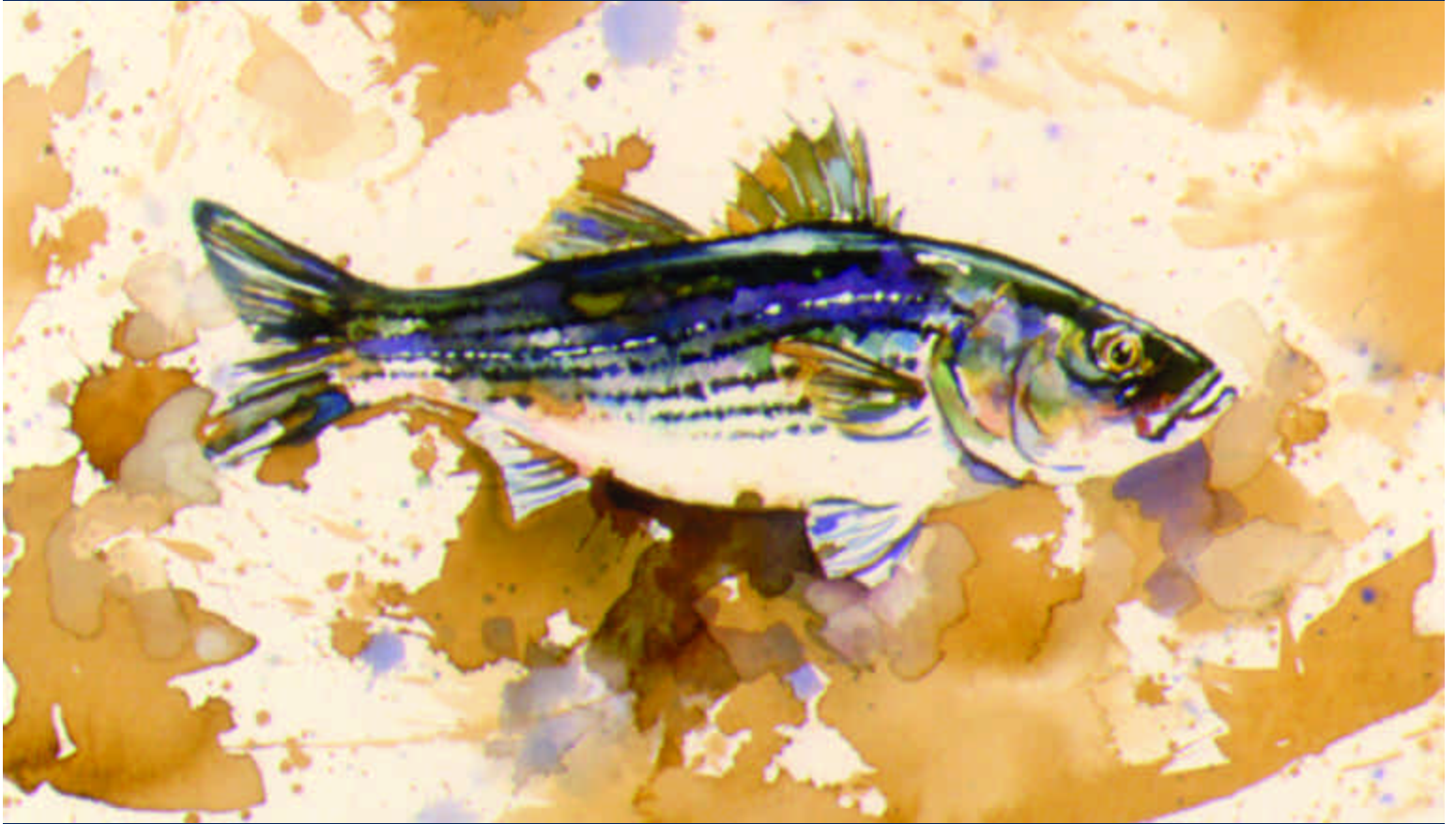


# Hudson River Estuary Action Plan 2001



## The Hudson River Estuary Program

New York State Department of Environmental Conservation

George E. Pataki, Governor

Erin M. Crotty, Commissioner



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February 2002

**The Hudson River Estuary Program** of the New York State Department of Environmental Conservation (DEC) is a unique regional partnership leading the restoration of the Hudson through implementation of the Hudson River Estuary Action Plan. The principal purposes are to:

- Conserve natural resources
- Clean up pollution
- Promote public use and enjoyment of the river

Partners in the program include: DEC as project manager; NYS Office of Parks, Recreation and Historic Preservation; NYS Department of State; NYS Office of General Services; NYS Department of Transportation; NYS Department of Agriculture and Markets, Empire State Development Corporation; Metro-North Railroad; the Hudson River Valley Greenway; the Hudson River Foundation, Cornell University, New England Interstate Water Pollution Control Commission, and a citizen advisory committee.

Local governments along the estuary, from the Troy Dam to the Verrazano Narrows, and the State of New Jersey also take part. Federal agencies, such as the Environmental Protection Agency, Army Corps of Engineers, Department of Commerce and Department of Interior and the American Heritage Rivers Program, also have a stake in the plan and participate actively.



Additional information and copies of this report are available through:

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Illustrations: cover by Shane Reiswig  
Woodcuts by Marlena Marallo, artistic director of Arm-of-the Sea Theater



STATE OF NEW YORK

GEORGE E. PATAKI  
GOVERNOR

Dear New Yorker:

The Hudson River Estuary today has taken its rightful place as one of New York State's great natural resources and has been nationally recognized as an American Heritage River.

Much remains to be done, however. In 1996, we released the first Hudson River Estuary Action Plan to guide priority initiatives for restoring fisheries, preserving open space, enhancing habitat, and improving water quality. Under this Plan, New York State has acquired nearly 2,000 acres of open space along the Hudson, established coordination for marine law enforcement, constructed or renovated sixteen boating access facilities, petitioned the federal government to declare key portions of the River as "No Discharge Zones," mapped key underwater habitats, and supported the research needed to maintain surging striped bass populations and arrest declines in shad and sturgeon stocks.

