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HEARING ON: H.R. 2496, TO REAUTHORIZE THE JUNIOR DUCK STAMP CONSERVATION AND DESIGN PROGRAM ACT OF 1994 AND H.R. 2821, NORTH AMERICAN WETLAND CONSERVATION COUNCIL EXPANSION ACT, AND H.R. 1775, ESTUARY HABITAT RESTORATION PARTNERSHIP ACT

HEARING

BEFORE THE

SUBCOMMITTEE ON FISHERIES CONSERVATION, WILDLIFE AND OCEANS

OF THE

COMMITTEE ON RESOURCES
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTH CONGRESS

SEPTEMBER 23, 1999, WASHINGTON DC

Serial No. 106–63

Printed for the use of the Committee on Resources

Available via the World Wide Web: http://www.access.gpo.gov/congress/house
or
Committee address: http://www.house.gov/resources

U.S. GOVERNMENT PRINTING OFFICE

63–806CC ⇆ WASHINGTON : 1999

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THURSDAY, SEPTEMBER 23, 1999

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON FISHERIES CONSERVATION,
WILDLIFE AND OCEANS,
COMMITTEE ON RESOURCES,
Washington, DC.

The Subcommittee met, pursuant to call, at 10 a.m., in Room 1334, Longworth House Office Building, before the Honorable Jim Saxton, Chair, presiding.

STATEMENT OF HON. JIM SAXTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. SAXTON. The Subcommittee on Fisheries Conservation, Wildlife and Oceans will come to order.

Today we are discussing H.R. 2496, the reauthorization of the Junior Duck Stamp Conservation and Design Program Act of 1994; H.R. 2821, the North American Wetlands Conservation Council Expansion Act; and, H.R. 1775, Estuary habitat Restoration Partnership Act.

The first bill, H.R. 2496, has been introduced by a friend and colleague, Congressman Solomon Ortiz, from Texas. This bill would reauthorize the Junior Duck Stamp Conservation and Design Program Act. This innovative idea was first enacted in 1994 and it has allowed thousands of school children, from kindergarten through high school, to participate in the nationwide wildlife art contest.

This program has also motivated students to take an active role in learning about and conserving our nation's wildlife resources. This measure does not make any significant changes in the underlying Act, but it will extend the annual competition, the marketing of these stamps, and the awards program for an additional five years.

The second bill, H.R. 2821, has been recently introduced by two House members who serve with great distinction on the Migratory Bird Conservation Commission.

This proposal, by our colleagues, Congressmen John Dingell and Curt Weldon, would increase from three to five the number of non-governmental representatives that may serve on the North American Wetlands Conservation Council.

This Council has been instrumental in approving hundreds of worthwhile conservation projects that have saved over 32 million acres of essential wetlands in Canada, Mexico and the United States.

Finally, H.R. 1775, to catalyze estuary restoration and coordinate Federal estuarine activities. This is an excellent bill and this action is long overdue from the Federal Government. I am the co-sponsor of the measure and I commend Mr. Gilchrest for his leadership on this issue.

I remain committed to attacking the problems facing this nation's estuaries and to restoring downgraded coastal habitat. Over a decade ago, Congress created the national estuary program to address serious environmental problems in estuaries of national significance. These problems include polluted runoff, habitat loss, development pressure, and harmful algal blooms.

Unfortunately, despite a significant amount of planning, very little effort has been made to implement comprehensive conservation management plans or to actively restore the most seriously degraded estuarine areas.

I am pleased that today we are taking positive steps to improve this unacceptable situation.

I would now like to recognize Mr. Faleomavaega for his statement.

[The prepared statement of Mr. Saxton follows:]

STATEMENT OF HON. JIM SAXTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

The Subcommittee on Fisheries Conservation, Wildlife and Oceans will come to order. Today we are discussing H.R. 2496, to reauthorize the Junior Duck Stamp Conservation and Design Program Act of 1994, H.R. 2821, the North American Wetlands Conservation Council Expansion Act and H.R. 1775, Estuary Habitat Restoration Partnership Act.

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Over a decade ago, Congress created the National Estuary Program to address serious environmental problems in estuaries of national significance. These problems

include polluted runoff, habitat loss, development pressure, and harmful algal blooms. Unfortunately, despite a significant amount of planning, very little effort has been made to implement comprehensive conservation and management plans or to actively restore the most seriously degraded estuarine areas. I am pleased that today we are taking positive steps to improve this unacceptable situation.

Mr. SAXTON. Without objection.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman.

Mr. Chairman, again, I want to thank and commend you for holding the hearings to consider the bills that are now before the Subcommittee.

I certainly look forward this morning to the hearing and especially appreciate that you have rescheduled for two days of hearing on H.R. 1775, a bill introduced by our colleague from Maryland, Mr. Gilchrest, to facilitate estuary habitat restoration. That was postponed last week due to Hurricane Floyd.

Mr. Chairman, consequently, we certainly have a busy agenda this morning. To keep things moving along, I will defer at this time from formally commenting on H.R. 2496, to reauthorize the Junior Duck Stamp Program. Actually, I do approve and support very much the proposed bill by our good friend and member of this Subcommittee from Texas, Mr. Ortiz, as well as the expanding the North American Wetlands Conservation Council by two seats.

I enjoy and welcome our distinguished colleague, Mr. Dingell, who is not here yet, but I certainly welcome him for hearing and I'm looking forward to his testimony and certainly look forward to hearing from our friend from Texas, Mr. Ortiz, on his bill.

Mr. Chairman, on H.R. 1775, again, I commend my good friend from Maryland for introducing this legislation. I share his overarching concern regarding the continued loss of estuary habitats across our nation. Ecologists and researchers estimate that we have lost well over 90 percent of the estuary wetlands that existed when European explorers first discovered—and I'd like to change that word and say the European explorers never discovered this part of the world. They landed here on this continent 400 years ago. Even though Columbus got lost, Mr. Chairman, but they came here nevertheless.

The estuaries, such as San Francisco Bay, Puget Sound, Long Island Sound and Chesapeake Bay, once renowned for their high ecological productivity, are now mere vestiges of their former selves.

To restore past ecological abundance is to begin to understand how much we have all lost and, most importantly, how far we must go to restore what has been despoiled.

Mr. Chairman, the decline in estuary habitat has been well documented in the scientific and resource management literature for over 30 years. We are now beginning to see what this loss means to the environment, expressed through the declines in commercial fisheries, saltwater intrusion, coastal aquifers, and shoreline erosion and subsidence threatened, even private property.

A loss of estuary wetlands also has contributed to a declining water quality in these areas and these habitats serve as natural filters for pollutants.

Mr. Chairman, the impacts are real and should surprise no one.

What does remain surprising is the stubborn insistence of some critics in the development and resource extraction industries who believe that we can continue to fill in and pave over our estuary

habitats, somehow believing the ecosystem is left unaltered and that our human environment is not diminished.

Simply a charade to contend that this loss of estuary habitat, Mr. Chairman, has not had a pernicious impact on both our environment and the economy.

Just ask any unemployed commercial fisherman or an angler who has lost his favorite fishing area and he will tell you otherwise, or just ask the economists who recently estimated the dollar value of services provided at no cost to us by various natural environments.

Estuaries weigh in at $56,000 per acre per year for a global total of $4 trillion per year.

Mr. Chairman, after reviewing the bill, I believe H.R. 1775 would provide a reasonable balanced approach to help preserve remaining estuary habitats and would stimulate practical and effective environmental restoration on the local level.

Particularly, I am pleased that the legislation incorporates an administrative structure similar to the model currently authorized under the North American Wetlands Conservation Act, or NAWCA.

I believe that the NAWCA model can be adapted successfully to administer a national estuary habitat restoration program and I will be interested to hear if our other witnesses share this view.

One very important concern that I do have with the legislation is that it would exclude the Great Lakes States from participation. Plainly stated, Mr. Chairman, the exclusion is unwarranted, unnecessary, and perhaps even, I might say, unfair. But I do hope, Mr. Chairman and our good friend from Maryland, your support of this would add the Great Lakes, as well as the other areas that are part of our great nation.

This bill proposes an artificial distinction that is inconsistent within the statutes. For example, the Great Lakes are fully recognized under the Coastal Zone Management Act. Furthermore, degraded wetlands habitats, wherever they are located, are worthy of restoration and should receive equal consideration, regardless of whether they are salty or freshwater.

With that said, I would say that my good from Maryland, Mr. Gilchrest's legislation is a very good step. I believe that with some pragmatic modifications, that maybe we can make it even more effective.

I look forward to working together with the gentleman from Maryland and look forward to hearing from our witnesses this morning.

[The prepared statement of Mr. Faleomavaega follows:]

STATEMENT OF HON. THE HONORABLE ENI F. H. FALEOMAVAEGA, A DELEGATE IN CONGRESS FROM THE TERRITORY OF AMERICAN SAMOA

Thank you Mr. Chairman. I look forward to this morning's hearing. I especially appreciate that you have rescheduled for today the hearing regarding H.R. 1775, Mr. Gilchrest's bill to facilitate estuary habitat restoration, that was postponed last week due to Hurricane Floyd.

Consequently, we certainly have a busy agenda this morning. To keep things moving along, I will defer at this time from formally commenting on either H.R. 2496, which would reauthorize the Junior Duck Stamp Program, or H.R. 2821, which would expand the North American Wetlands Conservation Council by two seats. Mr. Chairman, I join you in welcoming our esteemed colleague and avid sportsman from

Michigan, Mr. Dingell, and I await with interest his comments regarding this legislation.

I do have some brief remarks regarding H.R. 1775, and I commend my good friend from Maryland for again introducing this legislation.

I share his overarching concern regarding the continued loss of estuary habitats across our Nation. Ecologists and researchers estimate that we have lost well over 90 percent of the estuarine wetlands that existed when European explorers first discovered this continent 400 years ago. Estuaries such as San Francisco Bay, Puget Sound, Long Island Sound and Chesapeake Bay—once renowned for their high ecological productivity—are now mere vestiges of their former selves. To read historical accounts of past ecological abundance is to begin to understand how much we have all lost, and most importantly, how far we must go to restore what has been despoiled.

