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Information About Estuaries and Near Coastal Waters
June 2001 - Issue 11.3

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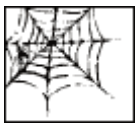

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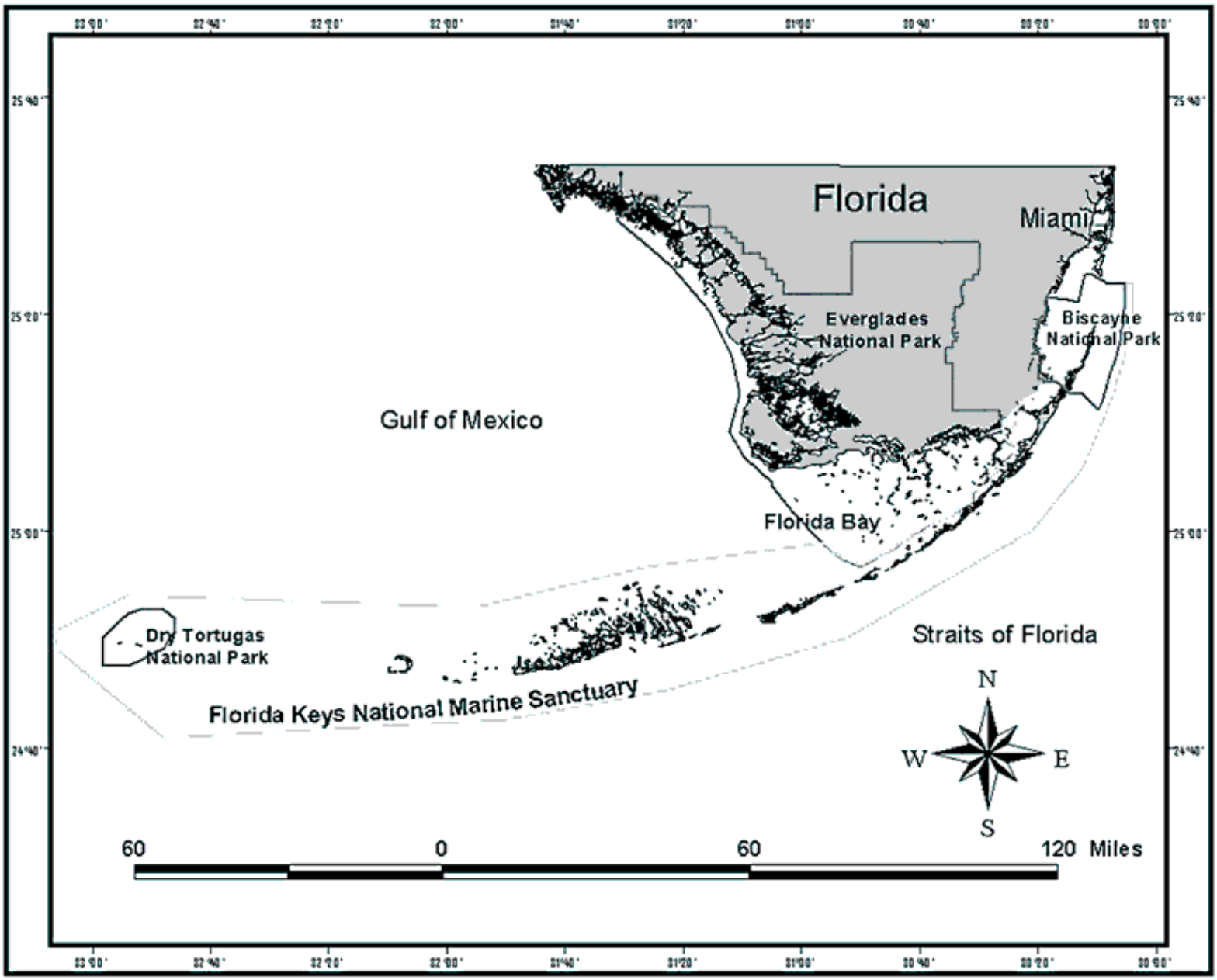
Protecting Ocean Wilderness in the Tortugas

More than 70 miles west of Key West and 140 miles from mainland Florida, the Tortugas consists of seven small islands made of sand and coral reef. The waters surrounding the Tortugas are a true ocean wilderness, home to a dazzling array of marine life.

There is a long history of marine conservation in this remote and unique region. The Tortugas were the site of the first marine protected area in the United States, the Dry Tortugas National Monument, established in 1935. In 1992, the monument was elevated to Dry Tortugas National Park. In 1990, much of the surrounding waters gained protection as part of the Florida Keys National Marine Sanctuary. From the beginning, the Sanctuary identified the Tortugas as deserving special protection.

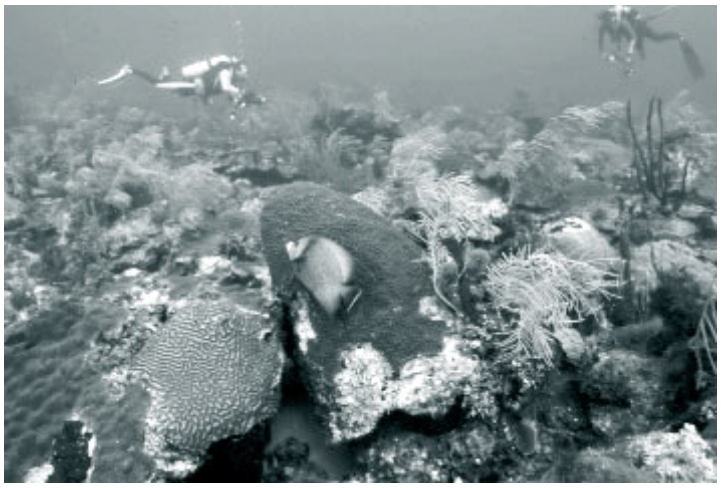
Protected by their isolation, the Tortugas boast lush coral reefs and the cleanest, clearest waters in the region. The Tortugas alone support numerous species of gorgonians, or soft corals.



More than 400 species of reef fish inhabit the region, including all of the Caribbean species of grouper. Intricate crinoids (feather stars) and black corals grace the deep reefs. Healthy baitfish populations support thriving colonies of seabirds, including sooty and noddy terns, masked boobies and the only roosting colony of magnificent frigate birds in North America. The Tortugas also supports endangered sea turtle populations by providing undisturbed sandy beaches for nesting.

In addition to the rich array of biological resources found in the region, the Tortugas are uniquely situated in the wider Caribbean at a crossroads of major ocean currents. Ten years of oceanographic studies have demonstrated that there are strong links between the Tortugas, Florida Bay and the Florida Keys, emphasizing the important role of the Tortugas in sustaining and replenishing fish and other marine life throughout the Florida Keys and beyond.