The Action Plan for 2001 addresses new challenges and opportunities. The knowledge we've gained over the past four years must be disseminated to local decision makers, enabling them to promote effective estuary conservation measures at the community level. Our estuary grants program will facilitate local efforts to conserve the estuary, restore valuable habitat, and promote environmental stewardship. Water quality problems will be addressed through a continued contaminant track down project and Clean Water/Clean Air Bond Act funded water quality improvement projects. We will also begin to integrate air quality issues into water quality management.

Many New Yorkers have contributed to this updated Estuary Action Plan: scientists, anglers, business representatives, environmental advocates, educators, local officials, and agency professionals. Today, I see not only a glorious River coming back into its own, but a firm resolve among our citizens to continue our progress. This Estuary Action Plan embodies our commitment to achieve full restoration of a healthy, bountiful, inspiring Hudson River for the next generation.

Very truly yours,

A handwritten signature in black ink that reads "George E. Pataki". The signature is written in a cursive, slightly slanted style.



GEORGE E. PATAKI  
GOVERNOR

STATE OF NEW YORK  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
ALBANY, NEW YORK 12233-1010

ERIN M. CROTTY  
COMMISSIONER

To the Citizens of the Hudson River Valley:

Governor George Pataki's first Hudson River Estuary Action Plan (Plan), released in 1996, was a pioneering initiative in promoting management of a vital natural resource. It provided a framework whereby all of the New York State Department of Environmental Conservation's (Department) resources, and those of other government agencies, academic institutions, and concerned citizens, could be joined in a effort to restore and protect an entire ecosystem.

Through the Plan and its 1998 update, the Department is now tracing contaminants from tributaries in the watershed all the way to New York Harbor. We are cataloging the rich tapestry of terrestrial life that gives the Hudson Valley region one of the highest biodiversity rankings in New York State, and we are conducting intensive studies of key estuarine fishes, including striped bass, sturgeon, and shad. As a result of the Plan, the Department has provided increased public access to the Hudson through land acquisition, fishing access and boat launch improvements, and tracked the increasing use of the River by bald eagles.

Action Plan 2001 continues this comprehensive approach. The Department is committed to management of the Hudson River ecosystem based on sound scientific information and principles. Collecting the baseline data needed to measure our success in meeting objectives will be a focus for the next two years. In addition, new emphasis will be placed on local involvement in estuary conservation through our grants program and an extension outreach effort in support of tributary management, habitat restoration, and biodiversity protection. We will assess the success of policies designed to restore the estuary's famed Atlantic sturgeon population. The Department's commitment to ecologically sound waterfront revitalization and brownfields cleanup will continue, and to encourage better coordination in state/federal permitting of small floating structures and piers, we will seek to better understand the impacts of such structures on aquatic life.

This year our commitment to restoration of the Hudson River Estuary has topped the \$173 million mark with appropriations from many funding sources, including the State Environmental Protection Fund, the Clean Water/Clean Air Bond Act and the NY-NJ Port agreements. This is an unprecedented level of support, but it marks just the beginning of what the Department hopes to accomplish for the future.

I am proud to present to you a Hudson River Estuary Action Plan that will insure continued progress into the new century.

Sincerely,

Erin M. Crotty



# **Executive Summary**

## **A River of National Significance**

The Hudson River estuary is one of New York's outstanding natural resources, world renowned for its history and scenery and vital as part of the Atlantic coast ecosystem. It has been and continues to be one of New York State's premier natural assets and is an engine of the state's economy, attracting tourist dollars, providing for high value residential and commercial development, sustaining multi-million dollar coastal fisheries and providing a critical transportation link in New York's import and export economy. In 1998, the Hudson River was designated as one of the nation's first American Heritage Rivers, a much deserved recognition of its central place in American history and culture.

The estuary provides crucial nursery and spawning grounds for a wide variety of fish species and is part of the great Atlantic flyway for migratory birds. The river's marshes and tidal flats contribute essential nutrients to the first links in a food web that extends throughout the river and far into the Atlantic Ocean. Last but not least, the Hudson nourishes our souls. It is a beloved river, beautiful, dynamic and ever-changing, a resource to protect, not only for ourselves but for generations to come.

## **The Hudson River Estuary Program**

In 1987, the New York State Legislature passed Section 11-0306 of the Environmental Conservation Law (Appendix A). Known as the Hudson River Estuary Management Act, this law directs the Department of Environmental Conservation (DEC) to develop a management program for the newly-created Hudson River Estuarine District and its associated shorelands. The Estuarine District is defined as the tidal waters of the Hudson River, including the tidal waters of its tributaries and wetlands from the Federal Lock and Dam at Troy to the Verrazano Narrows. The terms estuary or Hudson River estuary refer to the designated estuarine district.

The associated shorelands have not been defined by law; however, for purposes of developing the estuary management program, the east-west boundary has been established as those areas included within New York State's Coastal Management Program boundary. The Estuary Management Act also gives consideration to the remainder of the Hudson River watershed, New York Bight and the waters around Long Island as they impact the Hudson River estuary. Certain issues may require a broader geographic scope. In such cases, these are defined within the context of



specific initiatives, such as the Estuary Grants Program, biodiversity inventories and watershed management.

The Hudson River Estuary Program's integrated approach to the estuary's ecosystem combines scientific research, active resource protection and management, and public involvement and education in a concurrent implementation program. It offers an excellent opportunity for DEC to provide responsible protection, to attain sustainable use, to ensure diverse opportunities, and to achieve quality through measurable goals and objectives. Implementation of the Estuary Action Plan is the first step in that process. The Estuary Program is housed in the office of the Special Assistant and Hudson River Estuary Coordinator located in DEC Region 3 headquarters in New Paltz, NY.

Governor George E. Pataki released the first Estuary Action Plan in 1996, and it is updated every two years. Action Plan 1998 carried the program forward through the state fiscal year 2000-2001. Action Plan 2001 continues, amends and expands the action agenda through fiscal year 2002-2003. Funding to implement the program has been appropriated by the Governor and the Legislature in the Environmental Protection Fund (EPF) and other funding sources, including the Clean Water/Clean Air Bond Act (see Appendices K. and L.).

