

*Conserving Habitat for the Future*



NOAA

***NOAA Habitat Program  
2008 NMFS Accomplishments***



*Dear Friends,*

*Healthy marine, coastal, and riverine habitats support abundant commercial and recreational fisheries, help protect inland areas from erosion, filter sediment and polluted runoff from watersheds, and contribute to our quality of life. But our nation's habitats are under threat. Coastal areas continue to undergo rapid development. Wetland loss on our coasts continues at an alarming rate. Pressures on habitats from development and pollution are taking their toll, and the effects of climate change on habitats are being documented. The challenges we face in the coming years will make our work more difficult and more important.*

*During 2008, the NOAA Habitat Program and its partners restored more than 7,300 acres of wetlands, river habitats, mangroves, corals, and sea bottom vital to our nation's valuable natural resources. We opened more than 600 stream miles for migrating fish; developed partnerships for habitat conservation on local, regional, and national scales; and taught thousands of volunteers and students how to care for their local coastal and riverine habitats and why their stewardship is important.*

*In service to the American people, the NOAA Habitat Program will undertake continued, focused efforts to monitor and conserve U.S. coastal and marine habitats, especially as part of a coordinated federal response to the effects of climate change. In this report, I am pleased to present a selection of Habitat Program highlights from 2008.*

*Patricia A. Montanio*

*Patricia A. Montanio  
Director, Office of Habitat Conservation  
National Marine Fisheries Service*



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**March 2009**

*The NOAA Habitat Program serves the American people by protecting and restoring our nation's riverine, coastal, and marine habitats. Healthy coastal and marine habitats support valuable fisheries and protected resources, improve the quality of our water, and buffer our coastal communities from the impacts of storms and sea-level rise.*

*A publication of the Office of Habitat Conservation  
National Marine Fisheries Service  
National Oceanic and Atmospheric Administration  
Department of Commerce*



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## The Value of Coastal and Marine Habitats

- Healthy riverine, coastal, and marine habitats support the biodiversity on which marine and coastal ecosystems depend.
- Nationwide, commercial and recreational fishing, boating, tourism, and other coastal industries provide more than 2 million U.S. jobs. Coastal recreation and tourism generate \$8 to \$12 billion for the U.S. economy each year.
- Coastal and estuarine wetlands provide shelter, feeding, spawning, and nursery grounds for fish and shellfish, birds, and mammals. Estuaries provide essential habitat for 68 percent of U.S. commercial fish harvest (by value) and nearly 80 percent of the recreational catch of marine species.
- As runoff and surface water pass through coastal watersheds and wetlands, pollutants are removed or transformed through physical, chemical, and biological processes, preventing them from reaching coastal habitats downstream.
- Coastal wetlands are natural, cost-effective buffers that protect coastal and downstream properties from the impacts of storms.
- Healthy coasts and estuaries are essential for protecting more than \$800 billion in trade and tens of billions of dollars in recreational opportunities each year, as well as more than 45 percent of the nation's petroleum refining capacity.

### ***Mission***

*To protect, restore, and promote stewardship of coastal and marine habitats.*

### ***Vision***

*Healthy and self-sustaining coastal and marine habitats that support vital ecosystem functions, abundant marine life, and resilient coastal communities.*

# Introduction to the NOAA Habitat Program

According to a 2008 report by NOAA and the U.S. Fish and Wildlife Service more than half the nation's original wetlands have been destroyed since the mid-1800s (Dahl and Johnson 1991). Despite a net national increase in U.S. wetlands between 1998 and 2004, the coastal watersheds of the eastern United States suffered an average annual net loss of 59,000 acres of wetlands during this time period.

The loss of wetlands and other marine, coastal, and riverine habitats hinders their functions and benefits. Coastlines and infrastructure become more vulnerable to winds, waves, storm surges, and floods, increasing financial burdens on coastal communities.

In the face of 21<sup>st</sup> century challenges such as rapid coastal development and the effects of climate change, the importance of conserving coastal and marine habitats and educating Americans about the value of caring for them has never been more critical. The Habitat Program is committed to making a difference through protection, restoration, sound science, and stewardship to ensure our nation's coastal and marine habitats, and their benefits, will be available for future generations.

***“Making a Difference Through Protection, Restoration, Sound Science, and Stewardship”***



## Habitat Protection: Protecting Habitat Health

The NOAA Habitat Program works with colleagues from NMFS and other elements of NOAA around the country, other federal agencies, environmental groups, industry, academia, and communities to understand and minimize human impacts on marine, coastal, and riverine habitats.

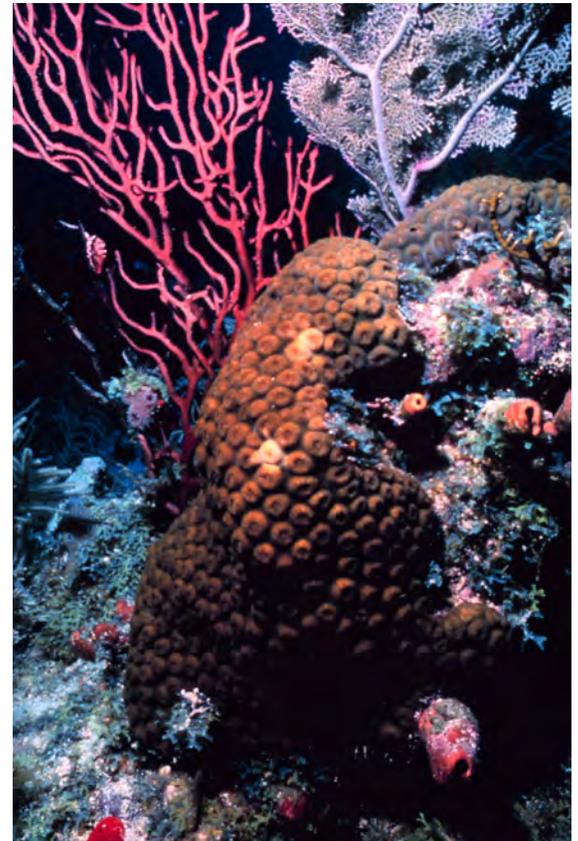
The Habitat Program conserves deep and shallow water coral ecosystems, improves federal mitigation guidance to protect coastal wetlands, and protects fish habitat through essential fish habitat consultations and fishery management actions.

### Conservation of Essential Fish Habitat through Environmental Reviews

Each year, NMFS regional offices and headquarters provide technical comments on about 5,000 individual actions including pre-application discussions, permit applications, license renewals, environmental analyses, management plans, and draft policies and guidance. Collectively, this work reflects stewardship responsibilities under nearly a dozen federal authorities and represents a major effort to protect marine, estuarine, and riverine habitats.