Despite early and progressive protection efforts in the Tortugas, today even this remote region shows signs of impacts from human activities. Catches of red grouper, black grouper, yellowtail snapper, mutton snapper and gray snapper have declined in the region over the last decade.

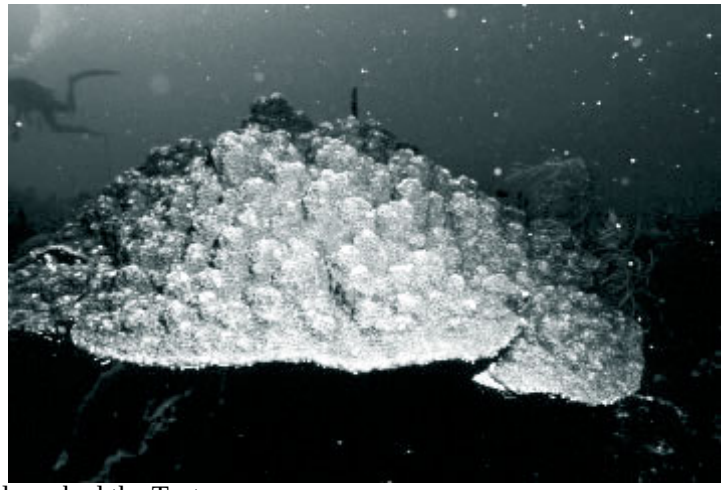


Visitation at Dry Tortugas National Park provides evidence of the increasing use of this remote locale, with park visitation skyrocketing from 1984 to 1999, straining park facilities and threatening the health of natural and cultural resources.

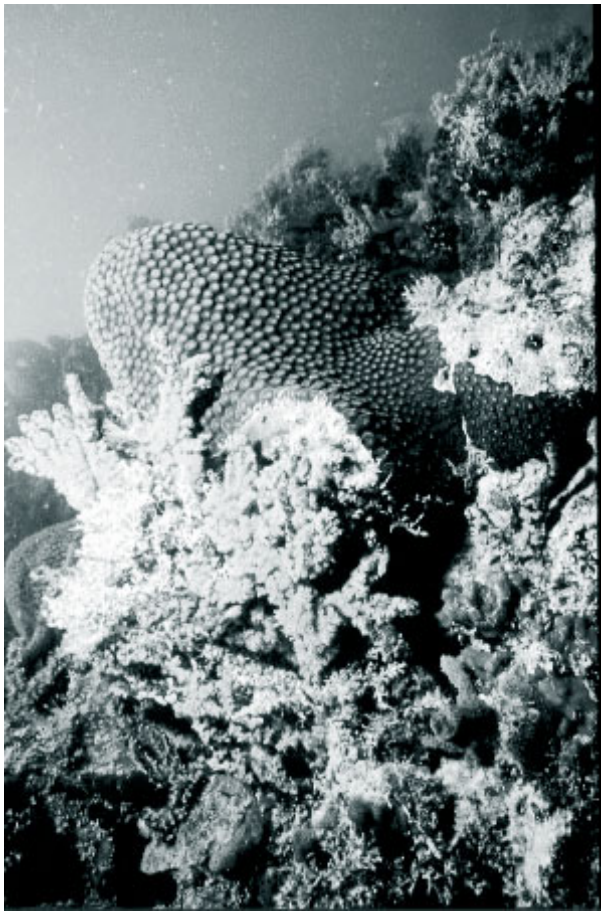
Anchor damage by large ships on Tortugas Bank led to a Sanctuary prohibition of the activity in September, 1997, but other critical coral and hardbottom habitats remained threatened by damage from large anchors. To address the myriad of burgeoning threats in the area, the Florida Keys National Marine Sanctuary initiated the design and development of the Tortugas Ecological Reserve.

In July, 1997, the Sanctuary implemented the first comprehensive network of marine zones in the U.S., including 23 no-take areas meant to preserve biodiversity, protect habitat and provide opportunities for scientific research.

Seeking to protect a continuum of marine habitats that plants and animals need to survive, a special type of no-take area, called an ecological reserve was implemented within the Florida Keys Sanctuary. Though an ecological reserve was proposed at this time for the Tortugas region, it was not established because public input suggested that the proposed boundaries did not include the most significant coral reef resources and the designation would cause serious economic harm to commercial fishermen.



Instead, the Sanctuary's final management plan called for a collaborative process to determine the area and degree of protection the Tortugas needed.



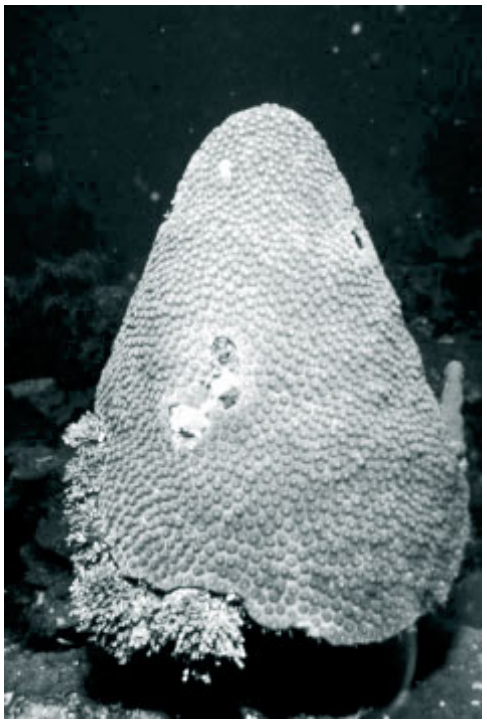
One year after implementing its network of no-take areas, the Sanctuary launched the Tortugas 2000 initiative. The Sanctuary sought to involve all stakeholders in the region from the beginning, by placing a 25-member working group comprised of commercial and recreational fishermen, divers, conservationists, scientists, concerned citizens and government agencies at the center of the process. The working group's instructions were to ignore jurisdictional boundaries and design a reserve based on the best available ecological and socioeconomic data.

The working group met several times over a year, and all meetings were open to the public. Working group members served as liaisons with their constituents, facilitating the exchange of ideas and information. A professional facilitator guided the process. A key element that contributed to the group's success was avoiding discussion of specific areas or a percentage of the study area to be set aside. Instead, the group drafted and prioritized goals and criteria, which were then used to design and evaluate proposed reserve boundaries. Meanwhile, the Sanctuary initiated a formal public involvement process, beginning with scoping meetings throughout Florida and in Washington, D.C.

In May, 1999, the Tortugas 2000 working group achieved consensus on a proposal that was jointly brought to the table by commercial fishing and conservation representatives. The full Sanctuary Advisory Council unanimously approved the proposal at its June meeting.

The working group's proposal became the basis for the Sanctuary's preferred alternative for the Tortugas Ecological Reserve, released for public comment in May, 2000. The Sanctuary received more than 4,000 comments on this proposal, over ninety percent of which supported the no-take reserve as essential for protecting some of the healthiest and most diverse coral reefs in the region. After considering all comments, the Sanctuary released its final plan for the Tortugas Ecological Reserve in November 2000.