The decline in estuary habitat has been well-documented in the scientific and resource management literature for over 30 years. Worse, we are now beginning to see what this loss means to the environment expressed through declines in commercial fisheries, salt water intrusion ruining coastal aquifers, and shoreline erosion and subsidence threatening public and private property. Loss of estuarine wetlands also has contributed to declining water quality in these areas, as these habitats serve as natural filters for pollutants. Mr. Chairman, the impacts are real and should surprise no one.

What does remain surprising is the stubborn insistence of some critics in the development and resource extraction industries who believe that we can continue to fill in and pave over our estuary habitats and somehow believe that the ecosystem is left unaltered, and that our human environment is not diminished.

It is simply a charade to contend that this loss of estuary habitat has not had a pernicious impact on both our environment and economy. Just ask any unemployed commercial fishermen, or an angler who's lost a favorite fishing area, and they will tell you otherwise. Or just ask the economists who recently estimated the dollar value of services provided—*at no cost to us*—by various natural environments. Estuaries weigh in at *$56,000 per acre per year,* for a global total of *$4 trillion per year.*

After reviewing the legislation, I believe that H.R. 1775 would provide a reasonable, balanced approach to help preserve remaining estuarine habitats and would stimulate practical and effective environmental restoration on the local level. Particularly, I am pleased that the legislation incorporates an administrative structure similar to the model currently authorized under the North American Wetlands Conservation Act, or NAWCA. I believe that the NAWCA model can be adapted successfully to administer a national estuary habitat restoration program, and I will be interested to hear if of our witnesses share this view.

One very important concern that I do have with this legislation is that it would exclude the Great Lakes States and insular areas from participation. Plainly stated, this exclusion is unwarranted, unnecessary and unfair, and I hope the Chairman and the sponsor will support the addition of these areas.

This bill proposes an artificial distinction that is inconsistent with other statutes. For example, the Great Lakes States and insular areas are fully recognized under the Coastal Zone Management Act. Furthermore, degraded wetland habitats—wherever they are located—are worthy of restoration and should receive equal consideration, regardless of whether they are saline or freshwater.

With that said, Mr. Gilchrest's legislation is a good first step, and I believe with some pragmatic modifications, that it can be made even more effective. I look forward to working with the gentleman from Maryland, and of course with you Mr. Chairman, to move this important legislation forward in the process.

Mr. SAXTON. I thank the gentleman for a very thoughtful statement. Just to amplify on what the gentleman just said, it was just a day or so ago that we were successful in adding several thousand more acres to the Coastal Barriers Resources system and we thank you for your cooperation, and I say that from the bottom of my heart, as you know.

Mr. Ortiz.

STATEMENT OF HON. SOLOMON ORTIZ, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. ORTIZ. Thank you, Mr. Chairman. I want to thank you and the Ranking Member for having this hearing today and for including the Junior Duck Stamp legislation on the agenda.

I had the honor of sponsoring the Junior Duck Stamp Conservation and Design Program Act back in the 103rd Congress, when I was a Subcommittee chairman of the Merchant Marine and Fisheries Committee.

The purpose of the program, as specified in the law, is to provide elementary and secondary school students with educational opportunities relating to the conservation and management of migratory birds. The program is also intended to increase the capacity for schools, states and other educational programs to conduct conservation and education programs.

As I was preparing for this hearing, I was pleased to hear the progress that has been made with this program. I am sure I am not the only person here who knows the importance of programs of this type to the future of our nation.

As economic and population growth continues and increasingly impacts our environment and natural resources, we have to work harder to find ways to preserve both our world and our standard of living. I would agree, solutions to these types of problems begin with knowledge and understanding and these begin with, of course, education.

This is where the benefits of programs such as the Junior Duck Stamp Program will be embraced by society. I am proud to be a part of the program that reaches out to grade school students to teach an appreciation for environmental science and habitat conservation, while also rewarding hard work and effort with support for continuing education.

I can see how this is a great tool to help educate students who have not had the opportunities that some of my colleagues and I have had to spend time in nature and develop an appreciation of our resources and their management.

I thank our witnesses for being with us today and look forward to hearing their testimony. Again, Mr. Chairman, I thank you.

Mr. SAXTON. I thank the gentleman. I would now like to introduce someone who truly needs no introduction, Mr. John Dingell, one of our most outstanding conservationists in the House, who is here to discuss the North American Wetlands Conservation Council Act of 1999.

My good friend, John Dingell, if you would take your place and proceed as you are comfortable, sir.

STATEMENT OF HONORABLE JOHN D. DINGELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. DINGELL. I thank you, Mr. Chairman, for the outstanding work of this Subcommittee. I feel very comfortable because I've spent a lot of time here in this room, both as a member of the Merchant Marine Fisheries Committee, which was just referred to by my good friend Mr. Ortiz, and, also, as a member of the Commerce Committee.

This is indeed the home of great conservation legislation and it has a proud history both in earlier days and also under your leadership, and I'd like to say how pleased I am to see my old friend Mr. Faleomavaega here and to have an opportunity to listen to him and to you, and, also, to my friend Mr. Ortiz.

I have a lengthy statement, Mr. Chairman, which I, with your permission, would like to insert into the record. It is on H.R. 2821, and I will try to summarize briefly the purposes behind that particular legislation.

You might be inquiring as to why it is I suggest a change be made. The legislation is a surprisingly important piece of legislation. In fact, NAWCA has been an enormous success. It's funded 629 projects between 1991 and 1999.

It's helped to restore, enhance or help approximately 34 million acres across this continent to achieve higher levels of conservation and wildlife use values.

It's triggered a ratio of partner-to-government contributions in which $2.50 of private money have matched every public dollar that has been spent. This investment is triggered by something which tends to indicate success. The Council which handles this is a nine-member panel. This legislation would increase it to 11.

The reason is, of course, that we're finding that in success and in matters where conservation is vitally concerned, there is a desire for a large number of organizations to participate and a desire on the part of the Administration to see to it that—and that would be true of any Administration—that the benefits are achieved by sharing the participation in the business of the Council and representation on that Council rather broadly.

Two very distinguished organizations which have worked very hard on this panel were scheduled to be dropped, the Ducks Unlimited and also the Nature Conservancy. These are two institutions that put hundreds of thousands, indeed millions of dollars into this program and into other land conservation and wildlife conservation programs.

I think that it would be unwise to drop them. I'm told that now Ducks Unlimited is going to be reappointed, although I've not heard of this, but officially, and that the other organization is not seeking at this time particular membership on the Council.

Very frankly, it seems to me that if we need additional representation on the Council and additional participation to expand not only the membership, but the opportunity of different organizations to serve here and to become participants and enthusiastic participants in the program, it would appear that we should, however, at the same time, keep both the Nature Conservancy and Ducks Unlimited, because of the sterling reputation they have and because of the superb work they have done in participation in particularly the conservation of lands, but also conservation of wildlife and specifically in areas involving wetlands, migratory birds and things of that sort.

So the legislation is really very simple. It will ease the pressure in the Administration to cut off those who are serving well and very, very effectively, in the best traditions of wildlife conservation, while, at the same time, affording them the opportunity to appoint

several new members to the Commission, which would be, in that fashion, very beneficial to all.

I would observe that my good friend, Mr. Weldon, who serves with me on the Migratory Bird Commission, which works very closely with this panel and indeed approves the projects that they recommend, or disapproves, and we haven't disapproved any, is also a co-sponsor of the legislation and feels, as I do, that we need to move forward to expand the capability of the Commission to do the things that it needs to do in terms of encouraging public participation by private citizens and private organizations in the conservation of wetlands under the North American Wetlands Conservation Council Expansion Act of 1999.

I want to commend this Committee and you, Mr. Chairman, for the fine leadership you've shown in matters of this kind. I hope that you will not consider that I'm wasting the time of this Committee by bringing to you a relatively piddly matter. I would observe that small matters oft times are very important to greater successes and this appears to fall into that area.

So with those remarks, Mr. Chairman, I thank you for your courtesy, the great work that you and the Committee are doing, and for permitting me to appear here this morning to share these thoughts with you and for your consideration of this bill.

[The prepared statement of Mr. Dingell follows:]

STATEMENT OF HON. HON. JOHN D. DINGELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. Chairman, I recently introduced H.R. 2821, the "North American Wetlands Conservation Council Expansion Act of 1999."I want to thank you and your Subcommittee staff for your generosity in granting a hearing on this legislation so quickly. I hope that H.R. 2821 might remain on a swift course so that the great benefits of the North American Wetlands Conservation Act (NAWCA) will be fully employed to conserve more wildlife habitat.

This legislation would make a modest improvement to a conservation law that has successfully saved wetlands throughout the United States, Canada, and Mexico during the past decade. The North American Wetlands Conservation Act was signed into law in 1989 in response to the finding that more than half of the original wetlands in the United States had been lost during the past two centuries. Congress recognized that protection of migratory birds and their habitats required long-term planning and coordination so that our treaty obligations to conserve these precious species would be met.

The purpose of NAWCA is to encourage partnerships among public and non-public interests to protect, enhance, restore and manage wetlands for migratory birds and other fish and wildlife in North America. NAWCA has been a tremendous success, funding 629 projects between 1991 and 1999, helping to restore, enhance or help approximately 34 million acres across our continent. Most impressive has been the ratio of partner-to-government contributions, which has been about $2.50 for every public dollar invested.

A little more than one year ago I first learned of the Fish and Wildlife Service's desire to promote change in the NAWCA program when the agency announced its intent not to reappoint two non-governmental organizations that played key roles in making NAWCA a cornerstone of American conservation success. I was greatly concerned that any replacement of Council members under NAWCA should not serve as a disincentive to continued active participation in meeting the Act's goals.

I inquired of the Fish and Wildlife Service why it was attempting to replace existing Council members. The Fish and Wildlife Service informed me that it sought to ensure more diversity on the Council. One organization chose to leave the Council, I was informed. The other chose to continue to seek reappointment. Recently my office region's quality of life and recreational value. The Bay Area economy is driven by industries that are located in the Bay Area because they choose to be here—and they choose this reason because valuable employees appreciate the quality of life in the Bay Area.

As species such as the Delta smelt and the winter run Chinook salmon have been protected under the Endangered Species Act, water users, including the East Bay Municipal Utilities District and the Contra Costa Water District have faced increasing restrictions on their ability to take water from the Delta. Restoring habitat is not the entire answer to this fisheries and ESA crisis, but it is a part of the solution. If we can restore habitat and ecosystem health, it will have direct benefits for local residents and the state's economy.