### Amended Anchorage Regulation at Port Everglades Protects Coral Reefs

The Habitat Program worked with scientists from the National Coral Reef Institute at Nova Southeastern University and local, state, and federal agencies to protect coral habitat from anchor damage at Port Everglades, Fort Lauderdale, Florida. In the past 10 years, nine vessel and six anchor incidents have damaged several acres of reef. As a result of NOAA's efforts, areas closest to sensitive coral reefs have been designated as off limits to vessel anchorage, restricting the amount of time vessels may remain in the anchorage area. Additionally, NOAA will begin noting coral habitat on all navigational charts for waters near Fort Lauderdale.



## Eelgrass Is Transplanted in Auke Nu Cove

Staff in the Alaska Region worked closely with the City and Borough of Juneau to offset the environmental impacts of a new dock and float for commercial vessels in Auke Nu Cove. Plans for the dock called for filling nearly five acres of productive intertidal habitat, including eelgrass beds that serve as essential fish habitat for important commercially harvested fish such as coho and sockeye salmon, Pacific herring, juvenile Pacific cod, several species of rockfish, and many other juvenile marine fish. In response to NOAA recommendations, the project was redesigned to avoid damaging area eelgrass habitat. One small portion of eelgrass could not be avoided and was transplanted elsewhere by NOAA staff with help from the City and Borough of Juneau, the U.S. Army Corps of Engineers, and Alaska Glacier Seafood Company. NOAA continues to monitor the newly transplanted area to determine the feasibility of future eelgrass transplant efforts in southeast Alaska.

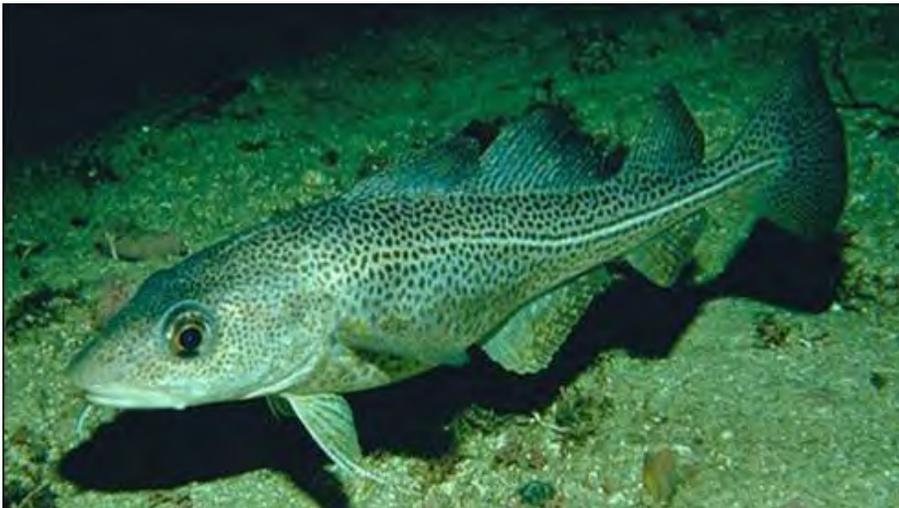


*Leveraging partners' resources to save eelgrass habitat in Auke Nu Cove.*

## Cod Recovery Efforts Benefit from NOAA's Advice on Winthrop Beach

In April 2008, the U.S. Army Corps of Engineers denied a permit request by the Commonwealth of Massachusetts to use 500,000 cubic yards of sand and gravel from a 103-acre offshore site in Massachusetts Bay for erosion control on 37 acres of Winthrop Beach.

The material would have been removed from an area of the Bay designated as essential fish habitat for 26 federally managed species, including Atlantic cod. Atlantic cod is an overfished but economically, ecologically, and culturally significant New England fishery. NOAA advised the Corps on alternate sources of material that would avoid the negative impacts of the proposed project. Denial of the permit, based largely on NOAA's advice, supported cod recovery efforts in Massachusetts and strengthened coastal communities, whose economies are based on a healthy fishing industry.



## Essential Fish Habitat Protection in the Bering Sea

In July 2008, NMFS issued a final rule implementing Amendment 89 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. The rule prohibits bottom trawling in 130,000 square nautical miles of the Bering Sea in order to protect bottom habitats. Amendment 89 establishes several conservation areas including: the Bering Sea Habitat Conservation Area; the St. Lawrence Island Habitat Conservation Area; the St. Matthew Island Habitat Conservation Area; the Nunivak Island, Etolin Strait, and Kuskokwim Bay Habitat Conservation Area, and the Northern Bering Sea Research Area (NBSRA). The NBSRA will play an important role in providing researchers with the opportunity to assess fishing effects on bottom habitats that have been fished without being subject to further fishing activities. The St. Lawrence Island Habitat Conservation Area is one of very few known blue king crab population areas within the North Pacific and Bering Sea.

# Habitat Restoration: Bringing New Life to Coastal and Marine Ecosystems

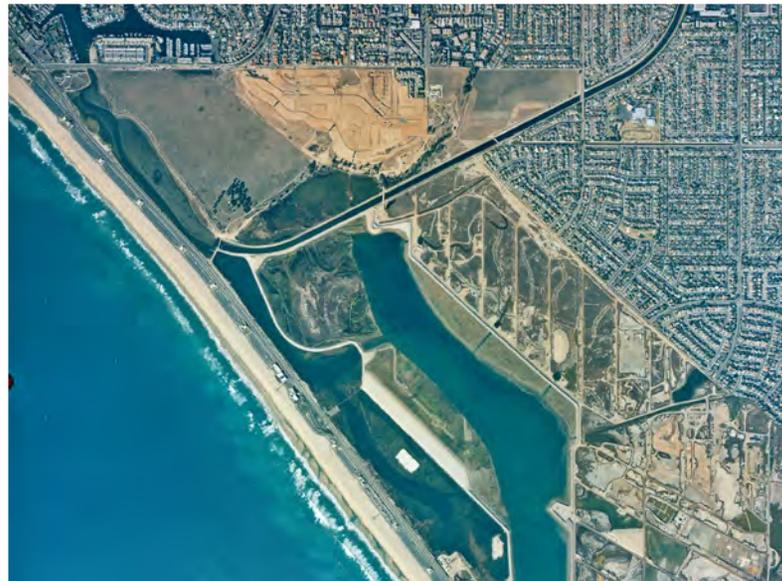
The Habitat Program rebuilds fish habitat lost to natural and man-made impacts. Such efforts help rebuild fisheries, support recreation, and strengthen the resilience of coastlines. The Habitat Program cooperates with other local, state, and national organizations to develop restoration plans, determine feasibility of restoration projects, and provide funding to selected projects.