This final plan calls for a 151-square nautical mile ecological reserve consisting of two sections, Tortugas North and Tortugas South. Tortugas North protects some of the most luxuriant coral reefs in the United States, where live coral cover often exceeds 40 percent, compared to 10 percent in the rest of the Florida Keys.

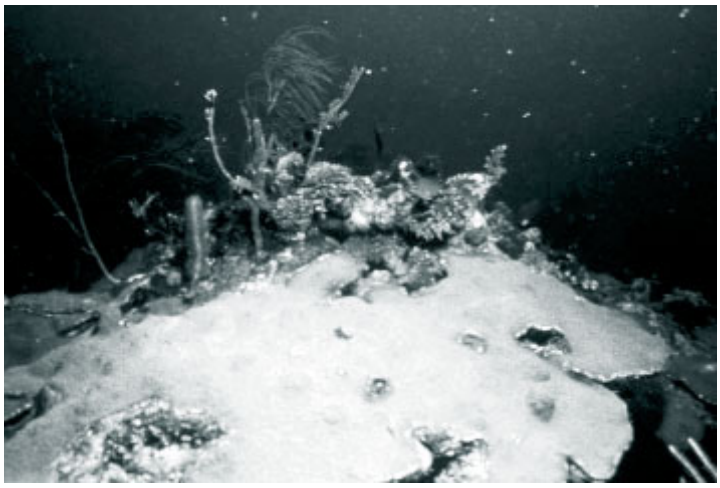


A lush coral carpet that stretches for miles, nicknamed Sherwood Forest for its mysterious mushroom and cone-shaped coral colonies, is included in Tortugas North. This portion of the reserve also incorporates the northern half of Tortugas Bank, an area of low relief coral and hardbottom interspersed with stunning coral-covered pinnacles that rise forty feet from the seafloor, providing foraging grounds for reef and open ocean inhabitants.

The Tortugas South portion of the reserve protects 60-square nautical miles that includes Riley's Hump, a spawning area for many species of snapper and grouper. Riley's Hump is also home to a colorful array of reef fish, including some not commonly seen in the Florida Keys. Cherubfish, longsnout butterflyfish, red-tailed triggerfish and rare hamlets are just a few of the many unique species found in the area. Sharks, tuna and other large predators cruise the area, lured by the warm water and powerful current of the Gulf Stream.

Under the new Tortugas Ecological Reserve designation, Tortugas North will remain open to diving and snorkeling under a simple access permit from the Sanctuary. To prevent damage to corals and other delicate organisms, the rules for the reserve prohibit anchoring; however, mooring buoys will be installed for use by visiting vessels.

All vessels will be allowed to travel through the Tortugas South portion of the reserve, but stopping will only be permitted for enforcement, research or educational purposes. The final regulations also expand Sanctuary boundaries by 96-square nautical miles, extending the protection of general Sanctuary regulations to all of the reserve.



The success of the Tortugas 2000 process and the resulting establishment of the Tortugas Ecological Reserve is the product of cooperation and involvement of all parties. Along with stakeholder involvement, unprecedented interagency cooperation contributed substantially to the design and implementation of the reserve. Representatives of the Florida Fish and Wildlife Conservation Commission, the Gulf of Mexico Fishery Management Council, the South Atlantic Fishery Management Council, the National Marine Fisheries Service and the National Park Service (NPS) all participated in working group meetings and collaborated closely with Sanctuary managers at each stage of the reserve proposal.

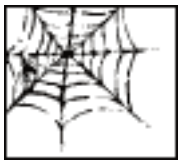
The Sanctuary fully coordinated its planning efforts with a NPS initiative to revise its general management plan for Dry Tortugas National Park. The NPS is proposing to create a Research Natural Area within the Park that complements the Sanctuary's reserve by protecting productive shallow and deep coral reefs, seagrass, sand, and hardbottom habitats.

The Gulf of Mexico Fishery Management Council is moving forward with its own regulations to close the federal waters of the Tortugas Ecological Reserve under the Magnuson-Stevens Fishery Conservation and Management Act. Also, the National Marine Fisheries Service will implement no-take regulations through the Office of Highly Migratory Species for pelagic fish such as tuna, sharks and billfish. The State of Florida recently voted to include state waters in the reserve, signaling the final approval for establishment of this protected area.

Upon its implementation in July, 2001, the Tortugas Ecological Reserve will be the largest permanent no-take reserve in the United States and the second largest in the world. With the creation of this reserve, the Sanctuary hopes to create a seascape of promise - a place where the ecosystem's full potential can be realized and a place where humans can learn about the environment and learn to respect it.

The Sanctuary anticipates that there will be significant ecological benefits to local and regional marine populations over time. To document changes inside and outside of the reserve, the Sanctuary will incorporate the reserve into its comprehensive monitoring program. The Tortugas Ecological Reserve also promises to provide unprecedented research and educational opportunities as the marine habitats of the region recuperate from years of use and return to a more natural, undisturbed state. In this day of ever-burgeoning human expansion and exploitation of the earth's marine resources, the Tortugas Ecological Reserve represents an area of true ocean wilderness, a legacy owed to future generations.

For more information on the Tortugas Ecological Reserve contact, Joanne Delaney, NOAA/Florida Keys National Marine Sanctuary; Phone: (305) 743-2437; E-mail: Joanne.Delaney@noaa.gov or visit www.fknms.nos.noaa.gov/tortugas EXIT disclaimer



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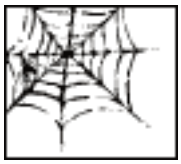
Exciting On-line Auction Launched to Help Protect our Nation's Bays and Estuaries

In early May 2001, Ebay.com will begin hosting an on-line auction where you can bid on fun and unique donated auction items. New items will rotate in on a continual basis...keep checking the site! Just go to www.ebay.com and see how easy it is! Type "ANEP" in the "search" box under the EBAY logo on the top left corner, and all ANEP's items will appear. Click on those that interest you, and have fun bidding! The proceeds from the sale of the tax-deductible donations will go to support the nation's 28 National Estuary Programs (NEPs) and their Association of National Estuary Programs (ANEP). Make the highest bid and 20 to 40 percent of the sale price will be provided, depending on the amount of the sale, to the particular National Estuary Program (NEP) that was responsible for bringing that item to the auction. Together, the NEPs and ANEP (a 501(c)(3) non-profit) provide local and national efforts to restore our nation's estuaries, bays and lagoons.

This is a great auction for finding a unique birthday present, an anniversary present for your parents, or a fun adventure for you and your family. Some exciting items found in our auction include boat rides; fishing trips; a 14-person party on board the "Glory", a replica of a Victorian fantail electric launch; and kayaking trips in your local bay or estuary. There will also be a week-long vacation in a Utah condo located within walking distance to downhill and cross country skiing! Pamper yourself and a special companion with a weekend stay in your choice of Bed & Breakfast locations. Or, why not buy a weekend

trip for some friends, as a present they will never forget? There may be concert tickets, a catered food party, and a dinner for four at a fine restaurant or at a waterfront bistro.

