Bottom, NJ 08008
 (609) 492-0222

Here in this little Bay
Full of tumultous life and great repose,
Where, twice a day,
The purposeless, glad ocean comes and goes.

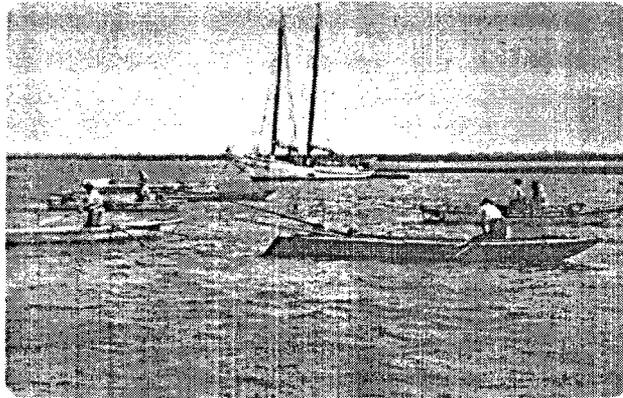
--Coventry, *Kersey Dighton Patmore (1823 - 1896)*

APPENDIX D

Public Outreach



PHOTO COURTESY OF THE TOMS RIVER SEAPORT SOCIETY.



New Jersey designed and built, the Garvey was the best workboat for Barnegat Bay shellfishing.

PHOTO COURTESY TUCKERTON SEAPORT, A PROJECT OF THE BARNEGAT BAY DECOY AND BAYMEN'S MUSEUM, INC.

PUBLIC OUTREACH ACCOMPLISHMENTS TO DATE**A. PUBLIC PARTICIPATION AND EDUCATION ACTION ITEMS FROM ORIGINAL WATERSHED MANAGEMENT PLAN**

- The Public Outreach Workgroup was formed and meets regularly with the support of a staff Public Outreach Coordinator.
- The Toms River BBNEP office serves as a clearinghouse for a great deal of the work that is going on in other programs and organizations.
- The first stakeholders workshop was held in the fall of 1998 followed by municipal workshops. The BBNEP has supported Personal Watercraft (PWC) Taskforce, the Educational Roundtable, and the Pumpout workshops.
- The annual Barnegat Bay Festival, coordinated in partnership with the Ocean County Board of Freeholders, provides a communication vehicle via interactive activities, interpretive tours, posters, billboards, radio public service announcements, cable TV, daily and weekly newspaper coverage, and participation by more than 3,000 people annually.
- For three summer seasons, the BBNEP has been active in many festivals throughout Ocean County with its traveling display.
- Several four-color posters were produced and extensively distributed ("Give Back to the Bay - Boaters," "Give Back to the Bay - What You Can Do in Your Yard", and "Barnegat Bay - Take a Second Look") in addition to brochures ("Water* our finite resource and its many uses" and "50 Nifty Facts" specific to the Barnegat Bay watershed). A weatherproof "Boaters Guide" was produced to communicate sensitive areas, public access points, and pumpout locations.
- A monthly "Program Update" has been developed to send to other organizations and as a communication vehicle for the BBNEP.
- Bi-monthly press releases have been placed in daily and weekly newspapers. Public Service Announcements have been broadcast for the Barnegat Bay Festivals in 1997 and 1998.
- The Citizen Advisory Committee (CAC) offered several months of speakers at the monthly CAC meetings as well as provided speakers at various clubs and organizations, including the Toms River Rotary, Employer Legislative Committee of Ocean County, Fishhawks, Whiting Mens Club, Bayhead Garden Club, and the Pinelands Commission.
- A Web site (<http://www.bbnep.org>) is under development and is updated periodically.
- Several meetings by the Video Committee of the CAC have developed a draft script for a half-hour film on the water resources of the Barnegat Bay watershed.
- As part of the Environmental Educators' Roundtable, coordinated by the Ocean County Soil Conservation District (OCSCD), the ecological, cultural, and historical aspects of the Barnegat Bay watershed will be integrated into a Barnegat Bay-specific Activity Guide.
- A relationship with the Barnegat Bay Watershed Association (BBWA) has been developed, whereby donations to the BBNEP can be held in trust and used for specific activities.
- Bumper stickers, T-shirts, and buttons are available as promotional incentives.
- Several appearances on local cable TV have spread awareness of issues.



PUBLIC OUTREACH

- With the support of the Minigrant Program and nearly \$50,000 available grant monies, more than 30 organizations and individuals have reached out to the public in signage programs, exhibits, teacher workshops, slide shows, etc. throughout the Barnegat Bay watershed.
- Partnerships have been developed with organizations and groups such as: Alliance for a Living Ocean (ALO); BBWEF(a.k.a. BBWF); Ocean County Vocational-Technical School; OCSCD; Watershed Partnership for New Jersey, etc.
- Targeted mailings have been sent to landscapers, garden clubs, marinas, yacht clubs, mayors, environmental commissions, environmental organizations, teachers, etc.
- "You are entering / leaving the Barnegat Bay watershed" and Barney the Crab signage have been placed at critical borders on county roads and municipal property.
- County-wide pumpout workshops were held to develop interest in a Barnegat Bay No Discharge Zone designation and to disseminate pumpout brochures.
- Continuing public service announcements are provided to the press; provide helpful tips on lifestyle changes to promote balanced use of the Barnegat Bay region's resources, in partnership with ALO.

B. MINIGRANTS

Over the past few years, approximately \$50,000 has been distributed to environmental and civic organizations, schools, municipalities, and business interests to reach out to the public on issues relevant to protecting the bay and watershed. These grants focus on increasing public awareness about major environmental problems facing the bay in one of the following subject areas:

- *Nonpoint source (NPS) pollution prevention/water quality control;*
- *Estuarine awareness;*
- *Habitat enhancement and preservation;*
- *Citizen monitoring; and*
- *Public participation.*

Increasing the number of people aware of the issues and unifying organizers and participants are ongoing BBNEP efforts. A summary of the Minigrant Awards is presented below.

1997 Minigrant Awards

- Jenkinson's Aquarium – Healthy Estuary Exhibit
- BBWA – NPS Pollution Education Campaign
- Point Pleasant Environmental Commission – Coastal Wetlands Awareness Signage Display
- Christine Raabe – Creating A Barnegat Bay National Estuary Slide Program
- ALO – Twilight At The Bay Summer Program
- Ocean & Nature Conservation Society – Annual Endangered Species Art Contest
- AJEC – An Educational Brochure, "Streams In the Barnegat Bay Estuary . . . Yours to Protect!"
- Jersey Shore Audubon Society – Barnegat Bay Marine Ecology Study Walk
- NJ Audubon Society – Bay Buffers, Barnegat Bay Watershed Pilot Program

1998 Minigrant Awards

- Ocean County Girl Scouts – Developed environmental kits that included water testing equipment, reference books, and signage relating to Lake Anity’s watershed relationship to the Barnegat Bay.
- NJ Society of American Foresters – Developed fact sheets and exploration center, “Water - A Forest Product” with a “talking tree” to deliver messages about trees, water and watersheds.
- Toms River Regional Schools – Produced a 30-minute television program to augment existing high school earth science curriculum and general science curricula at lower grades (supplemented by Telecenter Budget).
- Marine Trades Association of NJ Foundation – Developed and printed a “Users Guide to Barnegat Bay” – two-sided waterproof map delineating sensitive bay areas and providing environmental education on the reverse side.
- BBWA – Installed signs at waterfront access sites that promote stewardship of the Barnegat Bay resources.
- OCSCD – Promoted responsible litter disposal by reprinting 30,000 litterbags for distribution with beach badges and at marinas, festivals, and environmental events.
- Ocean Nature & Conservation Society – Conducted the annual Endangered Species Art Contest, educating children about endangered species.
- Barnegat Bay Decoy & Baymen’s Museum, Inc. – Supported publication of “The Closed Sea: Barnegat Bay & Environs,” a wealth of information on the natural resources of the Barnegat Bay, in conjunction with Dr. K. Mountford & Ocean County Historical Society.
- Township of Brick – Produced, as part of the Watercraft Accountability Project, public information pamphlets showing environmentally sensitive areas in the Upper Barnegat Bay Estuary and ways the public can help to protect these natural resources.
- Rutgers University, Institute of Marine and Coastal Sciences (IMCS) – Helped initiate the Community Tidal Marsh Assessment Project by training volunteers to conduct wetland water monitoring at selected sites in the Barnegat Bay Estuary.
- ALO – Constructed a public address system for versatility in presenting its environmental message to the public, especially in outdoor situations.
- NJ Coastal Heritage Trail – Developed 25 wayside information markers for use within the estuary to describe the varied plant, wildlife, and habitat conditions of the area.
- Pinelands Preservation Alliance – Produced an environmental photographic series for exhibition, concentrating on the Barnegat Bay watershed, by local children with disabilities. This program will be placed on tour for a minimum of four exhibitions and will include public speaking by many of the children.
- Ocean County Vocational Technical School – Developed a “wet laboratory” created by students and open to educators, civic groups, and supervised public.



Total \$26,839.40

PUBLIC OUTREACH

1999 Minigrant Awards

No minigrant award program in 1999.

2000 Minigrant Awards

- Seaside Heights, Hugh J. Boyd Jr. Elementary School – Developed environmental education, storm drain stenciling and NPS program.
- Toms River Avian Care – Developed public education program regarding the rehabilitation of wild migratory birds and protection of their habitat.
- Forked River Mountain Coalition – Developed program to increase public awareness with improved permanent interpretive exhibit (maps, photographs and signage) on displays at the Wells Mills County Park nature center as well as the portable interpretive exhibit used at festivals. The Web site was also improved.
- League of Women Voters – Facilitated Barnegat Bay specific modifications in 8-page booklet entitled “What you can do to prevent Nonpoint Source Pollution in the Barnegat Bay Watershed”; prepared press releases and distributed to various target audiences.
- Ocean Nature and Conservation Society – Continued the tradition of the annual Endangered Species Art Contest, which helps to instill a sense of responsibility for protecting wildlife and all living things.
- Ocean County Vocational Technical School – Developed a 30-50 page Barnegat Bay Estuary Species Field guide to be used in classrooms and programs such as the Barnegat Bay Educators’ Roundtable and NJ Community Water Watch.
- Rutgers Coop Extension – Promoted Home Landscape Best Management Practices to reduce NPS pollution and creating demonstration plots.
- NJ Society of American Foresters – Enhanced portions of Toms River through projects with area residents and user groups. Projects included planting trees for riparian buffers; benches/roofed information display boards.
- Alliance for a Living Ocean – Continued the Barnegat Bay Watch Program, educating the public through presentations demonstrating water quality monitoring techniques.
- Friends of Island Beach State Park – Developed and distributed a 12-page Park Visitors Guide to inform park visitors of events and activities to make them aware of the importance of Sedge Islands and Barnegat Bay.
- Ocean County Soil Conservation District – Developed outdoor classrooms in the Barnegat Bay watershed.
- Jenkinson’s Aquarium – Presented interactive and hands-on “Barnegat Bay Watershed Wonders” program to ten third-grade classes in the Barnegat Bay watershed.
- NJ Audubon Society – Provided four seminars and field trips throughout the watershed to educate 200 seniors about the need to protect and enhance the Barnegat Bay watershed. A “Habitat Guide” was compiled and distributed throughout Ocean County as well.

- Barnegat Bay Watershed Association – The third annual seminar series, “Waste Water Reuse and Water Conservation,” was designed, planned, hosted and followed-up with press releases and a White Paper.

Total \$31,481.00

2001 Minigrant Awards

- Marine Trades Association – Reprint the “Boater’s Guide to Barnegat Bay and Little Egg Harbor.”
- West Dover Elementary—Establish “Frog Pond Alley,” a water ecosystem in schoolyard habitat to use as an educational tool for all staff, students, parents and members of the community.
- Rutgers Cooperative Extension of Ocean County – Duplication of the video “Barnegat Bay Watershed On the Edge.” This provides grades 6-9 curriculum for the Barnegat Bay-specific activity guide project.
- Tuckerton Seaport – “A Day at the Back of the Bay” Teachers’ workshop, providing Ocean County educators the opportunity to study links between the environment and Barnegat Bay estuary.
- Ocean County Soil Conservation District – Promote the development and use of outdoor classrooms to increase opportunities for hands-on learning.
- Dover Township Environmental Commission – Reprint Non-Point Source Pollution Prevention Publication.
- Seaside Heights Board of Education – Develop the “Barnegat Bay Crab Information and Education Project.”
- Alliance for a Living Ocean – Sponsor “Inherit the Earth” field trips throughout the Barnegat Bay estuary.
- Ocean Nature and Conservation Society – Sponsor the 27th annual Endangered Species Art Contest. This educates children about disappearing plants and animals, fostering environmental stewardship.
- Youth Environmental Society (YES) – The implementation of Phase One of the management plan for the Experience Barnegat Bay Natural Resources Center and Camp. This increases public awareness about the potential of the facility as a premier environmental and natural resource education center.
- Ocean County College – Develop a summer training institute for K-3rd grade teachers in Ocean County to learn about the estuary and watershed.

Total \$20,000.00

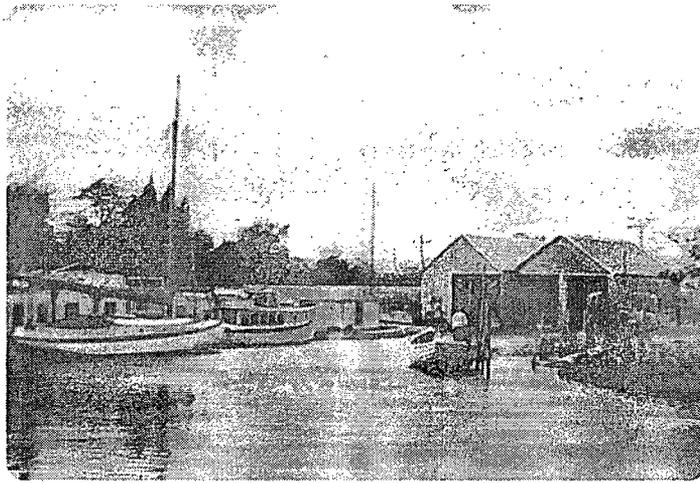
When the earth is sick,
the animals will begin to disappear,
when that happens,
The Warriors of the Rainbow will come to save them.

—Chief Seattle (1854)

APPENDIX E
**Management
Conference Members**



Harvesting salt hay. PHOTO COURTESY OF THE OCEAN COUNTY HISTORICAL SOCIETY



Tuckerton Creek, when shipbuilding was paramount, circa early 1900s.
PHOTO COURTESY OF THE TUCKERTON SEAPORT, A PROJECT OF THE BARNEGAT BAY DECAY
AND BAYMENS MUSEUM, INC.

MANAGEMENT CONFERENCE MEMBERS

APPENDIX E

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Shannon Shinault Public Outreach Coordinator
Mary Judge Program Assistant
Mary Jerkowicz Program Assistant

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Jane Kenny USEPA, Acting Region 2 Administrator
James Lacey Ocean County Freeholder
David Siddons Ocean County Mayor's Association

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Michael DeLuca Science and Technical Advisory Committee
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Eric Evenson US Geological Survey
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David Friedman Ocean County Soil Conservation District
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Penny Griber Scientific and Technical Advisory Committee
Richard Kunze Ocean County Utilities Authority
Jim Lacey Ocean County Freeholder
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Ken Winter Winter's Yacht Basin

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Barbara Edelhauser	Steve Magelnicki
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Sandy Gingras	Terry O'Leary
John Griber	Christine Raabe
Penny Griber	John Smath
Ed Harrison	Marilyn Treusch
Richard King	John Wnek
Joan Koons	

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The Ocean County Planning Department Staff is acknowledged for their assistance as sponsor during the planning phase of the program.

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Tina Bologna	Jacques Cousteau National Estuarine Research Reserve
Dr. Joanna Burger	Rutgers University
Sandy Carine	Ocean County College
Al Clericuzo	Rutgers University
Bob Connell	NJDEP
Alan Davidson	Marine Trades Association of New Jersey
Thomas Dunn	Technical Consultant
Gef Flumlin	Rutgers Cooperative Extension
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Ed Henry	USFWS
Kyra Hoffman	NJDEP
Kerry Jennings	OCSCD
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Susan Scibilia	Rutgers University
Deborah Smith-Fiola	Rutgers University
John Tiedemann	Monmouth University

MANAGEMENT CONFERENCE MEMBERS

LOCAL GOVERNMENT COMMITTEE

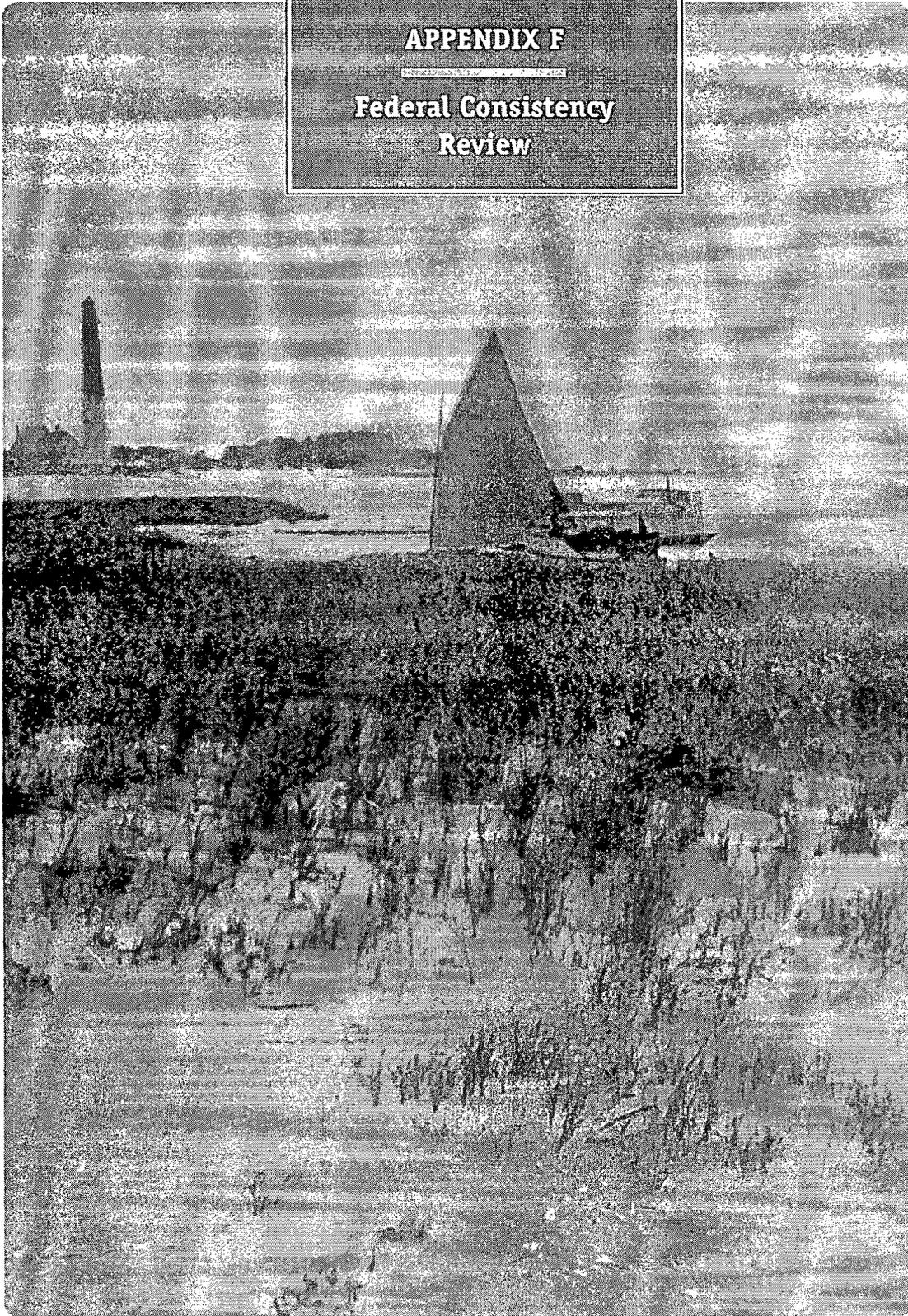
The Local Government Committee is comprised of all mayors of Ocean County and parts of Monmouth County. During the last four years of the BBNEP, the Ocean County Mayors Association served as the forum for discussion of environmental issues of concern to the 33 municipalities of Ocean County. The President of the Ocean County Mayors Association is the Honorable David Siddons, Borough of Island Heights.

The following mayors have also been especially helpful to this program: Hon. Deborah C. Whitcraft, Beach Haven Borough; Hon. Joseph C. Scarpelli, Brick Township; Hon. Stephen F. Childers, Lakehurst Borough; Hon. William K. Dunbar III, Mantoloking Borough; Hon. Ronald S. Dancer, Plumsted Township; Hon. Alexander B. Condos, Seaside Park Borough; former Mayor John Peterson, Seaside Park Borough; and Hon. Carl W. Block, Stafford Township.



APPENDIX F

**Federal Consistency
Review**



Barnegat Inlet looking from Island Beach toward Barnegat City. PHOTO COURTESY OF THE OCEAN COUNTY HISTORIC SOCIETY.

What would the world be once bereft
Of wet and of wilderness? Let them be left
O let them be left, wilderness and wet;
Long live the weeds and wilderness yet.

--Gerard Manley Hopkins

**FEDERAL CONSISTENCY REPORT
FOR THE BARNEGAT BAY NATIONAL ESTUARY PROGRAM****BACKGROUND**

The National Estuary Program (NEP) was established by the Clean Water Act (CWA) of 1987, Section 320. The purpose of the NEP is to identify, protect, and restore estuaries of national significance. The Barnegat Bay National Estuary Program (BBNEP) was nominated as an NEP by the Governor of New Jersey in 1995. In April 1996, the Management Conference was convened to oversee development of a Comprehensive Conservation and Management Plan (CCMP). There is a federal consistency review requirement for the NEP. This is distinct from the federal consistency requirement of the federal Coastal Zone Management Act (CZMA), conducted as part of the state's coastal zone management program. In the Barnegat Bay region of New Jersey, the coastal zone management program is administered through the Coastal Area Facilities Review Act (CAFRA). Revised regulations have recently been promulgated, and the current regulations are known as CAFRA II.

The federal consistency review procedures being recommended for New Jersey for the BBNEP are explained below.

PURPOSE OF REVIEW

EPA guidance states that the goal of the federal consistency review process is to ensure that federal actions do not adversely affect CCMP goals, and that they support actions proposed for the CCMP where possible. In addition, under an agreement between the U.S. Environmental Protection Agency (USEPA) and the National Oceanic and Atmospheric Administration (NOAA), CCMPs are submitted for determination that they are consistent with the coastal zone management plans of the affected states.

The major tasks in the federal consistency review process follow:

Consistency of Federal Actions with the CCMP

1. Development of an inventory of federal programs and development projects to be reviewed for consistency with the CCMP.
2. A one-time assessment of these programs/projects for consistency with the CCMP. Development of consistency review criteria were based on the goals, objectives, and actions of the Barnegat Bay CCMP. Using those criteria, the inventory was reviewed to identify programs that may be inconsistent with the Plan.
3. Setting up and implementing a continuing process to review individual federal projects for consistency with the CCMP. Numerous programs and projects were identified that have the potential to conflict with the Plan.
4. Concurrence of the U.S. Fish and Wildlife Service and National Marine Fisheries Service on the Endangered Species Act and of the State Historic Preservation Office on the National Historic Preservation Act.