## Salmon Creek Estuary Restored After Years of Lumber Mill Impacts

In 2008, NOAA completed restoration of the Salmon Creek Estuary, home to Endangered Species Act-threatened chum salmon, as well as Chinook and steelhead salmon. Much of this estuary has been uninhabitable for fish due to filled marshes and runoff from a lumber mill that started more than 50 years ago. This project removed more than 38,000 cubic yards of gravel and five derelict lumber mill buildings, along with the wood waste, and restored 2,600 feet of tidal channel and salt marsh. Shorebirds, waterfowl, and shellfish can now return to the creek, and bald and golden eagles can once again feed on salmon along the creeks and intertidal areas.

## Montrose Restoration Project Opens New Tidal Channels

As part of the Montrose Settlements Restoration Program, NOAA serves as the lead trustee overseeing a \$64 million program to restore natural resources harmed by millions of pounds of DDT and PCBs released into the southern California marine environment from the 1940s to the early 1970s. Fish habitat and recreational fishing were among the many resources injured by these chemicals, and the contaminants continue to harm fishing and fish habitat today. In 2008, the Habitat Program provided \$2.1 million for the Huntington Beach Wetlands Restoration Project as part of the larger Southern California marine restoration effort. The project will yield 140 acres of fully restored coastal wetland habitat along the Pacific Coast Highway, restoring essential fish habitat for important species. Additional funding is being provided to study halibut use of the restored wetlands. Bald eagles, peregrine falcons, and seabirds are also being restored through this program ([www.montroserestoration.gov](http://www.montroserestoration.gov)).



*Bolsa Chica Lowlands Restoration Project*



## Working with Korea on Oil Spill Assessment and Restoration

NOAA is supporting the Republic of Korea in its assessment and restoration of habitat after the Hebei Spirit oil spill in December 2007, the largest spill on record in South Korea. By offering guidance and technological expertise, NOAA has an opportunity to convey key messages about how the United States assesses and restores its coastal and marine resources after chemical spills and other disasters.

In May 2008, NOAA Restoration Center staff traveled to Seoul to help assess oiled areas, meet with local scientists and representatives, and offer guidance and technological expertise on best practices for restoration. The activities were part of an ongoing NOAA-wide agreement with the Republic of Korea's Ministry of Land, Transport, and Maritime Affairs to collaborate on integrated coastal and ocean resources management.



*Aerial view of Korean Hebei Spirit oil spill response efforts.*

## Emergency Coral Restoration in Puerto Rico

In March 2008, a strong winter storm caused significant damage to a coral reef along the north coast of Puerto Rico near Veja Baja, which had been recently identified as one of Puerto Rico's healthiest and most diverse reefs. A quick and thorough emergency response, managed by the NOAA Restoration Center, included damage assessments and stabilization of weakened corals that were at risk of further damage in the high energy environment.

## Fish Passage: Opening Stream Miles, Improving Habitat Health

Each year, dozens of fish species such as salmon, shad, striped bass, herring, and alewife migrate up U.S. rivers and streams seeking freshwater habitat to spawn. Throughout the nation, however, millions of dams and other barriers block these fish from healthy spawning grounds.

The NOAA Habitat Program provides fish passage expertise for addressing barriers both large and small. The Hydropower Program works with more than 100 hydropower projects annually, bringing outdated dam designs and operations up to modern environmental standards and consulting on the installation of fish ladders that provide fish passage over large dams. Through the Open Rivers Initiative, the Habitat Program works with partners to remove idle dams, replace culverts, and remove other barriers to fish migration.

Providing fish passage revives not only native fisheries but also the social and cultural traditions of the nation's rivers. When fish can reach healthier spawning grounds they have greater chances of successful reproduction, contributing to a healthier web of local plant and animal life, a more productive fishery, enhanced recreational opportunities, expanded local enterprises like tourism, and improved water quality.

In 2008, the Open Rivers Initiative removed 38 dams and other barriers, opening approximately 395 stream miles to migrating fish. The Hydropower Program opened 225 stream miles by working with dam owners, states, tribes, NGOs, and other partners during the hydropower dam relicensing processes.



*Fish ladder at McNary Dam on the Columbia River in Washington State.*



## Klamath Dam Removal Agreement

NMFS helped negotiate a tentative agreement to remove the lower four dams on the Klamath River in what will become the largest dam removal project in U.S. history. By opening more than 300 miles of historic habitat, threatened Coho salmon, commercially important Chinook salmon and steelhead, and culturally important lamprey will be able to swim freely from the Pacific Ocean to their spawning grounds in the upper reaches of the Klamath for the first time in a century.

The dam removal agreement, along with the related Klamath Basin Restoration Agreement, will help strengthen Pacific salmon populations and the fisheries that depend on them. Beleaguered Klamath salmon runs were once some of the largest on the Pacific Coast. Less than 10 percent of the historic Klamath salmon runs survive today. In recent years, low salmon populations levels have led to many West Coast salmon fishery closures. Stronger Klamath runs could help avoid such closures in the future. The agreement to remove the dams will trigger the Klamath Basin Restoration Agreement. This agreement is embraced by farmers, tribes, fishermen, and conservation groups, and will provide for the restoration of Klamath basin fish habitat and the sustainable use of the basin's resources.



*Iron Gate Dam on the Klamath River.*

## Penobscot River Restoration Reaches Its First Major Milestone

In 2008, the Habitat Program provided \$10 million in financial and technical support for an unprecedented collaboration to reopen nearly 1,000 miles of river habitat on Maine's Penobscot River. The project will remove two large dams and install a fishway at a third, benefiting 11 species of migratory fish, including ESA-listed Atlantic salmon. NOAA funding was crucial for the successful purchase of the three dams.

## Oregon's Gold Hill Dam: The NOAA's Largest Dam Removal

In summer 2008, the 900-foot-wide Gold Hill Dam was removed to provide unobstructed passage for salmon on the Rogue River in Oregon. Gold Hill Dam was one of the most damaging fish passage barriers on the Rogue River, second to Savage Rapids Dam, which is scheduled for removal in 2009. Together, the removal of Savage Rapids and Gold Hill dams will provide access to 16 miles of high-quality salmon spawning and rearing habitat. With the removal of the Gold Hill and Savage Rapids dams, and the eventual removal or notching of a third dam (Gold Ray), 300 miles of the Rogue River will be opened for salmon in Oregon.

## Ft. Halifax Dam Removed

The removal of the 29-foot-high Fort Halifax Dam on Maine's Sebasticook River began in July 2008, making way for migratory species such as alewife, blueback herring and shad to reach their spawning grounds in Sebasticook Lake. The NOAA Habitat Program played a significant role over the past 10 years in achieving the agreement leading to the removal of this century-old hydropower dam and allowing the Sebasticook River to flow freely to the ocean.

