



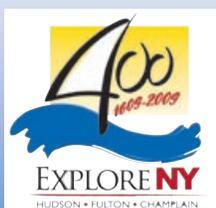
New York State Department of Environmental Conservation



In Celebration of the  
2009 Hudson-Fulton-Champlain  
Quadricentennial

# Hudson River Estuary Action Agenda 2005—2009

2007 update



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*In Celebration of the  
2009 Hudson-Fulton-Champlain  
Quadricentennial*



The Hudson River Estuary Program  
New York State  
Department of Environmental Conservation



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December, 2007

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December 2007

To the Citizens of the Hudson River Valley,

The world we live in is a rapidly changing place. Constant advances in technology have literally changed how we see and interact with our environment and with each other in profound ways. Through programs such as the Hudson River Estuary Program, many of yesterday's questions about the environment in which we live have become massive databases stored in computers that, through interpretation, have become today's answers, and will in turn, influence tomorrow's decisions.

With this in mind, it is with pleasure that I present you with this 2007 revision of the *Hudson River Estuary Action Agenda 2005-2009*. While maintaining the Hudson River Estuary Program's goal to foster collaborations among the many groups and citizens concerned with the Hudson River's future, this mid-course 'tune-up' acknowledges emerging issues, such as climate change and invasive species, while updating the program's many initiatives to reflect progress that has been made recently. It introduces new opportunities that, just a few years ago, were not technologically within reach.

When first released, the expectations of the *Action Agenda* were set purposefully high, inviting the greater Hudson River Valley community to join in a watershed-wide discussion to create a common vision for the 21st century. The response has been tremendous. Partnerships, including federal and state agencies, local counties, towns and villages, the scientific and educational communities, as well as many non-profit organizations, have evolved, presenting a diverse repertoire of approaches to meeting the program's goals. Each year, the list grows longer, reminding us, that the vision for the river and the valley is an on-going conversation engaging all who live and derive benefit from its treasured resources. No one organization or agency can fund all the science, all the education, all the conservation initiatives needed to protect and restore the Hudson and its watershed. Together, however, the Hudson Valley community can build a sustainable approach to the future, one that is both adaptive and responsive to change, and one that will lead to decisions based on a holistic understanding of the region.

In the coming months, the *Action Agenda* will undergo a major review process, resulting in a comprehensive update of the plan in 2009. Throughout this process and through implementation of the current plan, DEC will continue to foster the collective intellect, talent, skills, and dedication that those who have a stake in the river bring together in common purpose. The

challenge inherent in this initiative is to vitalize - not homogenize - the interests and diversity we all represent, in order to achieve specific common objectives that will realize long-term benefits for people and nature in the Hudson River Valley.

To those who have been active participants in the Estuary Program, I encourage you keep up the good work. To those of you who are just joining us, welcome aboard. To the staff of the Estuary Program who have worked so hard and creatively to develop and implement this program, I salute you.

Sincerely,

A handwritten signature in black ink, appearing to read "Alexander B. Grannis". The signature is written in a cursive style with a large, prominent initial "A".

Alexander B. Grannis

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## *Foreword*

This *Action Agenda*, now at its mid-way point, continues work begun in 2005 to develop long-range goals and measurable targets for the conservation of the Hudson River estuary and its surrounding watershed as called for in Section 11-0306 of the Environmental Conservation Law. Not a state agency ‘plan’ in the normal sense of the word, it is a statement of where the state wants to be in creating a new paradigm – one that uses the skills, imagination and resources of many collaborative efforts.

The *Action Agenda* sets official goals for the Hudson River Estuary Program and, establishes a framework for this venture. It is a blueprint that depends on partnerships for its implementation and success, recognizing the critical roles that local governments, non-profit organizations, federal agencies, citizens groups and a wide range of economic interests must play to assure success. In order to give timeliness and measurability to the goals, interim targets are stated in quantitative terms, wherever possible, with specific dates for their achievement. Many are tied to 2009 – the 400th anniversary of Henry Hudson's voyage of discovery and the anticipated celebration of the Hudson-Fulton-Champlain Quadricentennial. Longer-range goals are often set with 2020 as a focus.

Development of the *Action Agenda* was informed by participation of the Hudson River Estuary Management Advisory Committee and subcommittees representing scientists, businesses, sportsmen and women, commercial and recreational fishers, elected and appointed officials from local and county government, environmental and conservation groups, academics, educators and others.

Though the focal point of the program is the tidal portion of the Hudson (from the Troy dam to the Verrazano Narrows), the *Action Agenda* reaches beyond the banks of the river and addresses conservation of the Hudson Valley's landscape, scenery, and natural heritage as well. Addressing one goal often benefits another and many of the most important goals and targets for the Hudson can be reached only through actions on the lands that drain into the streams and rivers that feed into the estuary, including areas well up into the watershed. Thus, a landscape-scale approach is needed to deliver these diverse ecological benefits, while also providing direct value to the people who visit and reside here.

This revised 2005 *Hudson River Estuary Action Agenda* continues the watershed-wide discussion of a common vision for the 21st century, that commenced in April 2005 with the release of the draft *Action Agenda* at the Hudson River Summit in celebration of Earth Day. Our goal remains to help catalyze a more effective collaboration among the organizations and agencies that are concerned with the Hudson River's future by offering the *Action Agenda* as a starting point for developing this common vision and promoting collaboration and partnership. This vision needs to be an on-going conversation. It needs to be updated as we progress, and it needs to bring in new partners. No one organization or agency can fund all the science, all the education, all the conservation initiatives needed to protect and restore the Hudson and its watershed.

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The New York State Department of Environmental Conservation (DEC) seeks to provide support to the collective intellect, talent, skills, and dedication that those who have a stake in the river bring together in common purpose. The challenge inherent in this initiative is to vitalize - not homogenize - the interests and diversity we all represent, in order to achieve specific common objectives that will realize long-term benefits for people and nature in the Hudson River Valley.

Our history makes us confident that we can achieve this kind of collaboration. There is great progress to report on the Hudson since the 1960s and 1970s. However, what faces us now is not another series of large and definable threats to the river's health. Instead, the problems that remain are subtle in effect and ubiquitous in origin. They involve such difficult issues as stormwater management, land use decisions, climate change, and the effects of persistent chemicals. In a number of key areas of decision-making that affect conservation of natural resources, the state and federal governments are not even major players. Like the sources of our remaining problems, the solutions must be found everywhere and must involve everyone.

The Hudson is blessed with extraordinarily involved and educated constituencies – people who care about its future and who bring with them a track record of success. As you read this *Action Agenda*, we hope you will consider from your own perspective how your dreams for the Hudson can be woven into a larger strategy for the future of the river. Join with us to track our progress as we get ready to celebrate the Quadricentennial.

## ***Sustainability as a Guiding Principle for the Action Agenda***

In 1987, the United Nations Brundtland Commission defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." This means that collectively in the Hudson Valley, our decisions must allow our economy and community members to continue to thrive without destroying the natural environment upon which we all depend. It also means that in achieving a healthy environment, we must ensure that inequitable burdens are not placed on any one geographic or socioeconomic sector of the population and that improvements in our communities are accessible to all.

While the *Action Agenda* focuses on science and policy to conserve the natural resources of the Hudson Valley, it is the guiding principle of sustainability that underlies all of the work that we do. For that reason, we pledge to continue to diversify our partnerships to address the environmental conservation priorities of: sustainability; global warming; promoting smart growth and green communities; improving stewardship of and public opportunities to enjoy our natural assets; and building toxic free communities and a toxic free future. Key components of these five priorities and challenges are integrated throughout the *Action Agenda*.

Implementation of the *Action Agenda* translates these partnerships into manageable steps that, when taken together, will meet our broader goals. In all that we do we recognize that

our local environmental, economic and social issues cannot be separated from their global context. We hope that the partnerships we build and the success we achieve can serve as a model for regional conservation programs throughout the state as well as the nation.

## ***Hudson River Estuary Program Mission***

The mission of the Hudson River Estuary Program is to: conserve the natural resources for which the Hudson is legendary; promote full public use and enjoyment of the river, and clean up the pollution that affects our ability to use and enjoy it. Our program is founded in science and implemented in ways that support the quality of life of the Hudson Valley's citizens.