Activities that affect the quality of the Barnegat Bay National Estuary are supported and regulated, either directly or indirectly, by federal, state and interstate agencies. Because government-sponsored activities have a wide variety of objectives, it is possible that some activities may be inconsistent with the goals of the CCMP for the bay and watershed.

The need for coordination among governmental programs and program goals that will affect the Management Conference (and ultimately, the CCMP), has been addressed in Section 320(b) (7) of the CWA, as amended.

"Purpose 7" states that:

FEDERAL CONSISTENCY REVIEW

"The purpose of a Management Conference shall be to . . . review all federal financial assistance programs and federal development projects in accordance with the requirements of Executive Order 12372, as in effect on September 17, 1983, to determine whether such assistance program or project would be consistent with and further the purposes of the CCMP." It further specifies that the review shall not be limited to EO 12372 programs, but may include programs listed in the most recent Catalog of Federal Domestic Assistance that may have an effect on the goals and objectives of the Plan.

Concurrence of the CCMP with the Endangered Species Act and the National Historic Preservation Act

The Barnegat Bay National Estuary Program also needs concurrence with two additional Acts—the National Historic Preservation Act and the Endangered Species Act. Under Section 106 of the National Historic Preservation Act, Federal agencies that fund, permit, license, approve, or carry out actions in the CCMP may be required to consult the State Historic Preservation Office to determine if a site is listed on or eligible for listing in the National Register of Historic Places. If a site is listed or eligible for listing, then the agency must determine if there is a potential for adverse effects to the site as a result of the proposed action. Section 7(a)(2) of the Endangered Species Act directs Federal agencies, in consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize listed species of their designated critical habitat. Section 7(a)(2) consultation may be required during CCMP implementation where Federal agencies authorize, fund, or carry out an activity that may affect listed species. Each Federal agency must determine if consultation is necessary on a case-by-case basis. See Section 12.10 of the CCMP for further discussion of this topic.

It is well to note that the U.S. Fish and Wildlife Service and National Marine Fisheries Service have both been integral participants in the Barnegat Bay National Estuary Program from the very beginning. Both agencies are represented on the BBNEP Management Committee as well as on the Science and Technical Advisory Committee. Both agencies have made constructive contributions to the development of the CCMP, and they have both rendered their approval within the Management Conference approval process for the action items listed in the CCMP. At the end of this appendix are copies of the formal concurrence letters from each of the respective federal and state agencies.

Federal Consistency Review Process

To fulfill the requirements of Section 320 of the Clean Water Act, the following steps were taken:

1. An inventory was first compiled of federal assistance programs listed in the Catalog of Federal Domestic Assistance, direct federal development projects, and federal license and permit programs.
2. For the one-time review of federal programs, such programs that are likely to either positively or negatively affect the CCMP implementation have been screened against appropriate criteria in USEPA guidance to determine their inclusion and possible effect on CCMP implementation. These criteria are presented below.

Criteria for Consistency

The following criteria for determination of consistency for whether programs encourage or support the objectives as listed in the CCMP were developed by the Management Conference.

More specific criteria are whether the programs encourage or support the proposed CCMP actions in the following ways. Programs or projects are inconsistent if they inhibit these activities or harm the resources that they seek to protect or restore.

- Complies with existing management plans or supports continued development of interstate management plans for a wide variety of living resources and habitats;
- Encourages development of tools for such compliance, including Geographic Information Systems (GIS) and community classification systems;
- Encourages or provides for restoration of a variety of valuable habitats, including wetlands, streams, stream corridors, riparian and wetland buffer zones, artificial reefs, oyster reefs; shorelines, and large forested upland tracts;
- Reduces loss of wetlands;
- Protects shorelines;
- Promotes sustainable development;
- Reduces nonpoint source (NPS) pollution and protects water quality and quantity through watershed-based planning, best management practices (BMPs), and riparian corridor protection;
- Promotes improved land-use planning to protect water quality and reduce sprawl;
- Encourages regional coordination;
- Encourages redevelopment and compact development;
- Encourages water conservation and integrated planning for water supply and wastewater;
- Promotes better coordination and planning for dredging, including dredged material disposal;
- Encourages development and use of pumpout facilities;
- Improves public access to the river and bay;
- Addresses information and resource needs of the Toxics Management Strategy;
- Encourages wise use of chemicals by residents and businesses;
- Supports development and implementation of toxic water quality criteria;
- Helps to identify sources of contaminated sediments and identify control measures;
- Promotes regional information sharing and development of GIS;
- Supports private sector efforts to achieve all these objectives and activities;
- Supports public education activities, including newsletters, other outreach material, ecotourism promotion, hands-on activities for volunteers, and curricula development; and
- Supports existing and expanded monitoring plans, including volunteer monitoring.

Federal Consistency Review Strategy

After conducting a one-time assessment and identifying potential conflicts with the CCMP (Table F-1), the following was considered and a subsequent strategy was concluded.

Executive Order (EO) 12372, which established a procedure for state and local government review of federal assistance programs and development projects, was implemented by all federal agencies in 1983. A requirement of the CWA is compliance with EO 12372 for the review of federal assistance programs and development projects. These reviews, known as state clearinghouse reviews, are coordinated in New Jersey by the Department of Community Affairs, Division of Community Resources.

FEDERAL CONSISTENCY REVIEW

In 1988, the USEPA and NOAA entered into an agreement designed to avoid conflicts and duplication regarding the NEP and the Coastal Zone Management Program. One provision is that, after concurrence by the state governor and approval by the USEPA administrator, the USEPA and NOAA will encourage and/or require, to the extent permitted by law, that the CCMP be submitted for incorporation into the Coastal Zone Management Program, as appropriate.

Therefore, the consistency review requirement of the NEP can be met by integrating the process into the existing state Coastal Management Plan (CMP) consistency review process, or, as is currently being done in New Jersey, through the EO 12372 process. The BBNEP would be available to participate, as appropriate under existing appeal and mediation procedures, in assisting the state in the resolution of consistency determinations.

Note also that potential inconsistencies among coastal activities can be addressed through the Management Conference itself. Under Section 320(b) (7) of the CWA, as amended, the Management Conference has such authority, as described above. However, the goal of the review process established under Purpose 7 is to complement the state's existing review processes rather than duplicate them, and the current recommendation is that the BBNEP would be best served by using existing processes.

The appropriate ongoing review programs in the state of New Jersey have the staff and experience necessary to perform federal consistency reviews, whereas the costs and start-up time, in addition to the lack of experienced personnel, could make the undertaking of a separate federal consistency review prohibitive to the BBNEP.

The Management Conference has also raised concerns regarding the review of non-federal programs for consistency with the CCMP. These concerns will be addressed through existing state and local review procedures, such as CAFRA II review by the state of New Jersey and Ocean County's cross-acceptance review of municipal master plans.

For the continuing review process, which evaluates individual projects for consistency with the CCMP, New Jersey's EO 12372 process and single point of contact (state clearinghouse) will be used. Under the EO process, agencies must accommodate state comments, or explain in writing why they cannot. The EO process, used by most states, does not only focus on environmental protection; it covers all federal actions and can be used to further the consistency review of the BBNEP CCMP. NJDEP will conduct project reviews under the EO process considering the BBNEP CCMP. This process will provide additional assurance that project review will be consistent with the goals of environmental protection.

Consistency of the CCMP with Coastal Management Programs

Under Section 307(c) of the CZMA of 1972, as amended, and implementing regulations in 15 CFR 930, consistency with an approved state coastal zone management program is required: (a) for direct federal activities and development projects, (b) for activities requiring federal licenses or permits, and (c) for activities receiving federal financial assistance. In New Jersey, the program and the review of federal activities for consistency with the state's CMP, known as CAFRA II, is administered by the New Jersey Department of Environmental Protection (NJDEP).

The 1988 USEPA/NOAA agreement states that:

- "CCMPs developed under the NEP will voluntarily, as a matter of policy, be submitted for review under the federal consistency provisions of Section 307(c) of the CZMA of 1972, as amended."
- New Jersey, pursuant to the federal and state consistency provisions of CAFRA II, already has a review process in place. Based on a review of the CCMP and a consistency review submitted by the NEP (USEPA Region II will prepare such a review for the BBNEP), New Jersey will review the overall approval and adoption of the CCMP, and each proposal within it, for consistency with the policies of CAFRA II, which are specific with respect to use and development of coastal resources.
- The study area for the BBNEP covers all of Ocean County, New Jersey, which is nearly coincident with the boundaries of the Barnegat Bay watershed.

- For the CCMP consistency review with the state CAFRA II, under Section 307(c) of the CZMA, the USEPA will send a formal consistency determination to the NJDEP at the same time that the final CCMP is submitted to the governor of New Jersey and the USEPA administrator. The NJDEP will determine the consistency of the BBNEP CCMP with the CAFRA II and implement enforceable BBNEP CCMP actions accordingly.

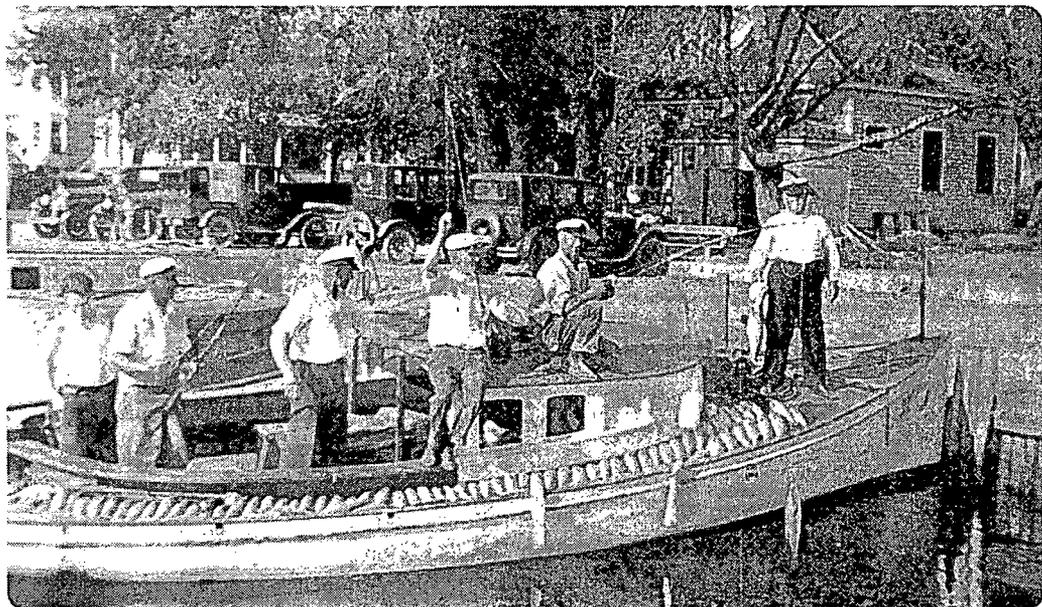
CCMP Actions with Potential Conflicts

CCMP actions were designed to meet the stated Program Goals and Actions. To the extent that federal programs are geared toward environmental protection, there should be no conflict with CCMP actions. However, federal programs that contain an element of economic development, construction, or infrastructure improvement may conflict with CCMP actions. It will be through the continued deliberation of the BBNEP Management Conference that such conflicts will be resolved and an accepted accommodation of development and environmental protection will be reached.

Federal Development Projects in the Barnegat Bay Watershed

Two existing federal projects are focused in the coastal area of the Barnegat Bay watershed. One project, a beach erosion control and hurricane project, extends along the coastal barrier from the Manasquan Inlet to the Barnegat Inlet. It is sponsored by the U.S. Army Corps of Engineers and the NJDEP. This project is in the feasibility stage and an environmental impact statement is under review. This project potentially conflicts with the goal of environmental protection, but by proposing an alternative that does not include hard coastal structures, the project reduces that potential. Members of the Management Committee, as representatives of the respective agencies, will take part in the review of this proposal.

The second project is the Barnegat Bay Restoration Study, which is also a joint feasibility study by the Corps and the NJDEP. It has been incorporated into the CCMP as Action Item 6.2. As the BBNEP has made a commitment to participate in the progress of this effort, this resolves any potential conflict of interest that may arise.



*A bountiful catch. PHOTO COURTESY OF THE TUCKERTON SEAPORT,
A PROJECT OF THE BARNEGAT BAY DECOY AND BAYMEN'S MUSEUM, INC.*

FEDERAL CONSISTENCY REVIEW

TABLE F-1. Federal Program Consistency with the Barnegat Bay National Estuary Program

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP CCMP	Potential to conflict with BBEP CCMP	Priority?
10.200	Grants for Agricultural Research, Special Research Grants	USDA-ES	X	-	-
10.069	Conservation Reserve Program	USDA-FSA	X	-	-
10.072	Wetlands Reserve Program	USDA-NRCS	X	-	-
10.901	Resource Conservation and Development	USDA-NRCS	X	X	-
10.902	Soil and Water Conservation	USDA-NRCS	X	-	-
10.903	Soil Survey	USDA-NRCS	X	-	-
10.904	Watershed Protection and Flood Prevention	USDA-NRCS	X	-	-
10.906	Watershed Surveys and Planning	USDA-NRCS	X	-	-
10.912	Environmental Quality Incentives Program	USDA-NRCS	X	-	X
10.913	Farmland Protection Program	USDA-NRCS	X	-	-
10.914	Wildlife Habitat Incentive Program	USDA-NRCS	X	-	X
10.768	Business and Industry Loans	USDA-RB-CS	X	X	-
10.769	Rural Development Grants	USDA-RB-CS	X	X	-
10.854	Rural Development Loans and Grants	USDA-RB-CS	X	X	-

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP/CGMP	Potential to conflict with BBEP/CGMP	Priority?
10-410	Very Low to Moderate Income Housing Loans	USDA-RHS	X	X	-
10-411	Rural Housing Site Loans and Self-Help Housing Land Development Loans	USDA-RHS	X	X	-
10-433	Rural Housing Preservation Grants	USDA-RHS	X	-	-
10-766	Community Facilities Loans and Grants	USDA-RHS	X	X	-
10.760	Water and Wastewater Disposal Systems for Rural Communities	USDA-RUS	X	X	-
10.762	Solid Waste Management Grants	USDA-RUS	X	X	-
10.770	Water and Waste Disposal Loans and Grants	USDA-RUS	X	X	-
11.300	Grants for Public Works and Economic Development	DOC-EDA	X	-	-
11.302	Economic Development-Support for Planning Organizations	DOC-EDA	X	-	-
11.307	Economic Adjustment Assistance	DOC-EDA	X	X	-
11.405	Anadromous Fish Conservation Act Program	NOAA	X	-	-
11.407	Interjurisdictional Fisheries Act of 1986	NOAA	X	-	X
11.417	Sea Grant Support	NOAA	X	-	X

FEDERAL CONSISTENCY REVIEW

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP CGMP	Potential to conflict with BBEP CGMP	Priority?
11.419	Coastal Zone Management Administration Awards	NOAA	X	-	X
11.420	Coastal Zone Management Estuarine Research Reserves	NOAA	X	-	-
11.426	Financial Assistance for National Centers for Coastal Ocean Science	NOAA	X	-	-
11.427	Fisheries Development and Utilization Research and Development Grants and Cooperative Agreements Program	NOAA	X	-	-
11.429	Marine Sanctuary Program	NOAA	X	-	-
11.433	Marine Fisheries Initiative	NOAA	X	-	-
11.441	Regional Fishery Management Councils	NOAA	X	-	-
11.444	Aquaculture Program	NOAA	X	X	-
11.463	Habitat Conservation	NOAA	X	-	-
11.473	Coastal Services Center	NOAA	X	-	-
11.474	Atlantic Coastal Fisheries Cooperative Management Act	NOAA	X	-	-
11.477	Fisheries Disaster Relief	NOAA	X	-	-
11.478	Center for Sponsored Coastal Research Coastal Ocean Program	NOAA	X	-	X
12.100	Aquatic Plant Control	ACOE	X	-	-

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP CCMP	Potential to conflict with BBEP CCMP	Priority?
12.101	Beach Erosion Control Projects	ACOE	X	X	-
12.102	Emergency Rehabilitation of Flood Control Works or Federally Authorized Coastal Protection Works	ACOE	X	-	-
12.104	Flood Plain Management Services	ACOE	X	-	-
12.105	Protection of Essential Highways, Highway Bridge Approaches and Public Works	ACOE	X	X	-
12.106	Flood Control Projects	ACOE	X	X	-
12.107	Navigation Projects	ACOE	X	X	-
12.109	Protection, Clearing and Straightening Channels	ACOE	X	X	-
12.110	Planning Assistance to States	ACOE	X	-	-
12.111	Emergency Advance Measures for Flood Protection	ACOE	X	X	-
12.300	Basic and Applied Scientific Research	ONR	X	-	-
12.301	Basic and Applied Scientific Research	ONR	X	-	-
12.600	Community Economic Adjustment	DOD-OEA	X	X	-
12.607	Community Economic Adjustment Planning Assistance	DOD-OEA	X	X	-

FEDERAL CONSISTENCY REVIEW

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP CCMP	Potential to conflict with BBEP CCMP	Priority?
12.612	Community Base Reuse Plans	DOD-OEA	X	X	-
12.613	Growth Management Planning Assistance	DOD-OEA	X	X	-
14.218	Community Development Block Grants/Entitlement Grants	HUD-CPD	X	X	-
14.2246	Community Development Block Grants/Economic Development Initiative	HUD-CPD	X	X	-
15.605	Sport Fish Restoration	FWS	X	-	-
15.611	Wildlife Restoration	FWS	X	-	-
15.614	Coastal Wetlands Planning, Protection and Restoration Act	FWS	X	-	-
15.615	Cooperative Endangered Species Conservation Fund	FWS	X	-	-
15.616	Clean Vessel Act	FWS	X	-	X
15.618	Administrative Grants for Federal Aid in Sport Fish and Wildlife Restoration	FWS	X	-	-
15.623	North American Wetlands Conservation Fund	FWS	X	-	-
15.805	Assistance to State Water Resources Research Institutes	USGS	X	-	-
15.976	Migratory Bird Banding and Data Analysis	USGS	X	-	-

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP CCMP	Potential to conflict with BBEP CCMP	Priority?
15.916	Outdoor Recreation - Acquisition, Development and Planning	NPS	X	X	-
15.918	Disposal of Federal Surplus Real Property for Parks, Recreation, and Historic Monuments	NPS	X	X	-
15.919	Urban Park and Recreation Recovery Program	NPS	X	-	-
15.925	National Maritime Heritage Grants	NPS	X	-	-
20.005	Boating Safety Financial Assistance	USCG	X	-	-
20.006	State Access to the Oil Spill Liability Trust Fund	USCG	X	-	-
20.007	Bridge Alteration	USCG	X	X	-
20.205	Highway Planning and Construction	FHA	X	X	-
20.219	Recreational Trails Program	FHA	X	X	-
20.312	High Speed Ground Transportation - Next Generation High Speed Rail Program	FRA	X	X	-
20.500	Federal Transit-Capital Investment Grants	FTA	X	X	-
20.505	Federal Transit-Metropolitan Planning Grants	FTA	X	X	-
20.507	Federal Transit-Formula Grants	FTA	X	X	-

FEDERAL CONSISTENCY REVIEW

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP CCMP	Potential to conflict with BBEP CCMP	Priority?
20.509	Formula Grants for Other than Urbanized Areas	FTA	X	X	-
20.514	Transit Planning and Research	FTA	X	X	-
20.515	State Planning and Research	FTA	X	X	-
20.801	Development and Promotion of Ports and Intermodal Transportation	DOT-MA	X	X	-
66.419	Water Pollution Control-State and Interstate Program Support	EPA	X	-	X
66.433	State Underground Water Source Protection	EPA	X	-	-
66.454	Water Quality Management Planning	EPA	X	-	X
66.456	National Estuary Program	EPA	X	-	X
66.458	Capitalization Grants for State Revolving Funds	EPA	X	-	X
66.460	Nonpoint Source Implementation Grants	EPA	X	-	X
66.461	Wetlands Protection-Development Grants	EPA	X	-	-
66.463	National Pollutant Discharge Elimination System Related State Program	EPA	X	-	-
66.500	Environmental Protection-Consolidated Research	EPA	X	-	-

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP CCMP	Potential to conflict with BBEP CCMP	Priority?
66.600	Environmental Protection Consolidated Grants Program Support	EPA	X	-	-
66.605	Performance Partnership Grants	EPA	X	-	X
66.606	Surveys, Studies Investigations and Special Purpose Grants	EPA	X	-	X
66.608	One Stop Reporting	EPA	X	-	-
66.609	Children's Health Protection	EPA	X	-	-
66.700	Consolidated Pesticide Enforcement Cooperative Agreements	EPA	X	-	-
66.701	Toxic Substances Compliance Monitoring Cooperative Agreements	EPA	X	-	-
66.604	Environmental Justice Grants to Small Community Groups	EPA	X	-	-
66.710	Environmental Justice Community/University Partnership Grants Program	EPA	X	-	-
66.713	State and Tribal Environmental Justice	EPA	X	-	-
66.801	Hazardous Waste Management State Program Support	EPA	X	-	-
66.802	Superfund State Site-Specific Cooperative Agreements	EPA	X	-	-

FEDERAL CONSISTENCY REVIEW

TABLE F-1. (continued)

Catalog of Federal Domestic Assistance	Program Title	Agency	Potential to support BBEP/CCMP	Potential to conflict with BBEP/CCMP	Priority?
66.804	State and Tribal Underground Storage Tanks Program	EPA	X	-	-
66.805	Leaking Underground Storage Tank Trust Fund Program	EPA	X	-	-
66.806	Superfund Technical Assistance Grants for Citizen Groups at Priority Sites	EPA	X	-	-
66.807	Superfund Innovative Technology Evaluation Program	EPA	X	-	-
66.808	Solid Waste Management Assistance	EPA	X	-	-
66.809	Superfund State Core Program Cooperative Agreements	EPA	X	-	-
66.810	CEPP Technical Assistance Grants Program	EPA	X	-	-
66.811	Brownfield Pilots Cooperative Agreements	EPA	X	-	-
66.708	Pollution Prevention Grants Program	EPA	X	-	-
83.536	Flood Mitigation Assistance	FEMA	X	X	-
83.537	Community Disaster Loans	FEMA	X	X	-
83.548	Hazard Mitigation Grant	FEMA	X	X	-
83.551	Project Impact-Building Disaster Resistant Communities	FEMA	X	X	-

APPENDIX G

Base Program Analysis

OCTOBER 2000

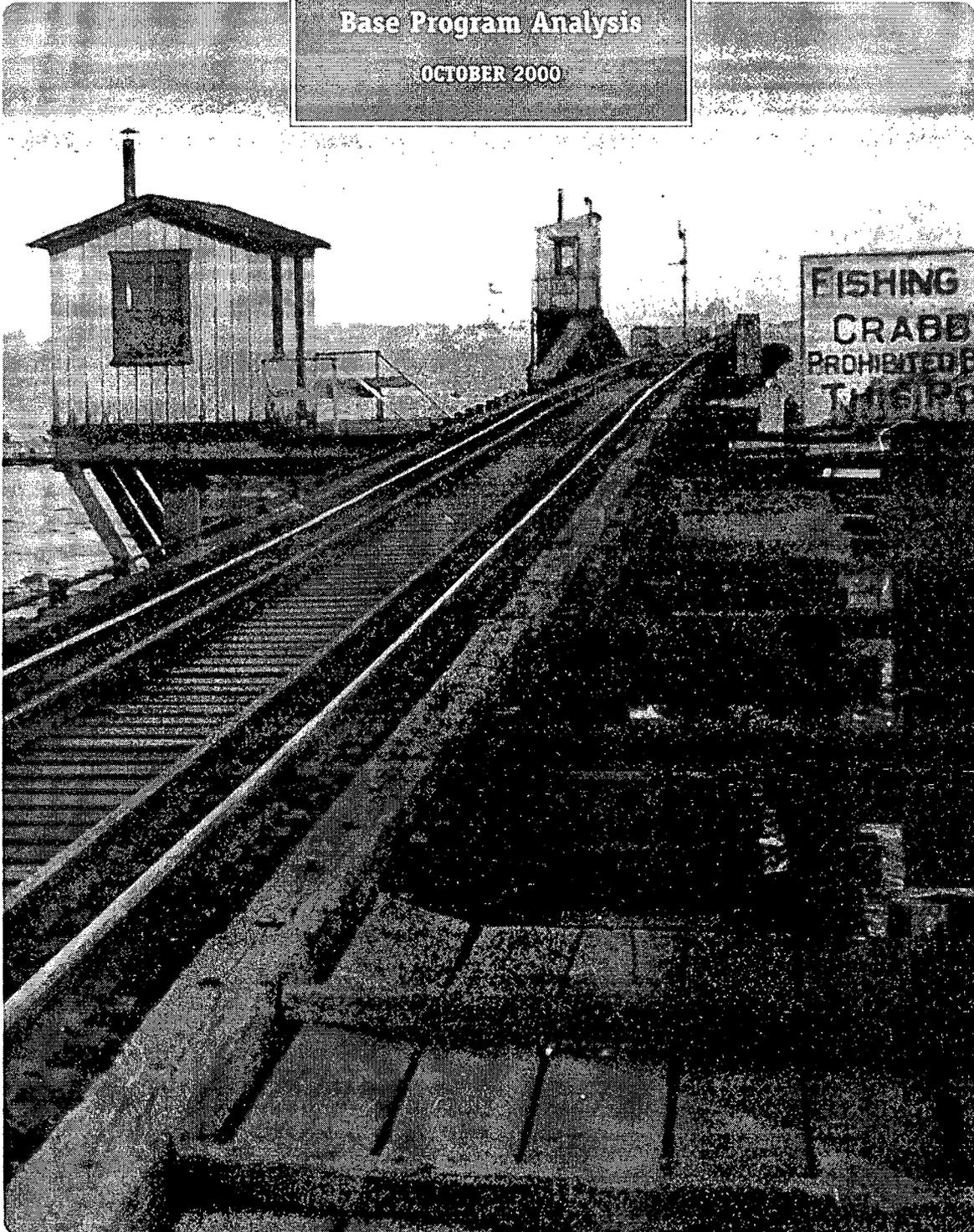


PHOTO COURTESY OF THE TOMS RIVER SEAPORT SOCIETY

The frog
does not drink up
the pond in which he lives.