The Region and the State of California Understand the Need For Estuary Restoration

There is a regional consensus in California that the restoration of habitat in the Bay-Delta Estuary should be a major priority. The state is already making funding available for the restoration of habitat in the Estuary, through Proposition 204, in 1996. This year, Governor Davis just signed a budget with $10 million for a new San Francisco Bay Conservancy—with a major focus on habitat restoration.

Save The Bay is taking a leadership role to restore wetlands habitat, working with other regional and local environmental organizations, private and public conservancies, farmers, landowners and other constituency groups, promoting policies that encourage restoration, and building alliances and partnerships to advance restoration throughout the region.

We have also learned in the Bay Area that habitat restoration can help solve some of our dredging needs. Several years ago, for example, the Port of Oakland, with the support of environmentalists, fishermen and state and Federal agencies, used millions of cubic yards of clean mud dredged from its channels to restore wetlands at a site called Sonoma Baylands. This project has been cited as a national model of cost-effective sustainable development. However, restoration does cost somewhat more than the old practice of dumping all of this material in the Central Bay. There are several other similar projects under development. Funding from H.R. 1775 could be invaluable for advancing this work.

Last year, another wetland restoration project was dedicated in the North Bay, affecting 300 acres of wetlands at Tolay Creek in the North Bay. What made this project particularly interesting was its broad support from environmentalists and farmers. Environmentalists and farmers in California often fight over water and wetlands issues. However, this restoration project helped farmers resolve permitting issues that had troubled their levee maintenance work. H.R. 1775 would provide for cooperation with private land owners to solve environmental problems that, if left unaddressed, could threaten the environmental and economic health of the Bay Area and many other coastal areas around the nation.

This legislation can be a catalyst for estuary restoration, eventually providing over $75 million per year of new Federal resources to achieve an actual increase of one million acres of habitat by 2010. It will also give local communities and our organizations a real voice in shaping restoration projects through voluntary efforts and public-private partnerships. It recognizes the value of watershed planning efforts and voluntary efforts by citizens groups helping with actual, on-the-ground restoration, and makes these a priority for funding. It will also improve coordination among Federal programs and agencies, and streamline their efforts to collaborate.

H.R. 1775 provides funding through the Army Corps of Engineers—and this bill could be one of the most important statutory efforts to reform the Corps' practices and shift its mandate and mission toward restoration. The Corps itself has said that it wants one third of its budget devoted to restoration within five years.

In case anyone wonders why we need funding through this bill, given the existing Federal funding for CALFED, it is important to underscore that CALFED's funding authorization expires this year. The CALFED Ecosystem Restoration Program also does not include the entire Bay, instead emphasizing the Delta and upstream areas. The lower reach of the estuary needs more attention, and this bill would help meet that need. While we work to renew the CALFED funding authorization, we need H.R. 1775 to help build a national constituency for estuarine restoration. Not only is that appropriate, but it will help maintain the Federal presence and effort to restore our estuary over the long term.

All of these factors explain for the bill's broad support among local organizations around the nation, and among the Federal agencies themselves.

We deeply appreciate the efforts of Representatives Gilchrest and Tauscher to work for preservation and restoration of our nation's estuaries, and we encourage you and all members of the House to swiftly pass this legislation.

Thank you for your consideration.

Mr. SAXTON. Thank you very much. And, believe me, we don't think that you are wasting our time in any way, shape or form.

When we have a program that works as well as this one does, where we appropriate a dollar and it turns into two or three because of contributions that interested parties make, certainly this is in no way, shape or form a waste of time, and we thank you for being here.

I would just say that my inclination is just to say, at this point, that people who are involved in this program make these contributions and if we can get more people interested and involved in the program to make more contributions, so much the better.

So I don't have any questions at this time, but I would like to commend you for your forethought and bringing this matter to our attention, and we intend to move forward with it as expeditiously as possible.

Mr. DINGELL. Thank you, Mr. Chairman.

Mr. SAXTON. Mr. Faleomavaega.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. I, too, would like to associate myself with your comments made earlier concerning Mr. Dingell's statement. Perhaps, just for the record, to my good friend from Michigan, my own personal welcome for him to testify this morning.

As you well know, Mr. Dingell, the Department of the Interior did something very funny last year and, perhaps for the record, if you could explain to the members of the Committee, this rotation consecutive appointment seems to have done something to the way the law had originally constituted the membership of the Council.

Can you share with the members of the Committee how this has affected your decision, with Mr. Weldon, to introduce this legislation, to increase the membership?

Mr. DINGELL. Yes, I will, and I thank you for that question. Originally, there were to be three private organizational members, which would be generally representative of the conservation community.

It was to derive the benefit of their expertise, to achieve the benefit of their support, and also to encourage their participation and that of others in the conservation community and program, which, as mentioned by the Chair, has been enormously successful because it brings in about $2.50 worth of private money for every dollar we spend of Federal money, and people are confident that this program is saving money because the areas are held under long-term contract and have the prestige of being denominated as essentially government or quasi-governmental undertakings. So people are comfortable giving money to carry these programs forward.

What has transpired is that the success of this has led the Secretary, and I think in a proper exercise of his judgment, to say, well, we want to spread the opportunity for responsible organizations around, to permit them to serve on this panel.

This would have the practical effect, and I agree with it, of increasing the support that is out there in the society generally, particularly in the organized conservation community.

Having said that, at the same time, however, we drop the two organizations that participate most extensively and in terms of the largest contributions, in terms of money and time and manpower and so forth: Ducks Unlimited, which is an extraordinary organization, a great treasure, and the Nature Conservancy.

Their purposes are slightly different, but they're all geared to buying land and at conserving and preserving the wildlife resources and the other environmental values.

So I find that the two purposes, the purpose of seeing to it that we encourage the participation by those who do the most, is somewhat at war with the idea of spreading it around to attract greater public attention and greater public support.

This is an attempt to meet the concerns of the Department, to see to it that we do keep the big givers and the people who do the most in a position where they can continue to do that and enthusiastically support it, while, at the same time, affording the Secretary the opportunity to provide some additional recruitment of public support for the program.

I think that in that particular, this is a pretty good compromising resolution for the difficulty that we confront and it doesn't make it so big that we run into social problems inside the institution.

Mr. FALEOMAVAEGA. I thank the gentleman for a very comprehensive explanation, and I do support the gentleman's bill, by the way. Thank you.

Mr. DINGELL. I thank my good friend and I would say to him hoya ah.

Mr. FALEOMAVAEGA. I think the Chairman probably doesn't know what that means, but maybe one day when you come see the South Pacific, we will share with him the meaning of those words.

Mr. DINGELL. We will sing him a song.

Mr. FALEOMAVAEGA. Thank you.

Mr. SAXTON. Thank you very much. Mr. Ortiz.

Mr. ORTIZ. Mr. Chairman, all I can say is that it's an honor to have the dean of the House with us this morning, and I think that you have a good bill and I'll support it. Thank you, Mr. Dingell.

Mr. DINGELL. I thank you. I'm honored to be here, Mr. Chairman. You are three distinguished members and we all have large reason to be grateful to all of you for your leadership and for your hard work in these matters. Thank you.

Mr. ORTIZ. Thank you. Thank you, Mr. Chairman.

Mr. SAXTON. We want to thank you for being here this morning, John. Your testimony is much appreciated.

We will now move on. I will now introduce the second panel. We have with us Tom Melius, the Assistant Director of External Affairs at the U.S. Fish and Wildlife Service.

I just would like to say, as a reminder, that the five-minute rule, of course, is in effect. Your testimony will be included in its entirety for the written record, and I now recognize Tom for his statement.

STATEMENT OF TOM MELIUS, ASSISTANT DIRECTOR FOR EXTERNAL AFFAIRS, FISH AND WILDLIFE SERVICE, U.S. DEPARTMENT OF THE INTERIOR

Mr. MELIUS. Thank you, Mr. Chairman. My name is Tom Melius, Assistant Director for External Affairs for the Fish and Wildlife Service, and I appreciate the opportunity to appear today to discuss the first two bills at this hearing.

The Fish and Wildlife Service strongly supports H.R. 2496, the reauthorization of the Junior Duck Stamp Conservation and Design Program, which was introduced by Congressman Ortiz. H.R. 2496 would reauthorize the administrative expenses for the Junior Duck Stamp Program at $25,000 for Fiscal Years 2001 through 2005.

In 1989, the Junior Duck Stamp Program was developed initially by the Service with a grant from the National Fish and Wildlife Foundation. The program was sanctioned and expanded by Congress in 1994.

This program is designed to offer young people from kindergarten to high school the opportunity to learn about wetlands, water fowl and wildlife conservation through their participation in an integrated curriculum of environmental science and the arts.

The highlight of the program is the annual Junior Duck Stamp contest. All 50 states and the District of Columbia participate. The Service owes a great deal of appreciation to the volunteers who assist with this program. These volunteers are responsible for many activities, such as receiving and recording the art and selecting the contest sites annually.

The Service believes the Junior Duck Stamp Conservation and Design Program plays an important role in the education of our youth, for it instills in them a strong environmental conservation ethic. Currently, over 100,000 young people in the public, private and home-school programs participate. The Service strongly supports adoption of H.R. 2496.

The next bill, H.R. 2821, the North American Wetland Council Expansion Act, introduced by Congressman Dingell and co-sponsored by Congressman Weldon, amends the North American Wetland Conservation Act to expand the Wetlands Council by adding two additional non-governmental organizations to the nine-member group.

The North American Wetland Conservation Act provides matching grants to private and public organizations and individuals who have developed partnerships to carry out wetland conservation projects in the United States, Canada and Mexico.

From 1991 through March 1999, over 900 partners have been involved in 684 projects, supported with over $287 million in Federal funding and total partner contribution exceeding the $272 million figure, a ratio of $2.5 for every one dollar of Federal funding, a very great leverage.

The North American Wetland Conservation Act also directs the Secretary of the Interior to appoint state and non-government agencies to the nine-member council, with permanent seats for the Director of the Fish and Wildlife Service and a representative from the National Fish and Wildlife Foundation. The states are represented by state directors from four of the states representing the four flyways.

The three NGO organizations are required to be active participants in wetland conservation projects. Both the states and non-governmental members are appointed to serve three-year terms.