If you have an item or service you would like to donate to this great cause, please contact Dawn Volk; Phone: (703) 333-6150; E-mail: drvolk@erols.com, or visit the website at www.anep-usa.org.



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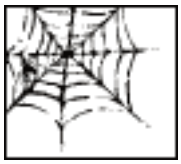
New Salt Marsh Restoration and Monitoring Guidelines from New York

The New York State Department of State and Department of Environmental Conservation have jointly developed guidelines offering technical assistance to local governments, environmental organizations and others interested in developing and monitoring salt marsh restoration projects. The New York State Salt Marsh Restoration and Monitoring Guidelines responds to gaps in restoration science and management, and include a standard monitoring protocol to increase data collection, assist in project comparisons, and improve evaluation of restoration success. The 140-page document is available from both the Department of State and Department of Environmental Conservation, and may also be downloaded from the Internet at either: http://www.dec.state.ny.us/website/dfwmr/marine/smguide.html EXIT disclaimer or http://www.dec.state.ny.us/website/dfwmr/marine/smguide.html EXIT disclaimer To request a copy, or for additional information, please contact Nancy Niedowski, NYS Department of State, 41 State Street, Albany, NY 12231; Phone: (518) 473-8359; E-mail: nniedows@dos.state.ny.us



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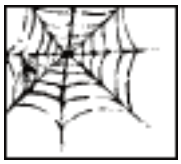
National Invasive Species Management Plan

On January 18, the interagency National Invasive Species Council issued a final plan, which includes a list of 57 action items to be implemented over the next four years. The action items are intended to guide federal agencies' actions to prevent and control invasives, as well minimize invasives' economic, ecological, and human health impacts, as required by Executive Order 1311. The Plan is available at www.invasivespecies.gov/council/nmp.shtml. EXIT disclaimer



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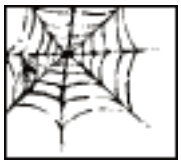
Two Studies Show Reduction in Wetland Losses

The U.S. Department of Interior (DOI) and the U.S. Department of Agriculture (USDA) have each released reports indicating that there has been a dramatic slowdown in the loss of wetlands over the past decade. The report by Fish and Wildlife Service (DOI), "Status and Trends of Wetlands in the Conterminous United States 1986 to 1997," shows that the rate of wetland loss in the U.S. decreased to an estimated annual loss of 58,500 acres - an 80 percent reduction compared to the previous decade. However, the national goal of "no net wetlands loss" has not yet been met. The study shows that between 1986 and 1997 forested wetlands and freshwater emergent wetlands continued to show the most losses. Open water ponds are increasing, yet there is concern that the long-term trend in the loss of vegetated wetlands may result in long-term adverse consequences.

The USDA report on the health of America's private lands, "National Resources Inventory," also shows significant reduction in wetland losses over this period of time. Prepared by the Natural Resources Conservation Service, the report shows an average annual net loss from all sources of 32,600 acres of wetlands from 1992 to 1997. The western part of the U.S. is approaching no net losses during this period, while the eastern U.S. has the largest wetlands losses in this period. The findings of the two reports reflect the culmination of more than a decade of progressive work and accomplishments in wetland conservation.

You can download the "Status and Trends Report" from the following website:

http://wetlands.fws.gov/bha/SandT/SandTReport.html EXIT disclaimer



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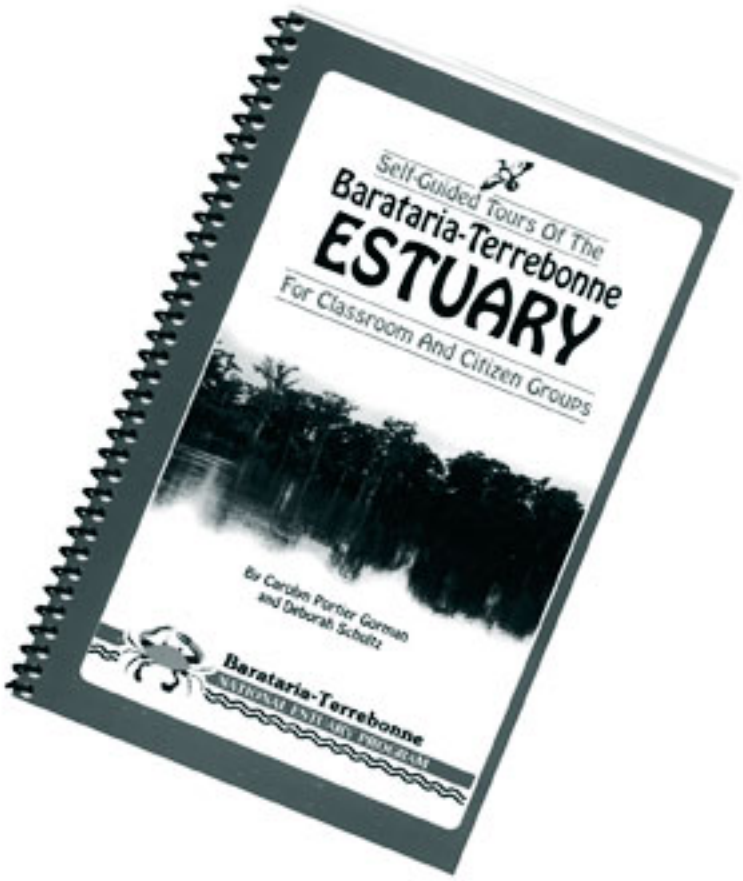
Self-Guided Education Tours in the Bayou

Imagine that you are a sixth-grade classroom teacher, living in South Louisiana. Your students have been studying the Barataria-Terrebonne Estuary and its 4.2 million-acre watershed which lies between the Mississippi and Atchafalaya rivers. Through reading Self-Guided Tours of the Barataria-Terrebonne Estuary, and other educational products produced by the Barataria-Terrebonne National Estuary Program, you and your students have learned that this rich deltaic system was formed by the flooding of the Mississippi River, and is one of the most productive areas in the world.



The wide variety of habitats include bottomland hardwood forests, freshwater "flotant" marshes, barrier islands, and vast salt marshes. These marshes are teeming with life and are extremely important to the local and national economy. Fisheries for menhaden, shrimp, oysters and crabs, as well as a booming sport fishing industry, bring in more than $540 million annually. Fur and alligator hides and hunting activities yield over $170 million per year. The rich delta soils accommodate sugarcane and other crops that generate over $600 million per year. The Barataria-Terrebonne Estuary is home to abundant wildlife, including neotropical migratory and resident birds and alligators, which encourages a thriving ecotourism industry.