—*American Indian Proverb*

TABLE OF CONTENTS

INTRODUCTION 1

A. WATER QUALITY AND WATER SUPPLY 2

1. Clean Water Programs 2

 a) Federal Clean Water Program 2

 b) New Jersey State Clean Water Programs 3

 c) Water Supply Program 5

 d) Analysis of Program Implementation 6

2. Clean Vessel Act 7

 a) General Program Discussion 7

 b) Analysis of Program Implementation 8

3. Air, Solid Waste, and Hazardous Waste Programs 8

 a) Air Programs 8

 b) Resource Conservation and Recovery Act (RCRA) 8

 c) Superfund 9

 d) State Hazardous Waste Programs 11

 e) Spill Prevention and Control 11

 f) Solid Waste Management 12

 g) Pollution Prevention 12

 h) Analysis of Program Implementation 12

B. HABITAT LOSS AND ALTERATION 13

1. Coastal Zone Management 13

 a) Federal Program 13

 b) New Jersey Coastal Management Program 13

 c) Federal Consistency Process 15

 d) Analysis of Program Implementation 15

2. Land Use Management 15

 a) Introduction 15

 b) State Role in Land Use Planning 16

 c) Pinelands Commission 16

 d) Ocean County and Municipal Roles 17

 e) Analysis of Program Implementation 18

3. Wetlands Regulation and Management 18

 a) Federal Program 18

 b) New Jersey State Wetlands Program 21

 c) Analysis of Program Implementation 22

4. The National Environmental Policy Act, and Related State Programs 22

 a) Historical Perspective 22

 b) NEPA Process 23

 c) Federal Agencies' and Public's Roles 23

 d) NEPA and Other Environmental Laws 24

 e) Integration into Federal Decision-Making 24

 f) State Programs Comparable to NEPA 25

 g) Analysis of Program Implementation 25

BASE PROGRAM ANALYSIS

5. Management of Fish and Shellfish	25
a) Federal Program	25
b) Interstate Programs	27
c) New Jersey State Programs	27
d) Analysis of Program Implementation	28
6. Endangered and Threatened Species Programs	29
a) Federal Program	29
b) New Jersey State Program	31
c) Analysis of Program Implementation	32
7. Wildlife Refuges and Preserves	33
a) National Wildlife Refuge System	33
b) Pinelands National Reserve	34
c) Other Federal Programs	34
d) State Program	35
e) Analysis of Program Implementation	35
C. HUMAN ACTIVITIES AND COMPETING USES	36
1. Public Access	36
a) General Program Discussion	36
b) Analysis of Program Implementation	36
2. Navigation and Water-Dependent Activities	37
a) Federal Actions	37
b) Analysis of Program Implementation	37
3. Parks and Recreation Areas	38
a) Introduction	38
b) Federal Parks	38
c) State and Local Parks and Forests	38
d) Natural Areas System	39
e) Green Acres Program	39
f) Natural Lands Trusts	39
g) Natural Heritage Program	39
h) Private Organizations and Land Trusts	40
i) Analysis of Program Implementation	40
4. Public Health and Education	40
a) Public Health Summary	40
b) Analysis of Program Implementation	41

INTRODUCTION

This draft inventory and summary analysis serves as a supporting document for the Barnegat Bay National Estuary Program's Comprehensive Conservation and Management Plan (CCMP). This document is designed to give a snapshot of the existing institutional framework of the Barnegat Bay region and Ocean County, New Jersey. The inventory is a compilation of regulatory and non-regulatory programs affecting the Barnegat Bay region, and covers the issue areas that are addressed in the CCMP: Water Quality and Water Supply; Habitat Loss and Alteration; and Human Activities and Competing Uses. The analysis presents an overview of the existing framework associated with each of the Program's issue areas, summarizes the individual programs associated with those issue areas, and identifies the gaps in the institutional framework, which the CCMP has been developed to address.

A number of governmental programs have been promulgated in order to regulate coastal development, navigation, waste disposal, water quality, water supply, and wetlands conservation. These programs directly or indirectly affect the water environment and natural habitat conditions in the Barnegat Bay watershed. An early step in the development of a comprehensive management strategy for the region is a focused assessment of the particulars of these governmental programs. Specific programs, or program areas, are detailed in the following pages, grouped as follows:

A. WATER QUALITY AND WATER SUPPLY

- Clean Water Programs
- Clean Vessel Program
- Air, Solid Waste, and Hazardous Waste Programs

B. HABITAT LOSS AND ALTERATION

- Coastal Zone Management
- Land Use Management
- Wetlands Protection
- National Environmental Policy Act, and related State Programs
- Fish and Shellfish Management
- Endangered and Threatened Species Programs
- Wildlife Refuges and Preserves

C. HUMAN ACTIVITIES AND COMPETING USES

- Public Access
- Navigation and Water-Dependent Activities
- Parks and Recreation Programs
- Public Health and Education

The three groupings follow a gradient from primarily regulatory to primarily non-regulatory programs. They also grade from federal-lead programs to non-federal, or even non-governmental, programs. The range of these programs makes clear the multiple responsibilities of the various Program participants to make the CCMP a success. No individual agency or organization can act independently to accomplish the tasks that need to be done.

BASE PROGRAM ANALYSIS

These program descriptions, and an analysis of their effectiveness, are the first step in developing a strategy for the protection and restoration of the Barnegat Bay watershed. The Comprehensive Conservation and Management Plan will use this analysis to prescribe additional measures to protect and improve habitat conditions in the region while first ensuring that existing programs have been implemented to their full potential.

A. WATER QUALITY AND WATER SUPPLY

1. CLEAN WATER PROGRAMS

a) Federal Clean Water Program

The principal law governing pollution of the nation's waterways is the federal Water Pollution Control Act, or Clean Water Act. Originally enacted in 1948, it was totally revised by amendments in 1972 that gave the Act its current shape. The 1972 legislation spelled out ambitious programs for water quality improvement that are still being implemented by industries and municipalities. Congress made fine-tuning amendments in 1977, revised portions of the law in 1981, and enacted further amendments in 1987.

The Clean Water Act (CWA) authorizes the US Environmental Protection Agency (EPA) to establish national, uniform technology-based effluent limitations for point sources of pollution discharging to "waters of the United States," broadly defined to include wetlands. Effluent limitations are enforced through Section 402 of the CWA, the National Pollutant Discharge Elimination System permit program (NPDES; delegated to New Jersey under NJPDES). The CWA does not apply to agricultural nonpoint source pollution.

Recently, Phase II Municipal Stormwater Rules have been promulgated under Section 402 by the EPA, which will extend regulatory requirements for stormwater effluent limitations to smaller urban areas than have previously been affected. The program will be phased in over seven years, and will be administered by the New Jersey Department of Environmental Protection (NJDEP) as part of its delegated authority under the CWA. Most, if not all, of Ocean County's 33 municipalities, which fell outside the regulatory purview of the Phase I Rules, will need to meet the compliance requirements of Phase II. Permitted municipalities will be required to implement six minimum control measures:

- Public education and outreach;
- Public involvement/participation;
- Illicit discharge detection and elimination;
- Construction site stormwater runoff control;
- Post-construction stormwater management in new development and redevelopment; and
- Pollution prevention/good housekeeping for municipal operations.

An action in the CCMP, Action Item 5.4, addresses the Barnegat Bay National Estuary Program's role in facilitating compliance of the regulated municipalities with the new Phase II Rules.

Sections 208 and 303(e) of the CWA of 1972 established the initial framework for addressing nonpoint sources of pollution (NPS). State and local planning agencies analyzed the extent of NPS pollution and developed water quality management programs to control it with funds provided by the EPA under Section 208. Best management practices were evaluated, assessment models and methods were developed, and other types of technical assistance were made available to state and local water quality managers. Section 208 provided that states prepare statewide and regional plans, based on watersheds, for the prevention of both point and nonpoint source pollution.

The EPA's Total Maximum Daily Load (TMDL) Program comes from Section 303(d). There remain waters in the nation that do not meet the CWA national goal of "fishable, swimmable" despite the fact that nationally required levels of pollution control technology have been implemented by many pollution sources. CWA Section 303(d) addresses these waters that are not "fishable, swimmable" by requiring the state to identify the waters and to develop total maximum daily loads (TMDLs) for them, with oversight from the EPA. Several waterways within Ocean County fall within the category of impaired waters as defined by Section 303(d), and an action in the CCMP addresses these.

Per Section 312 of the CWA, the EPA, individual states and the US Coast Guard work together to provide states with the opportunity to protect citizens and aquatic habitats through No Discharge Zone designations and national standards for marine sanitation devices on boat toilets, or heads. Section 312 of the CWA helps protect human health and the aquatic environment from disease-causing microorganisms which may be present in sewage from vessels and boats. These microorganisms can include bacteria, protozoans, and viruses. For more discussion on No Discharge Zones, see the entry on the Clean Vessel Act below.

Section 320 of the CWA of 1987 established the National Estuary Program (NEP), under which authority this document supporting the Barnegat Bay National Estuary Program was prepared. Section 320 authorizes the EPA Administrator to convene Management Conferences to develop Comprehensive Conservation and Management Plans for estuaries of national significance that are threatened by pollution. The general goals of the NEP are the protection and improvement of water quality and the enhancement of living resources. To achieve these goals, the program calls for activities to help:

- Establish working partnerships among federal, state, and local government;
- Transfer scientific and management information, experience, and expertise to program participants;
- Increase public awareness of pollution problems and ensure public participation in consensus building;
- Promote basin-wide planning to control pollution and manage living resources; and
- Oversee development and implementation of pollution abatement and control programs.

Section 320 also specifies members of a Management Conference to ensure representation by a broad range of interests. Membership must include, at a minimum, representatives of federal, state, regional, and local agencies, affected industries, academia, and the public.

Section 401 of the CWA of 1977 (33 U.S.C.1251, Section 401) provides that all projects requiring federal permits for the discharge of dredged or fill material into waters of the United States also require a Water Quality Certification. The purpose of this certification is to ensure that all such activities are consistent with national water quality standards and management policies. This program is administered by the state of New Jersey through federal delegation.

Section 404 of the CWA establishes the federal permitting program governing discharge of dredged and fill material into wetlands and other waters, administered by the EPA and the US Army Corps of Engineers. In New Jersey, the portion of the program applying to freshwater areas has been delegated to the state. A more detailed account of wetlands programs is found below under Topic 6 of Section C, Human Activities and Competing Uses.

b) New Jersey State Clean Water Programs

The New Jersey Pollutant Discharge Elimination System (NJPDDES) was established by the New Jersey Water Pollution Control Act of 1977 (*N.J.S.A. 58:10A-1, et seq.*) and regulates discharges to the land, groundwater, and surface waters of the state. Such discharges include effluent from: public and private sewage treatment plants; industrial discharges; land application of sludge, septage, and industrial wastes; discharges into municipal wastewater treatment plants which are regulated under the industrial pretreatment program; and underground injection. This program was delegated to New Jersey under the CWA, through which the state assumed the permitting functions of the National Pollutant Discharge Elimination System. This regulatory program is administered by the Division of Water Resources. In Ocean County, there are no major permitted discharges of municipal wastewater effluent; all regional sewage treatment facilities discharge through ocean outfalls. There are few permitted industrial dischargers of any kind in Ocean County, and the only major one is the GPU nuclear generation facility at Oyster Creek, which discharges the power plant's cooling water.

BASE PROGRAM ANALYSIS

The Wastewater Treatment Finance Program was established in 1985 and provides low interest loans to local government units for the construction and improvement of wastewater treatment facilities. In addition to monies from state general obligation bonds, this program receives funds from the EPA (under Section 201 of the Clean Water Act) for capitalization of a revolving fund loan program. The program has funded over half a billion dollars worth of improvements, but the total state need is over \$3 billion. Most of these projects are for combined sewer overflow control and other projects outside of the Barnegat Bay region.

The water quality certification program is authorized by the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 to 13), and the CWA Amendments of 1977 (33 U.S.C.1251, Section 401). All projects requiring federal permits for the discharge of dredged or fill material into state waters or wetlands also require a State Water Quality Certification. The purpose of this certification is to ensure that all such activities are consistent with New Jersey water quality standards and management policies. The Water Quality Certification for a project is "inherent" in most state-issued permits (NJPDES, CAFRA, Waterfront Development, Tidal and Freshwater Wetlands). Only rarely are Water Quality Certifications issued independently. At present, no review criteria for Water Quality Certification have been promulgated, so NJDEP utilizes the US Army Corps of Engineers Section 404(b)1 guidelines for review purposes.

New Jersey Surface Water Quality Standards classify certain shellfish waters in the state which possess exceptional resource value as Category One Waters for purposes of implementing Anti-degradation Policy: "Category One waters shall be protected from any measurable changes (including calculable or predicted changes) to the existing water quality characteristics that are generally worse than the water quality criteria, except as due to natural conditions, and shall be improved to maintain or provide for the designated uses where this can be accomplished without adverse impacts on organisms, communities or ecosystems of concern" (NJDEP 1986: 15). No freshwater areas of the state have been classified as Category One Waters.

As noted above, the NJDEP will be the lead agency in administering new Phase II Municipal Stormwater Rules for stormwater effluent discharges among the regulated Ocean County municipalities. The Barnegat Bay National Estuary Program will serve to facilitate the implementation of the new regulations.

The Sewerage Infrastructure Improvement Act establishes a non-regulatory program that provides for the supervision by the NJDEP of municipal storm sewer and nonpoint source pollution abatement programs in four coastal counties (Atlantic, Cape May, Monmouth, Ocean) and for the abatement of combined sewer overflows elsewhere in the state. Stormwater collection systems built by state agencies must be designed to minimize adverse surface water quality impacts to the greatest extent feasible. This act provided grants to municipalities in the four coastal counties to inventory and map storm sewer systems, to monitor water quality at storm sewer outfalls, and to plan and design the elimination of unauthorized interconnections of storm and sanitary sewers. The Bureau of Water Quality Planning of the Division of Water Resources is writing rules and administering contract applications for the mapping of stormwater systems. The first two phases of this program are nearing completion; a third phase, which was intended to help municipalities construct necessary infrastructure improvements, has not received funding.

The Stormwater Management and Combined Sewer Overflow Abatement Bond Act of 1989 was approved by referendum in November 1989. The Act authorizes the state to issue a total of \$50 million in bonds for the purpose of providing grants and low interest loans to local government units to manage stormwater and CSO discharges. Rules and regulations to implement this Act are being developed by the NJDEP.

The NJDEP stormwater program, authorized by the New Jersey Stormwater Management Act, emphasizes pollution prevention techniques and source control rather than "end-of-pipe" treatment and is implemented primarily through four general permits:

- Basic Industrial Stormwater - This general permit is available to regulated industrial facilities which have eliminated or can eliminate within 18 months of authorization, all exposure of industrial materials or activities to stormwater (rainfall and snowmelt waters). Exposure may be eliminated by covering the materials or activities or by moving materials or activities indoors.

- Concrete Products – This permit authorizes stormwater discharges to surface waters from facilities that manufacture concrete products, concrete block and brick, and ready-mixed concrete, or facilities classified as concrete manufacturers by the NJDEP.
- Construction and Mining Activities – This permit authorizes point source discharges from certain construction and mining activities. Regulated entities are required to develop a soil erosion and sediment plan aimed at eliminating the flow of contaminated rainwater into streams and rivers.
- Scrap Metal – This permit authorizes the discharge of stormwater from facilities involved in the recycling of materials (including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards -- limited to facilities classified as SIC Code 5015 and 5093).

Authorized by the Water Quality Planning Act (*N.J.S.A. 58: 11A-1, et seq.*), the Water Quality Management Plan Consistency Determination Program (*N.J.A.C. 7:15-1, et seq.*) assures that most projects approved by the NJDEP are consistent with the statewide and area-wide Water Quality Management Plans. Such projects include sewer systems, surface water and groundwater discharges, and actions regulated by the Coastal Areas Facility Review Act. This program is administered by the Bureau of Water Quality Planning of the Division of Water Resources. The Bureau conducts hundreds of consistency determinations annually and has approved dozens of Wastewater Management Plans.

Section 319 of the Clean Water Act directs each state to develop programs for controlling nonpoint source pollution. New Jersey has registered a State Assessment Report to the EPA which describes the state's nonpoint source pollution problems. A State Management Program, which addresses these problems, has also been filed with the EPA; however, at present, a structured program for nonpoint source pollution control in New Jersey does not exist. Among the specific issues of contention include estuary protection.

The Water Pollution Control Act (*N.J.S.A. 58:10A-1, et seq.*) gives the DEP the authority to regulate any nonpoint source pollution category for any water pollution control purpose. The DEP has applied this authority to industrial stormwater discharges, landfills, and land disposal of wastewater and sludge. The Water Quality Planning Act (*N.J.S.A. 58: 11A-1, et seq.*) requires area-wide Water Quality Management Plans to control several types of nonpoint source pollution, but the existing plans generally do not include any mandatory control procedures.

The state's Discharge Prevention, Containment and Countermeasure Plan requirements are designed to assist companies in preventing, and responding to accidental discharges and spills of harmful materials. This program is administered by the Division of Water Resources.

Soil Erosion and Sediment Control Plan Certification is a program that is authorized by the Soil Erosion and Sediment Control Act (*N.J.S.A. 4:24-1, et seq.*). Projects which will disturb more than 5,000 square feet of land surface area must develop a plan for soil erosion and sediment control. This plan must then be certified by the local soil conservation district. Best management practices must be installed to control soil erosion, sedimentation, and nonpoint source pollution, and for stormwater management, during construction and other land disturbance activities (exclusive of agriculture and horticulture). Standards for Soil Erosion and Sediment Control in New Jersey are published by the New Jersey State Soil Conservation Committee, and provide general standards for preparation of stream encroachment applications.

c) Water Supply Program

The waters of the Barnegat Bay estuary and watershed are a regional lifeline. People depend on the waters for food, livelihood, commerce, transportation, and recreation. The waters of the estuary are also home to thousands of fish, birds, plants, and animals. Water management is a complex task involving numerous players, each trying to balance use and conservation of a specific resource in the public's interest. For proper management, many issues need to be addressed.

BASE PROGRAM ANALYSIS

Federal water programs deal primarily with maintaining, preserving, and restoring the quality of the nation's waters; ensuring a continuing adequate supply of water is a responsibility primarily of state and local governments. In New Jersey, the state statute that ensures water supply is the Water Supply Management Act, *N.J.S.A. 58: 1A-1*, et seq. This statute declares "that the water resources of the state are public assets of the state held in trust for its citizens and are essential to the health, safety, economic welfare, recreation and aesthetic enjoyment, and general welfare of the people of New Jersey."

If the current trends of growth and development continue, the water supplies of the Barnegat Bay region will not be sufficient to meet the demand in some areas by the year 2040. In addition, there is a need for more integrated planning by water and wastewater utilities. This is an issue particularly important in coastal areas of the Bay watershed that are susceptible to saltwater intrusion into the near surface underground aquifer. Also, there is a need for increased funding to support information, education, and technical assistance programs for integrated resource planning, water conservation, and conjunctive use of groundwater and surface water. An action in the CCMP addresses these needs to maintain and protect sufficient freshwater supplies for the current and future population of Ocean County.

d) Analysis of Program Implementation

Taken as a whole, federal and state clean water programs have had a dramatic beneficial effect on water quality conditions in New Jersey, and no less so in Ocean County and Barnegat Bay itself. Improvements in wastewater treatment, regionalization of the wastewater treatment system in Ocean County, and the relocation of treated wastewater discharges to ocean outfalls were all funded in the 1970s and 1980s with federal and state assistance. These actions arrested a marked decline in Barnegat Bay's water quality, revived Bay beaches, and restored high quality primary contact recreation in the Bay. Today, there are no major discharges of treated wastewater effluent into Barnegat Bay. Pursuing a No Discharge Zone designation for the Bay will add to this positive trend by dealing with one of the remaining identifiable sources of contaminated wastewater.