The North American Wetland Conservation Act is one of the most successful and non-controversial Federal conservation laws, mainly due to the partnerships that have been formed for on-the-ground restoration efforts. The Council embodies these successful

partnerships and represents the broad-based coalition of interests committed to the protection of wetlands and migratory birds.

For these reasons, the Service does not believe the Council needs to be expanded to meet its current mission. However, should Congress expand the mission of the Council, as has been discussed, in conjunction with the debate on the Neotropical Migratory Bird Conservation Act, then the addition of two members may bring additional new expertise and perspective to the Council.

The Neotropical Migratory Bird Conservation Act, which the Senate passed in April of 1999, and is awaiting floor action in the House, as well as a bill very similar that was passed out of the Resources Committee, establishes a grant program to provide assistance in the conservation of neotropical migratory birds.

The legislation encourages the Secretary of the Interior to establish an advisory group to provide guidance in implementing a grants program. If that legislation is enacted, the Service intends to designate the North American Wetland Council as the advisory group for that program.

This program would bring the expertise and experience of the Council to the full range of needs of neotropical migratory birds. Recognizing this opportunity, the Service believes that if the Neotropical Migratory Bird Conservation Act were enacted, expanding the Council to include additional non-governmental groups with expertise in Latin America and the Caribbean and neotropical migratory bird conservation, it would make sense to enhance the Council's current expertise and representation.

The Service looks forward to working with Congressman Dingell and the Subcommittee to explore these opportunities to fulfill all needs of migratory birds, including neotropical migrants, water fowl and others.

This concludes my statement and I would be pleased to answer any questions the Committee may have.

[The prepared statement of Mr. Melius follows:]

STATEMENT OF THOMAS O. MELIUS, ASSISTANT DIRECTOR FOR EXTERNAL AFFAIRS, U.S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

Mr. Chairman, I am Tom Melius, Assistant Director for External Affairs for the U.S. Fish and Wildlife Service. I appreciate the opportunity to appear today to discuss these two Fish and Wildlife Service bills the Subcommittee is considering.

H.R. 2496, Reauthorization of the Junior Duck Stamp Conservation and Design Program

The Fish and Wildlife Service strongly supports H.R. 2496, which was introduced by Congressman Solomon P. Ortiz. We would like to thank Mr. Ortiz for introducing this bill and for his continued support of this program.

H.R. 2496 would reauthorize administrative expenses for the Junior Duck Stamp Conservation and Design Program at $250,000 for fiscal year 2001 through fiscal year 2005. Funds appropriated under this program are used for various purposes, including salary and travel expenses for the Junior Duck Stamp Manager, travel expenses for the Junior Duck Stamp winners and their teachers and parents, mailing contest information and scholarships and ribbons for contest participants.

In 1989, the Federal Junior Duck Stamp Conservation and Design Program was developed initially by the Service with a grant from the National Fish and Wildlife Foundation. The program was sanctioned and expanded by Congress in 1994, with the enactment of Public Law 103-340.

This innovative program is designed to offer young people from kindergarten to high school the opportunity to learn about wildlife conservation through an integrated art and science curriculum. The primary focus of the wildlife conservation program, which complements the regular environmental education curriculum for

students, is waterfowl and wetland education. The highlight of the program is the Junior Duck Stamp Conservation and Design art contest held annually and modeled after the successful Federal Duck Stamp. The Junior Duck Stamp program experienced a humble start with two states participating—California and Florida. Today, all fifty States and the District of Columbia participate.

Each year, as part of their environmental education studies, students throughout the Nation submit their designs relating to conservation of migratory birds (waterfowl entries) to a designated site in their State to be judged by volunteers who are versed in art and wildlife. The "Best of Show" designs in the State are forwarded to Washington, DC, where they are judged by a panel of five judges. The first place design in the national contest becomes the Federal Junior Duck Stamp. The Junior Duck Stamp, which sells for $5, is a collectible and is not used for hunting.

Because of the limited resources, States rely heavily on volunteers. These volunteers receive the art, record it, prepare the art for display and decide where in the State the contest will be held. Following the contest, they prepare the art for its return and prepare certificates of appreciation and ribbons for contest participants. Without these volunteers, the Junior Duck Stamp program could not be the success that it is.

The Service believes the Junior Duck Stamp Conservation and Design Program plays an important role in the education of our youth and it instills in them an environmental conservation ethic. In 1998, over 42,000 students entered the art contest. Educators who have consulted with the Service on the development of the Program, estimate that for every student who enters the art contest ten other students actually participate in the curriculum. In addition, the winning designs are displayed at State Fairs, National Wildlife Refuges, art galleries, museums, and government buildings, encouraging and educating students and the public.

The Service strongly supports H.R. 2496, and we encourage Congress to pass this important legislation to help the Service continue providing this educational program for young people.

H.R. 2821, North American Wetlands Council Expansion Act of 1999

The Service would like to thank Congressman Dingell and the Subcommittee for your continued interest in and support of the North American Wetlands Conservation Act (NAWCA) and the work of the North American Wetlands Council. H.R. 2821 would amend NAWCA to expand the Council by adding two additional non-govemmental organizations to the nine-member group. While the Service does not oppose the bill, we believe it is unnecessary because the Council has been working successfully for ten years to advance the goals of wetlands and migratory bird conservation.

History of NAWCA

NAWCA provides matching grants to private or public organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico. The law was originally passed to support activities under the North American Waterfowl Management Plan, an international agreement that provides a strategy for the long-term protection of wetlands and associated upland habitats needed by waterfowl and other migratory birds in North America. NAWCA established a nine-member Council to review grant proposals and recommend approval of qualifying projects to the Migratory Bird Conservation Commission (MBCC).

In 1998, Congress reauthorized appropriations for NAWCA through fiscal year 2003, reflecting the strong support shared by Congress and the public for the Act's goals. The ceiling for appropriations for NAWCA is $30 million per year, and Congress has appropriated $15 million for projects in fiscal year 1999, the highest level appropriated to date.

Successes of NAWCA

From 1991 through March 1999, over 900 partners, including environmental groups, sportsmen's groups, corporations, farmers and ranchers, small businesses, and private citizens have been involved in 684 projects under NAWCA. The law requires that U.S. and Canadian partners focus on protecting, restoring, and/or enhancing important habitat for migratory waterfowl and other birds. In Mexico, partners may develop training and management programs and conduct studies on sustainable use, in addition to habitat protection. NAWCA has supported projects with a total of over $287 million in Federal funding, and total partner contributions have exceeded $727 million. The law requires non-Federal matching dollars of 1: 1; however, partners have averaged 2.5 dollars for every Federal dollar. This tremendous leveraging has enabled well over 8 million acres of wetlands and associated uplands to be acquired, restored, or enhanced in the United States and Canada, while over

26 million acres in Mexico's large biosphere reserves have been affected through conservation education and management planning projects.

Current Operations of the Council

NAWCA directs the Secretary of the Interior to appoint State and non-governmental agencies to the nine-member Council, with permanent seats for the Director of the Fish and Wildlife Service and a representative from the National Fish and Wildlife Foundation. The States are represented by State Directors of Fish and Wildlife Agencies and represent the four migratory bird flyways. The three non-govermental organizations are required to be active participants in wetlands conservation projects. Both the States and non-governmental members are appointed by the Secretary to serve three-year terms. The Secretary is authorized to appoint one alternate member to the Council, who is able to vote if one of the nine seats is vacant or a voting member is absent from a meeting. The Secretary is also encouraged to appoint ex officio members to the Council, who are not voting members but able to participate actively in the selection process. Currently one non-governmental organization holds this status. Mexico and Canada also have ex officio membership and participate in the decisions of the Council. The Council meets three times a year to review and rank project proposals and is served by staff which provides extensive technical advice. The Council recommends projects to the MBCC, which has the authority to approve funding for projects.

Over the past ten years, the current nine-member Council has successfully collaborated to select the most important projects to protect migratory birds and their habitats and further the goals of the North American Waterfowl Management Plan. Part of the success of NAWCA has been the fair, equitable and non-biased way in which the Council has formulated sound recommendations to the MBCC. The results speak for themselves. NAWCA is one of the most successful and non-controversial Federal conservation laws; mainly due to the partnerships that have been formed for on-the-ground restoration efforts. The Council embodies these successful partnerships and represents the broad-based coalition of interests committed to the protection of wetlands and migratory birds. For these reasons, the Service does not believe the Council needs to be expanded to meet its current mission. However, should Congress expand the mission of the Council as has been discussed in conjunction with debate on the Neotropical Migratory Bird Conservation Act, then the addition of new members may bring important new expertise and perspectives to the Council.

Neotropical Migratory Bird Conservation

The Neotropical Migratory Bird Conservation Act, which the Senate passed in April 1999 and is awaiting floor action in the House, establishes a grants program to provide assistance in the conservation of neotropical migratory birds. The legislation encourages the Secretary of the Interior to establish an advisory group to provide guidance in implementing the grants program. If that legislation is enacted, the Service intends to designate the North American Wetlands Council as the advisory group for this program. This proposal would bring the expertise and experience of the Council to the full range of needs for neotropical birds that depend on healthy habitat throughout their migratory life cycles. Conservation of all migratory birds, not only in wetlands but in other important habitat areas as well, is already built into NAWCA. The Council is fully capable of carrying out this advisory role and has indicated its enthusiasm for doing so.

Recognizing this opportunity, the Service believes that if the Neotropical Migratory Bird Conservation Act were enacted, expanding the Council to include two additional non-governmental groups with expertise in Latin America, the Caribbean and neotropical migratory bird conservation would make sense to enhance the Council's current expertise. The Service looks forward to working with Congressman Dingell and the Subcommittee to explore these opportunities and fulfill the needs of all migratory birds including neotropical migrants, waterfowl and others.

This concludes my written testimony, and I would be happy to answer any questions.

Mr. GILCHREST [presiding]. Thank you, Mr. Melius. I just have a couple of questions.

How much money did Congress appropriate for the Junior Duck Stamp Program?

Mr. MELIUS. The Junior Duck Stamp Program receives an annual appropriation of $250,000 a year.

Mr. GILCHREST. And how many schools currently receive copies or applications or information about the program, public and private, and do you target specific schools? Is the country blanketed with information? What kind of follow-up do you have?