## The Merrimack Village Story

For nearly 300 years, the Merrimack Village Dam on New Hampshire's Souhegan River prevented migratory fish from reaching their traditional upstream spawning grounds. In 2008, the complex dam removal was accomplished through the NOAA Restoration Center's Open Rivers Initiative. The removal restored 14 miles of river habitat to its natural condition and opened healthier spawning grounds to species such as American shad, river herring, and Atlantic salmon.



*Merrimack Village Dam Removal .*





*Augusta Canal Diversion Dam.*

## **Augusta Canal Fish Passage Settlement Agreement**

In January 2008, a settlement agreement with the city of Augusta, Georgia, was signed requiring the city to install upstream and downstream fish passage at the Augusta Canal Diversion Dam on the Savannah River. Since 1840, the Augusta Dam has blocked upstream passage of anadromous fish to the majority of spawning habitat in the Savannah Basin, and since 1992 the Habitat Program has coordinated with the Georgia and South Carolina Departments of Natural Resources and the U.S. Fish and Wildlife Service to secure fish passage at this facility.

The new Augusta fishway will be constructed within three years after the Federal Energy Regulatory Commission issues a new hydropower license for the dam. The fishway will restore passage for American shad, blueback herring, sturgeon, striped bass, and American eel, reopening access to 13 miles of mainstem Savannah River spawning habitat and more than 510 miles of larger tributaries.

## Circle Creek Culvert Replacement

As with many small streams along the Oregon coast, Circle Creek, a tributary of the Necanicum River in Northwest Oregon, is critical to the survival of migratory fish such as Coho salmon, steelhead, and cutthroat trout. However, access to the meandering stream was impeded by an undersized and perched culvert beneath a road crossing. The NOAA Habitat Program partnered with American Rivers, Trout Unlimited, Oregon Department of Fish and Wildlife, and Weyerhaeuser Corporation to remove the 8-foot pipe culvert and replace it with a 20-foot “bottomless arch” culvert. The bottomless arch design allows a natural stream channel to form within the culvert, which will enable fish to easily move upstream to nearly four miles of high-quality habitat, considered to be key spawning habitat for species including ESA-listed Oregon Coast coho salmon.



*Circle Creek culvert replacement (before/after)*

## Nisqually River Estuary Restoration Project

The Nisqually River Estuary project aims to restore more than 700 acres of estuarine habitat and 21 miles of off-channel and slough habitat in the Nisqually River estuary, just south of Puget Sound in Washington. For more than 100 years, approximately one-half of external levee and 3 miles of dikes have kept the area from tidal influence. Removal of the dikes and levees will reconnect the land to Puget Sound and allow it to return to its natural state as estuarine habitat. The project, initiated in the summer of 2008, is the largest estuary restoration project in the Pacific Northwest. The restoration of the Nisqually estuary is expected to double the number of naturally spawning Chinook salmon in the Nisqually watershed. The project is an important step in the recovery of Puget Sound estuarine habitat.

## Colter Creek Culvert Replacement Project

Four culverts occur on Colter Creek in Wasilla, AK severely constricting the creek and creating velocity barriers to juvenile salmon. The Habitat Program's Restoration Center in partnership with the Nature Conservancy, the Mat-Su Borough, U.S. Fish & Wildlife Service, the Wasilla Soil and Water Conservation District, the Girl Scouts, and local landowners, are working to replace all four culverts with arched pipes. The restoration sites will be replanted and monitored with the help of volunteers and incorporated into existing environmental education programs conducted by the Wasilla Soil and Water Conservation District for local school children. The project will also be used to educate the public about fish passage. The Colter Creek Fish Passage Restoration Project will restore juvenile fish passage, improve stream function, and enhance fish habitat on Colter Creek.



*Local Girl Scout troop monitoring juvenile salmon status in Colter Creek.*

## Habitat Science: Supporting Resource Managers with Sound Science

The Habitat Program's mission requires that its work be grounded in decisions based on sound science. Decisions that impact the health and stability of the nation's marine, coastal, and riverine habitats are made daily by regulatory agencies, local fisheries managers, and private citizens making use of coastal areas. As part of a larger effort to advance prudent fisheries management, sound regulatory decisions, and a well-informed public, the Habitat Program supports scientific research leading to a better understanding of habitat functions and the relationship of those functions to the species that depend on them.

### *Studies, Descriptions, and Characterizations*

#### **NOAA-Funded Research Shows Loss of Coastal Wetlands and Benefits of Coastal Conservation**

In 2008, the NOAA Habitat Program worked with partners on two studies of coastal wetlands, both of which emphasized the importance of conservation.

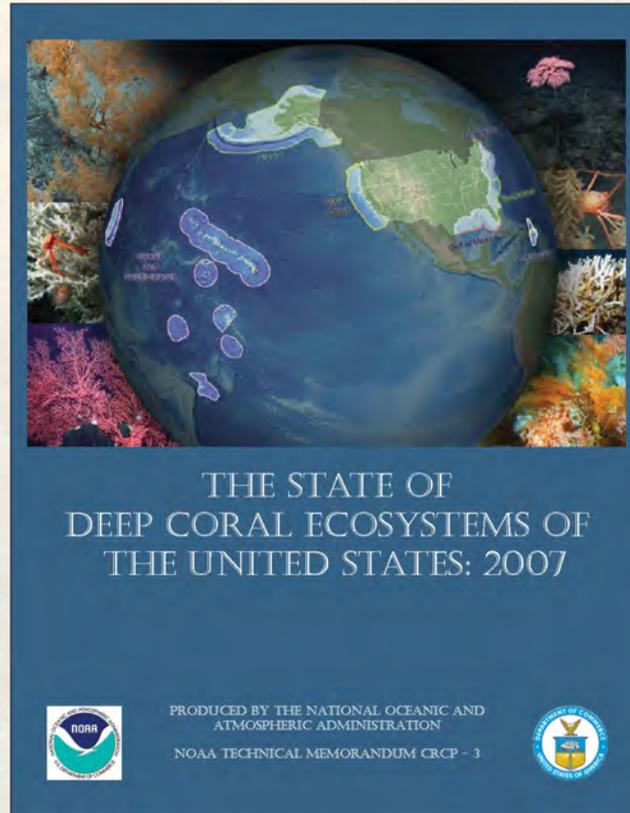
A joint study with and the U.S. Fish and Wildlife Service concluded that coastal watersheds in the eastern United States experienced an average net loss of 59,000 acres per year between 1998 and 2004. The report, "Status and Trends of Wetlands in the Coastal Watersheds of the Eastern United States," published in February 2009, points out that coastal wetland losses far exceed losses in inland areas and highlights the need for coastal conservation (both protection and restoration) to stem continuing losses.