Concurrent with effectively regulating point sources of wastewater, nonpoint sources of pollution resulting from an increasing rate of suburban residential development have become a rapidly rising component of the total contaminant discharges to the Bay and watershed tributaries. As a result, the implementation of nonpoint source programs will determine the ultimate success of the Barnegat Bay National Estuary Program in terms of maintaining acceptable levels of water quality in the Bay and its tributaries. Phase II Municipal Stormwater Rules are scheduled to be implemented, and the Program will take steps to ensure that they remain on schedule. Preliminary actions on TMDLs are under way, and the Program will similarly monitor the implementation schedule. The state-funded Sewage Infrastructure Improvement Act has helped municipalities identify and inventory their stormwater systems, but additional funding to help municipalities upgrade and improve their stormwater systems is not forthcoming. Efforts are needed to secure appropriate funding to see this program to its intended conclusion.

The success in regulating point sources of pollution in Barnegat Bay has helped the state to upgrade shellfishing waters. An improving trend in shellfishing water quality has persisted for about 20 years, and the state has upgraded an additional 5000 acres of shellfish waters in Barnegat Bay in 2001. New Jersey maintains one of the most comprehensive shellfish monitoring programs in the country, and further improvement will depend on the success of nonpoint source control programs.

Water supply is another issue that is increasing in significance with the growing coastal population. Some areas of the state have already reached the critical stage in terms of overpumping groundwater supplies. For example, a major revamping of the water supply system in Monmouth County was negotiated to reverse critical groundwater depletion in that coastal area of the state. At the southern end of the New Jersey shore, Cape May is facing the prospect of constructing a desalinization plant to forestall further saltwater intrusion into its groundwater aquifer. The Program regards the coastal water supply issue for Ocean County to be important enough to propose a comprehensive action to ensure that supplies are adequate through 2040 while not adversely disrupting the coastal hydrologic cycle (Action 5.2). History shows that it is possible to take action when conditions reach a critical stage; the question remains whether a broad consensus to take action can be reached prior to that critical point.

2. CLEAN VESSEL ACT

a) General Program Discussion

Congress passed the Clean Vessel Act (CVA) in 1992 to help reduce pollution from vessel sewage discharges. The Act established a five-year federal grant program administered by the US Fish and Wildlife Service (FWS) and authorized \$40 million from the Sport Fish Restoration Account for use by the states. Federal funds may constitute up to 75 percent of all approved projects with the remaining funds provided by the states or marinas. Grants are available to the states on a competitive basis for the construction and/or renovation, operation and maintenance of pumpout and portable toilet dump stations. Currently, states submit grant proposals by May 1 of each year, to one of seven Fish and Wildlife Service regional offices for review. The service's Division of Federal Aid then convenes a panel including representatives from the Service's Washington Office of the Division of Federal Aid, the National Oceanic and Atmospheric Administration (NOAA), the EPA, and the US Coast Guard. The panel reviews, ranks and makes funding recommendations to the director of the Fish and Wildlife Service. The Director gives priority consideration to grant proposals which provide installation and/or operation of pumpout and dump stations under federally approved state plans.

Three of seven recent pumpout facilities situated in Barnegat Bay were funded at least in part by the CVA. These facilities are available to any boater requesting pumpout. Two other marinas with pumpout stations also have applied for CVA funding to renovate or add to their facilities. Funding for the new facilities, including a mobile pumpout vessel, comes from state and federal grants administered by NJDEP's Clean Vessel Program, which supervises construction.

Pursuant to the CVA, the Sport Fish Restoration Program sets aside money for pump-out units for marinas; money comes from an excise tax built into sales of certain fishing or boating gear (money is administered by FWS and sent back to the state agencies for projects that would benefit recreational fishing and boating). Part of the money from the New Jersey "Shore to Please" license plates is earmarked for pump out.

As noted above under Clean Water Programs, Section 312 of the Clean Water Act authorizes the EPA, individual states and the US Coast Guard to work together to provide states with the opportunity to protect its citizens and its aquatic habitats through No Discharge Zone designations and national standards for marine sanitation devices on boat toilets or heads. The availability of pumpout stations and/or the importance of the waterbody for human health and recreation or the aquatic ecosystem bring to bear on a state's request for a No Discharge Zone designation. A graphic pumpout symbol is placed at docks and marinas to show boaters where a pumpout facility is located. In some cases, small boats may be modified to receive these wastes and can visit boats to provide this service.

There are three distinct kinds of No Discharge Zone designations that may be available to an interested state. These are: to protect aquatic habitats where pumpout facilities are available, to protect special habitats or species, and to protect human drinking water intake zones.

Enforcement of No Discharge Areas is the responsibility of the US Coast Guard; the Coast Guard may delegate this responsibility to the state. An MOU has been established between the Coast Guard and the state of New Jersey which designates the New Jersey State Police as the lead law enforcement agency for No Discharge Areas. The State Police enforce boating safety standards, marine sanitation device regulations and the discharge of vessel sewage.

The New Jersey Water Pollution Control Act gives the NJDEP the authority to enforce a federally designated No Discharge Area; NJDEP Enforcement will designate enforcement to the State Police through regulation. The State Police will handle enforcement of any Title 58 violations referred or discovered as outlined in the regulation. Certified county health agencies may seek certification in this area pursuant to the County Environmental Health Act in accordance with the regulation.

The Manasquan River, with a connection to Barnegat Bay by way of the Point Pleasant Canal, has already been declared a No Discharge Zone. In addition, the NJDEP is currently pursuing the nomination of Barnegat Bay as a No Discharge Zone as an action of the CCMP.

BASE PROGRAM ANALYSIS

b) Analysis of Program Implementation

Barnegat Bay has benefited significantly from the Clean Vessel Act and similar sources of federal funding. Nearly one dozen pumpout facilities, including two pumpout vessels, have been funded either in whole or in part through federal and state assistance. This progress advances the schedule to designate Barnegat Bay as a No Discharge Zone. The NJDEP is currently developing further documentation to permit the EPA to concur with the state's nomination.

3. AIR, SOLID WASTE, AND HAZARDOUS WASTE PROGRAMS

a) Air Programs

The Federal Clean Air Act's primary mechanism for achieving clean air is through State Air Quality Implementation Plans. These plans encompass many different elements, including regulations limiting emissions from small and large stationary sources, both new and existing, and strategies dealing with emissions from mobile sources such as vehicle inspection programs. The EPA's primary responsibilities are to assist and oversee the development of these plans, and once in place, to ensure their implementation. Because of the large number of responsibilities delegated to the states, Section 105 of the Act established a mechanism to fund a portion of these activities. These resources are used to fund both the base programs run by the states and special outputs which are specified by the EPA. The special outputs are negotiated with the states and are in accordance with national objectives. The use of these funds and the accomplishment of specific objectives contained in the grants are closely tracked by the EPA.

New Jersey's Air Quality Control Program (*N.J.A.C. 7:27-8.1, et seq.*) was established by the Air Pollution Control Act (*N.J.S.A. 26:2C-9.2, et seq.*) and requires a permit and operating certificate for equipment which emits, or controls the emission of, substances into the air. Such equipment includes manufacturing facilities with emission rates of air contaminants in excess of 50 pounds per hour, stationary storage tanks for liquids (10,000 gallons) and volatile organic substances (2,000 gallons), commercial fuel burning facilities having a heat input of rate of 1 million BTU per hour or greater, incinerators (with some exceptions for residential dwellings), and water or wastewater treatment facilities which emit air contaminants.

A special category of air emissions is made up of airborne toxic compounds. The EPA is developing a national program to implement the air toxics portion of the Clean Air Act and emissions are expected to be reduced over the course of a ten-year period as controls for various categories of sources are developed. In addition, the Clean Air Act establishes National Emission Standards for Hazardous Air Pollutants (NESHAPs) under Section 112 of the Act, and the EPA provides technical and financial support to state agencies for the development and implementation of air toxics programs. The EPA has established emissions standards for 7 pollutants, including mercury, and another 189 hazardous air pollutants will be regulated under the 1990 Clean Air Act Amendments. Mercury is a widespread environmental contaminant, and in New Jersey its presence has led to statewide advisories on the consumption of locally caught fish. Atmospheric sources of the contaminant are suspected of contributing to this problem.

Under the Resource Conservation and Recovery Act (RCRA), The EPA has developed regulations for toxic air emissions from hazardous waste treatment, storage and disposal facilities. In the Superfund program, air toxics are addressed in clean-up decisions at sites. In addition, the EPA has developed a program of technical and financial support to states to encourage them to develop air toxics control programs of their own.

b) Resource Conservation and Recovery Act (RCRA)

This federal statute was enacted in 1976 to ensure the proper management and disposal of hazardous and non-hazardous solid wastes and treatment, storage, and disposal facilities. In 1984, the Hazardous and Solid Waste Amendments (HSWA) were authorized by Congress to strengthen RCRA. Some of the significant requirements of the 1984 Amendments are to:

- Construct land disposal facilities in accordance with Minimum Technology Requirements, such as double liners and leachate collection and detection systems;

- Construct and operate treatment and storage tanks in accordance with the federal regulation promulgated July 14, 1986, which mandated secondary containment;
- Identify and address any release of hazardous waste and hazardous constituents from solid waste management units;
- Comply with restrictions to land disposal of hazardous waste; and
- Certify to waste minimization.

The HSWA permit also requires the applicant to initiate a corrective action program to address any environmental releases of hazardous waste or constituents at solid waste management units.

An RCRA corrective action program consists of the following major components:

- RCRA Facility Assessment to identify past and present releases or potential releases requiring further investigation;
- Interim/Stabilization Measures to take immediate action in response to releases and to recommend the final corrective measures;
- RCRA Facility Assessment to fully characterize the extent of releases; and
- Corrective Measures Implementation to design, construct, operate, maintain, and monitor the performance of the corrective measure(s) selected.

These four activities ensure that a facility will adequately identify all contamination and provide corrective action as necessary to protect human health and the environment.

New Jersey has obtained final authorization for the RCRA base program (plus additional provisions) inclusive of regulations codified in the July 1, 1993 Title 40 of the Code of Federal Regulations and is effective as of August 2, 1999; however, New Jersey does not have final authorization for the HSWA corrective action program.

c) Superfund

"Superfund" was established in December 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 USC 1901, et seq.). The purpose of this program is to provide funding for the cleanup of sites contaminated with hazardous wastes. The Act authorized the EPA to provide long-term remedies at hazardous waste sites, and established a \$1.6 billion fund, raised over five years from special industry taxes and general revenues, to finance remedial activities. In 1986, Congress reauthorized Superfund by enacting the Superfund Amendments and Reauthorization Act (SARA), increasing the fund to \$8.5 billion and strengthening the remedial process.

The sites eligible for receiving Superfund monies are listed on the National Priorities List (NPL), which is used by the EPA to set priorities for cleanup of the sites. A priority site can be remediated in several ways:

- The responsible parties, i.e., site owners and operators as well as generators and transporters, can remediate it voluntarily;
- The responsible parties can be forced to remediate it by legal and administrative actions; or
- Superfund monies can be used to finance the remedial action. If there is difficulty in getting the responsible parties to act, the EPA will proceed under Superfund and will seek recovery of costs through legal action at a later date.

BASE PROGRAM ANALYSIS

Seven existing and former Superfund sites are found within the Barnegat Bay watershed of Ocean County. One site, Beachwood/Berkeley Wells, has been satisfactorily addressed and has been deleted from the Superfund list. Four sites located in Plumsted Township of Ocean County lie outside the Barnegat Bay watershed and within the Delaware drainage area. Brief summaries of the six active Superfund sites in the Barnegat Bay watershed of Ocean County are presented below:

BRICK TOWNSHIP LANDFILL: This landfill site is suspected of having received chemical wastes within its 30 years of operation, ending in 1979. The removal of drums and filling and venting of septage pits have reduced the potential for exposure to contaminated materials. Further cleanup activities are being planned by the state of New Jersey, including capping the landfill, securing the site, installing landfill gas venting and air monitoring, installing a groundwater quality monitoring system, and installing a surface water control system.

CIBA-GEIGY CORPORATION: This is among the most contaminated Superfund sites within Ocean County, covering 1,400 acres, 320 of which are developed. Uncontrolled disposal of chemical wastes from the manufacture of dyes, pigments, resins, and epoxy additives have contaminated the groundwater and soils with volatile organic compounds, including benzene, trichloroethylene, chloro-benzene, 1-2-dichloroethane, and toluene, as well as heavy metals including arsenic and chromium. Initial remedial actions included removal of 15,000 drums of chemical waste and closure of a ten-mile-long ocean outfall pipeline carrying mixed waste effluent from the site. The more long-term remedy for groundwater cleanup, including recharge of the treated groundwater to the local aquifer, has been selected and is being implemented. The EPA has determined that the site does not pose an immediate threat to the surrounding community or the environment while progress is underway for final cleanup remedies for the contaminated source areas.

DENZER & SCHAFER X-RAY COMPANY, BAYVILLE: This company is involved in the reclamation of silver from both microfilm and X-ray negatives. Historic disposal of chemical wastes in the onsite septic system has contaminated the groundwater with heavy metals, including arsenic, chromium, lead, and mercury, as well as with volatile organic compounds, including chloroform and toluene. Potential risks exist for those who ingest or come into direct contact with groundwater from contaminated wells and soil. After adding this site to the Superfund list, the EPA determined that no immediate actions were required while selection of the final cleanup remedies were made. The selected remedy will likely include the connection of 129 residences and commercial establishments to municipal water; excavation and disposal of the underground wastewater storage tank; and removal of contaminated film waste stockpiled on the site.

JACKSON TOWNSHIP LANDFILL: This landfill, closed in 1980, was the site for dumping millions of gallons of liquid sewage and septage wastes. Having been a former titanium ore-mining pit, the site also contains mine tailings on the surface. Initial remedial action was to provide an alternate water supply for 130 wells that were contaminated as a result of groundwater contamination at the landfill. With the provision of this alternate water supply, the potential for exposure to contaminated groundwater has been eliminated, and the EPA and the state have determined that no further cleanup actions are necessary at the site.

NAVAL AIR ENGINEERING CENTER, LAKEHURST: This site, whose major function has been the development and testing of weapons systems, has multiple areas with varying levels of contamination. The site is currently being addressed by focusing on those areas where contamination is most significant. At some sites, the cleanup has been completed. While further investigations and other cleanup activities are underway, the EPA has determined that the overall site does not pose an immediate threat to the surrounding communities or the environment.

REICH FARM, DOVER TOWNSHIP: This site, covering approximately three acres, was used for a short period in 1971 for the illicit dumping of drums containing organic solvents, still bottoms, and residues from the manufacturing of

organic chemicals, plastics, and resins. Groundwater is contaminated with volatile organic compounds, including trichloroethylene, and semi-volatile organics. Initial remedial action was the removal of 5,095 drums and trench wastes from the site. Shortly after, an additional 50 drums were removed, as well as 1,100 cubic yards of contaminated soil. Nearly 150 private wells nearby were ordered closed and a zoning ordinance restricting groundwater use was established. Residents in the immediate vicinity were connected to a permanent alternate water supply. Further remediation will include: installation of extraction wells; treatment of extracted groundwater by air stripping and carbon adsorption; re-injection of the treated groundwater into the ground; excavation of soil contaminated with volatile organic compounds and treatment in an advanced volatilization unit; and backfilling the excavated area with the treated soil.

d) State Hazardous Waste Programs

The Environmental Cleanup Responsibility Act (ECRA; *N.J.S.A. 13:1K-6*), enacted in 1983, imposes preconditions on the sale, transfer, or closure of "industrial establishments" involved with hazardous substances or wastes. The NJDEP must approve and certify that a property is not contaminated or that the property owner will ensure remediation of the site. This process may include: (1) the execution of an approved cleanup plan; (2) a negative declaration that the site is not contaminated; or (3) the execution of an Administrative Consent Order (ACO) between the owner/operator and the NJDEP, allowing the sale to proceed, but which includes financial assurance for the estimated cost of the cleanup. This program has proven effective for remediating contaminated sites with funds provided by the responsible parties. It has prevented the abandonment of hazardous sites and encouraged proper environmental business practices.

The New Jersey Hazardous Site Discharge Fund provides monies to remediate hazardous waste sites where the responsible parties are not available to pay the cost of cleanup. The fund was established in 1986 with \$150 million in state appropriations. Additional appropriations totaling \$135 million were made in 1988 and 1989.

e) Spill Prevention and Control

Prevention and cleanup of oil and hazardous substance spills are the focus of federal programs administered by the US Coast Guard and the EPA. The National Oil and Hazardous Substance Pollution Contingency Plan was developed pursuant to the provisions of Section 311(c)(2) of the Clean Water Act of 1972, as amended. The National Plan is also required by Section 105 of the Superfund Act. The National Plan calls for the establishment of a network of regional contingency plans, whose purpose is to provide a coordinated and integrated response to spills by federal, state, and local agencies. The plans provide for the standardization of procedure and policy among agencies, and encourage the development of capabilities by both local governments and private interests to handle and prevent pollution discharges.

Additionally, Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) requires state and local level emergency planning efforts. SARA requires industries to notify local governments of potential chemical hazards present in the community. The EPA Region 2 publishes and maintains plans for New Jersey. The Coast Guard Captain of the Port (COTP) of New York publishes and maintains plans for the New Jersey shore from Sandy Hook to approximately Toms River; the Coast Guard COTP, Philadelphia is responsible for all plans in New Jersey south of Toms River.

The State Spill Compensation and Control Act (*N.J.S.A. 58: 10-23.11, et seq.*) prohibits the discharge of hazardous substances unless such discharge is in accordance with the conditions of a state or federal permit. The act provides New Jersey with a mechanism to tax the chemical industry to provide funding for the remediation of hazardous waste sites. These monies are deposited in the Spill Fund, which currently totals approximately \$150 million.

BASE PROGRAM ANALYSIS

The Spill Act imposes strict liability for cleanup and removal costs upon dischargers and any person responsible for any hazardous substance which the NJDEP has removed or is removing. Any person who violates the Spill Act is liable to a penalty of up to \$50,000 for each offense. The Act also gives the Administrator of the Spill Fund the authority to file liens against the property of dischargers to protect the NJDEP's cleanup expenditures from the spill.

f) Solid Waste Management

The current federal Solid Waste Management Program is an outgrowth of the Resource Conservation and Recovery Act of 1976 (RCRA). More recently, the Hazardous and Solid Waste Amendments of 1984 and the Municipal Solid Waste Task Force within the EPA have guided federal solid waste program development. In February 1989, a final report of the Task Force, entitled "The Solid Waste Dilemma: An Agenda for Action," set forth the current federal initiatives in solid waste management. This and New Jersey's Solid Waste Management Program form a comprehensive solid waste management strategy for the state.

The disposal of solid waste in New Jersey is regulated pursuant to the Solid Waste Management Act of 1976 (which amended the Solid Waste Management Act of 1970). The Act provided a comprehensive statewide strategy for managing solid waste by outlining county and NJDEP responsibilities. Regional planning is undertaken by the counties, who are responsible for master plan development, site and technology selection, permit application, and project financing and implementation. The NJDEP certifies amendments to the Statewide Solid Waste Management Plan, issues construction and operation permits (for landfills, resource recovery facilities, etc.), conducts compliance and enforcement monitoring, and provides some funding. The overall goal is to make New Jersey self-sufficient in its solid waste disposal needs. This is to be accomplished through the implementation of a four-part strategy of: (1) source reduction; (2) recycling; (3) resource recovery; and (4) landfilling. In addition, the Mandatory Source Separation and Recycling Act was passed in April 1987. This act requires each municipality to compost all leaves and recycle at least three other materials. Also, New Jersey has adopted rules regulating the disposal of certain medical wastes to prevent such wastes from despoiling shorelines.

g) Pollution Prevention

Pollution prevention has become a key notion for environmental progress in the last decade. Pollution prevention is a multi-media approach with its primary goal being the avoidance of waste and pollution generation, followed by source reduction and environmentally sound recycling. The ultimate goal is to avoid shifting pollutants from one media to another by reducing the need for treatment. The EPA has four strategic objectives by which the pollution prevention goal can be met:

- Develop multi-media approach;
- Support regional, state, and local multi-media prevention programs;
- Build consensus for a National Agenda on Prevention; and
- Establish data strategy to develop indicators, evaluate progress, and target opportunities.

h) Analysis of Program Implementation

Air, solid waste, and hazardous waste programs have generally been successful in New Jersey, including Ocean County. Air pollution levels have shown a continuing declining trend, as they have throughout the northeast. Superfund sites have been stabilized and/or remediated, and hazardous waste programs have increased surveillance and monitoring of these potentially contaminating sources. However, the legacy of toxic pollution remains a dis-

turbing undercurrent in the daily life of Ocean County residents. A federally supported study is currently under way to examine a cancer cluster in Dover Township that some suspect may be linked to the Ciba-Geigy Corporation Superfund site. No linkage has yet been established, and any conclusion must await the results of this study. Toxic contamination has not been identified as a priority area of concern for the BBNEP. The CCMP does, however, include a number of actions to ensure that any emerging issue will receive early attention by the primary responsible agencies.

B. Habitat Loss and Alteration

1. COASTAL ZONE MANAGEMENT

a) Federal Program

The Coastal Zone Management Act (CZMA) of 1972, established a national policy to preserve, protect, develop, and where possible, to restore or enhance, the nation's coastal zone. The Act also encouraged the states to exercise their responsibilities in the coastal zone through the development and implementation of management programs, the preparation of special area management plans, and the participation and cooperation of the public, local and state governments, interstate and regional agencies, and federal agencies in programs affecting the coastal zone. The US Department of Commerce is the federal lead agency charged with the responsibility of implementing the Act; however, the Act provides that the objectives of the law are to be achieved through the development and administration of approved state coastal management programs. The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) augmented the original Act by authorizing federal matching grants for assisting coastal states in developing management programs for the land and water resources of their coastal zones, particularly for nonpoint source pollution control.

New Jersey has an approved coastal zone management program (CMP). The New Jersey CMP was approved in two phases. The first phase covering the ocean counties was approved on September 19, 1978. The second phase covering the Hudson River, Raritan River, Arthur Kill, Hackensack River, and the Delaware River estuaries, was approved on September 20, 1980.

b) New Jersey Coastal Management Program

The New Jersey Department of Environmental Protection (NJDEP) was given the responsibility for preparing and administering the CMP by the governor. The CMP provides for greater consistency between federal and state actions in the coastal zone. The CMP has three interrelated basic elements: a boundary defining the general geographic scope of the program; Coastal Resource and Development Policies defining the standards for making decisions on what activities may take place within the boundaries; and a management system defining the types of decisions subject to the program and the process by which those decisions will be made.

The principal authorities that enable the NJDEP to implement the Act include the Waterfront Development Law, the Coastal Area Facility Review Act (CAFRA), the Wetlands Act, and tidelands and shore protection statutes. The Waterfront Development Act (*N.J.S.A. 12:5-3*) authorizes the NJDEP to regulate the construction or alteration of structures on or adjacent to navigable waterways and tidal streams throughout the state. The NJDEP has adopted regulations to fully implement the Law by defining both its geographic scope and types of development to which it applies. The waterfront area is defined by *N.J.A.C. 7:7-2.3* as including all tidal waterways and lands adjacent thereto up to the inland limit of the first property boundary from the waterway. This rule applies to all upland areas beyond the mean high water line outside the Hackensack Meadowlands District. Persons proposing to undertake waterfront development must obtain a permit from the Division of Coastal Resources. Persons who consider them-

BASE PROGRAM ANALYSIS

selves aggrieved by the granting or denial of a permit may appeal the Division's decision to the Commissioner in accordance with the 90-Day Construction Permit Law (*N.J.S.A. 13:10-29*).