Mr. MELIUS. The latter, as you just mentioned, is more the approach that we have taken. We try to blanket the entire nation using the database provided to us from the educational organizations, so that every school in our nation will receive information about how to implement this type of a program.

Mr. GILCHREST. Is it mailed to the individual schools?

Mr. MELIUS. Yes.

Mr. GILCHREST. Is it the school board that gets the information or the actual high school or middle school?

Mr. MELIUS. I believe it's through the elementary schools, as well as including the high schools, so that we get as broad a distribution as we can, because this is a program that does involve elementary schools or elementary students, as well as high school students.

Mr. GILCHREST. So it goes to the actual school or to the board in that county?

Mr. MELIUS. To the actual school itself, I'm told.

Mr. GILCHREST. So you send out tens of thousands of pieces of literature.

Mr. MELIUS. A brochure that explains the program, as well as then in each state and all states participate, we have a state coordinator, a volunteer normally, and we will have instructor curriculum, as well as go out and conduct workshops to try to get more participation in this program.

Mr. GILCHREST. How many schools participate, do you know? Throughout the country.

Mr. MELIUS. I believe that we have approximately 5,212 schools that are active participants at this time. We have approximately 42,000 students that are entering art into the contest to be judged annually in each one of the states. Winners of each one of these states then is submitted to Washington, DC for a national program, where we then judge a first and a second and a third place winner.

Mr. GILCHREST. Is it mostly high school students that participate, middle school?

Mr. MELIUS. It depends in each state on just where the enthusiasm lies with a lot of the volunteers and some of the instructors. We have had past state winners that are from elementary school, as well as from high schools. Last year, the winner was from Dearborn, Michigan and the winner of this year's contest, which was just announced a couple of months ago, was from Illinois.

Mr. GILCHREST. Is there certain criteria, water colors, acrylic, oil, does that matter?

Mr. MELIUS. The criteria of what type of medium they use is not really that important. It's more that they are learning about the whole water fowl and wildlife experience and incorporate some of that into the art that they are producing in each one of the states.

Mr. GILCHREST. Thank you very much. I yield now to Mr. Faleomavaega.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. I want to thank Mr. Melius for his statement this morning.

I was going through this very beautiful pamphlet or brochure about the national wildlife refuge system and I notice issues like Guam, like Baker Island, which I don't think anybody lives there, and Howland Island, even Rose Atoll, which is part of my jurisdiction.

Is there any particular reason why these areas are not included in this legislation? I notice some in Puerto Rico and the 50 states are part of the participants of the program, but I don't see any reference made to these areas. Hawaii is an area, even though it's a state.

Mr. MELIUS. I'm not certain of——

Mr. FALEOMAVAEGA. Do you have to have ducks in order to qualify to be a participant?

Mr. MELIUS. I'm not certain why it was not originally included in the '94 bill, as adopted by Congress. Since this is a reauthorization, that is something I'm sure could be looked into.

Mr. FALEOMAVAEGA. Would the Administration have any objection if I do ask my good friend from Texas and others here to include the insular areas? Would it be an extra cost in the program?

Mr. MELIUS. We feel that as many areas that we can get out this type of material and participation is just valuable to all of us.

Mr. FALEOMAVAEGA. It's not so much the money. It's the program. It's the orientation. It's the getting the young people of America to appreciate what wildlife is all about, especially our appreciation for ducks.

Am I correct in that?

Mr. MELIUS. You're very correct, as well as all water fowl, not just only ducks.

Mr. FALEOMAVAEGA. Mr. Melius, we had earlier the statement that was made by Congressman Dingell about the proposed bill to add two additional members to the North American Wetlands Conservation Council. I didn't get the gist of the Administrations position. Do you oppose the proposal made by the gentleman from Michigan to add two new members to the Council?

Mr. MELIUS. While we are not opposed to the addition of two additional members to the Council, the Administration believes that, at this time, under the current mission of the Council, there is a very strong balance of representation and that with the current policy of trying to rotate members onto that Council, that the Council is working very effectively.

Mr. FALEOMAVAEGA. But the Interior Department, when they took this position in '98, last year, was this part of the authorization of the legislation to allow the Secretary to do this consecutive term rotation, whatever it is?

Mr. MELIUS. The rotation policy was an effort that I believe the Fish and Wildlife Service initiated a year ago to try to give better clarity on just how the Council and the membership on the Council is going to be implemented.

Mr. FALEOMAVAEGA. Not wanting to put words in your mouth, Mr. Melius, but if I hear what you're saying, the Administration does not oppose, but really would prefer not having two additional members. Am I correct in that?

Mr. MELIUS. If Congress is wanting to have two additional members, of course, we will work with that in every fashion we can. We

just feel that the addition of some other areas to the Council may be a better thing to consider at this time.

Mr. FALEOMAVAEGA. You say that we have a strong balance, but what Mr. Dingell is proposing would make it even better. Right?

Mr. MELIUS. We're trying to work with the Council to make sure that there is a delicate balance kept. If the addition of two new members is what the Congress is wanting to do, I'm sure we will be able to accommodate that.

Mr. FALEOMAVAEGA. Mr. Melius, you're very—I like that. Thank you very much.

Mr. GILCHREST. Mr. Ortiz.

Mr. ORTIZ. Mr. Melius, thank you for being with us today. And I think that you gave a good explanation as to what H.R. 2496 does. I think that there were some very good questions that were asked.

I guess my question would be, what do you need for us, Congress, to do so that we can meet your plans? I know this is an exciting program. Many children in the middle schools and high schools take advantage of this program.

What can we do to help you?

Mr. MELIUS. Besides just adoption of this bill to keep the authorization flowing, I would like to thank you personally for the effort you have shown in this. I remember early in the '90s specifically having an opportunity to work in this body on the old Merchant Marine Fisheries Committee, when the 1994 bill was originally drafted, an issue that I was involved with at that time.

So I appreciate your steadfast support of this. Obviously, the appropriations are the life blood in allowing us to continue and we're very pleased that Congress has been able to provide the full authorization or full appropriations at the authorization level.

Mr. ORTIZ. Thank you. And I can assure you that I will do everything, with my good friend from American Samoa, to accommodate him, to work with him, because he's bigger than I am.

Thank you. Thank you very much, Mr. Chairman.

Mr. FALEOMAVAEGA. Would the gentleman yield?

Mr. ORTIZ. I yield.

Mr. FALEOMAVAEGA. Actually, Samoans are very small people. Just don't provoke them, that's all.

Mr. GILCHREST. Thank you. The gentleman from Texas, or the gentleman from Puerto Rico.

Mr. ROMERO-BARCELÓ Thank you, Mr. Chairman. I have no comments or questions.

Mr. GILCHREST. We thank the agency, Fish and Wildlife, for coming and testifying here this morning. Thank you very much.

Mr. FALEOMAVAEGA. Mr. Chairman.

Mr. GILCHREST. Yes.

Mr. FALEOMAVAEGA. I just want to ask unanimous consent to have the statement by Mr. Frank Pallone be made part of the record.

Mr. GILCHREST. Without objection.

Mr. FALEOMAVAEGA. Thank you very much.

[The prepared statement of Mr. Pallone follows:]

STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. Chairman, thank you for holding this hearing today on H.R. 1775, the Estuary Habitat Restoration Partnership Act. I know both the Chairman and the sponsor of this legislation have a keen interest in seeing our estuaries preserved and protected and I commend them for their efforts.

Estuaries are the richest part of our coastal areas, a wealth of biodiversity. They are havens for migrating shore birds and nurseries for essential fish habitat. They are critical to the survival of many species, which use estuaries as protective feeding areas for their young. Estuaries also offer vast scientific, educational, and recreational benefits. They are often the cultural centers of coastal communities. These fragile areas are also especially vulnerable to the impacts of over-development and pollution. At the same time, many estuary areas play a large role in local and regional economies. In New Jersey, the New York-New Jersey Harbor and Delaware Bay estuaries are important maritime commerce areas, and the Barnegat Bay estuary in the Chairman's district is a critical area for coastal recreation.

H.R. 1775's goal of restoring one million acres of estuary habitat by the year 2010 follows the spirit of President Clinton's Clean Water Action Plan which calls for an increase of 100000 acres of wetlands annually. I would like to hear our witnesses' views on the bill's goal of one million restored estuary acres.

I also hope our witnesses today will address the question of whether the bill should be expanded to include the Great Lakes and territories. I know many members of the Subcommittee would like to see the bill expanded, and I am interested in hearing what our panelists think about this proposal. Finally, I hope our panelists will comment on the council structure of the created by H.R. 1775 and the advantages to creating these types of partnerships.

Again, I thank the Chairman and the sponsor of this legislation. I am pleased to see this bill move forward and I look forward to working with my colleagues to enact this legislation.

STATEMENT OF HON. WAYNE GILCHREST, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MARYLAND

Good morning., Today the Subcommittee on Fisheries Conservation, Wildlife and Oceans will be hearing from various distinguished witnesses regarding the status of the nation's estuaries and, in particular, my bill H.R. 1775, the Estuary Habitat Restoration Partnership Act. This is a topic that has generated considerable interest this session of Congress, and it is my hope that we can come together to pass meaningful legislation to assist in the restoration of estuary habitat throughout the nation.

Habitat in estuaries has been degraded or destroyed over the past 100 years with little regard for its many economic values and quality-of-life benefits. Population growth in coastal watersheds; dredging, draining, bulldozing and paving; pollution; dams; sewage discharges—these and other impacts from human activities have led to the extensive loss and continuing destruction of estuary habitat.

For example, in our coastal states, more than half (roughly 55 million acres) of wetlands have been destroyed. Specific examples include:

In the Chesapeake Bay, 90 percent of sea grass meadows were destroyed by 1990. Over the last 30 years (1959-89), oyster harvest fell from 25 million pounds to less than one million.

In San Francisco Bay, 95 percent of its original wetlands have been destroyed and only 300 of the original 6,000 miles of stream habitat in the central valley support spawning salmon.

70 percent of salt marshes along Narragansett Bay are being cut off from full tidal flow and 50 percent have been filled; and

Louisiana estuaries continue to lose 25,000 acres annually of coastal marshes, an area roughly the size of Washington, DC;

For the most part, the loss in each estuary is an accumulation of small development projects and other impacts. The destruction cannot be blamed on one factor alone, but the cumulative effects of the destruction are surprising in extent and severity, amounting to tens of millions of acres.