## ***About the Action Agenda***

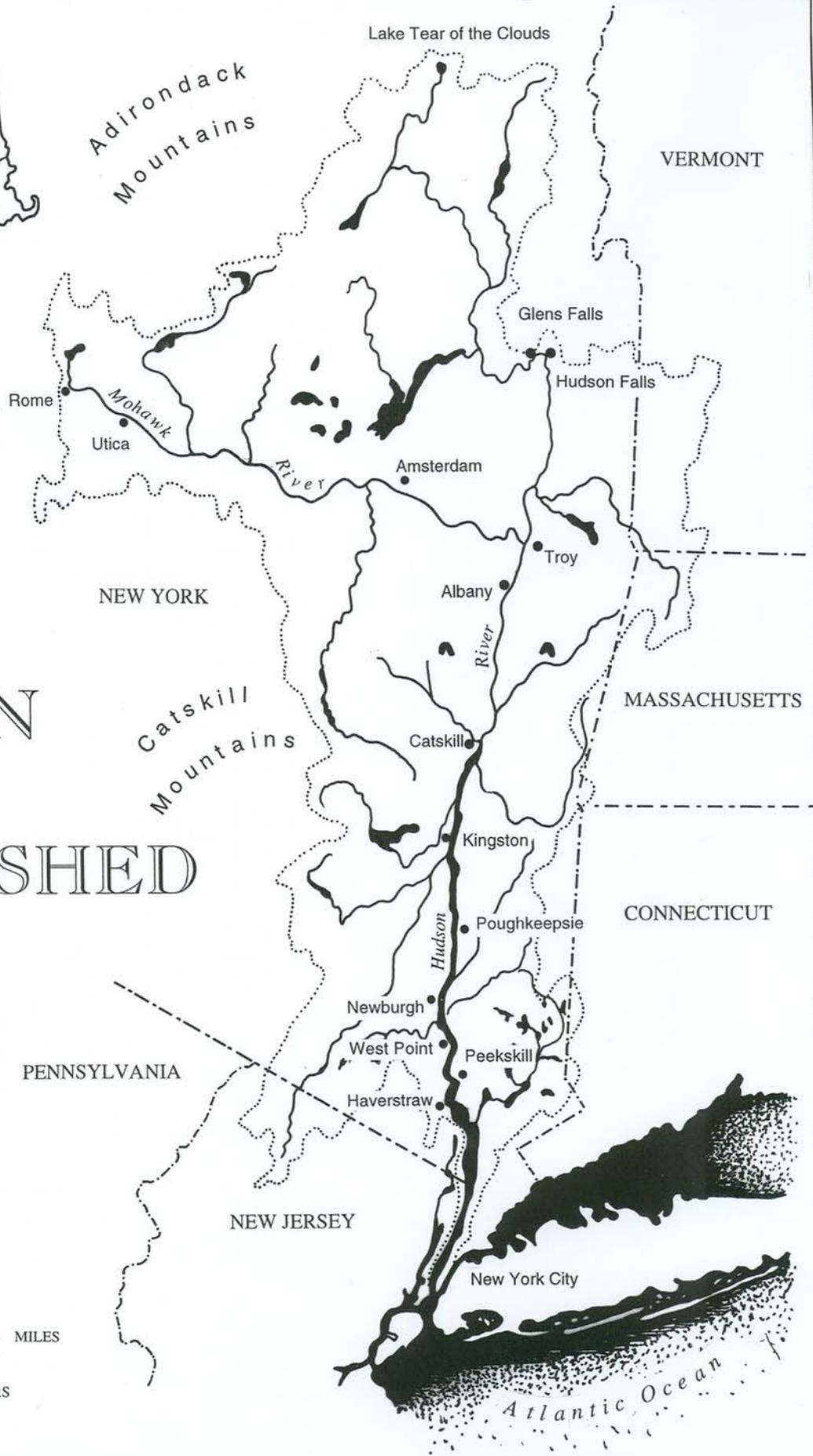
In 1987, the New York State Legislature passed Section 11-0306 of the Environmental Conservation Law. Known as the Hudson River Estuary Management Act, this law directs the Department of Environmental Conservation (DEC) to develop a management program for the Hudson River Estuarine District and its associated shorelands. This document contains long-range goals for the conservation and recovery of the Hudson Estuary and the lands of its watershed. For each goal, we have identified immediate actions to be completed by 2009, in celebration of the Hudson-Fulton-Champlain Quadricentennial, as well as additional actions that will move us significantly closer to our goals in the five to fifteen years that follow, by 2020. We seek to engage many partners in restoring the Hudson's extraordinary natural heritage and its setting of scenery and mystique.

State agency partners in the program include: DEC as project manager; NYS Office of Parks, Recreation and Historic Preservation; NYS Department of State; the Hudson River Valley Greenway, NYS Office of General Services; NYS Department of Transportation; NYS Office of the Attorney General; Empire State Development Corporation, and Metro-North Commuter Railroad. New England Interstate Water Pollution Control Commission and the Water Resources Institute at Cornell University are key partners that help carry out the program. Many non-profits such as those included in Appendix A, the Hudson River Advisory Committee, as well as many other non-governmental groups and organizations work in collaboration with the program. 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, including National Oceanic and Atmospheric Administration, and Department of Interior, including the US Fish and Wildlife Service, and the American Heritage Rivers Program, also have a stake in the plan and participate actively.



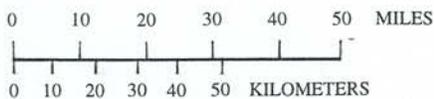
# THE HUDSON RIVER WATERSHED

Base from U.S. Geological Survey  
digital data 1:2,000,000, 1972



## KEY

- ..... Watershed Boundary
- - - - State Boundary



## ***Geographic Area and Environmental Setting***

The Hudson River Estuary, from the Troy dam south to the Verrazano Narrows, and the surrounding watershed, also known as the Hudson River Valley, is the focus of this program. This geographic area includes the 153 mile-long, tidal, main stem of the Hudson River, as well as upper New York Harbor, the Hudson's tributaries, and the upland areas of the Hudson Valley, encompassing 5,200 square miles of the river's overall 13,400 square mile watershed. The Estuary Program also gives consideration to pertinent issues in the non-tidal Hudson River and its tributaries above Troy, lower New York Harbor, the New York/New Jersey Bight, and the waters of Long Island Sound as they influence the estuary and its resources.

The Hudson River Estuary has long been recognized as a valuable state and local resource, as well as an integral part of the North Atlantic coastal environment. The estuary serves as a spawning and nursery ground for important fish and shellfish species, such as striped bass, American shad, Atlantic and shortnose sturgeon and blue crab. More than 200 species of fish are found in the Hudson and its tributaries. The estuary contains the only significant acreage of tidal freshwater wetlands within the state. These wetlands, along with the river's brackish tidal wetlands and stands of submerged aquatic vegetation, contribute essential habitat that support the Hudson's rich and biologically diverse web of life. More than 16,500 acres of river habitat, along the stretch from the Troy dam to the southern Rockland-Westchester County line, have been designated "significant coastal fish and wildlife habitat" by DEC and the New York State Department of State. The New York Natural Heritage Program has identified numerous sites where rare plant and animal species and exemplary natural communities occur. The Hudson Valley is particularly important globally for its diverse assemblage of turtles. Recently, bald eagles have successfully nested and raised their young for the first time in over 100 years along the shores of the river. The estuary also serves as an important resting and feeding area for other migratory birds such as osprey, a variety of songbirds and waterfowl.

The Hudson Estuary serves one of the most densely populated areas in the country. The estuary's north end is flanked by the cities of Albany and Troy. Numerous smaller communities are located along both banks of the river to the southern Rockland-Westchester lines. From here south, the greater New York Metropolitan area, with its estimated population of 8 million, dominates the landscape. Nearly one-half of the population of New York State lives within the 15 counties bordering the estuary, the largest proportion being located in the New York City area. Part of New Jersey's major metropolitan area, likewise, borders the estuary.

Human use of the estuary dates back 8,000-10,000 years before European settlement. Today the estuary is used for commercial navigation, recreation (including boating, fishing, swimming, and wildlife observation), commercial fishing, municipal drinking water supplies, and as a source of inspiration. Several major power generating facilities, manufacturing plants, petroleum terminals, cement and aggregate plants, resource recovery facilities, and various mining operations are located along the banks of the estuary. Railroad tracks hug the shores of the river on the east from Manhattan to Rensselaer County and on the west from Haverstraw State Park in Rockland County to central Ulster County.

# *Hudson River Estuary Action Agenda Goals 2005-2009*

## *In Celebration of the Hudson-Fulton-Champlain Quadricentennial*

1. Restore the **signature fisheries** of the estuary to their full potential, ensuring future generations the opportunity to make a seasonal living from the Hudson's bounty, and to fish for sport and consume their catch without concern for their health.
2. Conserve, protect, and, where possible, enhance **critical river and shoreline habitats** to assure that the life cycles of key species are supported for human enjoyment and to sustain a healthy ecosystem.
3. Conserve for future generations the rich diversity of **plants, animals and habitats** that are key to the vitality, natural beauty and environmental quality of the Hudson River Valley.
4. Protect and restore the **streams**, their corridors, and the watersheds that replenish the estuary and nourish its web of life—a system critical to the health and well-being of Hudson Valley residents and the estuary.
5. Conserve key elements of the **human, pastoral landscapes** that define the character of the Hudson River Valley and its setting of history and mystique.
6. Conserve the key features of the world-famous **river scenery**—the inspiration for the Hudson River School of American painting and for the tales of Washington Irving—and provide new and enhanced vistas where residents and visitors can enjoy Hudson River views.
7. Establish a **regional system of access** points and linkages so that every community along the Hudson has at least one new or upgraded access point to the river for fishing, boating, swimming, hunting, hiking, education, or river-watching.
8. Promote **public understanding of the Hudson River**, including the life it supports and its role in the global ecosystem, and ensure that the public understands the challenges the Hudson River faces and how they can be met.
9. **Revitalize all the waterfronts** of the valley so that the Hudson is once again the “front door” for river communities, where scenery and natural habitats combine with economic and cultural opportunity, public access, and lively “green ports” and harbors to sustain vital human population centers.
10. Ensure that the **Hudson River will be swimmable** from its source high in the Adirondack Mountains all the way to New York City.
11. Remove or remediate **pollutants** and their sources so that all life stages of key species are viable, and people can safely eat Hudson River fish, and so our harbors are free of the **contaminants** that constrain their operation.
12. Track our progress and **celebrate** our successes!

# ***Goal 1: Signature Fisheries***

## **Goal**

Restore the **signature fisheries** of the estuary to their full potential, ensuring future generations the opportunity to make a seasonal living from the Hudson's bounty, and to fish for sport and consume their catch without concern for their health.

## **Challenge**

The fisheries of the estuary—the striped bass, American shad, Atlantic sturgeon, river herring, smallmouth and largemouth bass, blue crab—as well as other important species, depend upon a healthy environment as well as effective management strategies, to assure their continued role in a balanced and sustainable ecosystem.

Of the more commonly known species, currently, American shad, Atlantic sturgeon, river herring, American eel and largemouth bass are in decline. Striped bass, having successfully recovered, face increasing fishing pressure, that requires careful management. Shortnose sturgeon may be at an historic high in the estuary. Blue crab and smallmouth bass continue to grow in popularity, but are less well understood, and are, therefore, at risk. Oysters, once sought after as a delicacy, are now found only occasionally in the estuary and are not edible due to biological contamination. The reason for their disappearance is not well understood. However, improved water quality and growing public interest have stimulated resource managers to consider options for re-cultivation within the river's main stem. New York's fisheries may also undergo significant change due to warming water temperatures. Today, New York's marine waters are home to a seasonal mix of cold and warm/temperate species, and our inland fresh waters support thriving populations of cold-water fish like trout. In both marine and freshwater fisheries, warming waters may tilt the balance toward warm-water species, diminishing the state's biodiversity.

Advisories regarding the consumption of fish taken from the Hudson continue. These public health warnings are based on persistent and unacceptable levels of toxic chemicals and heavy metals in fish and crabs, and pathogens in oysters. In addition, environmental factors affecting the survival of sensitive life stages in the water column at critical time periods must be addressed. Forage fish are needed as a food source and to help maintain a balanced ecosystem.