One of the key messages of the guidebook is that this area is plagued with severe environmental problems. The worst of these is the loss of 13,500 wetland acres per year, or an area the size of a football field, every forty-five minutes. The problem is largely due to flood protection levees on the Mississippi River, which prevent the river from annually nourishing the wetlands with fresh water, nutrients and sediment carried from the drainage of two-thirds of the nation. Other environmental problems include nutrient enrichment of inland waterways and the Gulf of Mexico, and pathogens and toxins which threaten human health and fisheries production. As the land and water quality degrades, both fisheries and wildlife habitat is lost. As the habitat declines, so also does the coastal culture that is entirely dependent on the wealth of natural resources.

Now that you and your students have learned a bit about the geology and ecology of the place you live, it is time to go out and experience it. The guide contains a total of twenty self-guided field trips with accompanying maps to guide the reader. Included in the guide is information designed to help the visitor choose trips to study specific topics, or to choose trips based on trip time, cost and trip features. Photographs, maps, and descriptions of trip sites form the body of the listing, followed by relevant activities and other places to note or visit while in the area. A resource list, sources for water testing equipment, and plant and animal lists for the varied habitats within the estuary complete the guide.

Several of the trips demonstrate the effects of coastal land loss through the landscape of dead and dying cypress trees - the result of saltwater intrusion deep into a fresh water system. Other trips highlight coastal restoration activities such as the Naomi Siphons, where Mississippi River water is being diverted into a degraded wetland. The tour book includes a visit to a world-class marine research facility in the salt marsh, complete with boat tour and laboratory activities. Students and other groups can also visit an oil spill response recovery ship, a swamp tour, state and national parks, or the Old River Control Structure, where the Army Corps of Engineers guards against the capture of the Mississippi River by its

sister river, the Atchafalaya.

More than 3,000 copies of the "Self-Guided Tour" have been distributed at educator workshops and conferences or through telephone requests to the office. Feedback from educators has been very positive. The guide is useful to a wide audience, including formal educators, scouting and church groups and individuals. Because a number of additional museums and coastal restoration activities have been developed since the guide was written, the Estuary Program will soon be updating the guide, providing the public with an additional five or ten trips to choose from.

Self-Guided Tours of the Barataria-Terrebonne Estuary is available to teachers, individuals and other local groups at no charge. It is also available online at www.btnep.org.

For further information, please contact Deborah Schultz, Education Coordinator; Barataria-Terrebonne National Estuary Program, Program Office, Nicholls State University Campus, P.O. Box 2663, Thibodaux, LA 70310; Phone: (504) 447-0868; E-mail: deborah_s@deq.state.la.us

An example of what you will find in the guide to help plan your trip.

TRIP 2:
Naomi Siphons
Hwy 23 at Naomi, Louisiana

CONTACT:
Plaquemines Parish Government
Coastal Restoration
(504) 682-0081

CATEGORY:
Hydrologic Modification
Guided tour of freshwater diversion project

ENVIRONMENT:
Mississippi River
Levee trail between freshwater swamp and canal/swamp.

GROUP TYPE:
Grades 5-12 to adult. The trail along the levee is a wild area and exhibits scat of many animals, including alligator.

DISTANCE:
16 miles on Hwy. 23 from the West Bank Expressway to the Naomi Siphon

TIME:
1 1/2 hours on site, including discussion time

COST:
Free

EQUIPMENT:
Wear enclosed shoes or boots. You will be in a wild area. Camera, binoculars, sampling and water quality testing equipment, plastic bag for scat collecting. Field guide to birds.

DESCRIPTION:


This trip begins at the Naomi Siphons on the Mississippi River levee. Arrange ahead of time to meet your guide by calling the contact number. The guide is a representative of Plaquemine Parish who can give a history of land loss in the area, as well as explain the two freshwater diversion projects at West Point a la Hache and Naomi. He or she will further explain the problems of saltwater intrusion into wetlands and land-loss from subsidence and salt-stressed plant death. The guide will also talk about the hope that the freshwater being siphoned into the swamp and marsh beyond will push back any salt water coming in and deposit land-replenishing sediments to combat subsidence.

The Naomi Siphons, which became operational in 1993 and is managed by the State Department of Natural Resources, diverts water from the Mississippi River through large pipes which travel over the levee and under the highway emptying into a freshwater outlet on the opposite side of the highway. Mississippi River barge traffic may be seen on the river at this point. When you cross the highway, you can view the outflow of the siphons into a man-made canal. With your guide, you will walk along a levee which leads you to the wetlands which are the focus of the project. You may catch a glimpse of a raccoon, opossum or deer on the levee or at the swamp's edge, and you may hear the loud splash of an alligator as it dives for cover at your approach. Waterfowl and wading birds are common here.

ACTIVITIES:

- Conduct a scat hunt on the levee. Animal droppings abound here. Try to determine who was eating what, based on what you see in the scat. A basic food web chart can be constructed later, based on your field discoveries. Look for other signs of wildlife here and record your observations for later discussion.

- Combine this trip with a morning trip to the Oil Recovery Station at Fort Jackson (see trip information, page 8). There are picnic tables and room to run in the shade at the Fort (50 miles further south on Hwy 23).

- For Plaquemines Parish residents only: combine this trip with a 30-minute bus tour of the BP Alliance Refinery in Naomi. Call (504) 656-7711, public relations department for details.

COASTLINES
Information About Estuaries and Near Coastal Waters

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Nation's First Wildlife Refuge Gets a Facelift

It is little more than a spit of an island, really ó a veritable blip in the Indian River Lagoon. Yet Pelican Island, a scrappy mangrove island just east of Sebastian, Florida, is one of the most historically significant wildlife habitats in the United States. Nearly a century ago, German immigrant Paul Kroegel patrolled this island, sometimes wielding a 10-gauge double-barreled shotgun, to fend off poachers and feather hunters to keep them from destroying what was the last brown pelican breeding ground along the entire east coast of Florida.

The efforts of Kroegel and other prominent locals inspired President Theodore Roosevelt on March 14, 1903, to establish Pelican Island as the first National Wildlife Refuge, the cornerstone of a nationwide system that now encompasses 93 million acres on more than 500 refuges.

In February of this year, the U.S. Fish and Wildlife Service joined forces with several other partners to fend off a more subtle, insidious threat to the island: erosion. In 1908 Pelican Island was five and a half acres in area, since then it has shrunk by more than 70 percent óto about three acres. No one is really sure why the island is eroding, but

contributing factors may include wakes caused by boat traffic along the Intracoastal Waterway or tidal flows from nearby Sebastian Inlet.

Operation "Save Pelican Island" began when a Black Hawk helicopter equipped with a dump truck-sized bucket airlifted 250 tons of fossilized oyster shells to the island. The oyster shells serve as a natural wave break to halt erosion. Laid out as carefully as any military maneuver, the two day project required a team near Jungle Trail, a nearby barrier island, to load the bucket with a front-end loader. Once full, the helicopter flew about a quarter mile to Pelican Island, where another crew directed the pilot to the drop location.