We can and must coordinate Federal, state and local management efforts to protect our estuaries. We must also provide sufficient resources for estuary restoration, without which all of our planning and coordination efforts are useless. Our estuaries are sick, and planning without implementation is like a diagnosis without any treatment. If we want to bring estuaries back to health, we need to commit the time,

money, and creativity necessary to restore the vital organs that make estuaries live and breathe.

H.R. 1775, the National Estuary Habitat Restoration Partnership Act, is not about a new layer of Federal bureaucracy—it is about coordination of existing estuary restoration efforts. H.R. 1775 will complement the efforts of programs like the National Estuary Program (N-E-P) and the Coastal Wetland Conservation Grants by providing direction to Federal agencies to work together with the states, local governments, N-E-Ps, conservation groups, and others to address a most critical need—habitat restoration.

My bill, which has 45 cosponsors, creates a national estuary habitat restoration council that will be responsible for reviewing and approving project proposals and developing a national strategy to identify restoration priorities. The council will consist of the Federal agencies that have some responsibility for estuary management—the Army Corp of Engineers, EPA, NOAA, the Fish and Wildlife Service, the Department of Agriculture, and the Department of Transportation.

The council will also include state government representatives from six regional councils from around the country. The six regional councils will be responsible for identifying restoration priorities for their member states and forwarding project applications that address those priorities to the national council. Each regional council is made up of the governor of each state in the region.

The Federal agencies will be expected to provide technical support to these regional councils in the development of their project applications. H.R. 1775 will engage the Federal agencies in new capacities to manage and restore this nation's estuaries. My bill gives the Army Corps of Engineers the responsibility for managing the operations of the national and regional councils, and for providing technical assistance on project development and implementation. NOAA is charged with collecting monitoring data on projects and maintaining a database of both successful and not-so-successful projects. All of the agencies are called upon to work together to coordinate their efforts and target those estuaries that are identified by the regional councils as priorities.

Despite our best efforts, the restoration of estuary habitat remains a roadblock to healthy ecosystems in many areas of the country. H.R. 1775 proposes a way to focus our efforts and to begin targeting specific, regional problems. This will be a learning experience. The agencies will need to develop new relationships and find ways to work together. With a comprehensive monitoring database, future project applicants should be able to learn from past project experiences. I see great potential for a renewed restoration effort, and I look forward to hearing the testimony on this bill.

STATEMENT OF HON. WAYNE GILCHREST, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MARYLAND

Mr. GILCHREST. Also, today, the Subcommittee on Fisheries Conservation, Wildlife and Oceans will be hearing from various distinguished witnesses regarding the status of the nation's estuaries; in particular, my bill, H.R. 1775, the Estuary Habitat Restoration Partnership Act.

This is a topic that has generated considerable interest of this session of Congress, mostly favorable interest, but some controversial. It's my hope that we can come together to pass a meaningful piece of legislation to assist in the restoration of estuary habitats throughout the nation.

This is going to be a fairly long statement, but I want to read it anyway, because it's a really good statement. That anything we can do to provide incentive, energy, as politicians say, fire in the belly, which I never had for politics, but I don't know, it's still here.

There's a lot of work to be done out there and there's a lot of good minds out there to do the work. If we can collaborate and coordinate all the various Federal, state and local projects, instead of the fragmentation that now exists, we can really turn some of this stuff around.

Habitat and estuaries have been degraded or destroyed over the past 100 years, with little regard for its many economic values and quality of life benefits. Population growth in coastal watersheds, dredging, draining, bulldozing, paving, pollution, dams, sewage discharges.

You know, the dynamic balance of nature has its ebbs and flows. Sometimes things are really good; sometimes, if you have a volcano explode, it really destroys the landscape. But it has a dynamic element to it.

But with paving, bulldozing, dredging, sewage, there is nothing dynamic about that. It's one big massive, dull thud that never gets out of the way.

These and other impacts of human activities have led to the extensive loss and continuing destruction of estuary habitat. For example, roughly 55 million acres of wetlands have been destroyed. In the Chesapeake Bay, we've lost about 90 percent of sea grass meadows. San Francisco Bay, 95 percent of its original wetlands have been destroyed and only 300 of the original 6,000 miles of stream habitat in the Central Valley support spawning salmon.

We've lost 70 percent of the salt marshes in Narragansett Bay. Louisiana estuaries continue to lose 25,000 acres of coastal marshes annually, An area roughly the size of Washington, DC.

For the most part, the loss in each estuary is an accumulation of small projects and other impacts. Let that acre go. Let that half-acre go. Let that 20 acres go. And the cumulative impact, based on the increase in population, begins to become more of a problem, a greater impact.

We can and must coordinate Federal, state and local management efforts to protect our estuaries. We must also provide sufficient resources for estuary restoration, without which all of our planning and coordination efforts are useless.

Our estuaries are sick, and all you have to do is go to one of them anywhere in the country and you're not going to see a vibrant, clean, clear body of water. Our estuaries are sick and planning without implementation is like a diagnosis without a treatment. We all know what the problems are, but we can't quite get out there in any meaningful way—I know the Corps of Engineers is doing some work in the Chesapeake Bay on oyster reefs. So is Fish and Wildlife, so is NMFS, so are any other given agency, but it's tiny little pieces, without much coordination.

I'm not being—casting stones to the agencies, but we need something like—you know, we have this funnel, we have this massive Federal Government that have pieces of certain projects or grants, but it's like a strainer. They don't really get a specific problem in any big way.

What we'd rather do with our legislation is take this—if you've ever put—what do you call it—transmission fluid in an automatic car, you have this funnel and this long shaft that goes down into that tiny little tube. Well, that's what we want to do. We want to get all these massive Federal agencies and programs and departments where they can target in a significant way some projects.

We'd like, for example, to—the state has a program to restore 10 percent of the oyster reefs in about 10 years. Well, we think we can

do 20 percent of the original oyster reefs in 10 years or less, if you coordinate all the efforts.

About 1 percent of the oyster production, harvest, is left after 100 years of damming and sewage and cumulative impacts of all sorts. Just one percent of the oysters are being harvested today of what it was 100 years ago, lost 99 percent of the resource.

We are fragmenting the environment. Everybody in the room knows it. And we have a fragmented program to fix it. I'm not saying this piece of legislation is going to solve all the nation's problems, but I think it would go a long way and it's a first really good step in the right direction.

H.R. 1775, the National Estuary Habitat Restoration Partnership Act, is not about—this is important, and I wish my colleague from Virginia was here to hear this—but if we can get this voted out of this Committee, it will have a great impact on the Transportation Committee.

It's not a matter of a new layer of Federal bureaucracy, and there's nothing wrong with bureaucrats, because you're related to that system. It is about coordination of existing estuary restoration efforts.

H.R. 1775 will complement the efforts of programs like the National Estuary Program, by providing direction to Federal agencies to work together with state and local governments, and we go on. We have 45 co-sponsors.

The Corps of Engineers, EPA, Fish and Wildlife Service, Department of Agriculture, Department of Transportation would be the people who make up this council. The six regional councils would be responsible for identifying restoration priorities for the member states and forwarding project applications that address those priorities to the national council.

Each regional council is made up of the governor of each state in the region. The Federal agencies will be expected to provide technical support to those regional councils in the development of their project.

We have the Chesapeake Bay program, and I'm sure they have similar programs—I know they have similar programs in Louisiana, similar programs in San Francisco. The Chesapeake Bay program is a good program. There's a lot of good people that work there. But there seems to me, and you can correct me if I'm wrong, that there's a little bit of—whether it's agency overlap or not enough agency collaboration between the Feds and the state and local private groups, like the Chesapeake Bay Foundation or university scientists, we'd like to get all these people together, all these bright minds together and use an effective means to specifically target programs that will actually restore some of these estuaries that are having problems.

In spite of our best efforts, the need for restoration of estuary habitat remains a roadblock to having healthy ecosystems in many areas of the country. We hope that this bill proposes a way to focus our efforts and to begin targeting specific regional problems.

This is going to be a learning experience. The agencies will need to develop new relationships and find ways to work together. With a comprehensive monitoring database—and I guess I'd like to emphasize that as my last point.

We want to do good things, but we want to make sure that those good things, whether it's restoring SAVs, oyster restoration, fish habitat, a whole range of other things, that we monitor what we do so that we can improve that process.

So at that point of preaching to the choir, I'm going to yield to my good friend from American Samoa for his opening statement.

STATEMENT OF HON. ENI F. H. FALEOMAVAEGA, A DELEGATE IN CONGRESS FROM THE TERRITORY OF AMERICAN SAMOA

Mr. FALEOMAVAEGA. Mr. Chairman, I want to thank you for explaining in great detail some of the provisions contained in the proposed bill. And I do want to apologize. I don't know what happened, but I would love to be a co- sponsor of this proposed bill, because I think, in principal, it has tremendous value.

I think the questions of the estuaries existing in our country needs to be deftly looked upon this and whether it be organizing or establishing a council similar to what we already have in our fisheries management council, I think it's a good idea, a principal one, a concept.

But I do look forward to hearing from our friends from the Administration and see what their responses, and I look forward to working with you on the provisions of the bill.

The one thing that I just wanted to raise, and maybe I kind of read it too casually, was just that the States of California and Hawaii are not included in the regions, unless if I misread the provision of the bill. But I don't know why, but I get into this position every time when there's a proposed bill.

The first question I raise is whether Puerto Rico is included or whether the insular areas are included. We always seem to be faced with these kinds of issues whenever legislation is being introduced. With 3.8 million American citizens living in Puerto Rico, I know perhaps it was just a slight oversight or maybe it was not intended, but I——

Mr. GILCHREST. If the gentleman would yield.

Mr. FALEOMAVAEGA. I'd gladly yield to the gentleman.

Mr. GILCHREST. Hawaii and California are included and we certainly will ensure that Puerto Rico is included, as well, and American Samoa.

Mr. FALEOMAVAEGA. We do have estuaries. I thank the Chairman and thank you very much for your explanation, and, again, I want to personally welcome our friends from the Administration and look forward to hearing their testimony.

Mr. GILCHREST. The gentleman from Puerto Rico.