CAFRA (*N.J.S.A. 13:19-1, et seq.*), originally adopted in 1973, authorizes the NJDEP to regulate and approve the location, design, and construction of major industrial sites and public works facilities as a way to control adverse impacts on water quality and estuarine habitat. CAFRA covers a 1,376 square mile coastal region encompassing portions of Middlesex, Monmouth, Ocean, Burlington, Atlantic, Cape May, Cumberland, and Salem counties. Lying within the CAFRA area are New Jersey's barrier beach islands, all of its coastal resort areas, portions of the Pinelands, and large agricultural areas. The Act is administered by the Division of Coastal Resources. Persons proposing to build CAFRA-regulated activities must submit an application and an Environmental Impact Statement (EIS) to the Division. Proposed development projects must adhere to a set of "Coastal Resources and Development Policies." A public hearing and a review of the document are required before a permit decision is rendered by the Division Director. CAFRA permit decisions may be appealed to either the Commissioner of the NJDEP or to a three member Coastal Area Review Board.

In 1993, amendments to CAFRA expanded the scope of review to include "developments" in regulated coastal areas. It also requires development of an environmental inventory of the coastal area and long-term environmental strategies. New revised regulations have only recently been promulgated by the NJDEP. These are meant to address shortcomings in the original regulations; moreover, they help to integrate state guidance, in the form of the New Jersey State Development and Redevelopment Plan, into the CMP. The guidance is designed to steer development and redevelopment towards areas with existing adequate infrastructure and to promote conservation of the state's natural resources. (See further discussion under Land Use Management below.)

New Jersey has also developed its Coastal Nonpoint Pollution Control Program pursuant to Section 1455 of the CZMA Amendments of 1990. These most recent amendments constitute a federal land-use planning statute that requires a state with an approved coastal management program to submit a detailed plan for developing and implementing management measures to control coastal nonpoint source pollution.

The Wetlands Act of 1970 (*N.J.S.A. 13:9A-1, et seq.*) authorizes the NJDEP to regulate activities on coastal wetlands. The Act, which is administered by the Division of Coastal Resources, gives the state broad discretion in regulating virtually all types of coastal development on mapped coastal wetlands, except for mosquito control and continued commercial production of salt hay or other agricultural crops. Coastal wetlands are defined as those wetlands subject to tidal action along specified water bodies; the Act does not affect inland or freshwater wetlands. The greatest amount of wetlands acreage is found along the Atlantic and Delaware Bay shorefronts, including the entire shoreline of Barnegat Bay.

"Tide-flowed" or riparian lands are owned by the State of New Jersey, except where already conveyed. The State's ownership interest extends to the mean high water mark, which is determined on the basis of a theoretical 18.6-year tide. The State's ownership role is exercised through the Tidelands Resource Council which may grant, lease, or license the use of State-owned tidelands provided that the action is in the public interest. Many of the State's tidelands were sold in the nineteenth and early twentieth centuries, but it is the present practice of the council only to license the use of the lands, and not to grant them outright. Decisions made by the council may be vetoed by the NJDEP Commissioner and Division of Coastal Resources if it is inconsistent with State policy. Should a veto occur, the application is returned to the council for reconsideration. A Waterfront Development Permit must be obtained for any activity within the tidelands.

The Watershed Protection and Management Act of 1997 dedicates a portion of the Corporate Business Tax for purposes of "water quality point and nonpoint source pollution monitoring, watershed-based resource planning and management, and nonpoint source pollution prevention projects." One of the key provisions of the Act is to facilitate the NJDEP's watershed-based resources management process, and to provide guidelines for long-range watershed management planning activities. The designation of 20 Watershed Management Areas in the State was the first step in this process. The formation of watershed management groups in each of these areas, as set forth in the Act, will assist the NJDEP in identifying key issues and establishing priorities with regard to implementing activities aimed at protecting and improving water quality and water supplies within each area. The NJDEP identifies the Barnegat Bay watershed as Watershed

Management Area #13, and intends the Barnegat Bay National Estuary Program to help fulfill its objectives for comprehensive watershed management in this area as well as to serve as a model for developing plans for the other 19 Watershed Management Areas.

c) Federal Consistency Process

Like their State counterparts, federal agencies operate a number of programs which affect the balanced use and protection of coastal resources. The CZMA, as amended, requires the actions of federal agencies to be consistent with the policies of a state's CMP. Federally conducted or supported activities (including development projects), activities requiring federal licenses or permits, federal financial assistance to state and local governments, and exploration, development, and production activities on the Outer Continental Shelf which require a federal license or permit are all subject to CZMA requirements and must be consistent with the New Jersey CMP.

To ensure that federal agencies comply with the CZMA provisions, the US Department of Commerce adopted regulations (15 CFR, Part 930) which established procedures for the federal consistency process. These regulations set up separate review procedures for each of the above-mentioned items.

d) Analysis of Program Implementation

The Coastal Zone Management Program has helped address some of the most damaging historic coastal land use practices in the region, and has helped to reduce the adverse environmental impacts of large-scale coastal development. Its influence on smaller-scale incremental development has been more limited. The original CAFRA regulations used a threshold of 25 housing units as one measure to trigger regulatory review. As a result, a number of housing developments were constructed that consisted of 24 units. The recent amendments to CAFRA, known as CAFRA II, were promulgated in part to lower this threshold. Action Item 6.10 of the CCMP contains an action to ensure that New Jersey evaluates the performance of this revised program. The BBNEP will consider the need to propose further action if the results so dictate.

Coastal zone management is part of land use regulation and falls primarily within the purview of local governments. As a result, the success of such a program rests to a large extent on the cooperation and action of individual municipalities. The BBNEP targets municipal governments in a number of actions to ensure that the Coastal Management Program is as effective as it can be in the Barnegat Bay watershed.

2. LAND USE MANAGEMENT**a) Introduction**

Land management is a priority issue area of the Barnegat Bay National Estuary Program. Population has increased by 700 percent within the watershed since 1950, and Ocean County continues to be one of the fastest growing counties in New Jersey. The need for the protection of critical habitats, the control of nonpoint source pollution associated with a growing population, and the need for improvements in current water quality standards are remaining issues to be addressed. As the Program works to achieve its goals of protecting the estuary's resources, it is necessary to reevaluate current land use practices and to focus on land use as a tool and an opportunity for improving the environmental health of the region.

Within the Barnegat Bay estuary, there are a number of federal agencies, the state of New Jersey, Ocean County and 33 municipalities, plus 4 additional municipalities within Monmouth County. These political entities and agencies have rules and policies dealing both directly and indirectly with land use. In addition to the governmental agencies in the region, a number of quasi-governmental and private entities have indirect influence on land use deci-

BASE PROGRAM ANALYSIS

sions. The federal government does not play a direct role in local land use planning, but a number of federal regulatory programs can act indirectly to affect land use and development. The federal regulatory role is mainly for environmental protection and deals with permitting and enforcement procedures, as with Section 6217 of the Coastal Zone Act Reauthorization Amendments. Also, it should be noted that federal funding for capital projects and acquisition of land for public uses often have effects on land use patterns. Non-regulatory federal programs provide technical assistance, education and funding to state, county and local governments.

b) State Role in Land Use Planning

New Jersey is involved, to a certain extent, with land use through direct regulatory control and financial assistance, but its most important role is in non-regulatory land use control. The guidance power of the state of New Jersey defines the powers of the county and municipal governments. Although the state has traditionally left land use decisions to local governments, the emergence of the Coastal Zone Management Program, concerns for environmental protection, greater interest in new techniques (Transfer Development Rights, the New Jersey State Development and Redevelopment Plan) and new methods to protect coastal environments, wetlands and farmland preservation (New Jersey's CAFRA Program) all enable the state to take a more expansive role in land use planning and management. State programs that influence land use decisions include programs of the NJDEP, such as for recreational services, protecting natural features and coastal lands, endangered species protection, and providing services dealing with groundwater supplies. The Land Use Regulation Program, in particular, administers statutes that authorize direct state regulation of environmentally sensitive features associated with wetlands, streams and tidal waters. Other programs that influence land use management include: the Department of Transportation, the Soil Conservation Service, the Department of Community Affairs, the New Jersey Economic Development Authority, and the Department of the Treasury.

In particular, the state has instituted a program managed by the Office of State Planning, which promotes the land use provisions of the State Development and Redevelopment Plan. The State Plan was authorized by the State Planning Act (*N.J.S.A. 52:18A-16, et seq.*) in 1986. The State Plan was established as a guide for municipalities and county master planning, state agency functions and infrastructure investment decisions. The state encourages all governmental agencies to review their plans and bring them into consistency with the strategies, objectives and policies set forth in the State Plan, a process known as "cross acceptance." The state is currently pursuing the "cross acceptance" process, but it carries with it no regulatory authority.

The goals of the State Development and Redevelopment Plan include the following: (1) to promote beneficial economic growth, development, and renewal; (2) to conserve the state's natural resources; (3) to preserve and enhance historic and cultural sites, open space, and recreational lands and structures; (4) to protect the environment; and (5) to ensure sound and integrated planning statewide. For planning purposes the state (exclusive of the Pinelands, CAFRA, and Hackensack Meadowlands) has been divided into one of seven "tiers." This tier system identifies a range of development/habitat types, from urban centers and suburbs to agricultural lands and environmentally sensitive areas. This Plan has been tied more closely into coastal zone management through promulgation of new CAFRA II regulations.

In summary, state regulatory programs and enforcement represent the principal tools for environmental protection, but it is recognized that these, for the most part, are reactive to land development pressures and seek to balance competing uses. Integrated planning among the different levels of government is needed with states playing a leadership role in articulating a vision for the future.

c) Pinelands Commission

In 1978, the National Parks and Recreation Act established the Pinelands National Reserve and called for the development of a Comprehensive Management Plan for the region. By executive order, in February 1979, the Governor established the Pinelands Commission. The Pinelands Protection Act (*N.J.S.A. 13:18-1, et seq.*), which authorized

the Commission to develop a Comprehensive Management Plan, was signed in 1979, and the Plan became effective in 1981 as *N.J.A.C. 7:50-1.1*, et seq. The Pinelands National Reserve is approximately 1.1 million acres in size and the Pinelands Area (state) includes approximately 937,000 acres.

The Commission is an independent agency which is included under the NJDEP for constitutional purposes. The Commission implements a land use plan for the Pinelands region of the state, which includes portions of seven counties in southern New Jersey. The Plan divides the Pinelands into nine land use management areas including: preservation areas, agricultural areas, forest areas, rural development areas, regional growth areas, military and federal installation areas, towns and villages, and special agricultural areas. It also establishes 16 management programs to protect air quality, water resources, vegetation, wetlands, fish and wildlife, scenic and cultural resources, agriculture, and other characteristics of the Pinelands environment. All counties and municipalities in the Pinelands are required to revise their master plans and zoning ordinances to be in conformance with the Comprehensive Management Plan. The Commission reviews all local development proposals and may deny them if the application is inconsistent with the Comprehensive Management Plan.

Thirteen of Ocean County's 33 municipalities lie wholly, or in part, within the Pinelands region, 8 of which have area included in the Pinelands inner Preservation Area, where development is more strictly regulated than in the outer Protection Area. Most Pinelands Area municipalities have revised their local master plans and land use ordinances to comply with the Pinelands Comprehensive Management Plan. In most of these "certified" towns, "minor" development applications (usually fewer than five residential units) can be submitted directly to the municipality for a building or subdivision approval. In these cases, the applicant is only required to send a copy of the application to the Pinelands Commission. Applications for "major" development (commercial, industrial, or larger residential developments usually involving five or more units) require initial Commission review, as do all development applications in towns which have not yet revised their plans and ordinances in compliance with the Commission's regulations.

As far as wetlands are concerned, most types of development are prohibited in the Pinelands. Exceptions include blueberry and cranberry farming, forestry, and other low intensity activities. Public improvements are permitted to cross wetlands in limited instances. In addition, no development is generally allowed within a 300-foot buffer zone surrounding wetlands.

d) Ocean County and Municipal Roles

The primary responsibility for land use planning and control lies at the county and local levels. Ocean County plays a significant role in land use management through non-regulatory planning and advisory roles, as well as through the development and promotion of its comprehensive plan. The Ocean County Planning Department assists municipalities in developing their own local plans and providing zoning assistance, but the county planning activities are nonbinding to the municipalities, and primarily limited to advisory and technical assistance. The counties are given the legal authority to review and approve subdivisions through the County and Regional Planning Enabling Act. This Act enables planning boards to review and approve subdivisions that affect county roads and drainage areas. Counties also review local applications to ensure that they are consistent with the county's stormwater control and transportation plans. The county's role is increasing in the areas of regional growth, water, stormwater and wastewater management, but counties are often caught between local governments who are often unwilling to relinquish local use controls and state governments that often have broader views of regional resource management.

The primary role of land use control in the Barnegat Bay estuary, as throughout New Jersey, is achieved at the municipal level of government. The authority that allows for this control is established through the Municipal Land Use Law in New Jersey. Municipal planning and zoning hearing boards include a mix of full-time, part-time and voluntary staff. In addition, most municipalities in Ocean County have environmental commissions which may prepare and submit an index of natural resources to the planning board. In some instances, they may also review applications for development. Problems and gaps associated with local land use planning often result because: many municipalities plan for development, and do not or cannot use planning as a tool for accommodating natural heritage and

BASE PROGRAM ANALYSIS

open space needs; many of the ordinances are outdated; and many plans and ordinances do not consider the comprehensive impacts on the natural elements of not only the local area, but also the estuary and watershed as a whole. Because of community prioritization and relatively low budgets, municipalities must focus on issues that relate to community infrastructure, education and crime. This often places environmental and conservation issues, such as nonpoint source pollution, low on the prioritization lists. Also, planning and zoning, and staffing resources are often limited at the local jurisdictions. Finally, because of the common municipal concern over ratables and/or the reliance on the local tax base to maintain municipal budgets, the idea of fiscal impacts to a locality is a major issue. Fiscal impact analyses can be utilized to compare land development futures of communities and to compare the fiscal impacts of these futures.

e) Analysis of Program Implementation

The Pinelands Commission administers one of the most effective state land use management programs. In addition, other land use planning tools are available to the state outside of the Pinelands Commission boundaries. Between the Pinelands Region and the State Coastal Management Program, about three-quarters of Ocean County is subject to state program review. Only the northwestern quadrant of the county lies beyond the boundaries of these programs. As noted in the analysis for the Coastal Zone Management Program (see above), much of the success of land use management depends on the motivation and action by local governments. Programs at the federal and state level are largely advisory, and may be helped through the offering of incentives or other benefits. In the long run, however, it will be the commitment of local government that will determine the success of land use management. The CCMP acknowledges this reality with a series of appropriate actions in Chapters 5 and 6.

3. WETLANDS REGULATION AND MANAGEMENT

a) Federal Program

General Overview

Until the 1970s, the regulatory program for the nation's waters consisted of the Rivers and Harbors Act of 1899, administered by the U.S. Army Corps of Engineers (the Corps). Section 10 of that Act prohibits the unauthorized obstruction or alteration of any navigable water of the United States. "Navigable waters" are defined as those waters that are subject to the ebb and flow of the tide and/or are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Since the focus of the Act is the navigation aspect of the waters, it did not serve directly to protect other attributes of waterways from environmental degradation caused by a host of both legal and illegal activities. Court decisions from several lawsuits in the 1960s expanded the ability of Section 10 to protect navigable waters so that the federal government now has the authority to regulate discharges of both liquid and solid materials. After passage of the Clean Water Act in 1972, several lawsuits served to expand federal jurisdiction from the traditional "navigable waters" to all tributaries and adjacent wetlands -- in effect, all waters within the United States.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the United States. These waters include all surface waters, their tributaries, and adjacent wetlands. The discharges subject to Section 404 permitting actions are commonly associated with projects such as channel construction and maintenance, port development, fills to create fastland for development sites, and water resource projects like reservoirs and flood control projects. Section 404 is somewhat limited as a tool for habitat protection in that it does not regulate dredging, ditching, or clearing of vegetation, nor does it allow for the provision of transition (or buffer) zones around special aquatic sites. A total wetland protection program would necessarily include all these facets to be most effective.

The principal authorities currently in use by the Corps are as follows:

AUTHORITY	ACTIVITY
Section 9, Rivers and Harbors Act of 1899	Dams and dikes across navigable waters.
Section 10, Rivers and Harbors Act of 1899	Any obstruction or alteration of navigable waters.
Section 404, Clean Water Act of 1972	Discharge of dredged or fill material into waters of the United States.

Major related laws implemented by other Federal agencies are:

AUTHORITY	ACTIVITY
Section 401, Clean Water Act of 1972	State water quality certification requirement.
Section 307(c), Coastal Zone Management Act of 1972	Requires federal consistency with State CZM plans.
National Environmental Policy Act of 1969	Requires environmental impact statements for major federal actions significantly affecting the quality of the human environment.
The Fish and Wildlife Act of 1956 & The Migratory Game-Fish Act	Protects aquatic environment as it relates to fish and wildlife resources.
The Fish and Wildlife Coordination Act	Requires equal consideration of fish and wildlife resources in water resource planning; authorizes Fish and Wildlife Service consultation.
Endangered Species Act	Protects federally listed endangered and threatened wildlife and their habitats.
Migratory Bird Treaty Act	Protects migratory birds and nesting habitats.
Executive orders 11988 & 11990	Protects wetlands and flood plains.

All regulated discharges are reviewed with respect to the Section 404 (b)(1) Guidelines, which set forth the review criteria for discharges of dredged or fill material into wetlands. Although promulgated by the EPA, the Guidelines were developed and are used by both the EPA and the Corps. In general, the guidelines require a permit applicant to demonstrate that: 1) no practicable alternatives exist; 2) threatened or endangered species will not be eliminated or water quality standards violated; 3) no significant degradation of waters of the U.S. will result; and 4) the impacts of any necessary discharge are minimized. The guidelines contain a "rebuttable presumption" that less damaging alternatives (usually upland alternatives) exist for non-water dependent projects being proposed within special aquatic sites. This means that someone proposing, for example, to discharge fill for development of a commercial project must first demonstrate that no alternative upland site or less valuable wetland site exists. This issue of practicable alternatives is generally the main point of contention in controversial Section 404 permit reviews.

The Corps conducts what is known as the "public interest review" in which the favorable impacts of a proposal are balanced against its reasonably foreseeable detrimental impacts. The Corps defines the program as "one which reflects the national concerns for both the protection and utilization of important resources." Part of the overall review process entails compliance with other applicable federal laws (i.e., NEPA, CWA, etc.).

BASE PROGRAM ANALYSIS

Nationwide permits give authorization for approximately 750 well-defined activities within wetlands areas. The nationwide permits administered by the U.S. Army Corps of Engineers have been revised since 1991 from a total of 26 to 42. Nationwide permit #26 allows for the filling of wetland areas less than three acres in size. In New Jersey, hundreds of acres of wetlands have been lost due to nationwide permits while over the past ten years, less than ten acres have been lost due to individual permits without mitigation.

Under Section 404(c) of the Clean Water Act, the Administrator of the EPA can prohibit or restrict the use of a water body of the United States as a disposal site for dredge or fill material. This can occur, after notice and opportunity for public hearing, whenever the Administrator determines that such disposal will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas. This authority is often referred to as the EPA's "veto" authority over Corps permits because it is generally invoked when there is a disagreement over a proposed permit issuance and the EPA has exhausted all other appeal measures to the Corps and to the Department of the Army itself. This authority is seldom exercised. Nationwide through 1990, there had been eight completed actions, three of which were completed in 1989-1990, and a relatively small number have been carried on in more recent years. EPA Region 2 invoked Section 404(c) in 1989 on a proposed development project in the Hackensack Meadowlands in northern New Jersey.

The Corps has the main responsibility to monitor compliance with program requirements and conditions of issued permits. Under a Memorandum of Agreement signed by the EPA and the Department of the Army in 1989 (the enforcement MOA), the EPA for the first time also has authority to pursue permit violations. The Corps must first determine that a violation of a permit has occurred and decline to take action before the EPA can use this authority.

Federal Agency Coordination

While the Corps has the primary responsibility of operating the program by reviewing and making decisions on permit applications, the EPA, along with the US Fish & Wildlife Service and the National Marine Fisheries Service, provides federal review and comments on Corps permits actions. The agencies also cooperate on the preparation of Environmental Impact Statements (EISs) for activities that impact waters of the United States, including wetlands. The EPA also assists the Corps in making wetland determinations/delineations, in reviewing proposed wetland mitigation plans, and in enforcement of the Section 404 program.

An agreement was recently reached between the EPA, the Corps, the Fish & Wildlife Service, and the Natural Resources Conservation Service on the publication and use of one unified federal method of identifying and delineating jurisdictional wetlands. The approach described in this manual is a further refinement of the "three-parameter approach" where soils, hydrology, and vegetation are examined to determine the presence of wetlands. This manual may serve as a guide to other federal agencies, states and local governments, environmental consultants, and the environmental and developmental communities to avoid confusion in identifying wetlands.

Until fairly recently, ignorance of the program's very existence was widespread and used as a popular excuse for non-compliance. Now, much emphasis has been placed on educating the public on wetland functions, values, and regulation. The EPA, the Corps and the USFWS, along with many private environmental groups, have been active in promoting this knowledge, and the incidence of unauthorized activity has subsequently decreased.

State Delegation of Section 404 Program

The Clean Water Act allows for the EPA to delegate the Section 404 regulatory program from the Corps of Engineers to interested states, although only non-tidal and other non-navigable waters may be assumed by the states. On March 2, 1994, the State of New Jersey, as only the second state in the nation to do so, assumed the Clean Water Act Section 404 permit program for the discharge of dredged or fill material into waters of the United States. See further discussion on this topic below under the heading "New Jersey State Wetlands Program." Most states have

not sought to assume the program, probably due to the time and expense involved.

When a state assumes the Section 404 program from the Corps, the EPA becomes the federal oversight authority. It is the decision of the Regional Administrator to delegate the program, and the EPA has a responsibility to oversee the state's management of that program for a certain period of time. In a delegated program, the EPA acts as the coordinator for federal comments, and the state is required to respond to any negative position forwarded by the EPA. While the Section 404 program remains under jurisdiction of the Corps, the EPA can also exercise its oversight authority under Section 404(c).

Other Activities

One of the EPA's national initiatives is to identify valuable wetland areas that are threatened by conversion for development or agricultural use. These listings are designed to focus attention on valuable wetlands and encourage their protection through regulatory, planning, and public outreach activities. The EPA has completed a listing for the State of New Jersey.

b) New Jersey State Wetlands Program

In 1970, the New Jersey State Legislature passed the Wetlands Act of 1970, designed to stop the destruction of coastal wetlands. Coastal wetlands are defined as those wetlands subject to tidal action along specified water bodies, and extend from the head of tide, out to the coastal shoreline. This Act empowered the NJDEP to map all coastal wetlands in New Jersey south of the Raritan River, and regulate all development within these wetlands. In the period immediately prior to the Act, over 3,000 acres of coastal wetlands per year were being lost to coastal and lagoon development. Since the time the Department implemented the law, the number of acres of coastal wetlands lost per year to development has dramatically decreased and approaches zero. Other state programs also have wetland review components. The Flood Hazard Control Act applies to wetlands located within designated floodplain areas.