Inside the oyster shell barrier, adults and Pelican Island Elementary School students planted several acres of smooth cord grass, which will trap sediments, break up wave energy, promote accretion (growth) of sand, and create additional habitat for the birds.

While construction of a wave break and planting shorelines may be considered relatively straightforward projects, the Pelican Island restoration project presented a number of challenges.

The island is situated near the eastern shoreline of the Indian River Lagoon, some distance from the Intracoastal Waterway. There is no deep-water access to the island, and waters around the island are extremely shallow and vegetated with seagrass, limiting barge or boat access. The island is an important brown pelican and wading bird rookery, which could easily be disturbed by construction activities. In addition, the island is considered a federal wilderness area, further limiting the ability to use heavy equipment as part of this project.

Initially, a pilot project was undertaken to evaluate manual moving of shell material. Roughly a ton of shell material, quarried from an inland site in Florida, was used to fill burlap bags. A boat ferried the filled bags near the island, where volunteers lugged them to the location of the wave break. All involved in this pilot project agreed that, while there was little disturbance to wildlife, this method was slow, inefficient, and likely to impact seagrass beds as a result of the increased foot traffic and turbidity generated by this traffic.

After consideration of a variety of alternatives, the only viable way to move and place the shell material at the island appeared to be the airlift maneuver. Experts chose early February because it preceded the onset of nesting season. Those birds present on the island were roosting, departing shortly after sunrise to feed. Therefore, the shells were airlifted to the site during this morning "window of opportunity." To further reduce potential impacts to wildlife, construction activities ended shortly after noon, allowing the birds to return to the island.

The Pelican Island project will be the subject of ongoing monitoring to determine whether it is successful. It may also serve as a model for other efforts to stabilize eroding shorelines. While the cost of airlifting materials was expensive ó $4,000 per hour ó the savings in time and the minimal impact to a sensitive resource appeared to balance the cost.

Save America's Treasures, a program administered by the National Park Service, provided $54,000 for the project. The St. Johns River Water Management District and the Florida Inland Navigation District provided a matching grant. The U.S. Army Corps of Engineers and Lewis Environmental Services provided engineering and planning assistance.

Land acquisitions over the years have expanded Pelican Island National Wildlife Refuge to include not only the island, but 5,000 additional acres of nearby barrier islands. A centennial celebration will be held in 2003, a milestone that is generating a fair amount of attention for the refuge and the restoration

project.

For further information, contact Ed Garland, St. Johns River Water Management District; Phone: (321) 676-6612; E-mail: Ed_Garland@district.sjrwmd.state.fl.us

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What is a Baykeeper?

More and more, the terms Baykeeper and Riverkeeper have been heard whenever the nation's estuaries and waterways are being discussed. But just what do Baykeepers and Riverkeepers do and how did they get started? The Keeper movement is an environmental "neighborhood watch" program, a citizen patrol to protect communities and the waters they depend upon.

The Keeper philosophy is based on the notion that the protection and enjoyment of a community's natural resources requires the daily vigilance of its citizens. A Keeper is a full-time, privately funded, non-governmental ombudsman whose special responsibility is to be the full-time public advocate for a water body. Being a Keeper involves advocating compliance with environmental laws; responding to spills, fish kills, and citizen complaints; identifying problems which affect a community's waterways and devising appropriate remedies to these problems; serving as a living witness to the condition of the ecosystem; and being an advocate for the public's right to protect and defend the environment. Keepers are part investigator, part scientist, lawyer, lobbyist, community organizer and public relations agent. All Keepers have a boat of some kind, ranging in size from a canoe to a research vessel. But sometimes a pair of hip boots is more important than a boat, and sometimes a legal brief is more important than either one.

The Keeper concept started on New York's Hudson River where a coalition of commercial and recreational fishermen mobilized in 1966 to reclaim the Hudson from its polluters. They constructed a boat to patrol the river and used the winnings from anti-pollution lawsuits to hire the first full-time Riverkeeper in 1983. They modeled the program after the Riverkeepers of the British Isles who looked after private trout and salmon streams, usually for estates and manors and private fishing clubs. By 1998, Hudson Riverkeeper had filed over 100 successful legal actions against the Hudson River polluters, forcing them to pay for $1 billion in remediation costs on the river. The river that was once dead for 20 miles at a stretch is now one of the richest and most productive waterbodies in the Northeast. The Hudson's miraculous recovery has helped make the Keeper program an international model for ecosystem protection.

The Keeper movement has spread quickly as individuals were drawn to the idea that citizens can and should take responsibility for protecting their community's natural resources. In 1992, the existing Keepers founded the National Alliance of River, Bay and Sound Keepers. This was renamed The Waterkeeper Alliance in 1999.

The Alliance oversees the formation of new Keeper programs, organizes annual conferences, licenses the use of the Keeper names, works on national issues of common interest, and serves as a networking center for the Keepers to exchange information, strategy and know-how. With the assistance of the Waterkeeper Alliance, sixty-three Keeper programs have now been started on water bodies across the United States and three countries. Together they represent one of today's fastest growing and most promising movements for long-lasting environmental resource protection.

While the Waterkeeper Alliance began and continues to be primarily a citizen advocacy group, the ability to litigate is a key component of the program's success. Skepticism about government's willingness to enforce environmental laws prompted Congress to include the citizen suit provisions in most of the environmental statutes. These provisions allow citizens with standing to step into the shoes of the United States attorney and prosecute polluters when government agencies fail to act. Alliance president and chief prosecutor, Robert F. Kennedy, Jr., systematically litigates as a highly effective tool to curb polluters.

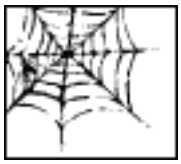
Keepers employ a variety of strategies to enforce environmental laws, including conducting water quality monitoring and patrols, attending municipal board meetings, educating and motivating the public to act on behalf of the waterway, participating in coastal planning, devising solutions to water quality problems, and pursuing litigation as a final step to enforcement.

On some waterbodies, litigation is a less important tool. On Casco Bay in Maine and on the Peconic Bay in New York, both part of the National Estuary Program, the Baykeepers share the same goals but employ different strategies, including conducting water quality monitoring, participating in coastal planning, educating the public and devising solutions with those who have caused problems for their bays. They do reserve the right to seek solutions in court where necessary. "We don't have a long list of lawsuits to point to for our success," says Sally Bethea, Upper Chattahoochee Riverkeeper in Georgia, "but just the threat of a suit is enough for some polluters to clean up their act."

How do you become a Keeper? "The Riverkeeper movement isn't top down, it's bottom up - we don't go out recruiting Riverkeepers. But if somebody will come to us and say: 'I want to shoulder this burden,' then we will help them." says Robert F. Kennedy, Jr.