The term Estuary Action Plan refers to the overall planning process being implemented through a continuum of action plan documents and includes previous, present, and future action plans. Discussions targeted at specific action plans identify each plan by date (i.e., Action Plan 1998, Action Plan 2001).

## **The Hudson River Estuary Management Advisory Committee**

In accordance with the Estuary Management Act, DEC established a Hudson River Estuary Management Advisory Committee, consisting of members representing interests directly involved in the estuary, including commercial fishing, recreation, research, conservation, education, local government and industry. The committee meets quarterly to review program activities and advise DEC on proposed agency actions. Since its appointment in 1988, the committee has provided valuable insight into the development of the estuary program and has participated in the debate and resolution of key issues involving the estuary. Continuation of the committee is an important component during implementation of the Estuary Action Plan and its subsequent biennial revisions and updates. A list of current Advisory Committee members is included in Appendix I.



## **A Partnership Approach**

The primary strategy for implementing the Estuary Action Plan is for the state government to work cooperatively and in partnership with local governments, the federal government, not-for-profit organizations, the private sector and individual property owners for the benefit of the Hudson River ecosystem, around which all New York State residents can build better and more rewarding lives.

In addition, the presence of other state and federal programs actively involved in the Hudson Valley provides opportunities for cooperative approaches to many of the estuary's most pressing issues.

Programs especially important to the Estuary Program include:

- The Rivers and Estuaries Center on the Hudson: Initiated by Governor George E. Pataki in 2000, the creation of this world-class research and educational institute will work toward fostering a deep understanding of how rivers and estuaries function, describe how the ecosystem processes of rivers and estuaries interact with humans, and develop tools for river and estuary conservation. To achieve these goals, the Center will: conduct research on physical, chemical and biological processes in rivers and estuaries around the globe; translate research for use by policy and decision makers; educate students; develop outreach for education and extension; provide facilities for research and technology collaboration, and host a technology and business incubator for river and estuary conservation.
- The American Heritage Rivers Program: The Hudson received this Presidential designation in 1998. The program is a partnership between the state and federal government designed to foster improved government coordination and to support local actions and needs in the Hudson Valley.
- The NY-NJ Harbor Estuary Program: Designated in 1987 by the EPA to develop a comprehensive management plan for the harbor area, this program links New York State, the federal government and the State of New Jersey together to address ecosystem-related issues.
- The New York State Coastal Management Program, Article 42 of the Executive Law: Managed by the New York State Department of State



*Hudson River Estuary Action Plan 2001*  
*Executive Summary*

(DOS), this program oversees compliance of federal and state actions with the state's 44 coastal policies. Coastal Management programs of particular importance to the Hudson Valley include: Local Waterfront Revitalization Programs, Significant Coastal Fish and Wildlife Habitats, Scenic Areas of Statewide Significance, and the NYS Coastal Non-point Pollution Control Program. The Department of State also works with municipalities to prepare harbor management plans and watershed management plans for Hudson River tributaries.

- The Joint Dredging Plan for the Ports of New York and New Jersey (the Bistate Plan): A blueprint for restoration of New York Harbor for navigation, including trackdown and cleanup of contaminants entering harbor sediments.
- The Hudson River Valley Greenway: Created by state legislation in 1991, this initiative focuses on voluntary regional planning, resource conservation, economic growth, the Hudson River Greenway Trail, and enabling cultural, historic and environmental linkages throughout the valley. The Greenway Conservancy also is responsible for management of the Hudson River Valley National Heritage Area, created in 1996.
- Other partners include NYS Office of Parks, Recreation and Historic Preservation (OPRHP); NYS Department of Transportation (DOT); NYS Office of General Services (OGS); Lower Hudson Coalition of Conservation Districts; Hudson River Foundation; MetroNorth; local governments along the estuary; private research institutions; and the nonprofit community. Federal agencies include the Environmental Protection Agency, Army Corps of Engineers, Department of Commerce and Department of Interior.

Within DEC, nearly every program and division is involved in some aspect of environmental protection of the estuary. However, four basic programs focus specifically on the estuary as a resource. In order for DEC to meet existing program needs, as well as address many of the new challenges outlined in this plan, core programs must be continued and maintained because they form the foundation on which the estuary program will build. These programs include the following:

- Hudson River Fisheries Unit (HRFU) and Anadromous Fisheries Section (AFS): These units collect and report biological and public use data required to manage Hudson River fish resources within New York State.



They also participate in management activities of the Atlantic States Marine Fisheries Commission (ASMFC) and support DEC efforts to reduce environmental impacts of various activities.

- Hudson River National Estuarine Research Reserve: Established in 1982 under the Coastal Zone Management Act, this cooperative state-federal program implements education and research programs, including the management of four major tidal wetlands: Stockport Flats, Tivoli Bays, Iona Island, and Piermont Marsh.
- DEC Region 2 Marine Program: The marine habitat protection staff in the New York regional office assure coordination and compliance with estuary management goals in regional program implementation.
- Hudson River Estuary Program: The Estuary Program is charged with development and implementation of the Estuary Action Plan. It also conducts special projects and educational outreach to citizens.

## **Funding for Implementation of the Estuary Action Plan**

Since Governor George E. Pataki released the first action plan in 1996, nearly \$173.3 million has been assembled to improve the Hudson River estuary including the following (through 3/31/01):

- \$30 million from the Environmental Protection Fund (EPF), an average of \$6 million annually since 1996, including the state fiscal year 2000-2001 for implementation of the 1998 Estuary Action Plan.
- \$50 million of Clean Water/Clean Air Bond Act funds earmarked for water quality and habitat restoration projects from NY Harbor to Troy. (Of this amount, \$39.2 million has been approved in grants to date.)
- \$19.6 million for a river-wide monitoring and trackdown of contaminant sources and pollution cleanup funded through the New York-New Jersey Port Restoration Agreement. (Of this amount, \$5 million has been spent to date.)
- \$22 million additional funds have been approved from the Bond Act for open space, state and municipal park improvements and brownfields cleanups.



- \$51.7 million in other state EPF and federal funds for waterfront revitalization, habitat restoration, public access and non-point source pollution control.