In 1987 the state of New Jersey enacted the Freshwater Wetlands Protection Act (P.L. 1987, c. 156) which controls the alteration or disturbance in and around freshwater wetland areas in the state, and the discharge of dredged or fill material into state open waters. Rules and regulations have been adopted to implement the provisions of the Act. New Jersey's freshwater wetlands program is designed to be more comprehensive than the federal 404 program, and regulates activities not covered by the federal program. The state open water program mirrors the federal Section 404 program and uses the federal Section 404(b)(1) guidelines as the document for policies related to regulated activities in open waters.

As noted above, the state of New Jersey assumed the Clean Water Act Section 404 permit program in 1994. Under the assumed program, the state of New Jersey has jurisdiction over all waters of the United States, as defined at 40 CFR §232.2(q), within the state as part of the state Program, with the exception of those waters which are presently used, or are susceptible to use, in their natural condition or by reasonable improvements, as a means to transport interstate or foreign commerce shoreward to their ordinary high-water mark, including all waters which are subject to the ebb and flow of the tide shoreward to their mean high water mark, including wetlands adjacent thereto.

The program description for the New Jersey Freshwater Wetlands Protection Act identifies the scope of regulated activities as follows: 1) the removal, excavation, disturbance or dredging of soil, sand, gravel, or aggregate material of any kind; 2) the drainage or disturbance of the water level or water table; 3) the dumping, discharge or fill with any materials; 4) the driving of pilings; 5) the placing of obstructions; 6) the destruction of plant life which would alter the character of a freshwater wetland, including the cutting of trees. Therefore, in addition to regulating the disposal of dredged or fill material as required by Section 404 of the Clean Water Act, the state program also regulates other activities. Additionally, the state's program includes the regulation of transition areas (non-wetland buffers) adjacent to most wetlands. These buffer areas

BASE PROGRAM ANALYSIS

and the state regulated activities that go beyond the purview of the federal program are not subject to EPA approval or oversight.

Despite the dramatic reduction in the loss of coastal wetlands, some coastal projects continue to destroy wetlands. In those cases where a particular use is allowed that will destroy wetlands, the NJDEP requires mitigation. The mitigation rule requires that in general, mitigation should be similar in type and location to the resource disturbed or destroyed and that the loss of wetlands must be compensated for by the creation and restoration of an area of wetlands at least twice the size of the disturbed surface area. To restore some of the wetlands previously lost, the state completed a study in 1988 to document the location of potential mitigation sites for coastal tidal wetlands and considered setting up a coastal wetland bank to assist in wetlands management.

The Waterfront Development Act (*N.J.S.A. 12:5-3*), revised in 1975, requires permits for the development along the waterfront upon any tidal or navigable waterway. This applies to the installation of docks, piers, wharves, bulkheads, bridges, pipelines, cables and pilings, and dredging. This program is the state's major permitting authority for development along the water's edge, and applies to all waterfronts of coastal waterways in New Jersey except upland areas under CAFRA jurisdiction.

In addition to increases in staff and funding, there is an increasing need to link habitat related environmental regulatory programs to land-use planning decisions. Many incompatibilities exist between habitat protection and environmental goals (specifically in regard to wetlands), and to state, regional, and federal economic development policies. Oftentimes, land use ordinances are not designed to consider the comprehensive impacts of growth and development. A need for incentives and innovative approaches for habitat protection and economic compatibility should be stressed and a more comprehensive estuary coordinated view beyond resource-specific habitat protection, should be considered in habitat protection programs. Updated information and critical habitat inventories are essential for better habitat protection and planning.

c) Analysis of Program Implementation

Implementation of tidal wetlands regulatory programs have been one of the great success stories in environmental protection. Where previously lagoon developments built from stretches of tidal wetlands were proliferating in the 1960s, tidal wetland destruction has been effectively regulated since 1970. Still, approximately one-third of the Barnegat Bay tidal wetlands have been destroyed as a result of historic dredging and filling operations. Of the tidal wetlands that remain, most have been grid-ditched for mosquito control.

Freshwater wetlands have undergone a similar level of assault. Except for the states of Florida and Louisiana, New Jersey ranks among the highest in percentage of freshwater wetland acres per total land acre. In Ocean County, many freshwater wetlands were converted into cranberry bogs; now abandoned, these bogs are reverting to wetlands. The state assumption of the freshwater wetlands program has generally been effective, but continuing development pressure in Ocean County demonstrates the need for constant vigilance in program administration.

One opportunity to recoup a measure of historic wetlands losses is afforded by the Barnegat Bay Restoration study undertaken by the U.S. Army Corps of Engineers in partnership with the NJDEP. This is Action Item 6.2 in the CCMP. The results of this study will include recommendations to rehabilitate areas that were former wetlands but are now either sites which have been filled, cranberry bogs, or constructed lagoon developments. Activities like this, combined with effective enforcement of regulatory wetland programs, offer the best chance to retain coastal and freshwater wetlands as an integral part of the Barnegat Bay ecosystem.

4. THE NATIONAL ENVIRONMENTAL POLICY ACT, AND RELATED STATE PROGRAMS

a) Historical Perspective

The National Environmental Policy Act (NEPA), (42 U.S.C. 4321, et seq.), was signed into law on January 1, 1970. The Act established national environmental policy and goals for the protection, maintenance, and enhancement of the environ-

ment, provided a process for implementing these goals within the federal agencies, and established the Council on Environmental Quality (CEQ) to oversee federal implementation of NEPA.

NEPA contains a Declaration of National Environmental Policy which requires the federal government to use all practicable means to create and maintain conditions under which people and nature can exist in productive harmony. NEPA also requires federal agencies to incorporate environmental considerations into their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of, and alternatives to, major federal actions significantly affecting the environment. These statements are commonly referred to as Environmental Impact Statements (EISs). Federal agencies are also required to lend appropriate support to initiatives and programs designed to anticipate and prevent a decline in the quality of human living and the world environment.

CEQ's regulations (40 CFR Parts 1500-1508) implementing NEPA are binding on all federal agencies. The regulations address the procedural provisions of NEPA and the administration of the NEPA process, including preparation of EISs for major federal actions which would significantly affect the environment. Additionally, most federal agencies have promulgated their own NEPA regulations and guidance, which generally follow the CEQ procedures but are tailored to the specific mission and activities of the particular agency.

b) NEPA Process

The NEPA process consists of an evaluation of the environmental effects of a federal undertaking, including its alternatives. There are three levels of analysis, depending on whether or not an undertaking could significantly affect the environment. These three levels include: categorical exclusion determination; preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and preparation of an environmental impact statement (EIS).

At the first level, an undertaking may be categorically excluded from a detailed environmental analysis if it meets certain criteria which a federal agency has previously determined as having no significant environmental impact. A number of agencies have developed lists of actions which are normally categorically excluded from environmental evaluation under their NEPA regulations.

At the second level of analysis, a federal agency prepares a written environmental assessment (EA) to determine whether or not a federal undertaking would significantly affect the environment. If the answer is no, the agency issues a finding of no significant impact (FONSI). The FONSI may address measures which an agency will take to reduce (mitigate) potentially significant impacts.

If the EA determines that the environmental consequences of a proposed federal undertaking may be significant, an EIS is prepared. Alternatively, if a federal agency anticipates that an undertaking may significantly impact the environment, or if a project is environmentally controversial, a federal agency may choose to prepare an EIS without having to first prepare an EA. An EIS is a more detailed evaluation of the proposed action and alternatives. The public, other federal agencies, and outside parties may provide input into the preparation of an EIS and then comment on the draft EIS when it is completed.

After a final EIS is prepared and at the time of its decision, a federal agency prepares a public record of its decision addressing how the findings of the EIS, including consideration of alternatives, were incorporated into the agency's decision-making process.

c) Federal Agencies' and Public's Roles

The role of federal agencies in the NEPA process depends on the agency's expertise and relationship to the proposed undertaking. The agency carrying out the federal action is responsible for complying with the requirements of NEPA. In some cases, there may be more than one federal agency involved in an undertaking. In this situation, a lead agency is designated to supervise preparation of the environmental analysis. Federal agencies, together with state or local agencies, may act as joint lead agencies.

BASE PROGRAM ANALYSIS

A federal agency having special expertise with respect to an environmental issue or jurisdiction by law may be a cooperating agency in the NEPA process. A cooperating agency has the responsibility to: assist the lead agency by participating in the NEPA process at the earliest possible time; participate in the scoping process; develop information and prepare environmental analyses, including portions of the environmental impact statement concerning which the cooperating agency has special expertise; and make staff support available to enhance the lead agency's interdisciplinary capabilities.

The EPA, like other federal agencies, prepares and reviews NEPA documents. However, due to the EPA's unique mission, many of its programs are exempted, by their authorizing legislation, from compliance with NEPA (e.g., Clean Air Act actions, and most Clean Water Act programs). Alternatively, some EPA programs utilize procedures which are functionally equivalent to NEPA requirements (e.g., the Comprehensive Environmental Response, Compensation and Liability Act [Superfund] program). Although not required to do so by law, other EPA programs prepare EISs on their actions voluntarily.

The EPA also has a unique responsibility in the NEPA review process. Under Section 309 of the Clean Air Act, the EPA is required to review and publicly comment on the environmental impacts of major federal actions, including actions which are the subject of EISs. If the EPA determines that the action is environmentally unsatisfactory, it is required by Section 309 to refer the matter to CEQ.

The public also has an important role in the NEPA process, particularly in providing input on what issues should be addressed in an EIS and in commenting on the findings in an agency's NEPA documents. The public can participate in the NEPA process by attending NEPA-related hearings or public meetings and by submitting comments directly to the lead agency. The lead agency must take into consideration all comments received from the public and other parties on NEPA documents during the comment period.

d) NEPA and Other Environmental Laws

The NEPA review takes into consideration the effects that an action may have on various aspects of the environment. Some of these areas, such as impacts on endangered species and cultural resources, are also covered by other environmental laws, including the Endangered Species Act, the National Historic Preservation Act, etc. To reduce paperwork and avoid delays in the decision-making process, federal agencies must, to the fullest extent possible, integrate the NEPA review with the analytic and consultation requirements of these other environmental laws.

The NEPA review also takes into consideration whether a federal undertaking is in compliance with statutes such as the Clean Water Act, the Safe Drinking Water Act, and the Clean Air Act. In these cases, the lead agency would consult with the agencies overseeing these statutes to ensure compliance with any criteria and standards promulgated under these laws.

e) Integration into Federal Decision-Making

The CEQ NEPA regulations require federal agencies to make the environmental review documents and any comments and responses a part of the record in formal rulemaking and adjudicatory proceedings. These documents must also accompany the proposal through the federal agency's review process. In making its decision on a proposal, an agency must consider a full range of alternatives, including ones evaluated in the NEPA review.

Most federal agencies have promulgated NEPA regulations which address how the NEPA review will be incorporated into their various programs. Agencies are encouraged to prepare broad EISs covering policy or programmatic actions, and to tier subsequent NEPA reviews to individual actions included within the program or policy. For legislative proposals, the NEPA process is integrated with the legislative process of Congress. Federal agencies are required to inte-

grate the NEPA review early in program or project planning. In the preparation of EISs, the scoping process provides for early identification and consideration of environmental issues and alternatives. One major problem with the NEPA process is the apparent lack of adequate consideration of cumulative impacts on the environment.

f) State Programs Comparable to NEPA

While NEPA only applies to federal actions, a number of states have passed laws which incorporate consideration of environmental effects in deciding state actions, many of which are modeled after NEPA. While it has no comprehensive environmental review statutes, the state of New Jersey has several programs which require the production of Environmental Impact Statements. These include: Coastal Area Facilities Review Act (CAFRA), the Tidal Wetlands Act, and Executive Order 215 (E.O. 215). CAFRA and the Wetlands Act are discussed in the sections above for Coastal Zone Management and Wetlands Management, respectively.

Executive Order 215 - Environmental Assessment, was enacted on September 11, 1989. It requires all departments, agencies, and authorities of the state of New Jersey to prepare and submit to the NJDEP an environmental assessment/impact statement in support of major construction projects. The objective of E.O. 215 is to reduce or eliminate any adverse environmental impacts of projects initiated or funded by the state and specifies two levels of review depending on the anticipated construction costs and area of disturbed land. Projects exempted from the E.O. 215 environmental review requirements include: projects with construction costs of less than \$1 million; maintenance or repair projects; building expansion of less than 25%; projects subject to review pursuant to CAFRA or the Municipal Wastewater Treatment Financing Program; and projects being reviewed pursuant to NEPA (categorical exclusions and full EIS).

g) Analysis of Program Implementation

NEPA and its state counterparts have helped to instill a level of environmental review into major civil works projects. In the case of projects relevant to Ocean County, beach erosion control is typically designed to minimize the use of hard structural elements. Highways and utility rights of way are examined for their potential impacts to sensitive habitats, and sanitary sewer infrastructure is studied for its impact on induced development. At the same time, increasing development necessitates improvements in regional infrastructure. NEPA and its state counterparts have become an indispensable tool in ensuring that large public works are constructed with a minimum of adverse environmental impacts.

5. MANAGEMENT OF FISH AND SHELLFISH

a) Federal Program

Introduction

The Magnuson Fishery Conservation and Management Act (MFCMA), Public Law 94-265 as amended, provides for the conservation and exclusive management of all fishery resources within the U.S. Exclusive Economic Zone (EEZ), defined as the seaward boundaries of the territorial sea, 3 nautical miles (nm) offshore, to 200 nm offshore. It also provides for exclusive management authority over continental shelf fishery resources and anadromous species beyond the U.S. EEZ, except during the time they are found within any foreign nation's waters.

Under the MFCMA, eight regional fishery management councils are charged with preparing Fishery Management Plans (FMPs) for the fisheries needing management under their jurisdiction. The Mid-Atlantic Regional Fishery

BASE PROGRAM ANALYSIS

Management Council (Dover, DE) covers New York, New Jersey, Delaware, Pennsylvania, Maryland and Virginia. However, FMPs prepared by the New England and South Atlantic Fishery Management Councils may be applicable in the Mid-Atlantic Region if the distribution of a particular fishery so warrants.

FMPs generally have the following objectives: (1) reduce fishing mortality on a stock; (2) increase yield from the fishery; (3) promote compatible management regulations between the territorial sea and the EEZ; and (4) minimize regulations to achieve the three management objectives recognized above. The Department of Commerce, through National Marine Fisheries Service agents and the U.S. Coast Guard, is responsible for enforcing the law and regulations.

National Marine Fisheries Service's Habitat Conservation Program

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) Habitat Conservation Program (HCP) activities are carried out nationwide as part of the overall NMFS fisheries research and management program. The NMFS HCP Central Office in Washington, D.C. provides policy guidance for the NMFS Regional and Central programs. The habitat programs are organized and administered in each area to respond effectively to unique regional issues and geographic constraints.

All Regional HCPs are a reflection of three important considerations: the pressures on the living marine resource habitats; the size of the area managed; and the commercial and recreational value of the species. The HCP is directed by several federal laws and the National Habitat Conservation Policy, which was published in 1983. Implementation of this policy is facilitated by 12 strategies targeting: research and management coordination, habitat research, interaction with the eight Regional Fishery Management Councils and specific FMPs, strengthening NMFS involvement under the Fish and Wildlife Coordination Act, assisting states with marine habitat issues, initiating and strengthening interagency agreements, protecting anadromous fish, increasing pre-application planning, integrating habitat consideration across NMFS programs, increasing intra-NOAA cooperation, providing necessary and appropriate regulatory relief, and communicating habitat information to NMFS constituents.

Essential Fish Habitat (EFH)

On October 11, 1996, the Sustainable Fisheries Act (Public Law 104-297) became law which, among other things, amended the habitat provisions of the Magnuson Act. The re-named Magnuson-Stevens Act calls for direct action to stop or reverse the continued loss of fish habitats. Toward this end, Congress mandated the identification of habitats essential to managed species and measures to conserve and enhance this habitat. The Act requires cooperation among NMFS, the Councils, fishing participants, federal and state agencies, and others in achieving the essential fish habitat goals of habitat protection, conservation, and enhancement.

NMFS is committed to working with the Councils, affected federal and state agencies, fishing and non-fishing industries, conservation groups, academia, land owners, and the general public to ensure that essential fish habitat provisions are understood and well coordinated, thereby providing effective protection for essential fish habitats as Congress envisioned. NMFS will seek working agreements with organizations and provide many avenues for public input to the EFH process. Partnerships with other federal agencies, state resource agencies, and non-governmental organizations will enhance the process.

b) Interstate Programs

The Atlantic States Marine Fisheries Commission's (ASMFC) Interstate Fisheries Management Program (ISFMP) was initiated through a state/federal cooperative agreement with NMFS in 1980. The five major components of the ISFMP are:

1. To determine priorities for Territorial Sea Fisheries Management;
2. To develop, monitor and review management plans for high priority fisheries;
3. To recommend to states, Regional Fishery Management Councils, and the federal government, management measures to benefit such fisheries;
4. To provide means of conducting short-term research essential to preparation or revision of fishery management plans; and
5. To provide an organizational structure for efficient and timely administration of the ISFMP.

Since the inception of this Program, the following Fishery Management Plans have been adopted for the Atlantic coastal waters: alewife, American lobster, American shad, Atlantic croaker, Atlantic menhaden, blueback herring, bluefish, hickory shad, red drum, spot, spotted seatrout, striped bass, summer flounder, and weakfish.

c) New Jersey State Programs

The NJDEP is responsible for management of the state's marine and estuarine finfish and shellfish resources and their habitats. Various components of the NJDEP are involved, including the Division of Water Resources, Division of Fish and Wildlife (principally stock management role) and Division of Science and Research (principally monitoring and assessment role). Three administrative groups within the Division of Fish, Game, and Wildlife have responsibility for administering a variety of programs which impact the fisheries resources of New Jersey. The purpose of these programs is to protect, maintain, and enhance aquatic organisms and the habitat needed to sustain them. Scientific studies and research programs are undertaken in order to develop management strategies and plans to prudently utilize fisheries resources.

The Marine Fisheries Administration coordinates state fishery management activities with four fisheries councils:

1. Marine Fisheries Council was established by the Marine Fisheries Management and Commercial Fisheries Act (N.J.S.A. 23: 2B-4, 5). This Council advises the commissioner of the NJDEP on the need for rules to regulate the conservation and utilization of the state's marine resources. The Council can also veto marine fishery regulations proposed by the commissioner. The Council contributes to the preparation and revision of fishery management plans and holds public hearings on marine fishery issues.
2. The Atlantic States Marine Fisheries Commission was established in 1941 by a compact entered into by New Jersey and 14 other Atlantic coastal states. The Commission assists the states in developing joint programs and administers the Interstate Fisheries Management Program.
3. New Jersey also serves on the Mid-Atlantic Fishery Management Council, which is one of eight regional councils that have exclusive management jurisdiction from 3 to 200 miles offshore. The Councils were established by the Magnuson Fishery Conservation and Management Act (PK 94-265) and are responsible for developing management plans for living marine resources. The Mid-Atlantic Council encompasses the area from Montauk, New York to False Cape, Virginia.

BASE PROGRAM ANALYSIS

4. The New Jersey Shellfisheries Council acts as an advisor to the commissioner and approves or disapproves shellfish leases. Staff is provided by the Bureau of Shellfisheries.

The Bureau of Marine Fisheries is responsible for the management of New Jersey's marine and estuarine finfish and crustacean resources and their habitats. The Bureau develops management plans in coordination with the New Jersey Marine Fisheries Council, the federal government and other states. In addition, a team of four regionally assigned biologists evaluate waterfront development projects to ensure protection of the state's fishery resources. The Bureau administers a number of projects impacting New Jersey fishery resources, including a network of offshore artificial reefs at eight sites, a seasonal census of the fish and macroinvertebrates that inhabit the coastal waters of the state, and studies of striped bass population restoration and the life history of winter flounder.

The Bureau of Shellfisheries has as its primary responsibility the protection and enhancement of New Jersey's shellfish resources and habitat for commercial and recreational fishing. The Bureau administers (with the New Jersey Shellfisheries Council) the state's shellfish licensing and leasing programs. In 1989 state law established the Shell Fisheries Law Enforcement Fund to dedicate all clam license fees to the protection and management of the state's shellfish resources. The Bureau also conducts a number of investigations evaluating New Jersey's shellfish resources. All estuarine waters between Raritan Bay and Great Egg Harbor have been sampled as part of the Shellfish Inventory Program established in 1983. The purpose of this program is to determine the distribution and abundance of the important molluscan species, particularly the hard clam, which occurs in New Jersey's estuaries. Additional programs have studied the oyster, surf clam, and blue crab resources of the state. NJDEP stock management programs relevant to Barnegat Bay include hard and soft clam relay, transplant and deputation, designation of hard clam spawner sanctuaries, and leasing of shellfish growing lots. Marine fisheries management programs are geared to monitoring status of stocks and harvests. The DEP is a member of the Mid-Atlantic Fisheries Management Council.

d) Analysis of Program Implementation

Fisheries management has become ever more important as fishing pressure and fishing technology have advanced. The economic impact of recreational and economic fishing to New Jersey is measured in billions of dollars. Barnegat Bay claims a measurable portion of that economic output, and its port facilities serve ocean-going vessels in nearshore waters.

Federal, state, and interstate commissions are charged with managing fisheries and shellfisheries in nearshore and offshore waters. They take actions to manage healthy fisheries and to schedule recovery of overfished stocks. There remains, however, a relative lack of information on fisheries within Barnegat Bay itself. Although fisheries remain a priority for the BBNEP, there is insufficient information for the Program to propose appropriate fishery management actions. Accordingly, Action Item 7.10 of the CCMP includes an action to conduct a shellfish resource survey of Barnegat Bay in order to develop a database that can be used for future Program actions.

6. ENDANGERED AND THREATENED SPECIES PROGRAMS

a) Federal Program

Historical Perspective and Program Authority

Native wildlife species and their habitats have been under continual assault since the first European colonization of North America. The Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531, et seq.) was one response to the growing concern for the integrity of native species and their habitats. This Act gives the US Fish and Wildlife Service (FWS) authority, acting for the Secretary of the Interior, to protect and conserve all forms of wildlife and plants that are endangered or threatened with extinction. The National Marine Fisheries Service (NMFS) maintains similar authority for marine species under the Act, as well as for marine mammals under the Marine Mammals Protection Act of 1972 (MMPA) (16 U.S.C. 1361, et seq.). NMFS also conducts the Cetacean and Turtle Assessment Program (CETAP). Under Section 7 of the Endangered Species Act, federal agencies are required to consult with FWS and NMFS on actions that they may authorize, fund, or carry out, which may affect any federally-listed species or its designated critical habitat, to ensure that their actions are not likely to jeopardize the species or result in adverse modification of its designated critical habitat. In June 1986, FWS and NMFS adopted final rules to improve interagency cooperation regarding Section 7 consultation.