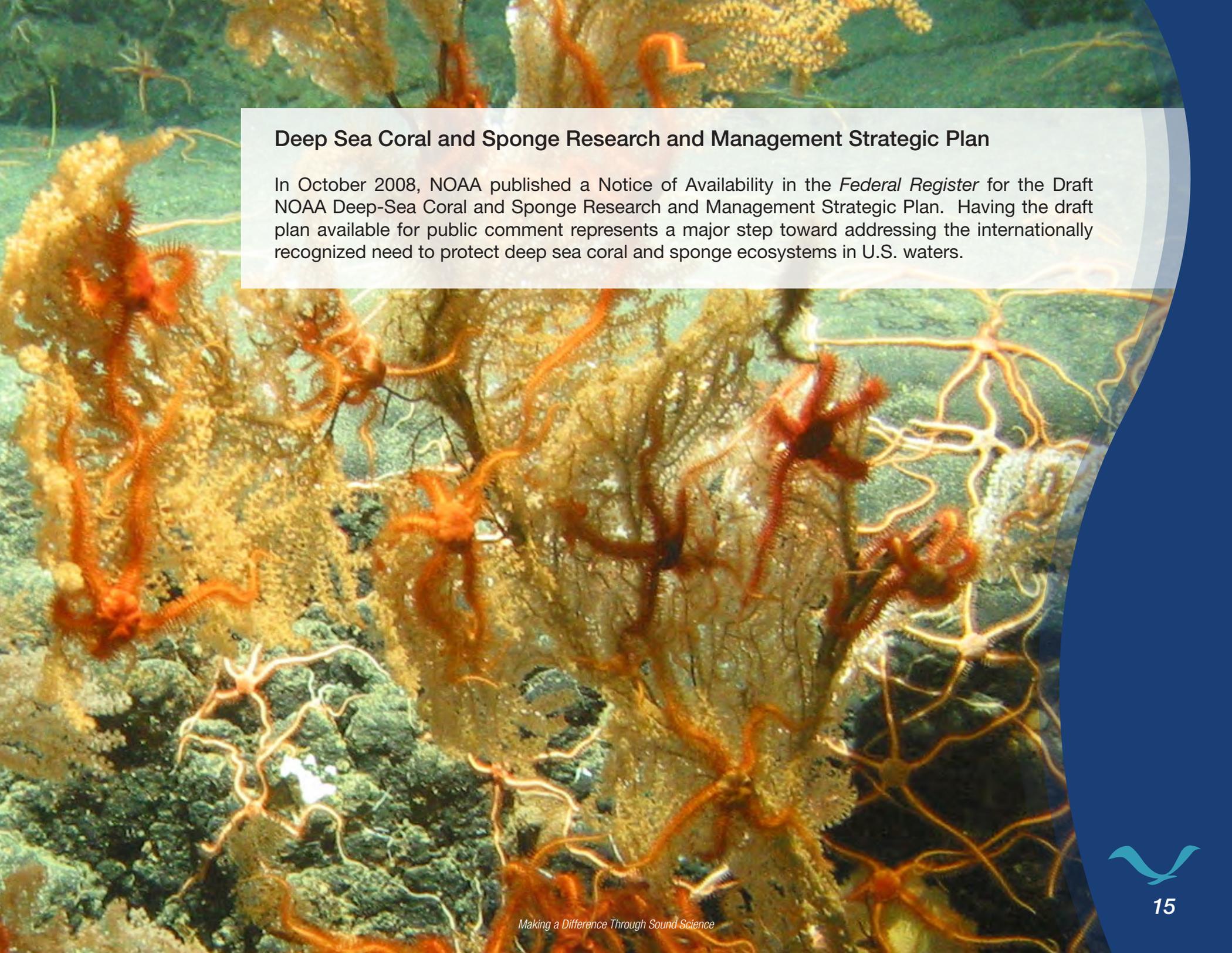
In addition, the NOAA Restoration Center and its partner Restore America's Estuaries produced the 2008 report, "Economic and Market Value of Coasts and Estuaries: What's at Stake." The report illustrates that coasts support most of the nation's economic output and population, and examines the economic costs of habitat restoration.



## Deep Sea Coral Reports

NOAA released the first comprehensive, peer-reviewed report on deep sea coral systems in the United States. "The State of Deep Coral Ecosystems of the United States: 2007" provides an up-to-date assessment of deep sea coral ecosystems in U.S. waters. Following the release of the status report, NOAA published its first Report to Congress on the Implementation of the Deep Sea Coral Research and Technology Program, called for in the reauthorized Magnuson-Stevens Fishery Conservation and Management Act. Both reports underscore the widespread nature of deep coral communities, their importance to sustainable fisheries, the lack of information about the details of their functioning, and the need to protect them through appropriate management.



An underwater photograph showing a dense and diverse deep-sea coral and sponge ecosystem. The scene is filled with various types of marine life, including large, branching sponges in shades of orange and yellow, and numerous brittle stars with their long, thin arms extending outwards. The background is a deep, dark blue-green, suggesting a deep-sea environment with low light levels. The overall appearance is that of a complex and intricate biological community.

## Deep Sea Coral and Sponge Research and Management Strategic Plan

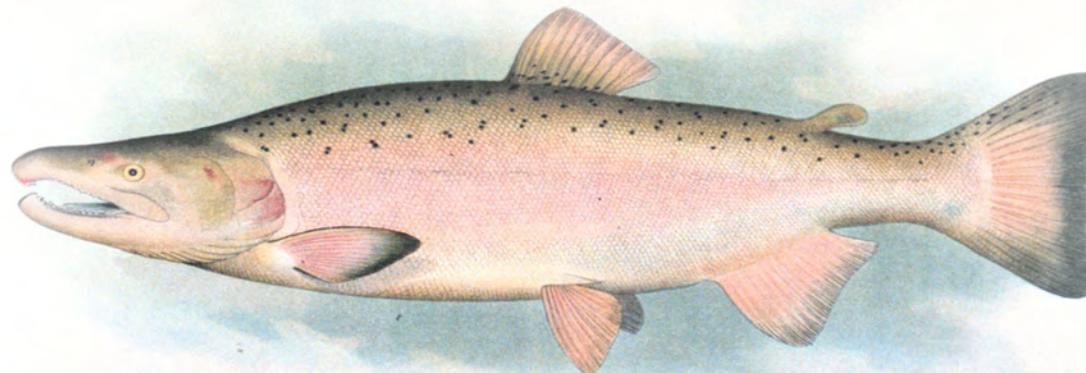
In October 2008, NOAA published a Notice of Availability in the *Federal Register* for the Draft NOAA Deep-Sea Coral and Sponge Research and Management Strategic Plan. Having the draft plan available for public comment represents a major step toward addressing the internationally recognized need to protect deep sea coral and sponge ecosystems in U.S. waters.