To ensure full enjoyment of the estuary's fish, crabs and oysters, now and into the future, will require management actions to maintain and, in some cases, restore populations, protect habitat, and reduce unnecessary mortality. This will require partnerships with federal agencies, Atlantic coastal states, local anglers, and others, to insure that state and federal plans are carried out.

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## **Accomplishments to date**

Atlantic sturgeon are now protected under a moratorium on possession while the population recovers. Interstate management plans have been adopted and are being updated for coast-wide recovery of American shad, Atlantic sturgeon, striped bass, and river herring.

Data collected through the Hudson River Estuary Program assists interstate managers in assessing stock condition as these management plans are updated. Information on smallmouth and largemouth bass, crabs, and eel is currently being collected and will be enhanced to guide stock management decisions.

DEC is making a concerted effort to reduce fish mortality from impingement and entrainment at Hudson River power plants by imposing the “best technology available” standard available under 6 NYCRR §704.5 and the Clean Water Act (§316(b)). This has been accomplished at new plants (Athens, Bethlehem Energy Center, Bowline 3), and one existing plant (Lovett) and is being or will be pursued at other existing plants (Indian Point units 2 and 3, Roseton, Danskammer, Bowline units 1 and 2.) PCB levels in fish are expected to decline as a result of the recently mandated cleanup project on the upper Hudson.

## **By 2009**

1. In accordance with the long-range (5-15 year) targets listed below for Hudson River populations of these species, by 2009 American shad and Atlantic sturgeon will show signs of recovery, while striped bass and shortnose sturgeon populations will continue to remain stable. This will be achieved by continuing to implement and update interstate management plans for these species according to schedules adopted for each, using up-to-date information on stock status and sources of mortality.
2. Annually determine progress in maintaining or increasing populations of Atlantic sturgeon, American shad, striped bass, and periodically for smallmouth and largemouth bass.
3. By 2007, adopt measures to increase the catch of largemouth and smallmouth bass larger than 15 inches in length.
4. By 2009, initiate studies to determine the feasibility of restoring oyster populations to the Hudson River estuary.
5. By 2009, develop a method to monitor status of river herring in the Hudson River Estuary.
6. By 2009, determine existing threats to American eels.
7. By 2009, reduce, or have schedules to reduce fish kills at the six existing power plants by imposing the “best technology available” standard pursuant to 6 NYCRR §704.5 and

§ 316(b) of the Clean Water Act, which both call for minimizing adverse environmental impact. Effective immediately, provide that future Hudson River power plants reduce fish kills over 2001 levels at once-through cooling plants, and reduce fish kills for all types of future water withdrawals compared to the impacts of unmitigated intake structures.

8. Track the responses of aquatic organisms to contaminants. Document changes in PCB concentrations (annual monitoring) and undertake special efforts to describe mercury and cadmium conditions.

9. By 2009, initiate studies to determine seasonal habitat use of shortnose sturgeon.

10. In 2009, release a report on the status of signature fisheries on the Hudson River Estuary.

### **5-15 Year Targets**

11. By 2016, ensure the return of the first mature and fully protected female Atlantic sturgeon to the Hudson River Estuary, with a long term goal of establishing the Hudson River Atlantic sturgeon population at a fishable level that would encourage its re-emergence as a regional gourmet delicacy.

12. Maintain a broad age-structure of striped bass and a self-sustaining spawning stock at appropriate levels of abundance to provide a quality and economically viable fishery.

13. Re-establish Hudson River American shad roe as a gourmet specialty in Northeast restaurants by 2020, with a long term goal of restoring the population to pre-World War II levels.

14. Restore the smallmouth and largemouth bass fishery, by 2010, to the nationally renowned levels of the mid-1980s.

15. By 2010, determine threats to blue crabs and implement management measures to assure sustainability.

16. By 2010, determine where healthy oyster populations could become viable, and by 2020 re-establish the seed oyster industry in the Hudson to 1950s levels of abundance.

17. Develop an American eel restoration plan by 2010.

18. Determine status and trend in relative abundance of resident and migratory forage fish species (river herring, white perch, Atlantic tomcod, killifish, spottail shiners, silversides and bay anchovies) of the Hudson Estuary by 2010.

19. By 2020, reduce fish kills for all types of water withdrawals compared to the impacts of unmitigated structures.

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20. By 2016, measurably reduce levels of contaminants in commonly eaten fish and blue crabs.

21. By 2010, explore methodology for tracking abundance changes in the shortnose sturgeon population.

## ***Goal 2: River and Shoreline Habitats***

### **Goal**

Conserve, protect, and, where possible, enhance **critical river and shoreline habitats** to assure that the life cycles of key species are supported for human enjoyment and to sustain a healthy ecosystem.

### **Challenge**

The diverse and varied habitats of the estuary have changed dramatically since 1609, when Henry Hudson first sailed up the river to Albany. Wetlands and shallows have been filled, miles of shoreline have been altered, and changing land use patterns in the watershed have contributed to degraded water quality. The key habitats of the estuary—the wetlands, the aquatic plant beds, the shoreline, and the very bottom of the river itself—need to be characterized, and, where necessary, conserved or restored. In addition, invasive species, such as water chestnut and zebra mussels have displaced native species, disrupting food webs and the complex ecosystem. Preventing the introduction of invasive species is critically important, because once they are established, it is difficult or impossible to eradicate them.

Climate change also poses a significant threat to river habitats. Data collected at gauges in New York Harbor indicate that sea level in our region has risen more than 15 inches during the last 150 years due to a combination of geological forces, expansion of ocean water as it warms, melting of glaciers and polar ice sheets. Scientists expect this trend to continue, potentially inundating tidal marshes and sensitive shallow habitats that support many species of fish and wildlife. Shoreline hardening and other attempts to buttress shorelines against flooding will damage critical aquatic habitats and prevent them from migrating inland with rising water levels.

### **Accomplishments to date**

Key habitat types – including shorelines, tidal wetlands, aquatic vegetation beds, and the river bottom – are being mapped. Detailed mapping of estuary wetlands greater than one-half acre has been completed in geographic information system (GIS) format and will be incorporated into the DEC's Master Habitat Data Base. Software for non-GIS users is being developed to allow the public to view this wetland information electronically. This coverage spans the Hudson River from the Troy dam to the Tappan Zee Bridge. All Hudson River submerged aquatic vegetation beds were mapped and have been placed on the DEC's Master Habitat Data Base. Detailed maps of the river bottom have been completed for two-thirds of the estuary. Efforts are underway to make all these data available on the web. Following the recommendations of a statewide invasive species task force final report, the state is working with many partners to establish a network of partnerships for regional invasive species management to prevent and control invasive

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species. A habitat restoration plan has been drafted and several habitat restoration and enhancement projects are underway.

## **By 2009**

1. Conserve key aquatic habitat types, including submerged aquatic vegetation (SAV), tidal wetland, intertidal area, and natural shoreline and river bottom, through the measures identified below:

By 2006, map natural and engineered shoreline habitats, and by 2012, complete mapping of all submerged habitats for the entire estuary, and make all habitat mapping products available in electronic form to the public.

Complete assessment of how SAV and tidal-wetland habitats are changing over time.

By 2009, advance our understanding of the seasonal use of habitats, such as spawning, nursery and wintering areas of key species of fish and crabs, such as shad, striped bass, Atlantic sturgeon, short-nose sturgeon, blueback herring, alewife, white perch, tomcod, American eel, winter flounder, killifish, shiner (various species) and blue crab.

Characterize the functional roles of shoreline habitats, intertidal areas, and vegetated shallows in the ecosystem.

By 2007, complete updates to existing conservation measures, including the state's Open Space Conservation Plan and Significant Coastal Fish and Wildlife Habitat designations that benefit a wide range of species, to reflect habitat information gained to date, including projections of shoreline land buffer needs to accommodate wetland migration inland as sea level rises.

Develop a strategy and tools for assessing and protecting significant coves and the mouths of Hudson River tributaries, provide technical assistance to municipalities in identifying and protecting significant natural resources, and develop a demonstration project where inter-municipal cooperation has resulted in conservation of important habitats.

By 2009, work with partners to develop high-resolution digital elevation maps of the entire estuary shoreline from New York City to the Troy dam. Use these maps to help shoreline communities understand and plan for threats associated with rising sea levels. Conduct a 'risk assessment' for SAV, wetlands and shorelines under various sea level rise scenarios.

2. Cooperate with the Partnerships for Regional Invasive Species Management to detect, prevent, and control and/or eradicate aquatic invasive species, press for needed federal action and conduct a pilot study to experiment with management of water chestnut to enhance its habitat value in local settings.

3. Annually provide training to user groups, resource managers, and other decision-makers on how to adopt best management practices that conserve aquatic habitat. By 2009, train 1,000 decision-makers on best management practices for habitat protection, including shoreline and habitat management, invasive species control, visitor impact assessment, habitat restoration, water quality protection strategies, and climate change.
4. By 2008, complete a Hudson River Estuary habitat restoration plan that identifies restoration priorities and provides for a restoration process that is goal-driven, adaptive, and based on site-specific monitoring and clear success criteria, and begin implementation.
5. By 2009, begin a small-scale pilot oyster habitat restoration demonstration project to determine the feasibility of re-establishing oyster reef habitat in the lower estuary. Conduct a pilot project to restore access to up-stream habitat for eels on one tributary stream.
6. Study the feasibility of restoring or enhancing natural shoreline, tidal wetlands, access to historically accessible habitat on tributaries with man-made barriers, and habitat for shad spawning and other estuarine species. Identify options for disposal and/or beneficial reuse of Hudson River dredge spoil associated with habitat restoration projects.
7. By 2007, develop and disseminate guidance on shoreline engineering options that provide high habitat value, and by 2009, develop two demonstration projects to return the river shoreline to a more natural condition.