Existing Program

The FWS has active endangered species programs consisting of efforts in monitoring candidate species (species under review for potential listing as threatened or endangered), listing, recovery, interagency consultation, coordination with state environmental agencies, and technical assistance. Current constraints on the program are manpower and funding.

BASE PROGRAM ANALYSIS

Federally listed species in the Barnegat Bay watershed region are summarized in the following chart.

SPECIES NAME	SPECIES RANGE	
	Bay Proper	Watershed
Endangered		
American Chaffseed* (<i>Schwalbea americana</i>)		H
American Burying Beetle (<i>Nicrophorus americanus</i>)		H
Peregrine falcon* (<i>Falco peregrinus anatum</i>)	N#	
Roseate tern* (<i>Sterna dougallii dougallii</i>)	N	
Kemps ridley sea turtle* (<i>Lepidochelys kempii</i>)	X	
Leatherback sea turtle* (<i>Dermochelys coriacea</i>)	X	
Green sea turtle* (<i>Chelonia mydos</i>)	X	
Threatened		
Knieskern's Beaked-Rush* (<i>Rhynchospora knieskernii</i>)		N
Hirst's Panic Grass (<i>Panicum hirstii</i>)		C
Swamp pink* (<i>Helontias bullata</i>)		N
Bog Asphodel (<i>Narthecium americanum</i>)		C
Sensitive Joint Vetch (<i>Aeschynomene virginica</i>)		H
Seabeach Amaranth (<i>Amaranthus pumilus</i>)	N	N
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis</i>)	H	
Bald eagle* (<i>Haliaeetus leucocephalus</i>)	X	N
Piping plover* (<i>Charadrius melodus</i>)	N	
Bog Turtle (<i>Glemmys muhlenbergii</i>)		N
Loggerhead sea turtle* (<i>Caretta caretta</i>)	X	

C = candidate species

H = historic occurrence

N = nesting, spawning, or resident species

X = transient or seasonal species

* = recovery plan established

= population in recovery; removed from list in 8/99

Recovery Plans

Once a species has been listed as endangered or threatened, a recovery plan is developed that specifies the means and schedule for improving the status of the species so that it may be taken off the list. A prime example is our national symbol, the bald eagle. Nationwide, it has recovered to the point where its status has been downgraded from endangered to threatened. No breeding pairs of bald eagles are known for Barnegat Bay itself, but active nests are found just to the south along the Mullica River, as well as just to the north at the Manasquan Reservoir.

In a more recent example, the federally threatened seabeach amaranth has been found recolonizing sandbeach habitats all along the Jersey Shore after having apparently been extirpated in New Jersey since 1913. As of 2001, this species was documented spreading and occurring in Monmouth, Ocean, Atlantic, and Cape May Counties. Seabeach amaranth populations are adversely affected by shoreline development and vehicular and pedestrian traffic.

The peregrine falcon, piping plover, and roseate tern also nest along the coast. For these species the FWS and other agencies, organizations, and individuals are currently implementing recovery plans. The populations of these birds have been relatively stable or increasing over the past 10 to 20 years. Among endangered and threatened plants found in or near the Barnegat Bay watershed, Knieskern's beaked-rush, swamp pink, sensitive joint vetch, and chaffseed have recovery plans. In addition, the New Jersey Field Office of the FWS works to ensure the protection of potential nesting habitat for endangered and threatened sea turtles (Atlantic Ridley turtle, green turtle, hawks-bill turtle, leatherback turtle, and loggerhead turtle) along the coast.

b) New Jersey State Program

The Endangered and Non-Game Program of the Division of Fish, Game, and Wildlife, established in 1973, provides scientific information and makes recommendations necessary to develop management programs for New Jersey's endangered and threatened plants and animals. The program performs hundreds of environmental reviews annually to assess the potential impacts of development projects on endangered/threatened and non-game species or their habitats. The goal of the program is to protect extremely sensitive habitats and to minimize the impacts of development on other non-game habitats. One major limitation of the New Jersey program is that the statute contains language to protect species, but not habitat. Theoretically, the habitat on which an endangered species depends can be destroyed as long as the species is not physically harmed. One way to close this loophole is to include endangered species regulations within other permit programs.

At the present time, 35 species of animals, and numerous additional plants that occur within the Barnegat Bay watershed are listed as endangered or threatened in New Jersey (see below). Research, habitat protection and management, and population restoration projects are currently being undertaken for the bald eagle, osprey, peregrine falcon, piping plover, least tern, and black skimmer. In 1988, the program completed a coastal mapping project in which the locations of 16 wildlife species and species guilds in New Jersey's coastal zone were identified. The purpose of this project was to develop maps outlining existing habitat for endangered species, colonial nesting water birds and migratory shorebirds within the coastal zone, including the entire Atlantic coastline of New Jersey.

BASE PROGRAM ANALYSIS

NEW JERSEY STATE LISTED SPECIES IN BARNEGAT BAY AND ITS WATERSHED

ENDANGERED

Shortnose Sturgeon (*Acipenser brevirostrum*)
 Eastern Tiger Salamander (*Ambystoma tigrinum*)
 Pine Barrens Treefrog (*Hyla andersonii*)
 Southern Gray Treefrog (*Hyla chrysoscelis*)
 Corn Snake (*Elaphe guttata*)
 Cooper's Hawk (*Accipiter cooperii*)
 Northern Harrier (*Circus cyaneus*)
 Bald Eagle (*Haliaeetus leucocephalus*)
 Peregrine Falcon (*Falco peregrinus*)
 Piping Plover (*Charadrius melodus*)
 Upland Sandpiper (*Bartramia longicauda*)
 Least Tern (*Sterna antillarum*)
 Roseate Tern (*Sterna dougallii*)
 Black Skimmer (*Rynchops niger*)
 Short-eared Owl (*Asio flammeus*)
 Sedge Wren (*Cistothorus platensis*)
 Vesper Sparrow (*Poocetes gramineus*)
 Loggerhead Shrike (*Lanius ludovicianus*)

THREATENED

Atlantic Sturgeon (*Acipenser oxyrinchus*)
 American Shad (*Alosa sapidissima*)
 Brook Trout (*Salvelinus fontinalis*)
 Atlantic Tomcod (*Microgadus tomcod*)
 Wood Turtle (*Clemmys insculpta*)
 Northern Pine Snake (*Pituophis melanoleucus*)
 American Bittern (*Botaurus lentiginosus*)
 Great Blue Heron (*Ardea herodias*)
 Yellow-crowned Night-Heron (*Nyctanassa violacea*)
 Osprey (*Pandion haliaetus*)
 Red-shouldered Hawk (*Buteo lineatus*)
 Northern Goshawk (*Accipiter gentilis*)
 Black Rail (*Laterallus jamaicensis*)
 Barred Owl (*Strix varia*)
 Savannah Sparrow (*Passerculus sandwichensis*)
 Ipswich Sparrow (*P. sandwichensis princeps*)
 Grasshopper Sparrow (*Ammodramus savannarum*)

c) Analysis of Program Implementation

In general, federal and state endangered and threatened species programs have had measurable success in New Jersey and in the Barnegat Bay watershed. Populations of coastal beach nesting birds have been fairly stable, though not necessarily increasing. Bald eagles and peregrine falcons have rebounded as nesting species in the state, and occurrences of a number of federal and state listed species have been well-documented both in the state as a whole and in Ocean County. Several down-listings or deletions of federally listed species have been proposed recently. In accordance with national policy, the New Jersey Field Office of the U.S. Fish and Wildlife Service intends to increase protective efforts, continue to promote species conservation and recovery, stress the need for Section 7 consultations, and increase the focus on candidate species.

7. WILDLIFE REFUGES AND PRESERVES

a) National Wildlife Refuge System

Introduction

Theodore Roosevelt established the first National Wildlife Refuge on Pelican Island, Florida in 1903. Today the National Wildlife Refuge System includes over 450 refuges totaling 90 million acres nationwide and is managed by the FWS.

The mission of the National Wildlife Refuge System is to "provide, preserve, restore, and manage a national network of lands and waters sufficient in size, diversity, and location to meet society's needs for areas where the widest possible spectrum of benefits associated with wildlife and wildlands is enhanced and made available" (US Fish and Wildlife Service, 1982).

Barnegat Bay is home to one of the largest National Wildlife Refuges on the East Coast. The Edwin B. Forsythe National Wildlife Refuge, in two units, is located in south coastal New Jersey and encompasses over 34,000 acres. The Forsythe Refuge was established in 1984 when the Brigantine and Barnegat National Wildlife Refuges were combined and renamed. The Brigantine and Barnegat Refuges date from 1939 and 1967, respectively, under authority of the Migratory Bird Treaty Act (16 U.S.C. 703-712). The purpose for their establishment was to preserve estuarine habitats important to the Atlantic brant (*Branta bernicla*) and to provide nesting habitats for black ducks (*Anas rubripes*) and rails (*Rallidae*) (Hamilton and Roelle, 1988).

Existing Programs and Policies

The Forsythe Refuge contains over 30,000 acres of estuarine habitat, dominated by saltmarsh cordgrass (*Spartina alterniflora*) and saltmeadow cordgrass (*S. patens*) and is actively managed for waterfowl. The refuge also provides important habitat for both federally and state-listed endangered and threatened species including the bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), piping plover (*Charadrius melodus*), osprey (*Pandion haliaetus*), least tern (*Sterna antillarum*), and black skimmer (*Rynchops niger*) (Hamilton and Roelle, 1988).

The refuge policies and management objectives are diverse. They include protection of federally and state-listed endangered species, protection of wetlands, reestablishment of native vegetation, and increasing public awareness. Policies at the Forsythe Refuge include protection of the saltmarsh vegetation from overuse by snow geese (*Chen caerulescens*) using methods such as hazing to discourage geese concentrations in specific areas identified through aerial surveys (Hamilton and Roelle, 1988). To further protect wetlands and water quality, the refuge maintains a policy to avoid the use of chemicals to control mosquito populations unless (1) a specific human health concern is identified by a state public health agency, and (2) no other means of control are workable (David Beall, Refuge Manager, Forsythe National Wildlife Refuge, personal communication). The Forsythe Refuge also maintains a policy to increase public awareness of wildlife and wetland issues through public liaison, interpretative exhibits and signs, leaflets, and information notices posted at visitor centers (Hamilton and Roelle, 1988).

Planned Activities

Within the past year, the FWS has completed its Comprehensive Conservation Plan to manage and expand the Forsythe National Wildlife Refuge and the Cape May National Wildlife Refuge, collectively known as the Jersey Coast Refuges. The Plan will assist the FWS in identifying what role the Refuges will play in supporting the mission of the National Wildlife Refuge System and addressing community expectations for public use. The Plan considered two alternatives for management of the Refuges. The Action Alternative will allow the FWS to initiate or expand additional habitat and population management efforts, wildlife-dependent recreation opportunities, land protection efforts, and consider new office and visitor center facilities. Planned activities along the southern New Jersey Coast

BASE PROGRAM ANALYSIS

include acquisition of additional high value estuarine wetlands adjacent to the Forsythe Refuge and within its authorized boundaries as delimited by Congress.

The North American Waterfowl Management Plan is an agreement between the United States and Canada for the conservation of important waterfowl populations and habitats. Acquisition of black duck wintering habitat along the Atlantic Coast has high priority under the plan. Consistent with this policy, the FWS is developing a proposal for acquisition of 2,000 acres on North Barnegat Bay, known as the Reedy Creek Area, for the Forsythe refuge. The proposed acquisition area contains no residential or commercial development and represents the largest natural open space remaining in the northern portion of Barnegat Bay. The Reedy Creek Area contains several natural habitat communities including coastal plain swamp, coastal bog, tidal creek, salt marsh, and Atlantic white cedar stands. Undisturbed coastal shorelines, such as those within the Reedy Creek area, are important for the survival of Atlantic brant, canvasback ducks (*Aythya valisineria*), and scaup (*Aythya marila* and *A. affinis*). In addition, waters off Reedy Creek provide the only waters clean enough for shellfish purification in the northern portion of Barnegat Bay (FWS, 1990).

b) Pinelands National Reserve

The Pinelands National Reserve, the country's first national reserve, was created by the National Parks and Recreation Act of 1978. At the state level, the Pinelands Protection Act of 1979 provided for implementation of the federal bill. A Pinelands Commission was established, which created a comprehensive management plan (CMP) to balance protection and development interests; the plan was adopted in 1980 and approved in 1981. The comprehensive management plan established a 136,380-hectare (337,000-acre) core preservation district to be maintained in its natural state through strict regulation of development. The plan also established a protection area where there are various categories of land use (forest, agriculture, regional growth, rural development, pinelands, towns and villages, military and federal institutions) based on existing natural features and projected need.

Approximately one-third of the Pinelands is publicly owned. Of the nearly 400,000-hectare (1 million-acre) Pineland, there are 30,000 hectares (75,000 acres) of federal properties, including portions of Forsythe and Cape May National Wildlife Refuges managed by the FWS, and military installations such as Fort Dix, McGuire Air Force Base, and Lakehurst Naval Air Engineering Station, plus about 110,000 hectares (275,000 acres) of state-owned lands. State forest managed by the New Jersey Division of Parks and Forests include Bass River, Bass River North, Belleplain, Lebanon, Penn, and Wharton, and state parks include Belleplain, Double Trouble, and Wharton. Designated Natural Areas contained within the state forests include Batsto, Cedar Swamp, Oswego River, and West Pine Plains. State Wildlife Management Areas managed by the New Jersey Division of Fish, Game and Wildlife include Colliers Mills, Greenwood Forest, Makepeace, Manchester, Pasadena, Peaselee, Stafford Forge, Swan Bay, Whiting, and Winslow. The New Jersey Natural Lands Trust owns 14 parcels within the Pinelands. The Nature Conservancy owns Hirst Ponds Preserve. The Pinelands National Reserve is part of the Atlantic Coastal Plain Biosphere Reserve designated by UNESCO under the Man and Biosphere program. A substantial portion of Ocean County lies within the Pinelands National Reserve.

c) Other Federal Programs

The Jacques Cousteau National Estuarine Research Reserve at Mullica River/Great Bay overlaps the southern portion of the Barnegat Bay study area. This reserve was created through the authorization of the Marine Protection, Research and Sanctuaries Act (MPRSA). The National Oceanic and Atmospheric Administration (NOAA) is the responsible agency for designation of National Estuarine Research Reserves. A scientific research and public outreach program is being developed and will be cooperatively managed by the New Jersey Division of Fish, Game, and Wildlife and the Institute of Marine and Coastal Sciences at Rutgers University.

d) State Program

New Jersey's 73 wildlife management areas, totaling 192,000 acres, are maintained by the Bureau of Land Management of the Division of Fish, Game, and Wildlife. Since 1932, the state has acquired these lands using Fish and Game Funds, Green Acres Funds, Pinelands Funds, Federal Aid, gifts, and funds from the Waterfowl Stamp Program. The Bureau develops plans and implements programs that serve to increase the habitat diversity and benefit of all wildlife species and that also maximize the opportunities for wildlife-oriented recreation.

Many wildlife and game management areas are found in Ocean County and they are well distributed within the Barnegat Bay watershed. These areas include both estuarine and freshwater habitats, as follows:

ESTUARINE HABITATS

- Manasquan Wildlife Management Area
- Forked River Game Farm
- Sedge Islands Wildlife Management Area
- Manahawkin Wildlife Management Area
- Great Bay Wildlife Management Area

WATERSHED HABITATS

- Butterfly Bogs Wildlife Management Area
- Stafford Forge Wildlife Management Area
- Colliers Mills Wildlife Management Areas
- Manchester Wildlife Management Area
- Whiting Wildlife Management Area
- Pasadena Wildlife Management Area
- Greenwood Forest Wildlife Management Area
- Prospertown Lake Wildlife Management Area



Egret at Sedge Islands. PHOTO BY RICH KING

For further discussion on land protection programs, see the section "Parks and Recreation Areas" under the main topic of "Human Activities and Competing Uses."

e) Analysis of Program Implementation

The wealth of federal, state, and county natural areas is one of the greatest assets of the Barnegat Bay watershed, and one that augurs well for the overall success of the BBNEP. The variety of habitats of these protected areas, from coastal dunes and wetlands to Pine Barrens and freshwater bogs, ensures living space for significant populations of most of the region's flora and fauna. However, the growing population of Ocean County is changing the conditions that support this diversity. Many of the habitats and species found in the Pine Barrens are fire-adapted, but when residential populations are at risk, fire suppression becomes a priority, threatening the long-term viability of those fire-adapted environments. Runoff from manicured lawns discharges lime and nutrients to naturally acidic waters,

BASE PROGRAM ANALYSIS

suppressing conditions suited to native life and providing opportunities for aggressive or weedy species to gain hold. As noted throughout this Appendix, the success of these programs is largely dependent on the human element. Public education and judicious management will help to ensure the long-term survival of the unique Pine Barrens habitat and the Barnegat Bay estuary.

C. HUMAN ACTIVITIES AND COMPETING USES

1. PUBLIC ACCESS

a) General Program Discussion

In New Jersey, the Rules on Coastal Zone Management (*N.J.A.C. 7: 7E-8.11 Public Access to the Waterfront*), states that public access is the ability of all members of the community to pass physically and visually to, from, and along the ocean shore and other waterfronts. It also states that coastal development adjacent to all coastal waters, including both natural and developed waterfront areas, shall provide permanent perpendicular and linear access to the waterfront to the maximum extent practicable, including both visual and physical access. Because coastal water and shorelines are such valuable and limited public resources, development that limits public access and the diversity of the waterfront experience is discouraged. At sites proposed for the construction of single family or duplex residential dwellings, which are not part of a larger development, public access is not required as a condition of the coastal permit. The shorelines in New Jersey are protected by the New Jersey Shore Protection Program and the New Jersey Marine Police, both of which are financed by state residents.

One of the most basic principles in regard to coastal access is the Public Trust Doctrine. This common-law doctrine dictates that open tidal waters, underwater lands, and the lands immediately adjacent are held by the state in trust for the benefit of the general public. The Public Trust Doctrine applies to land covered by water which is either navigable, or subject to tidal influence; however, the activities which may be legally carried out by the public in submerged and wet-sand areas are often limited in scope. Often only fishing, navigation and fowling were protected rights of use under the original Public Trust Doctrine, and many states continue this tradition. Even though most visitors come to the shore to swim, sunbathe, picnic, and walk, these are not protected uses of the shore since recreation is not a right historically covered by the Public Trust Doctrine.

The Public Trust Doctrine has successfully been applied to recreational uses of the shorelands only in New Jersey after the 1972 landmark case of *Neptune City v. Avon-By-The-Sea*. Although the Neptune court did not pass on the question of what rights the public has to use tidal lands and waters bordering a parcel of land in private ownership, it did interpret the Public Trust Doctrine to require that any beach owned by a municipality be open to all on equal terms. The court reasoned that public rights to lands in the tidal area are no longer limited to those essential to navigation and fishing, but also include recreational uses. It stated that the doctrine "should be molded and extended to meet [the] changing conditions and needs of the public it was created to benefit."

b) Analysis of Program Implementation

Despite basic rights of coastal access, as a practical matter upwards of 70 percent of the Barnegat Bay shoreline has been developed or modified, restricting opportunities for public access. Shoreline areas in public ownership remain the best opportunities for satisfying the public need for water access. Island Beach and Barnegat Lighthouse State Parks provide both ocean and bay access, as does the Holgate unit of Forsythe National Wildlife Refuge at the south end of Long Beach Island. Unfortunately, these relatively natural shoreline reaches also provide the best potential nesting habitat in the region for beach-nesting shorebirds, and access restrictions are put in place during the spring and summer months to protect these sensitive species.

Other major public access points to the Barnegat Bay shoreline include Cattus Island and Berkeley Island County Parks, Manahawkin Wildlife Management Area, and Forsythe National Wildlife Refuge. Commercial marinas and town parks also serve local and regional visitors.

Activities continue in the Barnegat Bay region to secure additional undeveloped lands for protection and potentially increased public access. One such project led to the Trust for Public Lands' Century Plan, a compendium of 100 of the most environmentally valuable undeveloped parcels in the Barnegat Bay area, and subsequent acquisition and protection efforts.

2. NAVIGATION AND WATER DEPENDENT ACTIVITIES

a) Federal Actions

Today, the US Army Corps of Engineers (COE) is responsible for the maintenance of the main channel of the Atlantic Intracoastal Waterway, a six-foot deep federal channel that reaches its northern terminus in Barnegat Bay. Other federal navigation maintenance responsibilities include Manasquan Inlet, the Point Pleasant Canal, Barnegat Inlet, and smaller navigation projects including a channel at Tuckerton Creek, a channel and timber jetty at Double Creek, and a dredging project at Toms River. Other navigation and water construction projects, such as marina construction and maintenance, residential bulkheading, connecting channels and others are a non-federal responsibility. Section 404 of the Federal Clean Water Act creates a permit program administered by the COE to control the discharges of dredged material into waters of the United States. In Barnegat Bay, dredged material originates from both federal channel maintenance and non-federal projects.

The COE has also entered into a cooperative partnership with New Jersey to develop the Barnegat Bay Ecosystem Restoration Study. Originally derived from the bi-annual Water Resources Development Act (WRDA), this restoration study is authorized by Section 206 of the WRDA of 1996, as amended. Section 206 provides authority for the Corps to investigate, study, modify, and construct projects for aquatic ecosystem restoration without specific additional Congressional authorization. This usually involves restoration of the ecosystem structure and function in an aquatic environment. Unlike earlier restoration study authorizations, there is no requirement for a connection to a previous federal project. The restoration must also demonstrate that it is cost effective and contributes to an improved environment that is in the general public interest. These projects are limited to a federal cost of \$5 million per project. Non-federal interests or sponsors provide 35 percent of the costs and provide any lands, easements, rights-of-way, relocations and disposal areas, and they agree to operate and maintain the project.

b) Analysis of Program Implementation

The Corps has recently released Early Action Reports and Environmental Assessments as part of its restoration study, focusing on two potential subjects for environmental restoration: historic deep dredge holes in the Bay bottom, and obstructed tidal tributaries that may benefit from the installation of fish ladders to restore anadromous fish passage. These draft reports will undergo a public review period before the projects are made final. Other types of projects that will be considered during the course of this study are: freshwater wetlands restoration/creation; salt marsh restoration; restoration of abandoned artificial lagoons; submerged aquatic vegetation restoration; and creation or restoration of Bay islands.

In review of the existing framework, the Barnegat Bay National Estuary Program recommends long-term planning for dredged material; more coordination among regulatory agencies; more informational exchange for port interests; and more coordination among the public and private sector for oil response and pollution prevention.

BASE PROGRAM ANALYSIS

Enforcement of navigation rules is the responsibility of the Marine Police division of the State Police as well as local police authorities. There is a high level of concern among some stakeholders that the current level of enforcement activity is insufficient to protect the natural resources, commercial viability, and public enjoyment of Barnegat Bay. This view is particularly strong with regard to the issue of personal watercraft, also known as jet skis. The Barnegat Bay Watershed Association has taken a lead role in addressing this outstanding concern in order to arrive at a mutually agreeable solution. One potential answer might be to employ volunteer citizen patrols that can take a public education approach in dealing with this issue.