## **Estuary Grants Program**

The Estuary Grants Program was initiated in 1999 to implement certain commitments of the Estuary Action Plan through local partnerships. Estuary grants range from a minimum of \$2,500 to a maximum of \$100,000 in five categories:

- Interpretation and Education
- Habitat Preservation and/or Restoration
- Local Scenic Resources
- Community Conservation and Stewardship
- River Access: Boating, Fishing, Swimming and Wildlife-related Recreation

Municipalities and non-profit organizations are eligible to apply for the grants, which are awarded annually. For state fiscal year 1999-2000, DEC awarded 33 grants totaling \$1,177,000. The Estuary Grants Program will continue to fund the local implementation of commitments where appropriate, in order to strengthen partnerships. See Appendix J for 1999/2000 grant awards.



## **Goal Statement and Guiding Principles**

The GOAL of the Hudson River Estuary Program is to protect and conserve, restore and enhance the productivity and diversity of natural resources of the Hudson River estuary to sustain a wide array of present and future human benefits.

### **Guiding Principles**

- The Hudson River estuary is an integral part of the North Atlantic Coast and our global environment. Activities and conditions within the estuary affect these greater systems. Likewise, conditions and activities occurring outside the boundaries of the estuarine district affect the estuary. Management of the estuary recognizes these interrelationships and shall take into consideration the impacts of actions on shared resources.
- Protection, restoration, and enhancement of the natural resources of the Hudson River estuary is the goal of the Hudson River Estuary Program and deserves equal consideration among other goals of the state. Measures and policies that sustain the natural resources of the Hudson over time shall be given priority over actions that exploit or deplete resources for short-term gain.
- Protecting and sustaining the Hudson River estuary as an integrated estuarine ecosystem is recognized as a human benefit. Additional benefits are derived from the uses a healthy ecosystem supports, including water supply, food production from fisheries, recreation, education, navigation, residential and commercial development, and sustainable community growth.
- Achievement of restored and sustained environmental quality is necessary to realize the full extent and diversity of benefits inherent in the estuary.
- It is the intent of the Estuary Program to identify and foster those uses of the estuary that utilize the estuary's many renewable resources and, while providing for appropriate uses that may permanently alter and cause significant impact to the ecosystem, to minimize any negative impacts associated with such uses.
- The primary strategy for achieving this goal is for the state government to work cooperatively and in partnership with local governments, the federal government, not-for-profit organizations, the private sector and individual property owners for the benefit of the Hudson River estuarine ecosystem, around which all New York State residents can build better, more rewarding lives.



## **Action Plan Commitments for 2001-2002**

Drawing on the strategic Estuary Management Plan adopted in 1996, an action plan of short-term immediate actions is developed every two years. Action Plan 2001 sets priority goals and describes projects that will realize them. The descriptions detail specific tasks, provide associated cost estimates, and assign responsibility for their accomplishment. The plan recognizes that DEC and its partners currently have many Hudson River projects underway. It describes how these initiatives will be enhanced and supported by the proposed actions.

Action Plan 2001 will focus on science related to the estuary and public outreach, building on our accomplishments to date. Since the first Action Plan was adopted in 1996, researchers and scientists have learned some revolutionary new information about the estuary and its environs. River bottom mapping of a 40-mile stretch of the river has revealed many surprises, including giant sand waves that help to explain the transport of sediments and may be important wintering areas for fish. It also has revealed the location of old oyster beds. Scientific studies on underwater vegetation in the estuary have helped scientists understand how nonnative plant species affect dissolved oxygen in the river and how these plant beds are changing in response to zebra mussels. Inventories and mapping efforts have revealed that the Hudson Valley is one of the richest and most biologically diverse regions in all of New York State.

Action Plan 2001 will use the information gathered since 1996 to address today's priorities. It calls for collecting scientific information on Hudson River resident and migratory fish, including attention for the first time on the American eel, and new work on striped bass nursery areas. The plan extends the range of river bottom mapping from the initial 40 miles to cover the entire 154 mile extent of the estuary from Manhattan to Troy. It intensifies the mapping of biodiversity in the valley and begins to explore relationships of breeding birds to habitat patterns, as well as changes in waterfowl use of the estuary over the last 20 years.

Through the Plan, scientific discoveries will be more broadly communicated to the public, local governments, schools, and others who might be interested. New outreach efforts will be designed to communicate specific results to the groups or individuals most actively involved in using the estuary's natural resources.

Another major emphasis for Action Plan 2001 is the expansion of conservation and stewardship efforts from the main stem of the estuary to its tributaries. What happens in the watershed has a profound effect on the estuary, and this link will be explored.



Action Plan 2001 pledges to address the following commitments as a supplement to the ongoing work of DEC and other partners to conserve the Hudson River. The actions listed below target the most pressing needs for the next two years. The 2001 Plan adds some new projects and adjusts or continues multi-year projects from prior action plans as needed.

The issues and problems of the estuary and the details of projects for 2001-2002 are more fully described in the action plan chapters which follow. The “Action Agenda” which appears in each chapter repeats the action plan commitments shown below and provides information on projected cost and funding sources, lead program in charge of implementing the project and a list of project partners. Accomplishments on action plan priorities since 1996 also are reported in each “Action Agenda.” A summary of costs contained in Action Plan 2001 appears in Appendix L. A list of completed action plan reports is contained in Appendix G.

## ***Theme I: Conserving Natural Resources***

### **1. Finfish, Shellfish and Crustaceans**

**Issue:** The Hudson is home to many fish of commercial, recreational and ecological importance. Of these, American shad, Atlantic sturgeon, river herring, American eel and largemouth bass currently are in decline, and it is difficult to assess the situation of blue crab, smallmouth bass, and other species about which little is known. Striped bass have increased over the last few decades, but fishing pressure in the estuary and along the Atlantic coast could lower current population levels. All of these species must be managed carefully on the basis of sound scientific information. Action Plan projects have gathered essential data and formed a solid foundation for new research on key species.