### **5-15 Year Targets**

8. By 2020, if feasible, restore or enhance key habitats including: 10 shoreline habitat enhancement projects; 30 acres of tidal wetlands; access to historic fish habitat on 5 tributaries with man-made barriers; and 20 acres of shallow water habitat re-created from dredge spoil uplands.
9. By 2015, work with 50% of Hudson River municipalities to explore opportunities for protecting highest priority aquatic habitat within their boundaries.
10. By 2015, train 3,000 decision-makers on best management practices for invasive species control, visitor impact assessment, habitat protection, habitat restoration, water quality protection, and climate change.

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## ***Goal 3: Plants and Animals of the Hudson River Valley***

### **Goal**

Conserve for future generations the rich diversity of **plants, animals and habitats** that are key to the vitality, natural beauty and environmental quality of the Hudson River Valley.

### **Challenge**

When wildlife and habitats are healthy, people are too. Healthy, natural areas reduce the spread of disease, reduce the cost of clean drinking water, and mitigate the effects of climate change. Insect pollinators support our food supply and our forests. Plants give structure to the soil and keep it from eroding. Diverse plant and animal populations keep the living world in balance and create the natural beauty of our region.

The Hudson River Valley hosts an unusually rich natural heritage. It is important globally for the conservation of turtles, and statewide for a variety of plants and animals, including several endangered species. This extraordinary biodiversity is challenged by today's pattern of sprawling development, which fragments and destroys habitats, and interrupts pathways for movement. As a result, many of the species that require a complex of habitats to complete their life cycles are declining in the Valley. Seasonal woodland pools, wetland buffers, lowland forests, stream corridors, grasslands and the wildlife they support are particularly at risk. Another threat to biodiversity is invasive and overabundant plants and animals that are homogenizing the Hudson Valley, degrading the region's distinctive character and often becoming nuisances to the public. Pollutants, delivered by stormwater runoff and transported sediments, threaten the future of the region's biodiversity in more subtle and long-term ways. Climate change is an emerging long-term threat to natural areas and wildlife in the Hudson Valley. As temperatures rise, some plants and animals will need to move to cooler spots to the north, or to higher elevations. To meet this challenge, we must maintain habitat connectivity across the landscape to allow plant and animal species to migrate and to help protect human communities from environmental disturbance.

Biodiversity conservation in the valley achieves multiple *Action Agenda* goals, including those for signature fisheries, river and shoreline habitats, tributary streams, water quality, and a scenic landscape. Maintaining a healthy and resilient Hudson River and Valley depends on the conservation of our unique and biologically diverse natural habitats.

### **Accomplishments to date**

The Estuary Program has made tremendous progress in better understanding the locations and health of wildlife and natural areas throughout the Hudson Valley and in sharing this information with local governments and other conservation planners. Efforts continue to

identify and map significant habitats of the Hudson Valley at several scales, including assessment of biological resources on state lands. In addition, biologists have completed surveys of reptiles, amphibians, mammals, and breeding birds. With this biological information, communities can make more informed and comprehensive land use decisions that realize community goals.

After gathering baseline information on biological resources, the Estuary Program began providing technical assistance to land use decision-makers. Outreach has focused on smart-growth strategies that reduce habitat fragmentation and maintain environmental infrastructure. A number of documents and tools have helped planners and officials to develop local conservation programs. A *Biodiversity Assessment Manual for the Hudson River Estuary Corridor* has been published, and a training program implemented to teach communities to better understand, assess, and map habitats to support local goals and programs. Workshops have been offered to private landowners and resource professionals to encourage best management practices for stewardship of target habitats. A *Wildlife and Habitat and Conservation Framework* was developed to guide municipalities, landowners, businesses, and non-profits in conservation planning and practices. A conservation planning handbook specifically for municipalities will be completed by 2008.

These efforts have resulted in more effective local government planning that reduces habitat loss and fragmentation. This includes development and implementation of inter-municipal biodiversity conservation plans; updates to local ordinances that incorporate natural resource protection, and improved understanding and management of habitats by both private landowners and natural resource professionals. The Estuary Program has also worked with land trusts to improve acquisition and management of critical habitats. In total, technical assistance, grants, and/or training in plant and animal conservation have been provided to 59 towns, cities, and villages; 7 counties, and 14 land trusts.

## **By 2009**

1. Enlist 200 partners in creating and enhancing local programs to conserve the following target habitats and representative species using methods such as: smart growth principles; planning and zoning updates; open space plans; natural resource inventories; local laws; federally funded incentive programs; site stewardship best management practices; conservation easements and open space acquisition; improved project review; model partnership agreements, and other means.

Target habitats:

- Seasonal woodland pools for animals that are declining throughout the Northeast: Jefferson, marbled, and spotted salamanders, wood frog, spotted turtle, fairy shrimp and others.
  
- Streams, shorelines, and corridors that provide essential habitat for river otter, wood turtle, cerulean warbler, wading birds, trout, stream salamanders and Hudson River water nymph.

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- Unbroken forests needed by scarlet tanager, wood thrush, warblers, wide-ranging mammals, hawks, owls, box turtles, and fringed polygala flower.

- Unique natural areas that support at-risk plants and animals such as smooth cliff brake fern, grass pink orchid, bog turtle, peregrine falcon, and bald eagle.

- Scarce grasslands and shrublands that shelter northern harrier (marsh hawk), bobolink, eastern meadowlark, golden-winged warbler, short-eared owl and uncommon butterflies.

- Wetlands, including marshes, swamps, wet meadows, bogs and surrounding lands that support great blue heron, American woodcock, Blanding's turtle, northern leopard frog, and pitcher plant.

2. Identify practices that can be adopted by municipalities, builders, businesses, non-profits, and individuals to manage their lands for habitat conservation as part of model partnership agreements.
3. Conserve 10 local-scale wildlife-migration routes through partnerships and voluntary programs.
4. Establish a plan for assessing progress in conservation of native wildlife and habitats and begin monitoring progress.
5. Train 50 educators and 150 community leaders to recognize and understand native wildlife and habitat, and to effectively communicate their importance to decision-makers.
6. Develop information and train public land managers to incorporate biodiversity into management plans.
7. Develop strategies to promote additional wildlife-related recreation.
8. Develop strategies to prevent invasive and exotic species from being established in order to protect native species of plants and animals.
9. Develop efficient methods to gather information on the status of plants and animals throughout the Hudson Valley and provide updated information to local conservation partners.

### **5-15 Year Targets**

10. Enlist 1,000 partners (municipalities, businesses, non-profits, and individuals) in conserving the target habitats and representative species listed in target number 1 above.
11. Identify and, where possible, conserve key missing links in regional-scale wildlife migration corridors for species moving northward and to higher elevations in response to climate change.

12. Have management plans in place or updated to maintain priority biological resources on state lands.
13. Promote new and improved access to 5,000 acres for wildlife-related recreation.
14. Continually update information on important plants, animals, and habitats to support local conservation programs. Begin a woodland pool mapping and outreach program.
15. Through best development practices, incentives, education and other voluntary measures, continually improve the overall habitat quality of the Hudson Valley.

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## ***Goal 4: Streams and Tributaries of the Hudson River Estuary Watershed***

### **Goal**

Protect and restore the **streams**, their corridors, and the watersheds that replenish the estuary and nourish its web of life—a system critical to the health and well-being of Hudson Valley residents and the estuary.

### **Challenge**

The health and condition of the Hudson River Estuary is directly affected by what it receives from the Upper Hudson and Mohawk River as well as its Lower Hudson tributaries and their watersheds. Approximately 65 tributaries enter the estuary south of the Troy dam. From the surrounding hills, the Hudson River is fed by more than 3,600 miles of headwater streams and rivers that drain an ever-changing landscape. These streams provide essential fish and wildlife habitat, as well as recreational opportunities and drinking water for millions. Tributaries are the links and passageways between thousands of miles of Hudson Valley streams and rivers and the Hudson River Estuary, contributing vital freshwater and nutrients to the estuary. The watershed, via the tributaries, is the single largest source of organic carbon for the Hudson River Estuary, forming the foundation of the estuary's food chain. Where these tributaries meet the Hudson River Estuary, important habitats and aquatic vegetation often exists, which are critical for a variety of fish and wildlife, such as migratory fish from the Atlantic Ocean.

Hudson Valley streams are affected by a wide range of stresses, such as increases in impervious surfaces, loss of vegetative cover, agricultural and lawn runoff, inadequate or failing onsite wastewater treatment systems, inadequate or under-maintained sewers and municipal wastewater treatment plants, fish barriers, water withdrawals and, atmospheric deposition of pollutants. In addition, as our climate changes, rainfall events are projected to become more intense causing increased flooding, while dry spells between heavy rains will grow longer and hotter, leading to more frequent and severe droughts. Our winters are also projected to be milder with less snowfall. These stresses can lead to soil erosion and siltation, polluted stormwater runoff, streambank erosion, property loss from flooding, loss of groundwater recharge, nutrient enrichment, and unnaturally low stream flows. Streams under this complex combination of stresses may become degraded, no longer providing healthy drinking water, outdoor recreation, productive fish and wildlife habitat or, the essential building blocks for the Hudson River Estuary food web. Effects often make their way downstream, making tributary health not just a local issue, but a regional issue often crossing municipal boundaries. Sediment and contaminants from the watershed, for example, enter the estuary through its tributaries, affecting the estuary and New York/New Jersey Harbor.

A healthy estuary requires a healthy watershed containing intact riparian corridors, floodplains, wetland complexes, limited impervious surfaces, and minimal dams and

barriers. Intact riparian areas along the streams are transition areas between water and land supporting a wide variety of plants and animals, such as cottonwood trees, wood turtles, stream salamanders, river otter, and a variety of birds. Rainfall that recharges groundwater also feeds wetlands in the watershed and regulates the flow of streams. When water does not reach underground aquifers due to impervious cover, habitats of the watershed suffer and less groundwater is available for drinking. Practicing good watershed protection principles also serves to advance other natural resource conservation goals and human well being.