Despite the Waterkeeper Alliance's many successes, there still are many areas which do not have Keepers. For example, there are no Keepers in the state of Texas or southern Florida. According to Robert F. Kennedy, Jr., appointing a Keeper supports the connection between "the environment and the economy. Sure, we can convert our natural resources to cash as quickly as possible. We can produce instantaneous cash flow and the illusion of a prosperous economy. But our children are going to pay for our joy ride with denuded landscapes and poor health and huge cleanup costs. If you take the long-term view, good environmental policy is always good economic policy."

For further information on Baykeepers, Riverkeepers and the Waterkeeper Alliance, contact Murray Fisher, Waterkeeper Alliance, 78 N. Broadway, E. Bldg. White Plains, NY 10524; Phone: (914) 422-4410; E-mail: Mfisher@keeper.org or visit the website www.riverkeeper.org. EXIT disclaimer



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Review of Aquaculture Impacts

A recent article in the scientific journal "Nature" concludes that, while fish farming still adds to the world's fish supply, some trends are headed in the wrong direction. Many types of aquaculture are hastening a worldwide fisheries collapse through practices that rely too heavily on feeding wild, caught fish to farmed fish. Some aquaculture systems also reduce wild fish supplies by destroying fish habitat and collecting wild fish to stock fish farms.

Aquaculture issues highlighted in the new review include:

- Using wild fish to feed farmed fish: Many farmed fish are fed ground-up wild fish, contributing to the depletion of ocean fisheries. It takes about three pounds of wild, caught fish to grow one pound of shrimp or salmon. There is also an increasing trend towards feeding oil and fish meal to herbivorous fish species to enhance production.

- Pollution: Fish farming often produces a flow of waste effluent, containing feces and uneaten feed, which contributes to pollution of coastal waters.

- Habitat Destruction: Hundreds of thousands of acres of coastal wetlands have been destroyed for aquaculture ponds and facilities.

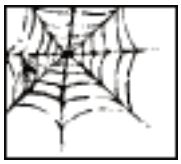
The authors recommend several ways to help reduce the pressure on the world's dwindling fisheries and conduct aquaculture in an environmentally sustainable manner. These include:

- Promoting the aquaculture of largely herbivorous fish, such as catfish or tilapia, or filter feeders like scallops, mussels and oysters; and

- Encouraging ecologically-sound management of aquaculture by mandating the treatment of wastewater, enforcing strict health and biosafety measures, and restricting the siting of farm ponds in mangroves and other coastal wetlands.

For further information, contact Roz Naylor, Institute for International Studies, Stanford University; Phone: (650) 723-5697; E-mail: roz@leland.stanford.edu. Naylor, R., et al. 2000. Effect of aquaculture on world fish supplies. Nature 405: 1017-1024.

Reprinted from SeaWeb July 13, 2000.



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Honor Your Coastal and Ocean Heroes!

The National Oceanic and Atmospheric Administration (NOAA) is proud to announce the call for nominations for the 2001 Walter B. Jones Memorial and NOAA Awards for Excellence in Coastal and Ocean Resource Management. From coast to coast, remarkable people and organizations are making a difference by improving coastal economies, revitalizing coastal communities and conserving coastal and ocean resources. Many people have dedicated countless hours and energy to ensure the nation's coasts and oceans remain treasured places to live, work and play. This is your opportunity to honor them by nominating them for these awards. All nominations must be received by July 31, 2001.

The Coastal Zone Management Act (CZMA) of 1972 created a unique and voluntary partnership of federal and state governments to provide a balance between land and water uses in the coastal zone, and to conserve fragile coastal resources. As part of the 1990 re-authorization of the CZMA, the late Congressman Walter B. Jones, Sr., then Chair of the House Merchant Marine and Fisheries Committee, granted NOAA the authority to honor individuals and organizations whose work reflects the innovation and balance needed to maintain healthy coasts and oceans for present and future generations.

The awards will focus on innovation, resourcefulness, and a commitment to balancing the human use of America's coastal and ocean resources with the needs of the resources themselves. There are ten categories to enter:

The Walter B. Jones Memorial Awards

- Coastal Steward of the Year
- Excellence in Coastal and Marine Graduate Study
- Excellence in Local Government

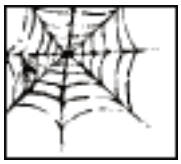
The NOAA Excellence Awards for Coastal and Ocean Resource Management

- Volunteer of the Year
- Non-governmental Organization of the Year
- Excellence in Promoting Diversity in Coastal or

Ocean Resource Management

- Excellence in Business Leadership
- Excellence in Coastal Zone Management
- Excellence in Estuarine Reserve Management
- Excellence in Marine Sanctuary Management

For information and a brochure on how to nominate your coastal and ocean heroes, please contact NOAA, Phone: (301) 563-7212; E-mail: jonesawards2001@noaa.gov; or visit: www.nos.noaa.gov/jones_award.html EXIT disclaimer



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Deposition of Air Pollutants to the Great Waters

On November 15, 1990, in response to mounting evidence that air pollution contributes to water pollution, Congress amended the Clean Air Act to establish research and reporting requirements related to the deposition of hazardous air pollutants to the "Great Waters." The waterbodies designated by these provisions are the Great Lakes, Lake Champlain, Chesapeake Bay, and certain other coastal waters (identified by their designation as sites in the National Estuarine Research Reserve System or the National Estuary Program).

The third Great Waters Report to Congress provides updated scientific information on trends in emissions, transport, deposition, fate and effects of toxic pollutants of concern. The report reviews many programs that EPA, states, tribes and others are implementing to address the pollutants of concern to the Great Waters. It also describes recent advancements in scientific research and tools used to improve our understanding of atmospheric deposition to the Great Waters.