## Research to Support Management and Habitat Program Goals

### *The Effects of Habitat Restoration on Anadromous Species in Urban Watersheds*

The Habitat Program completed an intensive 6-year study to assess the effectiveness of habitat restoration activities for anadromous species in urban watersheds. The study found a phenomenon called “pre-spawn mortality” in coho salmon is likely to pose an increasingly important threat to wild salmon populations and will significantly influence salmon conservation and recovery efforts in urbanizing watersheds throughout California and the Pacific Northwest.

Adult coho salmon returning to spawn in restored urban streams in the Seattle area were displaying anomalous behavior, including erratic surface swimming and loss of equilibrium, and then died hours later at an alarming rate—up to 90 percent mortality in some areas. Working closely with collaborators from the U.S. Fish and Wildlife Service, City of Seattle, Wild Fish Conservancy, and King County, Habitat Program scientists investigated the cause and extent of these recurrent fish kills. The phenomenon was closely associated with the timing and amount of fall rains, which can mobilize toxic pollutants from urban areas in stormwater runoff.



SILVER OR COHO SALMON  
Breeding male

## Menhaden, Oysters, and Blue Crabs in the Chesapeake Bay

The NOAA Chesapeake Bay Office (NCBO) delivers science that resource managers need to make informed decisions, especially on key Chesapeake Bay species such as blue crabs, menhaden, and oysters. Analysis of persistently low blue crab populations noted in the “2008 Blue Crab Advisory” led the Chesapeake Bay blue crab management jurisdictions to strengthen regulations for the crab fishery. In 2008, NCBO sponsored a symposium to review the latest research on menhaden. The symposium included a discussion of NCBO-supported menhaden research findings, an examination of the Bay and coastal systems exchange, a review of larval studies to determine the abundance of juvenile menhaden, and a discussion of the findings on menhaden abundance in the Bay.

NCBO science also provides important contributions to oyster restoration and policy in the Bay. Results from NOAA-funded research on a non-native species of oyster were incorporated into the U.S. Army Corps of Engineers’ 2008 draft Programmatic Environmental Impact Statement on oysters in the Chesapeake Bay.

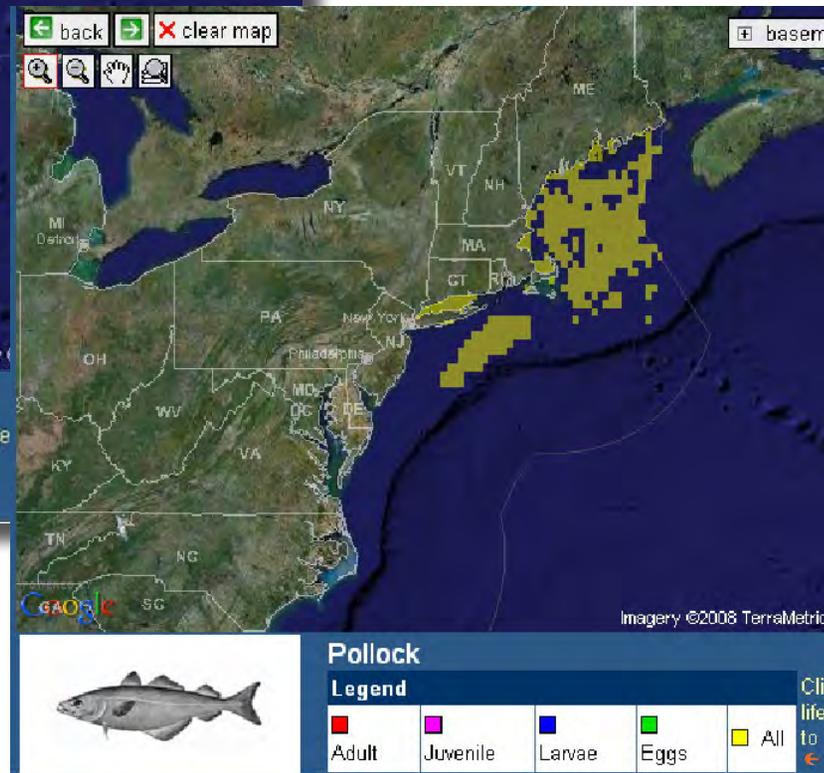
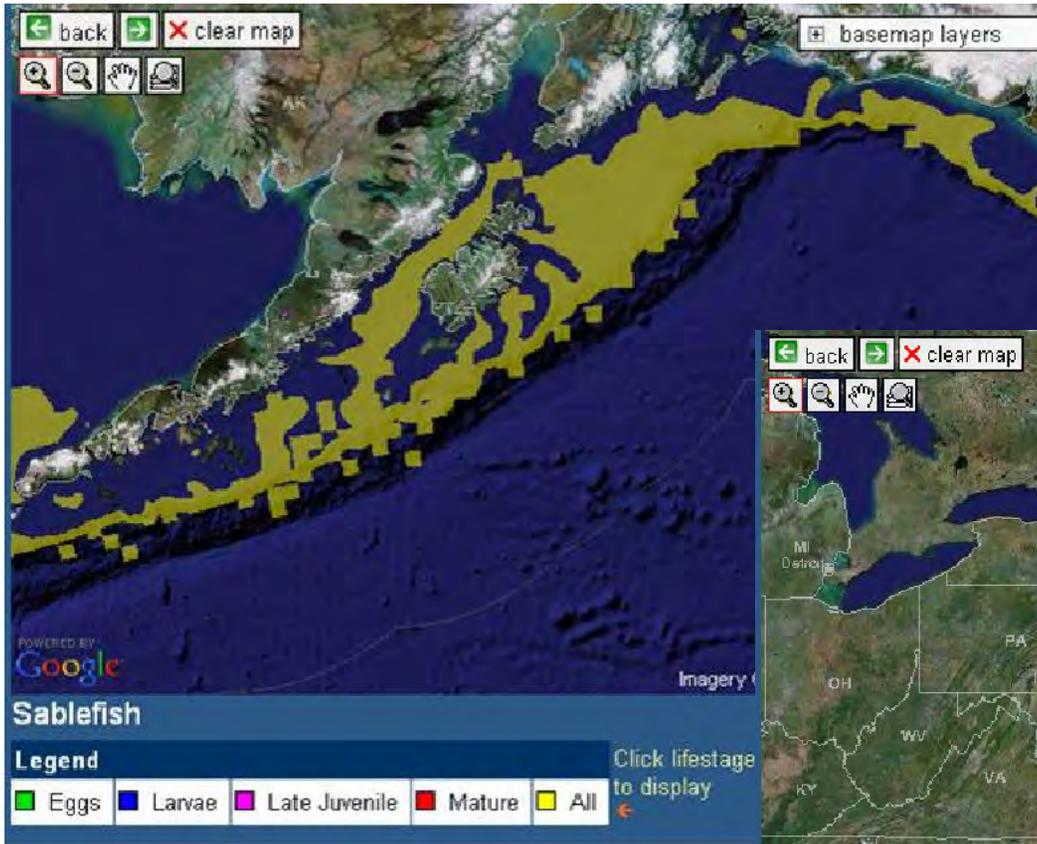




### Measuring the Impacts of Environmental Changes on Fish

The ability of juvenile salmon to survive and contribute to adult salmon returns is directly linked to the amount of available habitat. Additionally, it is anticipated that changes in habitat amount and availability as a result of climate change will likely be linked to survival potential for salmon as they enter the ocean environment.