## **Accomplishments to date**

Through extensive outreach efforts, the Estuary Program has improved the public understanding of how the Hudson Valley's streams and rivers are interconnected to the Hudson River Estuary ecosystem and related conservation concerns. The Hudson River Estuary Program has assisted in establishing and supporting the development of 10 watershed conservation groups and programs on the tributaries of the Hudson. Through these efforts, a river stewardship ethic has been instilled in many Hudson Valley communities to conserve Hudson River tributaries and their watersheds. Several of these watershed partners are being supported to develop watershed conservation and management plans. Two intermunicipal watershed agreements have been adopted. The Wappinger Creek Intermunicipal Council and Saw Mill River Coalition, comprised of local elected officials and river advocates, have signed pilot watershed "agreements" to implement water resource protection goals. Similar intermunicipal efforts are planned for the Fishkill Creek, Moodna Creek, Fall Kill Creek, Wallkill River, Rondout Creek, and other tributaries where watershed planning is underway. Education and technical assistance are delivered region-wide through watershed groups, NY Sea Grant, and our partners in County Environmental Management Councils, Cornell Cooperative Extension, Soil and Water Conservation Districts, planning departments, and water authorities. Citizen water quality monitoring is ongoing through school and adult programs by Hudson Basin River Watch. Colleges and universities are developing and implementing programs to assess local streams, and work with local communities to advance watershed conservation.

The Estuary Program has partnered with county and local governments to identify and adopt strategies for protecting water resources, such as inclusion of water resource and stormwater management considerations in comprehensive plans, riparian and wetland buffer protection ordinances and stormwater local laws. With the issuance of new stormwater regulations, education and technical assistance programs are underway to promote compliance and to educate municipalities, developers, consultants and contractors about better design principles that can be adopted as part of a stormwater program to promote on-site water resource conservation techniques. With assistance from the Estuary Program, the first pilot town has adopted 22 better site-design revisions to their local codes to reduce impervious surfaces, protect natural areas and better integrate stormwater treatment in development projects. The Hudson River Watershed Alliance (HRWA) is a regional collaboration of more than 200 organizations and agencies sharing the common goal of protecting and restoring water resources throughout the Hudson River basin. Another partner effort is a systematic regional planning process coordinated

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by The Nature Conservancy to help prioritize healthy tributaries and their watersheds for more rigorous watershed protection planning and action, helping focus some resources in meeting regional Hudson River tributary goals.

## **By 2009**

1. Assist eight community-led watershed groups in developing and implementing watershed protection and restoration plans, while engaging municipalities to take a leadership role through such measures as intermunicipal watershed agreements and incorporating water resource considerations in comprehensive plans. Encourage municipalities to take action on goals that implement local watershed plan priorities, protect the ecological health of headwater streams, revitalize urban waterways, prepare for the water-related effects of a changing climate, and address the targets of this *Action Agenda*.
2. By 2007, develop a framework to collect and assess trends for measuring key tributary inputs and water quality. By 2008, begin to implement this framework to demonstrate progress in meeting long-term targets and watershed health.
3. By 2006, develop a framework for characterizing dams and other stream barriers to identify potential barrier removal and stream restoration opportunities. By 2009, implement pilot dam-removal projects, where practical for stream restoration.
4. By 2008, map and characterize riparian buffer health of the Hudson River Estuary watershed to assist in identifying opportunities for protection and restoration. By 2009, through partnerships, implement riparian tree-planting programs where practical, including projects along urban streams.
5. With the assistance of the private sector and other partners, identify and catalog demonstration projects on residential, commercial and government properties, showing a variety of successful habitat restoration/conservation practices and water quantity and water quality control techniques, and establish programs to assure that key groups, including municipal officials, see them in operation throughout the Hudson Valley.
6. Establish and implement programs to reduce the adverse effects of stormwater runoff from impermeable surfaces. Use new and existing technologies to maintain and restore wetland and stream hydrology and recharge aquifers by retaining and managing water on site. Work with local partners in selected watersheds to develop and deliver training and assistance to municipalities on adapting to the potential effects of climate change, including the management of activities which tend to increase stormwater runoff and local flooding. Promote protection of floodplains, natural habitats, vegetated areas and groundwater infiltration through smart growth practices such as conservation design, low-impact development or better site design practices.
7. Collaborate with builders, businesses, landscapers, other nontraditional partners, as well as county Soil and Water Conservation Districts and municipal entities to create an incentive-based recognition approach to conserve water resources and wildlife in the Hudson River Valley.

8. Train 100 educators and 150 community leaders to recognize and understand the opportunities, optional methods, and benefits of Hudson Valley community planning and management in protecting the streams and tributaries of the Hudson River Estuary watershed.

9. Develop guidelines for local governments and regional organizations to incorporate in-stream flow needs for fish and aquatic life into their public water needs planning.

### **5-15 Year Targets**

The following targets related to water quality, in-stream flow, and wildlife habitat will be accomplished through local partners and implementation efforts, using local watershed planning efforts and intermunicipal agreements supported by this program, in addition to other initiatives.

10. By 2012, improve habitat quality and river connectivity for migratory fish spawning and/or aquatic freshwater species in at least 25 miles of new free-flowing river by removing at least 2 in-stream barriers such as dams, inadequate culverts, or other obstructions.

11. By 2015, protect and restore 750 miles of forest buffers through cooperative partnerships and local land use strategies to protect habitat, reduce flooding damage, and cleanse stormwater runoff.

12. By 2017, maintain existing water quality in Hudson Valley streams and rivers, while restoring to "best use," 25 percent of the waters listed as "precluded" or "impaired" by non-point sources, other than air pollution and contaminated sediments, on the state's most recent (1999) Priority Waterbodies List.

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## ***Goal 5: The Landscape***

### **Goal**

Conserve key elements of the **human, pastoral landscapes** that define the character of the Hudson River Valley and its setting of history and mystique.

### **Challenge**

The Hudson has been a working river from its earliest settlement leading to the development of commercial and recreational waterfronts, as well as its historic community centers. Likewise, the Hudson Valley, as a working valley, has benefited from the moderate river climate as well as the area's geography. Agriculture, forestry and the presence of "wild" open space have long been recognized as important components of the region's landscape. They maintain the rural character so loved by Hudson Valley residents and visitors. However, the economics of maintaining these traditional land uses and increasing pressure from sprawl threaten their long-term viability and our sense of regional identity. Supporting these and other aspects of the Hudson Valley's natural heritage will help maintain the region's diverse economic base, as well as protect its irreplaceable scenery, habitat, and character. In addition, the need to conserve open space, especially along our shorelines, is increasing to mitigate the effects of flooding on our communities and local infrastructure. The Hudson Valley has the potential to become a model for conserving the natural landscape while meeting human needs.

### **Accomplishments to date**

In ten Hudson Valley counties, state open space programs have conserved more than 46,133 acres since 1996. Many communities are developing open space plans and several have adopted funding mechanisms to conserve local open space. Federal funds are supporting forest stewardship on about 5,000 new acres per year. Additional lands have been conserved in the five boroughs of New York City. State grant programs through the Hudson River Valley Greenway, the DOS Coastal Program, the Estuary Program and the Office of Parks, Recreation and Historic Preservation all support these efforts.

### **By 2009**

1. Conserve 75,000 forested acres by working with private land owners to retain the characteristic woodland landscape. Use existing regional, state and federal forestry programs to encourage private forest landowners to: a) practice sustainable forestry, or "forest stewardship" on 45,000 additional privately owned acres over and above the 2005 baseline; b) commit 30,000 new acres to forest management through the forest tax law and other programs; and c) provide access to hunting, bird-watching and other pursuits.

2. Support the development of a statewide cost-sharing program for private forest landowners—as recommended in the 2002 Open Space Conservation Plan—to obtain professionally developed "Forest Stewardship Management Plans" for their properties. Implement stewardship management practices to conserve and enhance forest resources, water quality, wildlife habitats, biodiversity, and aesthetic qualities.
3. Retain the traditional agricultural landscape through the efforts of the State Department of Agriculture and Markets in supporting the viability of agriculture with regional, state and federal agriculture programs, including farmland preservation and stewardship programs.
4. Develop new tax incentives to encourage sustainable conservation management of private lands, and encourage landowners to more fully utilize existing incentive programs.
5. By 2006, reach the goal established in 1996 of acquiring 4,000 acres along or in sight of the Hudson River, and by 2009, working with many partners, protect 2,000 additional such acres. Prioritize conservation of parcels that provide north-south connectivity between larger habitat areas or conserve natural shoreline.
6. In partnership with local government, land trusts and others, permanently protect 40,000 acres of open space for wildlife-related recreation and for conservation of biodiversity, scenery and landscape character in the greater Hudson Valley, in addition to those protected from 1996-2006. Prioritize conservation of parcels that provide north-south connectivity between larger habitat areas or conserve significant ecological communities or pastoral landscapes.
7. Continue the Hudson River Estuary Grants Program support for local acquisition and open space planning by municipalities and conservation groups and for development of local open-space plans, site stewardship management plans, and local codes and ordinances that will allow the landscape objectives to be achieved.
8. By 2009, 20 percent of Hudson River Valley communities counties will have developed and implemented local open-space protection programs consistent with the state Open Space Conservation Plan.

## **5-15 Year Targets**

9. Ensure that by 2020, at least 50 percent of Hudson River Valley communities develop and implement local open-space protection programs consistent with the state Open Space Conservation Plan.
10. By 2020, working with land trusts and local governments and using a combination of fee, easement and other conservation mechanisms, protect 200,000 acres in the greater Hudson Valley for wildlife-related recreation and for conservation of biodiversity, scenery and landscape character, and working farms, of which at least 10,000 acres should be along or in sight of the Hudson River. Prioritize conservation of parcels that provide north-south connectivity between larger habitat areas.

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## ***Goal 6: River Scenery***

### **Goal**

Conserve the key features of the world-famous **river scenery**—the inspiration for the Hudson River School of American painting and for the tales of Washington Irving—and provide new and enhanced vistas where residents and visitors can enjoy Hudson River views.

### **Challenge**

For over a century, New York State has acted to preserve many of the Hudson River Valley's most dramatic scenic features — the Palisades, the Hudson Highlands and the views of the distant Catskills. The state's designated scenic areas of statewide significance are all located in the Hudson River Valley. Many vistas made famous by Hudson River painters remain essentially intact today. However, these and views of or from many publicly accessible historic sites are not protected from future changes that could alter or destroy them. Many Hudson River communities do not recognize these visual resources as unique community assets that also bolster the quality of life for residents and contribute to the region's tourist economy. Viewing opportunities to appreciate the river's scenery are limited and could be enhanced. Protection of river scenery will assist in achieving other *Action Agenda* goals, including those for waterfront revitalization, river and shoreline habitats, watershed conservation, plants and animals and public access. As we continue to improve the water quality of the Hudson itself, property values are increasing. We are moving aggressively to conserve the waterfront and adjacent upland areas of the Hudson as the renaissance of the Hudson River Valley continues.