#### **Action Plan 2001 Commitments:**

##### **1a. Migratory Species (striped bass, American shad, Atlantic sturgeon, American eel and river herring)**

- ' Survey juvenile Atlantic sturgeon for signs of stock recovery
- ' Conduct baseline assessment of American eel abundance, begin annual monitoring program, and evaluate management options that will support recovery



- ' Quantify ocean losses of American shad, Atlantic sturgeon and other species
- ' Complete three-year baseline assessment of river herring population status
- ' Collect data needed to maintain the estuary's healthy striped bass population, including:
  - a. Conduct annual, long-term monitoring of young-of-year striped bass population size
  - b. Collect information on striped bass nursery areas, rates of emigration to the ocean, abundance of species eaten by bass, and ocean losses from commercial "bycatch" harvest

### **1b. Resident Species (blue crab, black bass)**

- ' Continue to obtain information on blue crab biology by completing three-year baseline study of population levels
- ' Continue to determine habitat requirements for black bass by completing three-year study of wintering and spawning habitat locations. Complete study of causes of decline in largemouth bass stocks.

### **1c. Contaminants in Fish**

- ' Collect information on local variation in fish contaminant levels by testing fish from sites of concern. Determine how local sources of pollution affect these levels

## **2. Biological Indicators of Ecosystem Health**

**Issue:** DEC has historically assessed water quality through chemical analysis of water and sediments measuring levels of oxygen, nitrogen, phosphorus, and metals, for example. While this approach has been part of successful efforts to improve the estuary's health, it does not always capture the big picture of how water quality affects living organisms. Measuring the abundance of biological "indicator species" can detect problems that chemical analysis alone might miss or underestimate. By monitoring a small number of



sensitive indicator species, it is possible to assess how changes in water quality impact a wider array of organisms. USEPA is encouraging states to adopt and use such “biocriteria”. Under the action plan to date, DEC has been developing a model for selecting and monitoring indicator species. The model will be completed in the spring of 2001.

**Action Plan 2001 Commitments:**

- ‘ Field test the biocriteria model in water quality assessments on the estuary. Integrate it with other ecosystem monitoring programs currently underway.

**3. Submerged Habitat**

**Issue:** Underwater habitats, such as submerged aquatic plant beds, bottom sediments, and human artifacts, play a crucial role in the life cycles of species that live in the estuary. Some of them also influence levels of oxygen and nutrients in the water and affect the movement of pollutants in the ecosystem. Until recently, little effort was put into mapping these habitats. This made it difficult to track changes in the variety and extent of habitat types and, in turn, to assess the impact of such changes on the ecology of the estuary. For example, research by the Institute of Ecosystem Studies has recently revealed that the relative amounts of water chestnut and water celery influence oxygen levels in the freshwater portion of the estuary. The first action plan, adopted in 1996, initiated a comprehensive effort that included mapping beds of underwater plants and surveying 40 miles of river bottom. Completing the surveys, and detailing the ecological function of the submerged plant beds will help define spawning, nursery, and foraging areas for Hudson River fishes, blue crabs, and food chain species. Understanding how human structures affect habitat also is important.

**Action Plan 2001 Commitments:**

- ‘ Extend river bottom mapping to cover the entire area from the Troy Dam to the Battery in Manhattan
- ‘ Monitor how the extent of submerged aquatic vegetation beds changes over time, evaluate factors contributing to these changes, and detail the function of these habitats in the ecosystem
- ‘ Assess the impact of smaller piers and floating structures to determine whether design features and size guidelines could be developed to



reduce their habitat impacts.

#### **4. Aquatic and Shoreline Habitat Restoration**

**Issue:** Up until the 1970s, it was common practice to use Hudson River marshes as municipal landfills. Wetlands and shallows also were filled with sediments dredged from the navigation channel. The impacts have been dramatic. Between the Cities of Hudson and Albany, one-third of what used to be river has been filled in. Elsewhere, significant wetland acreage also was lost. Railroad construction in the mid-nineteenth century altered habitat too; shorelines were hardened with rip-rap, marshes and coves were cut off from the river, and circulation of tidal water into bays was restricted. For several years, the Estuary Program has been working in partnership with state and federal agencies to identify habitats that have been altered and opportunities for restoration. The Army Corps of Engineers, which filled many wetlands as part of its channel maintenance program, is a key partner in the restoration effort and is providing federal cost-sharing funds. Techniques for restoring tidal habitats are being explored in feasibility studies underway now.

##### **Action Plan 2001 Commitments:**

- ' Implement three wetland restoration projects in partnership with the Army Corps of Engineers
- ' If feasible, restore historic fish passage at one to two locations on tributaries of the estuary
- ' Continue to study the feasibility of restoring additional Hudson River habitats at up to 15 locations. Develop habitat restoration designs and an overall plan to guide future efforts
- ' Assist communities in efforts to enhance natural features and develop local habitat restoration plans as part of waterfront revitalization efforts
- ' Continue the Estuary Grants Program to support habitat restoration and restoration feasibility studies and acquisition of lands or easements which conserve habitat

#### **5. Tidal Wetlands**

**Issue:** The Hudson is unique in its mix of marshes, swamps and flats spanning a range of salt influence from seawater to freshwater. These habitats are the cornerstone of the



ecosystem, playing a critical role as nursery grounds for fish and shellfish species, nesting sites and migration stops for birds, and sources of nutrients to the food chain. Tidal wetlands have been protected by state and federal law since the 1970s. However, erosion, sea level rise, changes in salinity, introductions of nonnative species and other factors cause changes over time, not only in acreage but also in the types of plants and animals that live there. Through the action plan, baseline mapping of all estuary wetlands is underway and soon will be completed. The next step is to compare wetlands today with historic records, including maps from the turn of the century and aerial photographs from more recent times. This will help determine where there have been losses, where there have been gains, and what types of wetland vegetation and habitat have been most affected, and will help identify potential restoration sites. This information will guide restoration efforts and build understanding of how habitat change has affected river life so that DEC and local decision makers can best manage this vitally important part of the ecosystem.

