

APPENDIX G

Base Program Analysis

OCTOBER 2000



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

--American Indian Proverb

TABLE OF CONTENTS

INTRODUCTION1

A. WATER QUALITY AND WATER SUPPLY2

1. Clean Water Programs2

 a) Federal Clean Water Program2

 b) New Jersey State Clean Water Programs3

 c) Water Supply Program5

 d) Analysis of Program Implementation6

2. Clean Vessel Act7

 a) General Program Discussion7

 b) Analysis of Program Implementation8

3. Air, Solid Waste, and Hazardous Waste Programs8

 a) Air Programs8

 b) Resource Conservation and Recovery Act (RCRA)8

 c) Superfund9

 d) State Hazardous Waste Programs11

 e) Spill Prevention and Control11

 f) Solid Waste Management12

 g) Pollution Prevention12

 h) Analysis of Program Implementation12

B. HABITAT LOSS AND ALTERATION13

1. Coastal Zone Management13

 a) Federal Program13

 b) New Jersey Coastal Management Program13

 c) Federal Consistency Process15

 d) Analysis of Program Implementation15

2. Land Use Management15

 a) Introduction15

 b) State Role in Land Use Planning16

 c) Pinelands Commission16

 d) Ocean County and Municipal Roles17

 e) Analysis of Program Implementation18

3. Wetlands Regulation and Management18

 a) Federal Program18

 b) New Jersey State Wetlands Program21

 c) Analysis of Program Implementation22

4. The National Environmental Policy Act, and Related State Programs22

 a) Historical Perspective22

 b) NEPA Process23

 c) Federal Agencies’ and Public’s Roles23

 d) NEPA and Other Environmental Laws24

 e) Integration into Federal Decision-Making24

 f) State Programs Comparable to NEPA25

 g) Analysis of Program Implementation25

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 (NJPDDES, 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

Barneget 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 Barneget 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 & SCHAFFER 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 '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 americanas</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>Dermodochelys 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>Helonias bullata</i>) | | N |
| Bog Asphodel (<i>Narthecium americanum</i>) | | C |
| Sensitive Joint-Vetch (<i>Aeschynomene virginica</i>) | | H |
| Seabeach Amaranth (<i>Amarathus 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 melodius</i>) | N | |
| Bog Turtle (<i>Clemmys 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, hawksbill 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 | THREATENED |
|--|---|
| Shortnose Sturgeon (<i>Acipenser brevirostrum</i>) | Atlantic Sturgeon (<i>Acipenser oxyrinchus</i>) |
| Eastern Tiger Salamander (<i>Ambystoma tigrinum</i>) | American Shad (<i>Alosa sapidissima</i>) |
| Pine Barrens Treefrog (<i>Hyla andersonii</i>) | Brook Trout (<i>Salvelinus fontinalis</i>) |
| Southern Gray Treefrog (<i>Hyla chrysoscelis</i>) | Atlantic Tomcod (<i>Microgadus tomcod</i>) |
| Corn Snake (<i>Elaphe guttata</i>) | Wood Turtle (<i>Clemmys insculpta</i>) |
| Cooper's Hawk (<i>Accipiter cooperii</i>) | Northern Pine Snake (<i>Pituophis melanoleucus</i>) |
| Northern Harrier (<i>Circus cyaneus</i>) | American Bittern (<i>Botaurus lentiginosus</i>) |
| Bald Eagle (<i>Haliaeetus leucocephalus</i>) | Great Blue Heron (<i>Ardea herodias</i>) |
| Peregrine Falcon (<i>Falco peregrinus</i>) | Yellow-crowned Night-Heron (<i>Nyctanassa violacea</i>) |
| Piping Plover (<i>Charadrius melodus</i>) | Osprey (<i>Pandion haliaetus</i>) |
| Upland Sandpiper (<i>Bartramia longicauda</i>) | Red-shouldered Hawk (<i>Buteo lineatus</i>) |
| Least Tern (<i>Sterna antillarum</i>) | Northern Goshawk (<i>Accipiter gentilis</i>) |
| Roseate Tern (<i>Sterna dougallii</i>) | Black Rail (<i>Laterallus jamaicensis</i>) |
| Black Skimmer (<i>Rynchops niger</i>) | Barred Owl (<i>Strix varia</i>) |
| Short-eared Owl (<i>Asio flammeus</i>) | Savannah Sparrow (<i>Passerculus sandwichensis</i>) |
| Sedge Wren (<i>Cistothorus platensis</i>) | Ipswich Sparrow (<i>P. sandwichensis princess</i>) |
| Vesper Sparrow (<i>Pooecetes gramineus</i>) | Grasshopper Sparrow (<i>Ammodramus savannarum</i>) |
| Loggerhead Shrike (<i>Lanius ludovicianus</i>) | |

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).

Barneget 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 Bio-sphere 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