### **Accomplishments to date**

This project focuses on views of and from the Hudson River. Since 1996, more than 3,500 acres of land along or in sight of the Hudson have been conserved through state open space programs. Grants to partner organizations have supported watershed analyses for Olana State Historic Site, vista restoration for the historic Wilderstein property, and removal of derelict utility poles along the Metro-North Hudson River railroad tracks. The Hudson River Valley National Heritage Area has started to develop an inventory of vistas painted by the Hudson River School of Painters, as well as other areas of environmental and scenic significance.

The Hudson River Valley Greenway is working with NYSDOT and the Federal Highway Administration National Scenic Byways Program to explore the potential for a system of scenic byways in the Hudson River Valley. The NYSDOS Coastal Program continues to fund Local Waterfront Revitalization Programs which encourage protection of scenic resources as a critical component of waterfront development, and to apply the coastal consistency requirements on scenic protection in the Hudson River Valley.

## **By 2009**

1. Encourage 15 municipalities to develop programs to inventory and protect important local river vistas.
2. Continue the annual Hudson River Estuary Grants Program support for local projects that protect or enhance scenic river vistas and promote the conservation of the scenic quality of the river.
3. Protect key scenic properties, as described under the “Landscape” goal.
4. Develop a program to designate and conserve 400 scenic viewpoints of the Hudson Valley by the 400<sup>th</sup> anniversary of Henry Hudson’s voyage.
5. Through partnership with the Hudson River Valley National Heritage Area, develop an inventory of the key vistas painted by the Hudson River School of Painters and viewsheds associated with public recreational and historic sites, and develop a program for their conservation.
6. Provide training and technical assistance for local government in the use of tools for scenic conservation.
7. Secure the conservation of one or more key scenic vistas, and showcase the community river vistas that have been protected.

## **5-15 Year Targets**

8. By 2012, implement the program to designate and conserve 400 scenic viewpoints of the Hudson Valley, and designate an additional 600 scenic viewpoints.
9. By 2015, conserve the key viewsheds from publicly accessible parks and historic sites, and their cultural landscapes and set a long term target of permanently conserving 25 vistas painted by the Hudson River School of Painters.

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## ***Goal 7: Public Access***

### **Goal**

Establish a **regional system of access** points and linkages so that every community along the Hudson has at least one new or upgraded access point to the river for fishing, boating, swimming, hunting, hiking, education, or river watching.

### **Challenge**

The main stem of the Hudson River and its shores offer exceptional opportunities for a variety of outdoor experiences including: swimming, fishing, boating, hunting, hiking, education and river-watching. Water quality has improved markedly in the last 30 years, and the demand for river access by residents and visitors is growing. Getting the people to the resource is vital. The challenge of creating public access is affected by shoreline topography, railroad rights-of-way, land ownership patterns, and local water conditions. Design standards for access facilities must ensure that habitat is not degraded and consider the effects of a changing climate, including a projected increase in local shoreline flooding events. Exploring the use of the public trust doctrine as well as other local conditions will be key to meeting this goal. Achieving the targets of this goal may also be implemented by progress in other aspects of the plan: waterfront revitalization, open space and scenery. In addition, fishing and water quality management targets will improve conditions for fishing and swimming.

### **Accomplishments to date**

Since 1996, trailered boating access has been created or upgraded at 7 locations, and access for small craft has been established at 14 locations. Nine projects to create access across the railroad tracks are underway or completed. A study of potential sites for swimming beaches has been completed. Two new fishing piers have been opened, and three others are in the planning, design or construction phases. Fishing access has been mapped along the entire estuary. The Hudson River Greenway Water Trail is nearing completion, and 190 miles of the riverside hiking trail have been designated by the Hudson River Valley Greenway.

### **By 2009**

1. Improve public access to the water and the shoreline so that by 2009 every river community has at least one new or improved access opportunity.
2. By 2008, survey and map current public access points along the river and tidal portions of the tributaries. Make this information available to the public and update on a regular basis. Identify locations where additional access is needed.

3. In addition to sites already improved since 1996, create and/or upgrade at least four boating access sites in areas of greatest need 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 using grants and municipal agreements.
4. By 2008, develop and implement plans for a system of fishing access sites. Continue to educate the public about safe fishing practices, including health advisories.
5. Identify potential swimming areas, and provide assistance to interested partners in developing those sites for such use.
6. By 2009, substantially complete the Greenway Water Trail for small non-motorized water craft, with one launch site at least every 10 miles and one camping /overnight accommodation site every 15 miles on each shore, and by 2009, relying on voluntary agreements, add 30 miles of riverside trails and 30 miles of countryside corridor and connector trails to the Hudson River Greenway Land Trail system.

### **5-15 Year Targets**

7. Work with landowning state agencies to coordinate management objectives of all state-owned property on or in sight of the Hudson so that habitat and recreational needs are met.
8. Develop a plan for new shoreline access points across the railroad tracks, and implement feasible projects. Fully use the public-trust doctrine where applicable.
9. Establish new or upgraded recreational boating access where feasible, focusing on areas of greatest need.
10. Establish a network of fishing access sites linked, where possible, to public transportation. Establish at least one shore fishing access per 10 miles.
11. Double the number of public swimming beaches on the Hudson, and improve facilities at the four existing beaches including bath houses.
12. Create 5 new shoreline access points across the railroad tracks.
13. Relying on voluntary agreements, complete the Hudson River Valley Greenway Land Trail on both sides of the river from Waterford to Manhattan, and promote use of the paddle craft Greenway Water Trail, as a segment of a statewide Blueway Trail System.
14. Develop standards for improvements at access points to insure that new facilities and /or upgrades to facilities are designed to withstand projected increases in shoreline flooding events due to climate change.

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## ***Goal 8: Education***

### **Goal**

Promote **public understanding of the Hudson River**, including the life it supports and its role in the global ecosystem, and ensure that the public understands the challenges the Hudson River faces and how they can be met.

### **Challenge**

Since its inception, the Hudson River Estuary Program has made great strides in better understanding many aspects of the estuary and its surroundings including its fish, its wetlands, the river's bottom, and the rich biodiversity of the landscape.

In order for this information to be effectively applied in future management decisions, long-term support for conservation of the region's resources must be built into the public's awareness of its role in the future of the region and the river. Likewise, the active participation of citizens, river users, scientists and community leaders must be engaged. To accomplish this, the information gathered by the Hudson River Estuary Program must be readily accessible to the public and local community leaders in formats that are user-friendly. Technical assistance must be made available to land managers, local governments and others to develop creative solutions to complex issues at the local level.

### **Accomplishments to date**

Since 1996, the Estuary Program has provided technical assistance and funded nearly 50 projects to develop a network of environmental education centers along the Hudson with high quality exhibits, facilities and programming. By coordinating river-wide efforts, such as the "Day in the Life of the River" and providing up-to-date scientific information about the river to valley educators, the Estuary Program is enhancing the quality of river teaching and making it easier for our partners to share resources and learn from each other. Estuary grant support has broadened capacity for river education at more than 20 sites, and classroom programs are underway in 40 Hudson Valley schools. In addition, partnerships have been established with academic and research institutions to strengthen these efforts.

Standards-based curriculum materials are being developed by Estuary Program staff and by many partners, including, among others, the "Teaching Hudson Valley" initiative of the Hudson River Valley National Heritage Area. The Hudson River National Estuarine Research Reserve is making data collected at Reserve sites available to schools through innovative electronic portals and is helping them use this information in science programs. DEC's education sites at Five Rivers and Stony Kill are supporting Project WET/WILD and hosting AmeriCorps interns, who offer educational programs every year through the Student Conservation Association.

## **By 2009**

1. Establish enough riverfront field education sites and facilities so that every school district in the Hudson Valley has a place to bring students for outdoor experiences.
2. Ensure that the public recognizes the Hudson River Estuary Program, and the National Estuarine Research Reserve as reliable agency sources of accurate, current information about the river's resources and opportunities for stewardship.
3. Develop for use by interested school districts, interdisciplinary Hudson River curriculum materials tied to state learning standards for all grade levels. By 2006, develop curriculum for grades 3-5, and test these lessons in at least one school. Provide training for teachers, and develop a plan to annually increase the number of school districts using these resources. In successive years, add curriculum for middle schools, primary grades (K-2) and relevant courses offered to grades 9-12. Encourage the use of Project WET and Project Wild. The lesson plans for grades 3-5 will be in use in 75 percent of the valley's school districts.
4. Through the Hudson River Estuary Grants Program, continue to support the development or improvement of facilities and programs for place-based interpretation and education that enhance public understanding of estuary management issues and opportunities to observe and directly experience fish and wildlife, the river environment and the natural landscape.
5. Expand annual programs such as the Hudson River Almanac and the "Day in the Life of the River" sampling event to increase public understanding of and involvement in the natural environment of the Hudson River.
6. Identify ways that the Hudson River Estuary Program can add value to the efforts of its education partners and implement as many of them as possible. Provide technical assistance to organizations offering education programs on the Hudson.
7. In 2009, 25 river education sites will celebrate Henry Hudson's 400<sup>th</sup> anniversary, with special exhibits and outdoor programs. Students will compare the river today with the river that Henry Hudson saw in 1609.

## **5-15 Year Targets**

8. By 2010, working with its education partners, the Hudson River Estuary Program will establish the Hudson as a national and international model for interdisciplinary environmental education. Host events that promote national or international partnerships.
9. Ensure 20 new opportunities per year for the public to experience, learn about and enjoy the Hudson River Valley's abundant and diverse natural resources.

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## ***Goal 9: Waterfront Revitalization***

### **Goal**

**Revitalize all the waterfronts** of the valley so that the Hudson is once again the “front door” for river communities, where scenery and natural habitats combine with economic and cultural opportunity, public access, and lively “green ports” and harbors to sustain vital human population centers.