STATEMENT OF HON. CARLOS A. ROMERO-BARCELÓ, A COMMISSIONER IN CONGRESS FROM THE COMMONWEALTH OF PUERTO RICO

Mr. ROMERO-BARCELÓ. Thank you, Mr. Chairman. I just want to welcome the witnesses here today and I'm very glad to be here.

I will have to excuse myself a little later on, because I have another commitment. But I wanted to say that I would like to also join the Chairman as a co-sponsor of this bill. It's a very important and very timely brought up, and I join with my colleague, Mr.

Faleomavaega, in requesting to make sure that we are also included in the bill.

Thank you.

Mr. GILCHREST. We will ensure that before the markup.

Mr. ROMERO-BARCELÓ. Thank you, Mr. Chairman.

Mr. GILCHREST. Now I would like to introduce our witnesses. We have Ms. Sally Yozell, Deputy Assistant Secretary of Oceans and Atmosphere, National Oceanic—I'm going to say NOAA; Mr. Mike Davis, Deputy Assistant Secretary of the Army for Civil Works, Department of the Army; and, Mr. Gary Frazer, Assistant Director of Ecological Services, U.S. Fish and Wildlife.

Thank you for coming this morning. We have a new light system, but we also want to make sure that your entire statement is read and we're not cut off before we miss any important information.

Ms. Yozell, you may go first.

STATEMENT OF SALLY YOZELL, DEPUTY ASSISTANT SECRETARY FOR OCEANS AND ATMOSPHERE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Ms. YOZELL. Thank you very much. Good morning, Mr. Chairman and members of the Subcommittee. My name is Sally Yozell, and I'm the Deputy Assistant Secretary for Oceans and Atmosphere, at the U.S. Department of Commerce.

First, let me thank you, Mr. Chairman, for your leadership on this legislation and, Congressman Faleomavaega, let me also thank you for your leadership particularly in restoration of marine areas, such as corals and our great success recently in Pago Pago in removing those vessels. So thank you for your assistance.

This hearing comes at a very timely moment. Estuaries and fisheries from North Carolina through the Chesapeake Bay and up through the New Jersey coast are suffering from the intense flooding from last week's hurricane. On Monday, the President declared a commercial fishery failure in North Carolina as a result of the hurricane.

We know that oyster beds have been destroyed, other shellfish are being contaminated, and we've only begun to assess the overall resource damages. Restoration activities can play a key role in how well and how quickly we can undo some of the damage done from this recent hurricane.

For example, we can create oyster reefs and create or restore coastal wetlands to replace those damaged by the storm. Both are important because they help stabilize the bottom and serve as a natural filter to minimize the fluxes of sediments and nutrients into our coastal waters.

Today's hearing is very timely under these unfortunate circumstances.

I appreciate the Committee's leadership in focusing on the need to protect the nation's estuary and coastal resources. Estuaries are an important part of our nation's economic and environmental well being. These special coastal places provide habitat for many important species, act as a natural water treatment system, provide flood control and protection against storm damage, and are wonderful recreational areas.

In fact, estuaries and coastal wetlands provide essential habitat for 80 to 90 percent of our recreational fish catch and 75 percent of the nation's commercial harvests.

These natural systems, though, Mr. Chairman, as you just so eloquently pointed out, are in big trouble and they are suffering from many water quality problems, declining habitat, et cetera.

So NOAA supports your legislation, H.R. 1775. NOAA's science and expertise in estuary restoration can contribute significantly in achieving the goals of this bill, especially when we are coupled with the capabilities of all the other Federal agencies here and who are also included in the legislation.

You asked me to focus specifically on six areas, so let me first comment on those. Regarding the bill's impact on existing NOAA restoration programs, I can only say that it will compliment our existing suite of activities in a very major way, and, in particular, the national council will ensure coordination among the federally-sponsored estuary efforts, as well as with our partners in the local and state governments.

Second, regarding the structure of the proposed councils, I believe the collaborative approach to restoration fostered by the national council will have a great benefit. Although I strongly support the involvement of states, local governments and constituents, I'm not totally certain that having two separate councils is the most efficient way to achieve this.

Perhaps workshops or advisory panels may be more efficient or even ex-officio members will accomplish the goals, but I'd like to work with you on that.

Third, concerning the type of restoration that could be conducted, NOAA envisions a broad range of activities, such as improvements tidal exchange, dam or berm removals, fish passageway improvements, and the establishment of riparian buffer zones.

I would also encourage that the legislation reward the use of innovative approaches and recommend that each project include a long-term monitoring phase, as this seems to be the most effective method to determine success, make corrections and advance the science of restoration.

Fourth, concerning what we see as NOAA's main role in the bill, NOAA looks forward to serving on the national council. We envision providing the scientific and technical expertise gained over many years of involvement in habitat restoration, and I endorse the specific role to manage the data collected from all of the restoration projects.

With regard to the funding identified for NOAA to manage the monitoring data, it seems adequate. However, I'm not confident there is enough funding to support the full range of administrative and technical support activities to cover the whole Act.

Fifth, concerning the extent that NOAA participates in and coordinates estuary restoration, NOAA is involved in a wide range of these activities with other Federal and state partners.

For example, we're part of Louisiana's Coastal Wetlands Planning, Protection and Restoration Act, known as CWPPRA, which this legislation is closely modeled after. Through CWPPRA, we have sponsored 17 projects, totaling over $65 million.

NOAA's damage assessment and restoration program, or DARP, cooperates with many of our Federal and state partners. It restores coastal and marine resources injured by releases of oil and other hazardous materials. DARP has obtained more than $250 million in settlements and has been involved in over 50 restoration projects.

Then we have a new program that is called our community-based restoration program, and that works with local communities to restore coastal habitats using small amounts of Federal moneys, and we have, in the last three years, done over 70 projects.

Lastly, Mr. Chairman, I was asked about the role NOAA anticipates for the National Estuarine Research Reserve System. Through state and Federal partnership, NOAA manages 25 estuarine reserves, totaling over a million acres. To date, there has been some limited restoration at these sites, but the restoration needs are significant and this legislation would help significantly in accomplishing this.

For example, the Chesapeake Bay Reserve in Maryland is working to address erosion and habitat loss. Currently, the reserve is evaluating Maryland's policies concerning the removal of invasive marsh grasses. The reserves can also serve as a scientific baseline where areas of controlled studies can be conducted on restoration techniques.

If I could, I'd like to make just a couple more comments with regard to the legislation. First, I would recommend that the Great Lakes states (and I'm happy to hear now that the U.S. Territories and Commonwealths) should also be included and eligible for assistance. They have important estuaries and analogous restoration needs.

I also believe the bill should place greater emphasis on the biological significance of restoration, as opposed to just share acreage. Often, the greater ecological benefit is derived from a small restoration project, not necessarily a larger one.

As you noted earlier, it's a half-acre here, a full acre there, and whatever. Sometimes those can be very beneficial in just restoring that small amount.

And NOAA agrees with you that the priority should be given to restoration projects that have area-wide restoration plans in place and, also, the strong effect of non-point and point pollution programs.

Lastly, I would like to remind the Subcommittee that earlier this year, the President announced his one billion dollar Lands Legacy Initiative to expand Federal efforts to conserve and restore America's natural resources. The initiative included $14.7 million increase to improve the reserve system and $22.7 million to fund the existing community-based restoration program, which I just mentioned.

The House Commerce, Justice, State Appropriations mark includes only $1.35 million for the NERS program increase, and no increased funding for the community-based restoration effort. I know that they're going to conference now and I urge the Committee please to work with the Appropriations Committee.

And, Mr. Chairman, I have to say, we believe that the Subcommittee has taken a very important leadership role in address-

ing the estuarine restoration issue. NOAA supports the bill, H.R. 1775, and I applaud the efforts that have gone into developing this important legislation.

I look forward to working with you and the Committee to fine tune this very commendable legislation, and I'd like to, if I could, insert my full statement into the record.

[The prepared statement of Ms. Yozell follows:]

STATEMENT OF SALLY YOZELL, DEPUTY ASSISTANT SECRETARY FOR OCEANS AND ATMOSPHERE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

INTRODUCTION

Good morning Mr. Chairman and members of the Subcommittee. My name is Sally Yozell and I am the Deputy Assistant Secretary for Oceans and Atmosphere for the National Oceanic and Atmospheric Administration (NOAA). I want to thank you for the opportunity to testify today on H.R. 1775, the Estuary Habitat Restoration Partnership Act of 1999.

NOAA AND ESTUARY HABITAT RESTORATION

We appreciate the Committee's leadership in focusing on the need to protect the Nation's estuarine and coastal resources. Estuaries are an important part of our Nation's economic and environmental well-being. These special coastal places provide habitat for many important species, act as a natural water treatment system, provide flood control and protection against storm damage, and are wonderful recreational areas. Estuaries and coastal wetlands also provide essential habitat for 80-90 percent of our recreational fish catch and 75 percent of the Nation's commercial harvest.

These natural systems are in trouble. Estuaries are suffering from water quality problems, declining habitat quality and, in some areas, significant habitat loss. We desperately need to restore these areas to help replace habitat that fish, marine mammals and endangered species need to survive and prosper.

Restoration, however, is only part of the answer for degraded estuary and coastal habitats. The other part is to prevent habitat loss and degradation through sound conservation and management programs. Nonetheless, there are many instances where restoration is the only viable alternative. We believe that NOAA's expert scientific capabilities and experience in estuary and coastal restoration programs can contribute significantly to achieving the goals of H.R. 1775, especially when coupled with the science and expertise of other Federal agencies and our state and local partners. As the Nation's premier marine and coastal science and management agency, NOAA brings together a unique combination of scientific expertise and capabilities, a combination which is needed for successful restoration of our valuable estuaries and coastal waters.

H.R. 1775 ESTUARY HABITAT RESTORATION PARTNERSHIP ACT OF 1999

I now would like to focus my remarks on several specific issues that the Subcommittee has asked NOAA to address.

• How will H.R. 1775 impact existing NOAA habitat restoration programs?

NOAA believes that H.R. 1775 will serve to complement existing habitat restoration programs in a number of ways. The national Estuary Habitat Restoration Council will help to ensure coordination and cooperation with all federally-sponsored estuarine habitat restoration efforts. The estuary habitat restoration strategy called for in H.R. 1775 should aid in keeping these programs focused on the highest priority restoration needs. We also anticipate that some restoration projects supported under H.R. 1775 can be designed in such a way as to complement those conducted by NOAA. Finally, we recognize that restoration science is still quite young and as such, the restoration efforts under this bill would enhance this body of science, especially if H.R.1775 encourages the application of innovative science and technology in its supported restoration projects.