A NOAA Habitat Program study currently under way involves use of 12 years of data on the abundance, growth, and distribution of juvenile salmon in the northern California Current ecosystem. Information obtained will link changes in juvenile salmon survival with atmospheric and oceanographic conditions, to allow projections of longer-term impacts of climate change and yearly forecasts of potential impacts on adult salmon returns. These projections and forecasts are needed to assess the recovery potential of endangered salmon stocks.



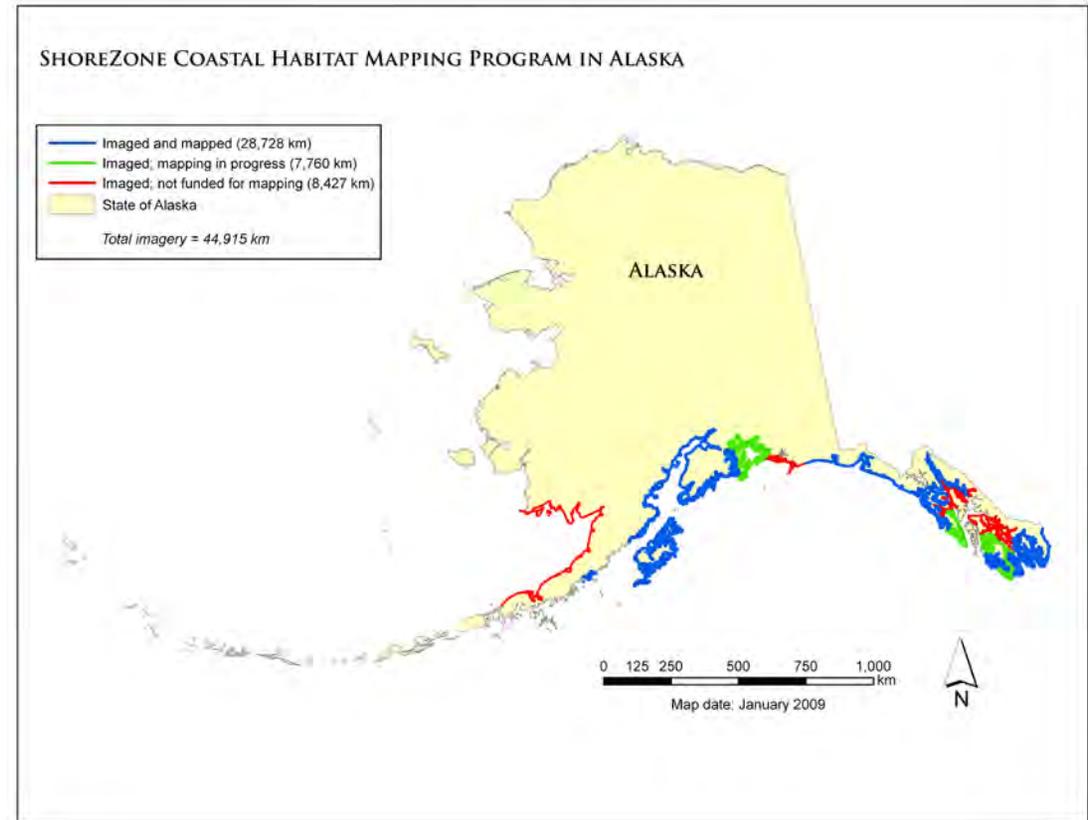
## The Essential Fish Habitat Mapper

NOAA completed the development of the Essential Fish Habitat Mapper. This web-based tool is the first of its kind to use a national database to display essential fish habitat (EFH) data and maps.

The Magnuson-Stevens Fishery Conservation and Management Act requires federal fishery management plans to identify and describe habitat necessary to fish for spawning, breeding, feeding, or growth to maturity. Managers consider specific protection measures for EFH areas. The new interactive Mapper enables managers and the public to seek information simultaneously from multiple fishery management plans and view habitat maps and species lists for specific locations. The Mapper uses web-accessible technology to create a platform for distributing spatial habitat data. It enables users to generate EFH maps for more than 100 species groups and displays more than 100 offshore areas identified as Habitat Areas of Particular Concern.



## ShoreZone Mapping in *Alaska*



**ShoreZone** is a coastal habitat mapping and classification system that uses aerial imagery to interpret and inventory geomorphic and biological features along coastlines. In 2001, the Habitat Program began using ShoreZone in Alaska. Now, just seven years later, nearly 5,000 kilometers of shoreline have been imaged, bringing the total area imaged by all of NOAA to approximately 45,000 kilometers. Mapping and classification is completed for about 29,000 kilometers of shoreline.

ShoreZone is an important coastal resources management tool with the potential to help address both local and broad coastal management planning issues. The NOAA Habitat Program's Alaska Region provides funding for ShoreZone and hosts its online interface on their website at <http://www.alaskafisheries/maps>.

The Habitat Program is actively seeking partners to help complete ShoreZone imagery collection and mapping for the entire Alaska coastline and to help make the images and data web-accessible to all users.

## Chesapeake Bay Fisheries Ecosystem Modeling

To quantify estimates of food web connections in the Bay, the NOAA Chesapeake Bay Office is developing the Chesapeake Bay Fisheries Ecosystem Model, a comprehensive computer-based ecosystem model of Bay area habitat. Resource managers can use the information generated by the model to understand how one stock affects another within the food web and how the Bay fisheries impact the ecosystem. For example, if more striped bass are caught, the model helps determine what this means for the menhaden population on which the striped bass feed. The model includes 45 functional groups of organisms, and synthesizes large quantities of fisheries data and research into a single tool.