3. PARKS AND RECREATION AREAS

a) Introduction

Parks and recreational areas are important, especially around densely populated centers. They are, however inherently different from wildlife refuges in that they generally provide open spaces and facilities for human recreation, such as ball fields, picnic grounds, and boat launching facilities, with a lesser emphasis on protected habitat for wildlife. For this reason, these programs are listed separately. In addition to the areas under federal jurisdiction listed here, there are many state, county, and local parks within the Barnegat Bay watershed. Some of the non-federal facilities are listed here. Some of the programs supporting state park or other open space acquisition also support wildlife refuge programs discussed under Wildlife Refuges and Preserves in the Habitat Loss and Alteration Section of this document.

b) Federal Parks

The Federal Parks program began with the establishment of Yellowstone National Park in 1872, and has for a long time been associated with the wide-open spaces of the American West and other scenic, pristine areas of the country. A more recent development in the Federal Parks program is exemplified by the Pinelands National Reserve in the Pine Barrens region of central and southern New Jersey. This designated area is a cooperative federal (National Park Service) and state effort that combines the protection of public parklands with comprehensive land-use management of private lands to achieve the long-term conservation of this unique and regionally significant habitat in the congested northeast corridor. The discussion of Land Use Management under the Habitat Loss and Alteration Section gives more information on the management of the Pine Barrens National Reserve.

Other large federal landholdings in Ocean County include the military reservations at Fort Dix and the Lakehurst Naval Air Engineering Center. While the missions of these facilities vary greatly from those of the National Park Service, they lie within the Pinelands National Reserve and harbor significant tracts of undisturbed Pine Barrens habitat. Conservation of these natural resources is an important element of the protection of the Pinelands National Reserve.

c) State and Local Parks and Forests

The Federal Parks program was a relative latecomer to the northeast region. As a result, state and local governments were primarily responsible for the system of regional parklands that exists today, and many jurisdictions continue to pursue aggressive land acquisition and management programs to meet the recreational and outdoor needs of the public.

New Jersey has an extensive system of state parks and other public lands. The system of New Jersey State Parks and Forests is managed by the Division of Parks and Forestry. There are 35 state parks and 11 state forests with a total

land area of approximately 266,223 protected acres. Existing parks, such as Island Beach and Barnegat Lighthouse State Parks protect more than ten miles of oceanfront and bay beaches. Inland, Double Trouble State Park protects sensitive Pine Barrens habitat along with its endemic fauna and flora and several miles of the Cedar Creek riparian corridor. Lebanon State Forest and additional large acreages of state-owned land are included within the Pinelands National Reserve.

County parks are found throughout the watershed from Cattus Island and Berkeley Island on the bayshore to Ocean County Park and Wells Mills County Park in interior areas. Smaller municipal parks supplement this extensive network of public lands and recreation areas.

d) Natural Areas System

The Office of Natural Lands Management, within the Division of Parks and Forestry, is responsible for overall administration of the Natural Areas System. The goal of the system is to permanently preserve and manage lands, often within state parks, supporting significant habitats of endangered and threatened species, natural communities and wildlife of New Jersey. There are 42 designated natural areas in the state with a total land area of approximately 30,000 acres. Management plans for each area are being developed. Five areas are found within the coastal areas of Barnegat Bay.

e) Green Acres Program

The Green Acres Program acts as a "real estate" agent for the DEP. This program determines where and how state funds should be spent for park and open space acquisition, development, and capital improvements. It provides guidance and financial assistance to local municipalities to preserve open space and develop recreation facilities. Since 1961, when the program was established, the voters of New Jersey have approved Green Acres bond issues totaling \$710 million, permanently preserving 243,000 acres of land.

f) Natural Lands Trusts

The New Jersey Natural Lands Trust is a state-funded land preservation organization that owns and manages, or holds conservation easements on, more than 3,000 acres of open space in New Jersey. The Trust was established in 1968 and is an independent agency within the Division of Parks and Forestry.

In 1997, the voters of Ocean County approved an incremental increase in the property tax assessment to establish the Ocean County Natural Lands Trust. The funds from the Trust will be used for open space land acquisition throughout the County.

g) Natural Heritage Program

The Natural Heritage Program was established in 1984 as a joint effort between the NJDEP and The Nature Conservancy. The program has been administered by the DEP since 1986. This program is responsible for identifying New Jersey's most significant habitats and developing an inventory of rare plants, animals, and representative natural communities. This program is administered by the Office of Natural Lands Management in the Division of Parks and Forestry.

BASE PROGRAM ANALYSIS

h) Private Organizations and Land Trusts

Most recently, organizations of private citizens have become active in preserving undeveloped upland and wetland areas with high natural resource values. This trend has been especially notable in the urbanized northeastern United States, where such organizations have been able to respond quickly to threatened losses of natural habitats by encroaching development.

Organizations such as The Nature Conservancy and the Trust for Public Land have built up a system of natural preserves, refuges, and parks that provide an important supplement to the existing land preservation programs in the region. In fact, many of the newest public park acquisitions were initiated by one of these organizations, which then transferred ownership or management responsibility to the respective public parks agency. The Trust for Public Land, in fact, has an ongoing active program to manage a \$2.5 million donation from the Ciba-Geigy Corporation to the state of New Jersey for completing an inventory of sensitive habitats in the Barnegat Bay region and to secure purchases of areas on the list for long-term preservation. Other active environmental groups within the Barnegat Bay region, such as Save Barnegat Bay, have also helped to protect important habitat areas that come under the threat of development.

i) Analysis of Program Implementation

With the combined efforts of federal agencies, state agencies, local agencies, and nonprofit groups, approximately one-third of Ocean County is protected or managed as public open space. This is a significant achievement, and represents a substantial down payment to the long-term protection of the County's and Barnegat Bay's natural resources. On the other hand, the north-south Route 9 corridor, along which most of Ocean County's development is concentrated, separates the interior Pinelands Region watershed from the coastal marshes and estuary. The BBNEP proposes that steps be taken, such as Action Item 6.1., to ensure that intact habitat and riparian corridors be maintained to connect the Bay and its estuary with the upstream watershed.

4. PUBLIC HEALTH AND EDUCATION

a) Public Health Summary

Interstate fish consumption programs include the Shellfish Sanitation Program, administered by the Interstate Shellfish Sanitation Conference, and are implemented through the state Departments of Health, and the Departments of Fish and Game. This program plays an important role in assuring that uniform shellfish control measures are adopted, and that these measures are enforced consistently by state regulatory authorities. New Jersey has programs dealing with water quality, fish consumption, and toxics.

One of the primary programs is the New Jersey Pollution Discharge Elimination System, enabled through the Water Pollution Act. This program requires all dischargers of pollutants to obtain a NJDEP permit, unless they have a valid federal permit or are exempt. Permits are conditioned to control the wastes discharged into New Jersey waters, and to achieve effluent limitations and restrictions needed to meet water quality standards and the goals of water quality management plans. Additional programs include the Fish and Game, Wild Birds and Animal Act (*N.J.S.A. 23: 5-28*) which prohibits the discharge of any petroleum product, debris, and hazardous, deleterious, destructive or poisonous substances of any kind into any fresh or tidal waters.

Fish consumption and contamination programs in New Jersey include the Shell and Shellfish Beds Program (*N.J.S.A.* 58:24-1, et seq. And regulations such as *N.J.A.C.* 8:13-1, et seq. (sanitation, handling, shipping, and shucking of shellfish) both of which set standards for the handling of shellfish. In addition, the NJDEP samples and issues fish advisories in areas of concern throughout the state.

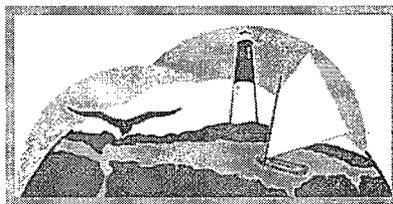
The County Division of Health (DOH) has been certified by the NJDEP to administer environmental health services as called for in the County Environmental Health Act (CEHA). Environmental health services include the monitoring and enforcement of environmental health standards, the enactment and enforcement of environmental health ordinances to control solid waste, hazardous waste, air pollution, noise and water pollution, to protect workers and the public from hazardous substances and toxic catastrophes, and to protect against other threats to environmental health.

b) Analysis of Program Implementation

Compliance monitoring and complaint investigation is conducted for air pollution control, water pollution control and violations of the state noise ordinance. The DOH receives annual funding from the NJDEP to partially support its CEHA programs. Appropriations from the general county budget coupled with revenues generated from violations of the environmental statutes provide the balance of funding.

A joint federal/state investigation is underway to study an unusual concentration of childhood cancer in the Dover Township area, known as the Toms River cancer cluster. The study will investigate potential environmental causes for this high incidence of cancer within this section of Ocean County.

Public Education efforts have been an ongoing activity at all governmental and non-governmental levels. The CCMP is replete with action items directed towards improving public outreach and education. One action in particular, Action 5.7, proposes to improve outreach and education to local government officials through the Nonpoint Education for Municipal Officials (NEMO) program, an existing initiative that will be administered in Ocean County through the Rutgers Cooperative Extension Services of Ocean County. Other agencies and organizations actively involved in public environmental education activities include the Natural Resources Conservation Service, the Ocean County Soil Conservation District, various offices of the NJDEP, the New Jersey Marine Trades Association, the Alliance for a Living Ocean and other local environmental organizations, and several school districts in Ocean County. See Chapter 8 of the CCMP, Public Outreach and Education, for a more comprehensive overview of ongoing and proposed public outreach and education efforts to support the Barnegat Bay National Estuary Program.



What is the use of a house
if you haven't got a tolerable planet
to put it on?

—Henry David Thoreau

APPENDIX H

Glossary



Harvesting Barnegat Bay clams circa mid-1900s. PHOTO COURTESY OF THE TOMS RIVER SEAPORT SOCIETY

Tug on anything in nature
and you will find it connected to everything else.

--John Muir

GLOSSARY

APPENDIX H

Ambient	<i>Surrounding; encompassing on all sides. Specifically, existing environmental conditions, contaminant levels, rates, or species in the environment.</i>
Anadromous	<i>Marine or estuarine species of finfish that spawns in freshwater.</i>
Anadromous Fish	<i>Anadromous fish are saltwater species which spawn in rivers.</i>
Anadromous Fish Runs	<i>Anadromous fish spawning runs are waterways which serve as passages for spawning fish to or from seasonal spawning areas.</i>
Anthropogenic	<i>Effects or processes that are derived from human activity, as opposed to natural effects or processes that occur in the environment without human intervention.</i>
Aquatic Ecosystem	<i>Waters of the United States, including wetlands, that serve as habitat for interrelated and interacting communities and populations of plants and animals.</i>
Assimilative Capacity	<i>The ability of a natural system to absorb and neutralize pollutants before it begins to display a significant reduction in the biological diversity, chemical, and/or physical quality.</i>
Barrier Island	<i>A wave-built deposit of mainly sand, raised above sea-level by constructive wave action and separated from the shore by a bay or estuary.</i>
Benthic	<i>Occurring or living on or in the bottom of a water body.</i>
Best Management Practices (BMP)	<i>A method, activity, maintenance procedure, or other management practice for reducing the amount of pollution entering a water body.</i>
Biotic	<i>The plant and animal assemblage of a biological community.</i>
Bivalve	<i>An aquatic invertebrate animal of the class Bivalvia. Bivalves, such as clams and oysters, have two shells (valves) and most are filter feeders.</i>
Buffer	<i>An area between a sensitive site and development site which cushions and lessens the conflict between the two sites.</i>
Carrying Capacity	<i>The ability of the natural and built environment to absorb or receive development.</i>
Catadromous	<i>Freshwater fish that return to the ocean to spawn.</i>
Citizen	<i>An inhabitant of one of the municipalities of Ocean County, one who is entitled to the rights and privileges of such residence.</i>
Clean Water Act	<i>An act passed by Congress in 1987 that amends the Federal Water Pollution Control Act. The objective of the Clean Water Act is to restore and maintain the integrity of the nation's waters.</i>
Coliform Bacteria	<i>Fecal coliform bacteria are those coliform bacteria that are found in the intestinal tracts of mammals. These organisms indicate the presence of pathogens that are harmful to humans. High numbers of fecal coliform bacteria therefore limit beneficial uses such as swimming and shellfish harvesting.</i>
Commitment	<i>An agreement to lead or assist in the implementation of an action, and may also include an agreement to assume a financial obligation.</i>

GLOSSARY

Contaminant	<i>A substance that is not naturally present in the environment or is present in amounts that can, in sufficient concentration, adversely affect the environment.</i>
Cross Connections	<i>Unintended or illegal connections between storm sewers and sanitary sewers.</i>
Cumulative Impacts	<i>The total effect of a series of actions or activities as opposed to that of a single one.</i>
Degradation	<i>Diminution or reduction of value or quality.</i>
Detention Basin	<i>A facility for the temporary storage of stormwater runoff.</i>
Dredge Spoil	<i>Mud, silt and sand which has been removed from the bottom of a water body, generally to allow safe navigation.</i>
Dune	<i>A rounded hill or ridge of sand heaped up by the action of the wind. Dunes help protect lives and property from effects of major natural coastal hazards such as hurricanes, storms, flooding and erosion. Dunes provide important habitats for wildlife species.</i>
Ecosystem	<i>A system made up of a community of animals, plants, and bacteria and its interrelated physical and chemical environment.</i>
Endangered	<i>A species whose prospects for survival within the state are in immediate danger due to one or many factors.</i>
Environmentally Sensitive Area	<i>An area which tends to suffer impairment of the physical, biological, social or aesthetic quality of the resource when disturbed. Examples include: aquifer recharge areas, dunes, beaches and shorelines, flood plains, habitats of endangered and threatened species, staging areas for migratory species, stream corridors, wetlands, wildlife corridors.</i>
Erosion	<i>Wearing away of rock or soil by the gradual detachment of soil or rock fragments by water, wind, ice, and other mechanical and chemical forces.</i>
Estuarine	<i>Of, relating to, formed, or living within an estuary.</i>
Estuary	<i>Any confined coastal water body with a connection to the sea, diluted by outflowing fresh water and with a quantity of marine salt in the waters greater than 0.5 parts per thousand (ppt). Estuaries provide habitats for rare, endangered, recreational and commercial wildlife and provide stopover sites for migratory waterfowl. Estuaries provide water quality and flood control functions, and serve as important aesthetic, sport and recreational resources.</i>
Fauna	<i>A collective term for the animal species present in an ecosystem.</i>
Flood Plain	<i>The channel and relatively flat area adjoining the channel of a stream or river which has been or may be covered by flood water.</i>
Flora	<i>A collective term for the plant species present in an ecosystem.</i>
Habitat	<i>The area or type of environment in which an organism or biological population normally lives or occurs.</i>
Headwater	<i>The upper part of a river, near its source, or one of the streams that contribute their waters to form a larger stream.</i>

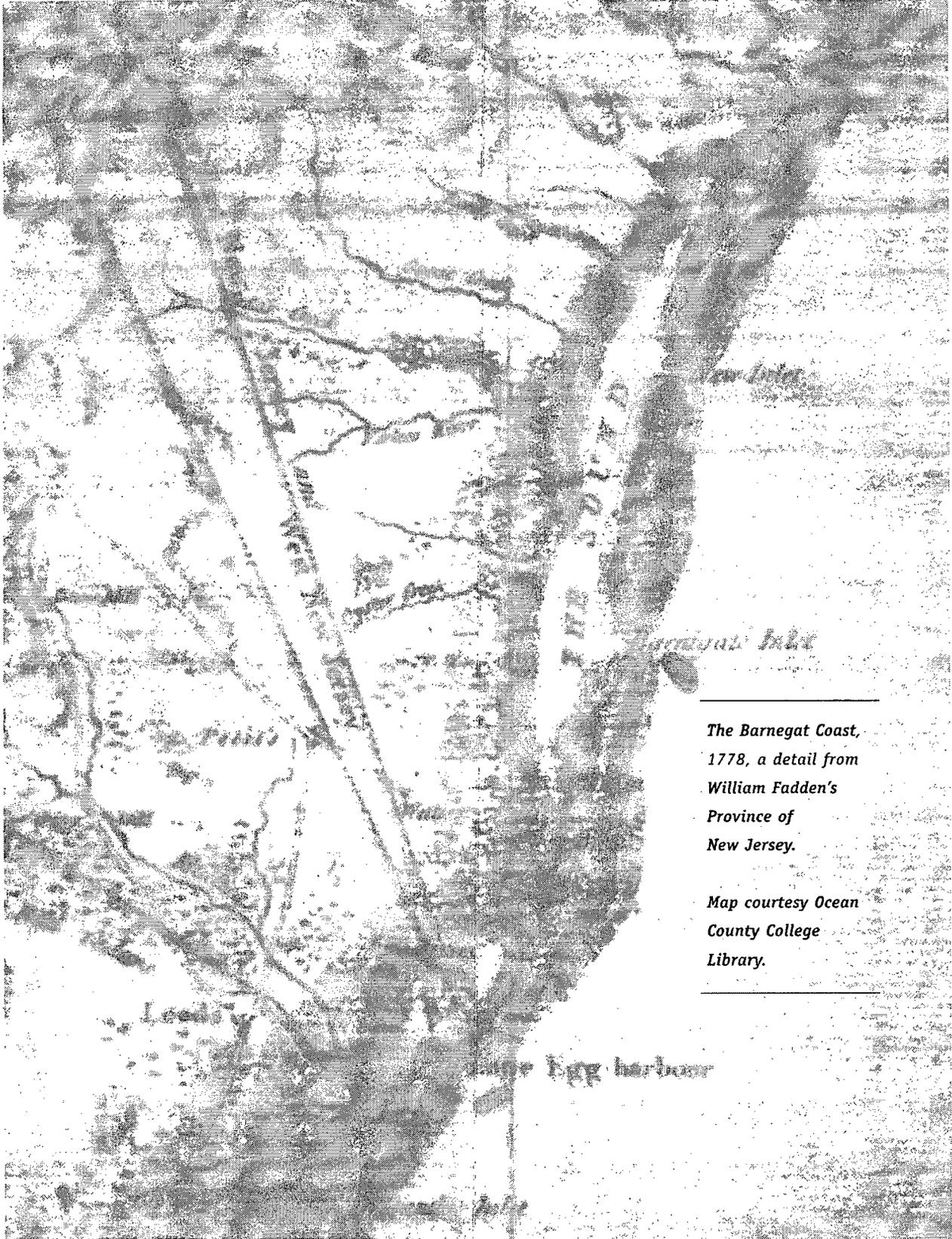
GLOSSARY

APPENDIX H

Hydrologic/ Hydrology	<i>The science dealing with the waters of the earth, their distribution on the surface and underground, and the cycle involving evaporation, precipitation, flow to the seas, etc.</i>
Impervious	<i>A surface that cannot be easily penetrated. For instance, rain does not readily penetrate asphalt or concrete pavement.</i>
Indigenous	<i>Having originated in and being produced, growing, or living naturally in a particular region or environment; native species.</i>
Infrastructure	<i>A facility or facilities, frequently linear, which transport(s) people, materials, energy or information, and upon which development is dependent.</i>
Land Use	<i>The way land is developed and used in terms of the types of activities allowed (agriculture, residences, industries, etc.) and the size of buildings and structures permitted.</i>
Marina	<i>A waterfront facility predominantly used for the dockage (wet or dry stack) or moorage for recreational boats.</i>
Master Plans	<i>A comprehensive long-range plan intended to guide the growth and development of a community or region.</i>
Migratory	<i>To move from one region to another with the change in seasons as with many birds and some fish.</i>
Nonpoint Source Pollution	<i>Pollution that enters water from dispersed and uncontrolled sources rather than through pipes. Nonpoint sources (e.g., surface runoff, on-site sewage disposal, and recreational boats) contribute pathogens, suspended solids, and nutrients. The cumulative effects of nonpoint source pollution can be significant.</i>
Pathogen	<i>An agent such as a virus, bacterium, or fungus that can cause disease in humans. Pathogens can be present in municipal, industrial, and nonpoint source discharges to the Bay.</i>
Phytoplankton	<i>The single-cell plant component of plankton.</i>
Plankton	<i>The usually microscopic animal and plant life found floating or drifting in the ocean or in fresh water and used as food by nearly all aquatic animals.</i>
Pollutant	<i>A contaminant that adversely alters the physical, chemical, or biological properties of the environment. The term includes pathogens, toxic metals, carcinogens, oxygen-demanding materials, and all other harmful substances.</i>
Pollutant Loading	<i>The amount of pollution that enters an aquatic system in various chemical forms and from various sources, such as runoff, rivers and storm drains.</i>
Recommendation	<i>A suggestion that may lead to an agreement to lead, or assist in, an action or a funding obligation; an item that does not yet carry a commitment but is in the process of negotiation.</i>
Riparian	<i>Of, adjacent to, or living on, the bank of a river or, sometimes, of a lake, pond, etc.</i>
Sedimentation	<i>The process of gravitational deposition of organic and/or inorganic suspended particles by water.</i>

GLOSSARY

Septic Systems	<i>An underground individual sewage system with a septic tank used for the decomposition and treatment of domestic wastewater.</i>
Shellfish	<i>An aquatic animal, such as a mollusk (clams and oysters) or crustacean (crabs and shrimp), having a shell or shell-like exoskeleton.</i>
Silt	<i>Fine particulate matter suspended in water and later deposited on water body bottom.</i>
Spawning	<i>The reproductive act of lower organisms where fertilization of eggs is usually external.</i>
Stakeholder	<i>An individual, agency or organization that has an interest in, or may be affected by the actions of the Barnegat Bay National Estuary Program.</i>
Stormwater Runoff	<i>Waters which result primarily from surface runoff and includes street wash water and drainage.</i>
Stormsewer System	<i>The designed infrastructure within a municipality which collects, conveys, channels, holds, inhibits or diverts the movement of stormwater.</i>
Subdivision	<i>The division of a lot, tract or parcel of land into two or more lots, tracts, parcels or other divisions of land for sale, development or lease.</i>
Submerged Aquatic Vegetation (SAV)	<i>SAV's are vascular seagrasses such as eelgrass (<i>Zostera marina</i>) and widgeon grass (<i>Ruppia marina</i>). SAV habitats provide many environmental benefits, including serving as nursery and feeding habitats for numerous species of fish, crabs and shellfish.</i>
Threatened	<i>A species that may become endangered if conditions surrounding it begin to or continue to deteriorate.</i>
Toxic	<i>Poisonous, carcinogenic, or otherwise directly harmful to life.</i>
Tributary	<i>A stream that flows into a larger stream or body of water.</i>
Turbidity	<i>Reduced water clarity resulting from presence of suspended matter.</i>
Wake	<i>The track left by a ship or other body in the water usually in the form of waves.</i>
Watershed	<i>The geographic region within which water drains into a particular river, stream, or body of water. A watershed includes hills, lowlands, and the body of water into which the land drains.</i>
Wetlands	<i>Habitats where the influence of surface or groundwater has resulted in development of plant or animal communities adapted to aquatic or intermittently wet conditions. Wetlands include tidal flats, shallow subtidal areas, swamps, marshes, wet meadows, bogs, and similar areas.</i>
Zooplankton	<i>The animal component of plankton.</i>



*The Barnegat Coast,
1778, a detail from
William Fadden's
Province of
New Jersey.*

*Map courtesy Ocean
County College
Library.*

On Spaceship Earth there are no passengers;
everybody is a member of the crew.
We have moved into an age
in which everybody's activities affect everybody else.

--Marshall McLuhan (1911-1980)

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