To review the report visit the website: http://www.epa.gov/oar/oaqps/gr8water

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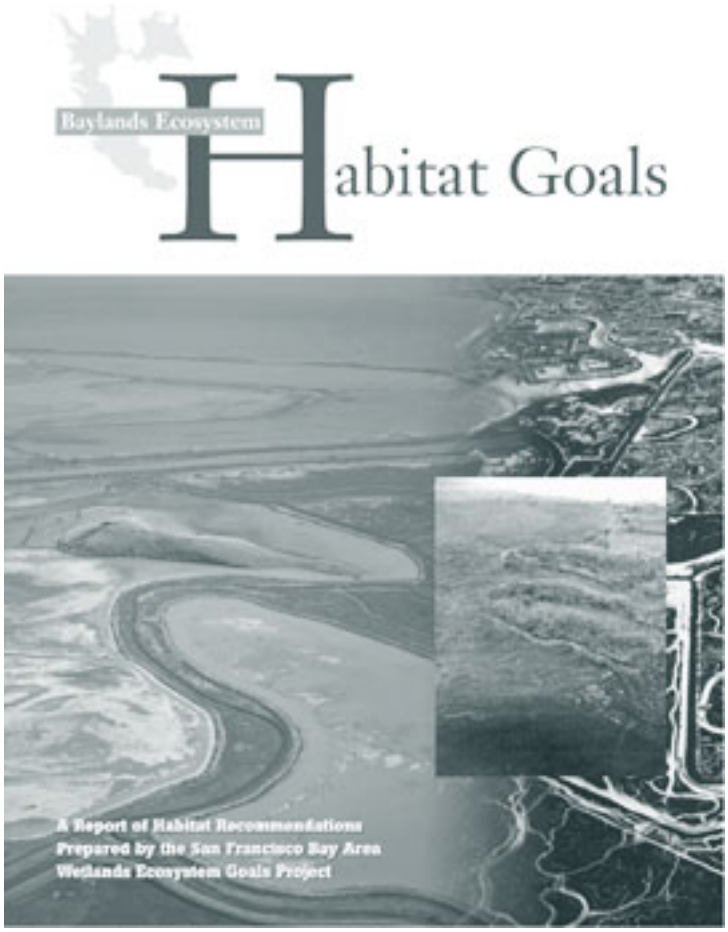
The Bay Area EcoAtlas: A Regional GIS Supports San Francisco Bay Habitat Restoration

The San Francisco Bay Area environment is constantly being changed and reshaped. People come and go; there are landslides and floods; hills have been leveled, creeks have been filled and rivers rerouted. Human activities during the last 150 years have filled or otherwise altered over 80% of the tidal marshes in the San Francisco Bay estuary, while at the same time new wetlands, such as salt ponds and seasonal wetlands have been created and many wildlife species rely upon them. Important questions that should be answered before habitat restoration is undertaken are: What kind of habitat existed before? How can we assess environmental changes accurately, and provide these data to environmental planners and the public to make informed decisions to restore habitat?



In San Francisco Bay, the development of a Bay Area EcoAtlas has helped in regional efforts to protect and understand the environment. The Bay Area EcoAtlas is a Geographic Information System (GIS) database of past and present local ecology of the bays, baylands, and adjacent habitats of the San Francisco Bay Area. Designed to support regional environmental planning and management, the EcoAtlas provides a view of the region's environmental past, present, and changes that have occurred over time. Originally focused on lands draining directly to San Francisco Bay, the EcoAtlas has been expanded to encompass the full extent of the San Francisco Bay Watershed (as delineated by the State of California's Water Resource Control Board).

EcoAtlas Beginnings

The EcoAtlas is managed by the San Francisco Estuary Institute (SFEI), a non-profit organization created in 1994 as a result of the Comprehensive Conservation and Management Plan (CCMP) for the San Francisco Estuary Project. SFEI's mission is to foster development of the scientific understanding needed to protect and enhance the San Francisco estuary through research, monitoring, and communication.

In 1994, members of the Bay Area academic, science and government communities, along with interested members of the public, defined a common objective: to establish goals for habitat restoration. This effort became the Baylands Ecosystem Habitat Goals Project, which seeks to restore the types, amounts, and distribution of wetlands and related habitats needed to sustain diverse and healthy communities of fish and wildlife in the San Francisco Bay area. The EcoAtlas was created, in part, to meet the needs of the Goals Project.

The EcoAtlas was created using many kinds of information from numerous sources to form a comprehensive picture of the environmental past, of the present, and of changes. The EcoAtlas provides the most detailed regional views of the past and present ecological conditions now available. It also provides a spatial template for viewing possible scenarios for environmental management and a geographic index for environmental data and their sources. The high level of accuracy and detail was made possible in large part by the over 200 Bay Area residents who have contributed information.

The EcoAtlas provides a classification system describing the level of certainty for the shape, location, and size for each historical feature in the map based on a file of supporting information. Based on these classifications, composite "landscapes" can be assembled to depict past or present conditions. For example, the Native Landscape View (c.1770-1820) is a composite picture based on information gleaned from thousands of documents examined at archives throughout the region. The sources included 18th and 19th century maps, paintings, photographs, engineering reports, explorers' journals, hunting magazines, and interviews with elders. While the Native Landscape View likely approximates pre-European conditions at a regional scale, with substantial local detail, it must be emphasized that substantial uncertainty may be present at a local scale. The Modern Landscape View (c. 1998) is based on infrared aerial photography taken during the winter of 1995-96 and confirmed by more than 100 local and regional experts.

Over time the EcoAtlas has continued to evolve. SFEI is currently incorporating new layers of regional and local information into the EcoAtlas including data on native and introduced species, aquatic contaminants, local watershed habitat, infrastructure and aerial-imagery. EcoAtlas has been used in diverse public settings for science, planning, and education. Curricular materials based on the EcoAtlas have been designed and tested by a local school district. SFEI has made the EcoAtlas accessible through the SFEI website and by providing paper maps and documents. Along with helping stakeholders to envision habitat restoration goals, it is hoped that the EcoAtlas will enhance a regional sense of place and purpose and provide a useful tool for those who wish to see a sustainable future.

For further information, contact Robin Grossinger, The San Francisco Estuary Institute; 180 Richmond Field Station, 1325 South 46th Street, Richmond, CA 94804; E-mail: robin@sfei.org; Phone: (510) 231-5742. Access the EcoAtlas on-line at www.sfei.org EXIT disclaimer Information for this article was excerpted and edited from an article in the Winter 1998-99 California Coast & Ocean newsletter and the San Francisco Estuary Institute website.

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Liquid Assets 2000: America's Water Resources at a Turning Point - New Report Says Clean Water is Important to the Economy

Liquid Assets 2000: America's Water Resources at a Turning Point provides a snapshot of the economic value of clean water, the problems we face in the new millennium, and the actions we must take to protect and restore the nation's water resources. This report explores the current conditions of the nation's water resources and demonstrates the link between clean water and a strong economy by focusing upon specific businesses and activities that rely on clean water.

In Liquid Assets 2000, EPA reports that:

- A third of all Americans visit coastal areas each year, making a total of 910 million trips while spending about $44 billion. Each year, millions of additional dollars go to noncoastal recreational waterways;
- Water used for irrigating crops and raising livestock helps American farmers produce and sell $197 billion worth of food and fiber each year;
- Manufacturers use more than nine trillion gallons of fresh water every year;

- Every year, the Great Lakes, Gulf of Mexico and coastal areas produce more than ten billion pounds of fish and shellfish;

- States have identified almost 300,000 miles of rivers and streams and more than five million acres of lakes that do not meet state water quality goals;

- In 1998, about one-third of the 1,062 beaches reporting to EPA had at least one health advisory or closing; more than 2,500 fish consumption advisories or bans were issued by states in areas where fish were too contaminated to eat.

To obtain copies of this report, visit EPA's web site at www.epa.gov/ow/liquidassets or call EPA's Office of Wetlands, Oceans and Watersheds at (202) 260-7040.