**Action Plan 2001 Commitments:**

- ' Assess changes in wetland acreage and vegetation types from the Tappan Zee bridge to the Troy Dam between the mid-1970s and the present. Assess the causes of these changes
- ' Determine the historic extent of all estuary wetlands circa 1900

**6. Community-based Conservation and Stewardship**

**Issue:** Decisions made every day by river users, local governments and valley residents can affect the natural resources of the Hudson and its watershed, often in unintended ways. Information about how best to support conservation of the estuary's ecosystem needs to get into their hands. Many municipalities and community groups are interested in carrying out conservation and stewardship activities at the local level. The action plan will encourage responsible use and stewardship of estuarine resources by user groups (boaters, anglers, etc.) and support voluntary community involvement in projects that can assist with conservation of Hudson River resources.

**Action Plan 2001 Commitments:**

- ' Provide extension services to educate people who use the estuary for recreation or other purposes about ways they can contribute to the conservation of natural resources



- ' Through the Estuary Grants Program, continue to support local projects that promote conservation and stewardship of the estuary
- ' Conduct conferences and seminars to publicize information collected under the Action Plan

## **7. Terrestrial Biodiversity**

**Issue:** Many rare, threatened and endangered species, such as the bald eagle and peregrine falcon, inhabit the estuary and its associated environs. Numerous other wildlife species and plant communities form the basic fabric of the region's biodiversity. Habitat mapping conducted under the Estuary Action Plan to date has revealed areas that may have special significance in maintaining this rich natural heritage. The next step is to conduct intensive studies of areas thought to be most significant and to begin to reach out to landowners and local decision makers with tools and information on ways they can voluntarily support conservation of these habitats. Additional projects will study the habitats used by birds and seek to assess and reduce the impacts of invasive species.

### **Action Plan 2001 Commitments:**

- ' Conduct intensive inventories and assessments of areas thought to have great significance for regional biodiversity and promote their conservation through voluntary measures
- ' Provide training on biodiversity conservation and offer technical resources to local decision makers, community groups and landowners who request assistance
- ' Survey migrating waterfowl to explore relationship to habitat; assess change over time since the last survey was conducted in 1978
- ' Survey mute swan populations and assess their impact on native shorebirds and waterfowl
- ' Study the relationship of breeding bird diversity to habitat patterns and trends in the Hudson Valley
- ' Continue to use biological controls to reduce purple loosestrife in selected areas and assess the results



## 8. Conservation of Tributaries

**Issue:** Conservation of the Hudson estuary cannot be separated from conservation of its tributaries. Migratory fish, like herring and eels, and resident species, such as black bass, rely on tributary habitats to complete their life cycles. Pollutants released in the watershed find their way to the estuary through tributaries, as do sediments and nutrients. The Estuary Program will reach out to communities in the Hudson River Valley to encourage local stewardship of tributaries in the watershed. Successful projects, such as the one currently being developed for Wappingers Creek in Dutchess County, will be promoted as models of voluntary conservation working toward sustainable end products.

### **Action Plan 2001 Commitments:**

- ' Work with communities, watershed organizations and the Lower-Hudson Coalition of Conservation Districts (LHCCD) to provide technical assistance to support watershed planning efforts, such as watershed restoration and protection strategies for the tributaries that enter the Hudson south of the Troy Dam
- ' Support tributary stewardship projects through the Estuary Grants Program

## 9. Open Space Acquisition

**Issue:** As the pace of development continues in the Hudson Valley, it is important to permanently protect key open space properties which provide river access, scenic vistas and habitat. In 1996, the action plan set a goal of 4,000 acres to be acquired. To date, about 2,000 acres have been protected at 7 locations, and additional acquisitions are under consideration. In addition, nearly 1,000 acres of state lands with conservation value have been transferred between agencies to assure their long-term protection. The Estuary Program will complete the acquisition of 4,000 acres of open space lands along the Hudson River from willing sellers and the transfer of additional state lands where appropriate. This will be accomplished in partnership with the NYS Office of Parks, Recreation and Historic Preservation, the Hudson River Valley Greenway Conservancy, and local partners. In addition, farmland is being preserved through the purchase of development rights, coordinated by the NYS Department of Agriculture and Markets.



**Action Plan 2001 Commitments:**

- ' Continue to acquire open space lands along or in sight of the Hudson to reach the goal of 4000 acres. Explore opportunities to conserve additional acreage identified as significant for biodiversity in the Hudson River estuary watershed.
- ' Develop management plans and implement capital improvements and stewardship measures for properties acquired
- ' Continue Estuary Grants Program support for local acquisition by municipalities and land trusts
- ' Assist local communities with development of new or improved access to existing locally owned public lands along the estuary

## **10. Protect or Enhance Scenic Resources**

**Issue:** Hudson Valley scenery has been world renowned since it was captured on canvas by the artists of the Hudson River School. New York State residents have done a great deal to preserve this heritage for more than a century. River scenery enriched by the history and culture of the region continues to attract tourists as it has for almost two centuries. In 1997, the Estuary Program convened a task force to explore ways to conserve river scenery. Participants in the task force recommended a program of financial and technical assistance to local governments and community organizations. Initiated in 1999, the Estuary Grant Program provides this assistance.

**Action Plan 2001 Commitments:**

- ' Continue Estuary Grants Program support for local projects that protect or enhance views of and from the river and promote the conservation of the scenic quality of the region
- ' Acquire properties or conservation easements to provide scenic views and conserve river scenery



## ***Theme II: Promoting Use and Enjoyment of the River***

### **11. Enhance Recreational Opportunities**

**Issue:** Improved water quality in the estuary has made it possible for people to enjoy the river in many ways, including fishing, swimming, boating or just plain relaxing. A resurgence of striped bass has created an economically valuable recreational fishery that contributes to the tourism economy. To sustain this fishery will require an understanding of the factors that affect survival and mortality of this important fish. In addition to studies discussed above in “Finfish, Shellfish and Crustaceans,” annual surveys are essential to determine recreational fishing effort and to calculate the harvest in the sport fishery. Sound fishing practices to reduce mortality need to be promoted.

Access across railroad tracks is important, not only for fishing but for other forms of recreation. In 1999, Governor Pataki convened a task force to evaluate estuary access opportunities, working with Metro-North railroad, DOT and other state agencies. The task force recommended development of nine access sites. In addition, the Estuary Program supported development of dedicated fishing areas, as well as other public uses of shoreline access properties.