### **Challenge**

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 as vibrant places to live and work. In the valley's urban areas, this includes returning long dormant waterfronts created by the loss, relocation, and retreat of waterfront industry, back to productive use with new businesses, a cleaner environment, and new recreational opportunities. Many of the Hudson Valley's smaller villages and communities are revitalizing their downtown and waterfront areas. At the same time, the region is facing large scale residential development pressure, particularly along the immediate shoreline of the Hudson River. These proposals, if not planned and implemented correctly, may cut off public access to the waterfront, impact water quality, impair habitats, impact scenic resources and impose a burden on public infrastructure.

Through its Local Waterfront Revitalization Program and Environmental Protection Fund grant program, the NYS Department of State (DOS) will continue to work in collaboration with local governments, regional organizations, businesses, community organizations, and citizens to improve their waterfronts — while advancing economic development opportunities and protecting natural coastal resources. 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 Land Trail and Water Trail. Directing new growth to urban and community centers also will help to protect open space and prevent habitat fragmentation.

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. The lighthouses on the Hudson provide an opportunity to link waterfront revitalization with education and tourism. Providing environmentally sound locations for these uses as well as working with communities to incorporate the most current information on local strategies to conserve critical shoreline habitats and adapt to a changing climate will further strengthen the waterfronts of the valley and help them adapt to changing conditions over time. As municipalities adjust to new economic opportunities, many riverfront communities are finding that environmental conservation plays a key role.

## **Accomplishments to date**

Interagency coordination of grant programs for economic development, parks, historic preservation, waterfront revitalization, brownfields cleanup, and water quality improvement has supported 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. DOS is working with 38 communities to prepare and implement Local Waterfront Revitalization Programs and other planning initiatives that guide the beneficial use, revitalization, and protection of their waterfront resources. As part of this effort DOS has assisted 10 communities to advance redevelopment plans in urban areas with vacant and abandoned waterfronts.

In addition, DOS has funded 225 Hudson River projects totaling more than \$41 million since the first Estuary Action Plan was adopted in 1996. DOS also has completed three multi-media packages featuring a new web site - [www.nyswaterfronts.com](http://www.nyswaterfronts.com), guidebooks and video. One package examines "How to Make the Most of Your Waterfront;" another is a guide to restoring abandoned buildings — "Opportunities Waiting to Happen," and a guide to preparing watershed plans was completed recently. These packages feature success stories from the Hudson River Valley.

As part of the DEC Brownfields Opportunities Areas program, conducted in partnership with DOS, 10 Hudson Valley communities have received \$1.8 million to help plan for the redevelopment of former industrial and commercial waterfronts in target communities with abandoned buildings and vacant waterfront parcels. In addition, the investigation of 21 brownfield sites is under way and remediations are under way for 5 others.

The Hudson River Valley Greenway has adopted "Greenway Principles for Economic Development." It has also allocated approximately \$7 million since 1996 for projects within the legislatively defined Greenway Area, which includes the riverfront from Waterford, Saratoga County, to the southern tip of Manhattan. Currently, 87 of 94 eligible riverfront communities and 224 riverfront and countryside communities, from a total of 259 eligible, have chosen to become designated Greenway Communities.

## **By 2009**

1. Advance the ten local waterfront revitalization programs (LWRPs) that are currently underway in the Hudson Valley, expand the number of communities advancing local waterfront programs and continue implementation of waterfront redevelopment plans with a focus on the cities of the Hudson Valley and on mitigating the residential housing development pressures in the valley.
2. Continue and expand the Greenway partnership with fellow state agencies, riverfront municipalities, and non-profit organizations to foster economic revitalization of riverfront communities. Expand access to the Hudson River through the Greenway Water Trail program for canoeists and kayakers, and through the development of the Greenway Land Trail for pedestrians, as well as through the preservation and protection of historic and cultural resources along the riverfront.

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3. Continue to promote and advance the multi-media information packages, developed by DOS, to facilitate waterfront revitalization efforts and provide communities with essential information that can help them achieve their goals.
  4. Continue a coordinated approach to the economic revitalization of waterfronts through state grant programs, and support infrastructure needs for waterfront revitalization efforts, especially in urban areas where public access is provided. Furnish technical assistance to marinas and boat clubs in managing environmental concerns.
  5. Promote cleanup and reuse of six or more additional contaminated, brownfield sites affecting the Hudson Estuary. Continue to encourage the participation of municipalities in the voluntary cleanup and restoration of contaminated urban waterfront sites. Provide technical and financial support to preliminary investigations and cleanups.
  6. Adopt urban-greening and smart-growth programs that improve the environmental quality and infrastructure of river cities and improve environmental conditions for disadvantaged populations.

### **5-15 Year Targets**

7. By 2015 , provide economic, scenic, ecological and recreational enhancements to riverfront sites which are being developed or redeveloped as part of a brownfield cleanup, Local Waterfront Revitalization Program or a Greenway strategy.

## ***Goal 10: Water Quality for Swimming***

### **Goal**

Ensure that the **Hudson River will be swimmable** from its source high in the Adirondack Mountains all the way to New York City.

### **Challenge**

Accompanying the rise in recreational use that the Hudson has experienced in recent years, a public call for increased swimming opportunities is being heard. Currently swimming is known to occur in any number of popular “anchoring” spots along the shore, including in areas not currently designated for swimming. However, in spite of the popular use of the river for swimming, there are very few publicly available swimming areas. In parts of the Hudson this use is limited by high pathogen levels, especially in the Capital District and near the mouths of some tributary streams. The primary sources of bacterial contamination include non-disinfected municipal discharges in the Class C portion of the river, non-point source stormwater runoff and combined sewer overflows (CSO) associated with heavy rainfall.

To make the river suitable for swimming would not only benefit eager bathers on a hot summer’s day, but would also promote other recreational activities and economic benefits associated with a healthy water resource. To reach this objective, the Hudson River Estuary Program and DEC’s Division of Water will focus on four primary areas of water quality impact: 1) need for seasonal disinfection of municipal wastewater discharges, 2) reduction of CSO impacts through appropriate control strategies, 3) implementation and compliance with Phase II Stormwater Permit Program, and 4) support for No Discharge Zones where appropriate. Although these strategies will be applied to the entire length of the river, much of the initial efforts will focus on water quality in the Capital District Area, where stormwater and combined sewer overflows from a number of municipalities along both the Troy and Albany sides of the river continue to discharge elevated levels of pollutants into the stretch of river known as the “Albany Pool.”

### **Accomplishments to date**

Since 1996, \$25 million from the Clean Water/Clean Air Bond Act has been invested in municipal facilities and infrastructure, which will result in measurable improvements to water quality. Much of this funding has gone to projects in the Capital District, where water quality needs improvement to be fully protective of public bathing. The state is working with municipalities in this reach to develop a Long Term Control Plan for CSOs to improve water quality in this portion of the estuary so that it is suitable for swimming. An additional \$25 million from the 1996 Bond Act has been allocated for water quality improvements in New York harbor.

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## **By 2009**

1. Assess the water quality of the Albany Pool to determine the actions that would be needed to achieve swimmable waters, and to measure progress toward that goal. Sampling began in 2005 and will be conducted both before and after the implementation of water quality improvement projects by DEC.
2. Disinfect municipal discharges where needed to achieve swimmable water quality on the Hudson Estuary from the Troy dam to New York City, as well as in the Upper Hudson above Troy. Seasonal disinfection of dry weather discharges (as needed) is to be incorporated into municipal SPDES permits by the end of 2007.
3. Address impacts from CSOs through implementation of best management practices by 2006 and Long-Term Control Plans for Hudson River municipalities by 2008.
4. Fully implement and ensure compliance with Phase II Stormwater Permits (MS4 and construction) for Hudson River municipalities by early 2008 and facilitate the use of rain gardens and green streets for low-cost approaches to storm water source control and groundwater recharge.
5. Continue to support No Discharge Zone in the Hudson River Estuary. Promotion of additional pump-out facilities to support this designation will continue.

## **5-15 Year Targets**

6. By 2020, swimming all along the Hudson River will be considered a routine and popular summertime activity, with new beaches and floating swimming pools drawing more and more New Yorkers to the Hudson waterfront each year.

## ***Goal 11: Pollution Reduction***

### **Goal**

Remove or remediate **pollutants** and their sources so that all life stages of key species are viable, and people can safely eat Hudson River fish, and so our harbors are free of the **contaminants** that constrain their operation.

### **Challenge**

Maintaining the commercial ports and recreational harbors on the Hudson requires periodic dredging of the main channel as well as docking berths and turn-around basins. In addition, many smaller marinas and boat clubs that service state residents and visitors are losing dockage areas and navigable channels because of sediment deposition.

Sediments in the estuary have varying levels of contamination. Sediment with relatively low levels of contamination can be amended and safely used upland, typically beneath a layer of topsoil or under paved areas. Dredging has the potential to adversely affect habitat, and, in some areas, the presence of contaminated sediments can make it difficult and costly to dispose of dredged materials, especially in the New York Harbor area. Port planning must meld environmental concerns with economic and port operation strategies necessary to respond to increased trade. Solutions are needed for the management of large quantities of dredged material currently causing problems in some areas. In the longer term, contaminant loadings must be halted at their source and upstream sediment loadings reduced. Ultimately a truly “green port” will take advantage of opportunities to beneficially reuse dredged material in a number of ways, including habitat improvement and brownfield cleanups. Another benefit of contaminant reduction is reduced uptake of pollutants into the food chain.

### **Accomplishments to date**

Through funding from the Port Authority of New York & New Jersey, DEC has completed an extensive research project studying contaminant levels in water, biota, and sediment in the estuary. A contaminant reduction model is being developed to determine the sources of contaminants and evaluate which ones would respond best to remediation efforts. The model will be used to develop total maximum daily loads (TMDLs) for the lower estuary. Design of the dredging remedy in the upper Hudson River as defined in USEPA’s 2002 Record of Decision is nearing completion, and implementation of the remedy is scheduled by USEPA to begin in 2007. The Hudson River Natural Resources Trustee Council, state and federal agencies that have a role in protecting and restoring natural resources, has been investigating injuries to fish, wildlife and other natural resources caused by PCB releases in the upper Hudson. They are coordinating their efforts to restore injured resources with the PCB clean-up project.