*NCBO is currently developing three-dimensional computer-generated graphics to depict changes in the Chesapeake fisheries ecosystem based on various scenarios. These animations will be the foundation for educational and management tools. This snapshot from a short movie based on computer-generated imaging depicts the cleaner, healthier conditions in the Bay before nutrient pollution became problematic.*



## Invasive Species and Alaska

Habitat Program staff in Alaska provided leadership to address the threat of marine invasive species by implementing early detection and rapid response activities. Initially, efforts focused on the European green crab, which is expected to migrate northward from the Seattle-Vancouver area to southern Alaska. However, the crab has not yet been detected that far north. Working with the NOAA Aquatic Invasive Species Program, staff developed a European green crab habitat suitability map for southeast Alaska to identify and prioritize potential sites for early detection. Upon completing the maps, staff initiated a community-based monitoring program for the area. Working with the State of Alaska and the Prince William Sound Citizen's Advisory Council, Habitat Program staff trained volunteers and established community-based monitoring sites in Gustavus, Ketchikan, and Sitka. The monitoring efforts prompted the State of Alaska to develop and test a green crab rapid response plan.



## Habitat Stewardship: Cultivating Conservation-Minded Citizens

The Habitat Program increases awareness of the importance of coastal and marine habitats by providing education and training programs, and encouraging the involvement of volunteers, community members, and students in conservation efforts. The Program is committed to the principle that community participation fosters long-term stewardship of the nation's coastal and marine resources. The NOAA Chesapeake Bay Office has a robust education and outreach program aimed at increasing environmental literacy among citizens from kindergarten to retirement, and among local leaders and organizations who want to plan and implement restoration activities and influence management decisions at the federal, state, and local level.



*The "Scientist for a Day" project provided an opportunity for disadvantaged youth and their adult mentors to experience "habitat research" for one exciting day.*





## Eelgrass-Friendly Moorings

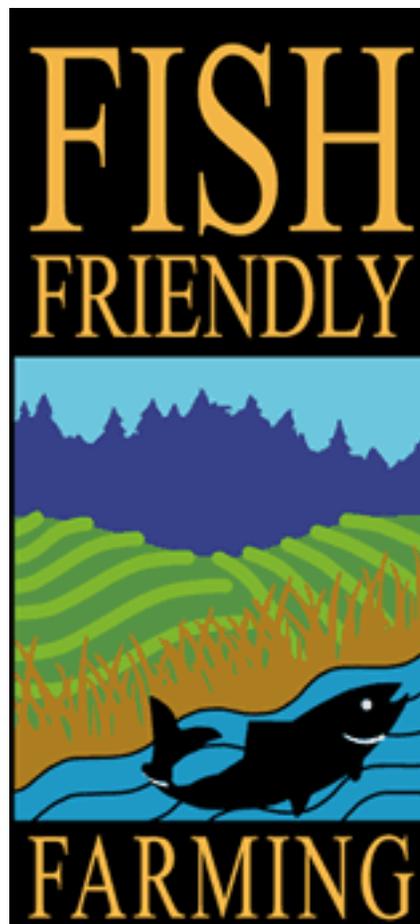
The Habitat Program began conducting a pilot project with Vineyard Haven, Massachusetts, Harbor Master to promote the use of more eelgrass-friendly moorings. This proactive effort to protect essential fish habitat from the damages of ship mooring will include the installation of an educational sign/kiosk at the harbor to inform recreational boaters of the environmental benefits of the eelgrass-friendly moorings. Though still in the pilot stages, the project is attracting attention from other harbor masters on the east and west coasts interested in learning more about the moorings.

## Fish Friendly Farming

NMFS staff serve on the Technical Advisory Committee of Fish Friendly Farming®, a certification program for vineyard properties in California that are managed to restore fish and wildlife habitat and improve water quality. Through the program, vineyard owners develop Farm Conservation Plans for their properties, in which they lay out strategies for implementing conservation projects. Projects can include conserving soil and water, limiting chemical use, and restoring and repairing riparian corridors.

Once certified, growers receive a letter from each agency recognizing their achievement in environmental land management, water quality improvement, and habitat protection.

In 2008, more than 14,000 total acres were inspected: 7,482 acres of vineyards and 7,142 acres of wildlands. Scientists identified 114 minor and 12 major road projects, 38 invasive plant removal and native-plant replacement projects, 13 creek stabilization/willow planting projects, 13 ditch erosion projects, four fish screens that require upgrading, and 16 other erosion control projects within the vineyards. Although primary participants remain wine-grape growers, inspections of operations growing pears, walnuts, and olives also began in 2008.



## Educating Our Nation's Future Stewards

The NOAA Chesapeake Bay Office is developing innovative ways for educators to use real-time data from the Chesapeake Bay Interpretive Buoy System (CBIBS) in their classrooms. CBIBS is a network of six observational buoys that collect and transmit real-time environmental data to a wide variety of constituents including scientists, commercial and recreational boaters, educators, and natural resource decision makers.

In 2008, NCBO began developing the concept of the Basis Observation Buoy (BOB) to give students a hands-on experience with observation buoys. The BOB was conceived as a way to use lower-cost electronic sensors to increase the coverage of water quality observations in the Bay and to teach students about water quality. BOBs are designed so they can be built, installed, calibrated, and deployed by students. The prototype BOB was deployed in 2008; and will be ready for student use in 2009. A companion observational tool, the Fixed Local Observation (FLO), will be a similar tool attached to a pier or landing.





## National Fish Habitat Action Plan

The National Fish Habitat Action Plan (NFHAP) is a blueprint for action by private and public partners to improve fish habitat through regional partnerships taking targeted action. In 2008, NOAA and other members of the National Fish Habitat Board developed strategic planning guidance for Fish Habitat Partnerships and revised guidance on becoming a Board-recognized Partnership. The NOAA Habitat Program worked with nine Board-recognized and Candidate Fish Habitat Partnerships to develop and implement their strategic plans to achieve maximum benefits for harvested and protected marine resources and their habitats. As examples of specific action through these regional partnership, in 2008, 18 habitat conservation projects were funded through NFHAP's Southeast Aquatic Resources Partnership and eight were funded through the Matanuska-Susitna Basin Salmon Conservation Partnership.



*“Make a difference in the Future”*

*Today, more than ever, the economic health of our nation, the safety of our coastal communities, and the welfare of our valuable natural resources depend on successful, well-planned habitat conservation efforts such as those carried out by the NOAA Habitat Program. We will continue to address impacts to essential fish habitat from barriers to fish migrations to marine debris to threats from chemical spills. We will work with industry to help minimize the impacts on fish habitat caused by coastal development. In partnership with others, we protect and restore valuable coastal wetlands and other habitats that are threatened, damaged, or lost, and we will continue to work with communities and the public to educate and foster stewardship.*

*-Pat Montanio, Director, Office of Habitat Conservation*



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U. S. Government – 2009



**NOAA Habitat Program**  
Conserving Habitat for the Future