Also, a consultant study started in 2000 is evaluating opportunities for increased swimming in the river. Continuing these programs will lead to increased recreational opportunity for all valley residents and visitors.

#### **Action Plan 2001 Commitments:**

#### **11a. Recreational Fishing**

- ' Conduct annual creel surveys to provide information on recreational fisheries for important species such as striped bass, black bass and bluecrab
- ' Identify options, such as angling methods, to reduce mortality from catch-and-release sport fishing for striped bass and American shad
- ' Support the development of local fishing access sites



- ' Calculate the economic value of the recreational fisheries of the estuary

## **11b. Access Across Railroad Tracks**

- ' Evaluate shoreline access opportunities throughout the railroad corridors on both sides of the river to determine whether additional railroad crossing access sites can be developed beyond the nine announced by the Governor's Task Force on Estuary Access

## **11c. Swimming**

- ' Identify opportunities to enhance swimming, including local water quality improvements and potential beach development where suitable

## **12. Boating Access Facilities**

**Issue:** Boating access is limited in many reaches of the river, and providing boat launching facilities requires a substantial public investment. An inventory of existing sites and new opportunities was completed in 1998. The Estuary Action Plan has funded new boating access facilities for trailer launching, hand launching and community boating needs. Where suitable sites can be identified, the Estuary Program will continue to support this type of access.

### **Action Plan 2001 Commitments:**

- ' Create and/or upgrade two or more boating access sites in areas of greatest need, using the Estuary Grant Program and direct investment of state funds, where appropriate, to support trailer and hand launching as well as community boating needs, such as floating docks in New York City, rowing facilities for crew, and docking for educational and research purposes.

## **13. Interpretation and Education**

**Issue:** The active participation of citizens, river users, scientists and policy-makers in development of the action plan is a key to its success, but long-term support for conservation depends on building public and community awareness of the estuarine ecosystem and the myriad benefits it provides. Many people in the Hudson Valley are not aware that the lower Hudson River is an estuary that provides critical habitat for numerous



plant and animal species of the Atlantic coast. There is a great deal of confusion about ways in which the Hudson is polluted and ways in which it is now cleaner. Public appreciation for the river can be fostered in many ways. Providing opportunities for learning through experiences on or near the water, publishing reports and working with the media to get the word out are all ways of doing this. Programs started under the action plan to date will be continued and expanded. The Estuary Grants Program will be a principal means of fostering local, community-driven projects. Technical assistance also will be provided by Estuary Program staff.

#### **Action Plan 2001 Commitments:**

- ' Continue to support the development of interpretive and educational programs that contribute to enhanced public understanding of estuary management issues through the Estuary Grants Program
- ' Continue to support development or improvement of facilities for interpretation and education through the Estuary Grants Program, emphasizing opportunities to observe and directly experience fish, wildlife and the river environment
- ' Provide technical assistance to community groups and municipalities seeking to promote understanding and appreciation of the estuary, and provide training for teachers
- ' Support the *Hudson River Almanac* as a key tool to encourage outreach and expand citizen stewardship and understanding of the entire Hudson River watershed

### ***Theme III: Cleaning Up Pollution***

#### **14. Waterfront Revitalization**

**Issue:** The Hudson Valley economy is diversifying, and a key element of the region's economic strategy is to strengthen and revitalize riverfront communities and waterfront areas as destinations for tourists and vibrant places to live and work. Projects such as the Hudson River Park will recreate significant waterfront linkages to the river in close proximity to the homes and work places of millions of New York State residents. The Hudson River Valley Greenway will continue to foster revitalization efforts at the local level as well as continue to connect the valley through the Greenway Trail. Directing new



growth to urban and community centers also will help to protect open space and prevent habitat fragmentation. Governor Pataki has created a Quality Communities Task Force to study community growth in New York State and develop measures to help communities implement effective land development preservation and rehabilitation strategies.

As municipalities adjust to new economic opportunities, many riverfront communities find that environmental conservation plays a key role. Governor Pataki has established the Waterfront Rediscovery Program to accelerate redevelopment of former industrial commercial waterfronts in target communities with abandoned buildings and vacant waterfront parcels. Interagency coordination of grant programs for economic development, parks, historic preservation, waterfront revitalization, brownfields cleanup, and water quality improvement support the revitalization efforts of riverfront communities and can protect the estuary by guiding new development to population centers and avoid continued sprawl into pristine areas. Both the Quality Communities Initiative and the Waterfront Rediscovery Program will be coordinated by New York State Department of State (DOS) and will bring together a wide range of involved agencies.

Thousands of New York State residents and visitors enjoy boating on the river and rely on public and private marinas and boat club facilities for access both to and from the river. These facilities offer an excellent vehicle to provide environmental and safety information to the public. Many boating facilities are rapidly losing dockage areas and navigable channels because of sediment deposition. Dredging of these facilities is necessary to insure continued facility operation and boater access to the Hudson. Organizations representing marine interests have requested that DEC and NY Sea Grant assist them in dealing with dredging and disposal, which has become costly and often impracticable.

#### **Action Plan 2001 Commitments:**

### **14a. Riverfront Communities**

- ' Continue a coordinated approach to the economic revitalization of waterfronts through state grant programs
- ' Support infrastructure needs for waterfront revitalization efforts, especially in urban areas where public access is provided



## 14b. Marina Assistance

- ' Provide technical assistance to marinas and boat clubs in managing environmental concerns

## 15. Brownfields

**Issue:** Brownfields are contaminated industrial sites that can be cleaned up and turned to new productive uses either as parks or as new development sites. Because of the potentially high cost of cleanup, many of these sites have been abandoned by their owners and taken over by municipalities through tax foreclosure. The 1996 Clean Water/Clean Air Bond Act provides grants to municipalities to clean up brownfield sites, including the studies needed to investigate the type, amount and location of pollution. In the Hudson Valley, since the adoption of the action plan, more than \$7 million in grants have been approved for 13 brownfield projects. On the riverfront, cleanups in Irvington, Cortlandt, Yonkers and Hudson will result in new parks, trails and public access to the waterfront. Brownfield cleanups will continue to be a priority of the action plan.