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## **By 2009**

1. By 2007, use the model to evaluate our capability of meeting targets for the reduction of contaminants in the River. Define the work necessary to attain appropriate contaminant concentrations by 2020.
2. Complete a characterization of sediment loading to the estuary and develop regional sediment management tools by 2009. Begin to investigate how sediment movement may be affected by projected increases in sea level and storm events associated with climate change.
3. Improve the quality of newly deposited sediments to target levels that will be established by 2007.
4. Develop the programs needed to promote soil and water management practices throughout the estuary to achieve the targets to be established by 2007. Work with three or more county soil and water agencies to reduce sediment transport in the estuary and implement sediment reduction projects and programs, especially in priority areas.
5. Dredged sediments will be beneficially reused where such use is determined to be protective of the public health and the environment.
6. Continue to systematically track down sources of contaminants in the Hudson River Estuary and monitor the response to pollution reduction activities. In particular, identify, quantify and remediate sources of contaminants of concern such as dioxin, PCBs, PAHs, metals, and pesticides. Review other chemicals that may become targets for future resolution. Work with USEPA as it guides implementation of the dredging remedy for PCB hot spots in the upper Hudson. Begin to investigate how contaminant movement may be affected by projected increases in sea level and storm events associated with climate change.
7. Evaluate opportunities and develop a plan to reduce contamination at the source which will facilitate future navigational dredging of New York Harbor and other ports on the estuary and minimize the uptake of these chemicals into the food chain.

## **5-15 Year Targets**

8. By 2020, sediment hot spots, and point and non-point sources of contaminants entering the estuary will be reduced, such that levels of toxics in newly-deposited sediments do not inhibit a healthy thriving ecosystem and can be dredged and beneficially reused with little or no treatment required.
9. By 2020, the quantity of sediments entering the estuary system will support the ecological health of the estuary, including protection of shallow water habitats, such as oyster reefs, without impairing navigational activities.

## ***Goal 12: Celebrate Progress and Partnerships***

### **Goal**

Track our progress and **celebrate** our successes!

### **Challenge**

The Hudson River ecosystem is going through a period of profound change. Zebra mussels have altered the food web, impacting the aquatic animal populations. The composition of terrestrial species is shifting as well, with consequences that are not entirely known. In the watershed, the patterns of development are changing, with the potential to affect water quality and habitats. Changes in our climate have the potential to impact aquatic and terrestrial habitats, species distributions, and shoreline and coastal infrastructure. The challenge is to be sure that we observe and record these changes in order to understand and predict how they will affect the river and to engage our partners in effective action to insure that development and growth are implemented in ways that minimize environmental impacts.

Today, we are in a better position to track these changes than ever before. In the last several years, we have established working partnerships with local governments, business leaders, schools and grass-roots non-profit organizations. These partnerships can usher in a new era of cooperation, if we nurture them. In partnership with regional academic and research institutions, DEC is poised to strengthen the scientific foundation of the Hudson River Estuary Program. The challenge is to make the Hudson a model for scientific management through productive partnerships.

With ambitious goals for the future, we also need to communicate with the public and our partners how well we are doing. We will need to track program effectiveness in meeting the Action Agenda goals, and we will need to establish broad understanding of what needs to be done to continue our progress.

Finally, it is beneficial to reflect upon and celebrate our successes, evaluating what has been accomplished and looking toward future achievements.

The Hudson River Estuary Action Agenda 2005-2009 offers a combination of ways that the program's successful achievements can be viewed and celebrated. The first step will be to work with our partners to develop a set of monitoring stations along the river to track critical components of the Hudson River ecosystem such as dissolved oxygen and water temperature. Scientific information gathered by the program's many studies will be presented in an understandable format, allowing the public to monitor progress, evaluate effectiveness of the program, and participate in future decision-making exercises to help

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guide the program. Celebrations such as National Estuaries Day will continue to bring heightened attention to the Hudson River and its many values. The upcoming Hudson Fulton Champlain Quadricentennial, in 2009 offers a unique opportunity to celebrate our accomplishments and pass on legacy projects, securing the future of the Hudson River for generations to come.

## **Accomplishments to date**

To date, the Hudson River Estuary Program has dedicated nearly 10 years to intensive research, adaptive approaches to management, public outreach and the development of partnerships with both state and federal agencies, local governments, and other involved groups and organizations, all for the betterment of the Hudson River Estuary and its surrounding watershed lands. Indeed, we have much to celebrate, as we have described in the preceding pages.

## **By 2009**

1. Partner with the Hudson-Fulton-Champlain Celebration Commission to identify opportunities to celebrate conservation accomplishments for the Hudson in 2009.
2. By 2006, complete the planning for a long-term program to track progress on the goals set for the river and to allow the public to follow our efforts.
3. By 2008, work with our partners to gather appropriate real-time, internet accessible monitoring data from the Hudson River. Support the efforts and report the findings of multiple partner organizations that conduct river monitoring activities, and link Hudson Valley monitoring to emerging national monitoring systems.
4. By 2009, gather and analyze available information on indicators of change over time in the Hudson River watershed, as was done for the NY-NJ Harbor Estuary. Make a summary report on the "State of the Hudson" available on our website.
5. By 2008, develop an information and data management system to ensure that the databases and reports generated by Estuary Program projects are readily available to our partners and the public. Develop strategies to foster greater integration between program projects.
6. By 2006, report on 10 years of progress since the first Hudson River Estuary Action Plan was adopted in 1996.
7. Annually celebrate National Estuaries Day (the 4<sup>th</sup> Saturday in September) with Hudson River activities.

## **5-15 Year Targets**

8. By 2010, develop funding mechanisms to establish long term collection of scientific information that is needed to support management decisions and to develop public understanding of the need for management action.

9. By 2010, enlist 1,000 partners (municipalities, businesses, non-profits, and individuals) in implementing this Action Agenda. Ensure that our partners represent the diversity of the Hudson Valley.

## Appendix A

### Hudson River Estuary Action Agenda 2005-2009

#### Estimated Program Cost

Goal / (Lead DEC Division)	HRE-EPF Funds	Other Funds/Match
<b>Signature Fisheries</b> (DEC-DFWMR) (Partner with federal agencies)	\$2,000,000	Seek \$500,000 federal (SWG)
<b>River Habitats</b> (DEC-DFWMR) (Partner with NYSDOS and USACE)	\$3,000,000	Seek \$2 million federal (ACE, NOAA, SWG)
<b>Plants and Animals</b> (DFWMR) (Partner with Cornell University, TNC)	\$2,500,000	Seek \$2 million federal (NRCS), State wildlife grant (SWG)
<b>Streams and Tributaries</b> (DEC-DOW) (Partner with WRI, Cornell)	\$1,800,000	Seek \$1 million (EPA)
<b>The Landscape</b> (DEC-DLF) (Partner with Greenway, NHA, OPRHP, NYSDOS, Ag & Mkts)	\$400,000	\$10,000,000 EPF open space, Federal forest stewardship funds
<b>River Scenery</b> (DEC-HREP) (Partner with Greenway, OPRHP and NYSDOS)	\$ 0	Possible NHA funds**
<b>Public Access</b> (DEC-DFWMR) (Partner with OPRHP)	\$2,000,000	Other EPF, federal LWCF**
<b>Education</b> (DEC-DPA) (Partner with NYS Education Department, OPRHP, Greenway)	\$2,000,000	Seek \$500,000 federal (EPA, NOAA, NPS)
<b>Waterfront Revitalization</b> (Partner with NYSDOS & Greenway)	N/A	Use state and federal funds**
<b>Water Quality</b> (DOW) (Partners with NEIWPC and WRI, Cornell)	\$4,000,000	Seek \$4 million federal funds
<b>Pollution Reduction</b> (DOW) (Partner with NY-NJ Port Authority)	\$400,000	NY NJ Port funds**
<b>Celebrate Progress</b> (HREP) (Partner with Rivers and Estuaries Center)	\$400,000	Seek additional monitoring**
Administration	\$1,500,000	
<b>Total</b>	<b>\$20,000,000*</b>	<b>\$20,000,000**</b>

\*The Estuary Grants program will be continued annually to carry out some of the Estuary Plan actions through local partners. The grants are contained in the above cost estimates by program area.

\*\*Additional matching funds are expected but cannot be quantified at this time.

## Appendix B

### Hudson River Estuary Management Advisory Committee Members and Ex-officios

**HREMAC Members:**

Dennis Suszkowski, Committee Chairman  
Hudson River Foundation

Judy Anderson  
Community Consultants

Allan Beers  
Rockland County

Andy Bicking  
Scenic Hudson

Jeff Clock  
Central Hudson Gas & Electric Corp.

Bill Conners  
Federation of Dutchess Co.Fish and Game Clubs

Bob Creeden  
Hudson River Waterfowl Protective Association

Gina D'Agrosa  
Westchester County

Bill Emslie  
Coastal Conservation

Stuart Findlay  
Institute of Ecosystem Studies

Bob Gabrielson  
Commercial Fisherman

Sara Griffen  
OLANA Partnership

Shannon LaFrance, Esq.  
Rapport, Myers, et.al.

Tom Lake  
Commercial Fisherman /Educator

Chris Letts  
Hudson River Foundation Educator

Eric Lind  
Audubon Constitution Marsh Sanctuary

Alex Matthiessen  
Riverkeeper, Inc.

John Mylod  
MT Nets

Jon Powell  
Columbia Greene Community College

Gregg Swanzey  
Hudson River Maritime Museum

David VanLuven  
The Nature Conservancy  
Eastern NY Chapter

Rene VanSchaack  
Greene County Soil & Water

John Young  
ASA Analysis Communication, Inc.

**HREMAC Ex-officios:**

Tom Baudanza  
NYC Department of Environmental  
Protection

George Stafford,  
Bob Elliott  
NYS Department of State

Mario Del Vicario  
US Environmental Protection Agency

Noreen Doyle  
Hudson River Park Trust

Nordica Holochuck  
NYS Sea Grant

Len Houston  
US Army Corps of Engineers

Mary Mangione  
Hudson River Valley Greenway

Boris Rukovets  
Interstate Environmental Commission