### **Action Plan 2001 Commitments:**

- ' Continue to seek the participation of municipalities in the voluntary clean-up and restoration of contaminated urban waterfront sites. Provide technical and financial support to preliminary investigations and cleanups. Seek the passage of the Governor's proposed Superfund Bill to provide continued funding for clean-up of priority sites.

## 16. Abandoned Boats and Derelict Structures

**Issue:** Abandoned barges, derelict piers and old railroad ties, dumped in the days when that was legal, can be found along the shoreline in some places. Many of these decaying structures have become habitat for fish and birds. They detract, however, from waterfront revitalization. Because of potential impacts, full or partial removal requires coordination with multiple agencies to assure that habitat concerns are considered.

### **Action Plan 2001 Commitments:**

- ' Conduct demonstration projects on how to remove abandoned structures without damaging habitat values



## 17. Water Quality - Point and Non-Point Source

**Issue:** Great progress has been made in cleaning up sewage pollution in the Hudson, yet problems remain which must be addressed. These include accidental sewage discharges during power outages and sewer overflows, which occur in many places during periods of rainfall. In addition, pollution from runoff needs to be addressed. Vessel waste discharges into the river have been substantially curtailed by designating vessel no-discharge areas, but there is a need for additional pumpouts at marinas. Sediment from construction sites, oil and gasoline from parking lots, and fertilizers from lawns and farms end up in tributaries and the estuary. This is known as “non-point source” pollution. Through the EPF and Clean Water/Clean Air Bond Act, New York State has funded projects which address these problems in the estuary. This work will continue.

### Action Plan 2001 Commitments:

- ' Support projects which reduce impairments to water quality and habitat caused by discharges from combined sewer overflows (CSOs), boats, accidental discharges, non-point sources, or other causes
- ' Local municipalities shall develop a long term plan for the communities in the Albany/Capital District area that will minimize combined sewer overflows in a cost-effective manner, thereby reducing or eliminating impairments in the Hudson River associated with wet weather conditions

## 18. Track Down and Clean Up Chemical Contaminants

**Issue:** During the past 30 years, levels of contaminants have decreased in the water, sediments, and fish of the estuary. However, some chemicals remain in the ecosystem. Primarily, these are persistent organic chemicals, such as PCBs, discharged into the river prior to the passage of the Clean Water Act in 1972. Heavy metals once used in manufacturing batteries, paints and dyes also remain. Continuing sources of chemical pollution include pesticides applied to lawns, farms and golf courses, which enter the Hudson as runoff, and airborne contaminants such as polycyclic aromatic hydrocarbons in the air contaminating the earth. Because chemical pollutants in the river move through the food chain, the NYS Health Department recommends limited consumption of estuary fish. The shipping industry too is affected by the difficulty of disposing of contaminated sediments from dredging.



In 1998, New York State committed \$12.4 million to a comprehensive track down of contaminants, funded by the NY/NJ Port agreement and supplemented by funds from the Estuary Program. This multi-year effort continues.

**Action Plan 2001 Commitments:**

- ' Continue to track down sources of contaminants in the Hudson River estuary and monitor response to pollution reduction activities. In particular, identify and quantify sources of contaminants of concern such as dioxin, PCBs, PAHs, metals, pesticides, and volatile organic compounds; identify changes or trends over time
- ' Evaluate opportunities to reduce contamination at the source in order to facilitate future navigational dredging of New York Harbor and other ports on the estuary and to minimize uptake of these chemicals into the food chain. Support the continuing efforts of USEPA to implement the active remediation of upper Hudson PCBs, and work with federal partners to seek recovery of natural resource damages caused by PCBs.
- ' Expand analysis of pesticides and air pollutants
- ' Explore the feasibility of establishing a system to monitor sediment transport in the estuary

## **19. Funding for Long-term Monitoring**

**Issue:** From managing fish populations to ensuring adequate water supplies, New York State needs improved data on environmental conditions to make informed decisions. The state does not have an early warning or reliable forecasting system to detect significant changes in the estuary and prevent future problems. Presently, limited monitoring programs are conducted by DEC, other agencies and the private sector. A comprehensive long-term monitoring program is being developed to establish a scientific basis for decision making and to track progress in conserving the region's natural resources. To assure the ongoing effectiveness of the program, a stable funding mechanism must be established that is potentially funded by the multiple partners who would benefit. Through action plan activities, a long-term monitoring plan is being developed. The next step is to determine the best way to fund its implementation.



**Action Plan 2001 Commitments:**

- ' Complete development of a plan for a long-term monitoring program
- ' Explore mechanisms to create a stable fund for ecosystem monitoring and education to establish a scientific basis for management decisions and public support for carrying them out; explore options for creating cost-sharing mechanisms through public-private partnerships involving resource users, private foundations and government agencies; conduct projects that address current monitoring needs and priorities; support creation of a center on the shores of the Hudson which will conduct world-class research and education on rivers and estuaries

## **20. Core Programs**

**Issue:** The action plan initiates many projects and programs that address pressing immediate needs of the estuary. However, these actions should not be undertaken at the expense of the ongoing DEC programs that carry out the state's conservation mission on the Hudson. Therefore, a key element of the plan is to maintain the core programs that have helped DEC achieve great progress to date. This includes providing administrative support to carry out the Estuary Action Plan.

**Action Plan 2001 Commitments:**

- ' Maintain core Hudson River programs in DEC and build on them to accomplish the Estuary Action Plan. These programs include the Hudson River Estuary Program, the Hudson River Fisheries Unit and Anadromous Fisheries Section, the Hudson River National Estuarine Research Reserve, the Regional Marine Program and others
- ' Continue to coordinate and integrate the Estuary Action Plan agenda in partnership with state agencies such as the NYS Office of Parks, Recreation and Historic Preservation, Departments of State, Transportation, General Services, Agriculture and Markets, Empire State Development Corporation, and the Hudson River Valley Greenway. Involve additional federal partners such as the US Army Corps of Engineers, US Departments of Commerce and Interior, and the American Heritage Rivers program