• What is NOAA's view on the structure of the proposed councils?

NOAA believes that a collaborative approach to decision making is important. The proposed national Estuary Habitat Restoration Council should provide for improved cooperation among Federal agencies. Our experience with collaborative efforts such as those being conducted as part of the South Florida Ecosystem Restoration Initiative, the Coastal Wetlands Planning, Protection and Restoration Act and Coastal

America programs has demonstrated time and time again that success comes more easily when Federal agencies work together.

NOAA supports the intent of H.R. 1775 to seek out and obtain the involvement of coastal states, estuary and coastal managers, local governments, and constituents in the proposed program. Regional and local involvement in national decision-making and priority setting is critical and should be encouraged in any legislation for estuary restoration. However, NOAA is concerned that the formal nature and structure of the proposed Regional Councils could divert limited resources away from restoration projects and slow decision making. We suggest the use of regional or area workshops or advisory panels. Advisory panels are especially attractive in that they could have short or long term durations, depending on the issue or issues being addressed, and the Secretary or Council could have the flexibility to select the appropriate mix of people to serve on the panels. We have had good success with advisory panels in the management and conservation of marine resources and believe that they could help serve the needs of H.R. 1775, as well. Representatives of the regional advisory panels also could serve as ex-officio members of the national Estuary Habitat Restoration Council. We note that an August 11, 1999, Department of Justice letter outlines the Administration's concerns with a potential constitutional problem under the Appointments Clause, and we defer to the Department of Justice regarding this issue.

• What types of restoration activities could be conducted if H.R. 1775 is enacted? Habitat restoration activities could include improvement of coastal wetland tidal exchange or reestablishment of historic hydrology, dam or berm removal, fish ladder or other fish passageway improvements, natural or artificial reef/substrate/habitat creation, establishment of riparian buffer zones and improvement of freshwater habitat features that support anadromous fishes, planting of native coastal wetland and submerged aquatic vegetation, and removal of invasive vegetation. Additionally, we recommend that the habitat restoration activities include a significant research component to promote the development of innovative approaches and techniques for estuary habitat restoration. There should be a major monitoring and evaluation phase for all restoration projects, as this is the only way to gauge restoration success and advance the science of estuary restoration.

• What does NOAA see as its main role under H.R. 1775? Does the bill provide sufficient funding and direction to carry out these activities?

NOAA sees its major role in H.R. 1775 as a contributor of the science and technology we have gained over the years in habitat restoration and in the investigation of our many coastal and estuarine ecosystems. Additionally, we see a critical role in ensuring coordination of our ongoing restoration programs with those of H.R. 1775 to minimize redundancies and to complement and capitalize on the achievements of all of the programs. We endorse the specific area of work specified for NOAA in H.R. 1775 which is to serve on the National Council and to directly support restoration efforts through the collection and management of data related to the restoration projects.

The funding as proposed in H.R. 1775 is probably adequate to address NOAA's role in establishing a monitoring database. NOAA currently is not funded and staffed to adequately support the Councils and provide the increased technical assistance that would be necessary to meet the needs from partners. We want the majority of funding under the bill to go toward on-the-ground restoration activities. However, we hope the Congress will provide a reasonable amount of funding to the Federal agencies to enable us to effectively implement this Act. We support the bill's subdivision of the authorization section, providing separate subsections for each of the following: an authorization of appropriations for restoration activities; monitoring; and a cap on administrative expenses. This is similar to the approach under the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA).

• To what extent does NOAA currently participate in estuary habitat restoration efforts? Which programs are involved and what has the agency done to coordinate its efforts with other agencies?

NOAA is engaged in a wide range of estuary habitat restoration efforts. I will briefly summarize each of the major activities in four categories as well as their coordination with other agencies.

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

The Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) provides funding and support for the restoration, protection, conservation and enhancement of threatened wetlands in the Louisiana coastal zone. NOAA and the other

participating Federal and State agencies have the opportunity to plan and implement large-scale coastal wetlands restoration projects that are significant on a local and national level. Forging partnerships within the State such as with the Louisiana Department of Natural Resources and local parish governments has proven critical to the success of the restoration projects. It has resulted in funding for restoration projects totaling over $65 million that are designed to address the rapid loss of Louisiana's wetlands. For NOAA and the State of Louisiana, CWPPRA provides the hope of sustaining coastal wetlands that are important to the economic, recreational and cultural base of the State and region.

As required by CWPPRA, the U.S. Army Corps of Engineers established a Task Force composed of the U.S. Environmental Protection Agency (EPA), the Department of Commerce, the Department of the Interior, the Department of Agriculture, and the State of Louisiana. The Task Force annually prepares and submits to Congress a priority list of wetland restoration projects for Louisiana. The site selection process is based on the technical merit, cost effectiveness, and predicted wetland quantity and quality of the proposed project. The Task Force was responsible for the preparation of a comprehensive coastal Restoration Plan for the State of Louisiana, which was completed at the end of 1993. The Plan provides much of the basis for selecting restoration projects.

Each CWPPRA project requires the sponsorship of a Federal agency Task Force member for implementation. The Act uses a trust fund, which is supported by revenues from tax receipts on small engines and other equipment. Of the amount appropriated from this fund, 70 percent (an amount not to exceed $70 million annually) is available for wetland restoration projects and associated activities in Louisiana. While some 70 percent of the funds available under CWPRA are dedicated to restoring Louisiana wetlands, it is important to note that project selection is still based on merit criteria. CWPPRA mandates a cost-share of 85 percent Federal funds to 15 percent State funds for all projects.

RESTORING ESTUARIES THROUGH TRUSTEESHIP

As a coastal steward and a designated natural resource trustee under the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), and the Oil Pollution Act, NOAA protects and restores marine and coastal resources on behalf of the public. NOAA works at hazardous waste sites with the EPA and other clean-up agencies to develop remedies to protect coastal resources, and to support habitat and human health. NOAA's Coastal Resource Coordination program works at approximately 260 hazardous waste sites a year, about 75 percent of which affect estuaries. Examples of on-going protection and restoration efforts in estuarine environments include the Tulalip Landfill in Puget Sound in Washington, the Exxon Bayway oil spill in the Arthur Kill in New York Harbor, the *Apex Houston* Oil Spill in Point Lobos, California, and the Greenhill oil spill in Louisiana.

NOAA's Damage Assessment and Restoration Program (DARP) restores coastal and marine resources injured by releases of oil and other hazardous materials. Since its inception, DARP and its partners have generated more than $240 million in settlement funds to restore injured coastal resources on behalf of the public from those responsible for the damage.

Through DARP, NOAA is working on a number of damage assessment cases in estuarine environments including Lake Barre in Louisiana, Commencement Bay in Washington, Narragansett Bay in Rhode Island, Lavaca Bay in Texas, and Pago Pago Harbor in American Samoa. By working together with responsible parties and co-trustees to collect data, conduct assessments and carry out restoration actions, NOAA is able to restore a clean and healthy environment as quickly and effectively as possible. Most of these restoration projects are completed through cooperation with both Federal and state resource trustee agencies. This experience has reinforced the importance of partnerships and the absolute need to document restoration success for the benefit of future restoration efforts.

NOAA's trustee activities ensure that resources are protected and restored following releases of oil and other hazardous materials, which results in more productive and diverse estuarine habitat for fish and wildlife, cleaner water, and healthier ecosystems.

COMMUNITY-BASED RESTORATION PROGRAM

In 1996, the NOAA Fisheries Restoration Center formulated the highly successful Community-Based Restoration Program (CRP). The CRP achieves habitat restoration by engaging communities in local marine and estuarine habitat restoration projects. It provides funding and technical expertise to restore coastal habitat and partners with local constituencies to accomplish meaningful, grass roots projects. In addition to seed money, the CRP provides support by leveraging expertise and funds

from partner organizations. Through these partnerships, the program generates funding up to tenfold the original Federal investment. Moreover, the program seeks to promote coastal stewardship and a conservation ethic among coastal communities.

The Administration's FY2000 Budget Request includes $22.7 million of new funding for the restoration of coastal habitat. Seven million is slated for expanding the existing CRP. Almost $16 million is identified for implementing habitat restoration on a regional basis through the creation of a new, regional habitat restoration program.

NATIONAL ESTUARINE RESEARCH RESERVES

Realizing the importance of our Nation's estuaries, Congress established the National Estuarine Research Reserve System (NERRS) in 1972 to improve the health of estuaries and coastal habitats. This Federal/state partnership has proven successful in managing some of our Nation's relatively pristine estuaries. Through the work of expert staff, monitoring and education programs and on-site laboratories, NOAA has developed innovative partnerships with coastal states in connection with 25 Reserves, which have resulted in improved management of nearly one million acres of estuarine waters and lands.

Although the Reserves represent some of the Nation's most valuable and relatively undisturbed estuaries, restoration in the Reserves around the Nation is still an essential activity to protect these biologically diverse areas. To date, many of the Reserves have undertaken innovative restoration projects. For example, the Chesapeake Bay Reserve in Maryland is working to address erosion and habitat loss. Areas of the Chesapeake Bay region are severely eroding from impacts of sea level rise. In an effort to deter erosion, the Reserve is currently evaluating Maryland's policies concerning the removal of invasive marsh grasses, a traditional restoration practice. An evaluation and revision of current State policies relating to salt marsh grass management in certain regions around the Chesapeake Bay may result from this work. The South Slough Reserve near Coos Bay, Oregon, has conducted restoration activities at two sites that were experiencing significant subsidence and ditch erosion. By redistributing organic material over the surface of the marsh, the Reserve was able to restore habitat used by salmon and other fish. Indicators of healthy marsh ecosystems were monitored at all the restored sites. Further work is being designed to examine different techniques for developing tidal channel habitat for salmon and other fish.

To further improve our Nation's estuaries, NOAA and the University of New Hampshire established the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET), which serves as a national center for the development and application of innovative technology for restoration. CICEET uses the Reserves as living laboratories and is currently supporting several projects that apply innovative technologies to coastal habitat restoration.

SOUTH FLORIDA ECOSYSTEM RESTORATION

Another example where large scale habitat restoration will be carried out is in South Florida. In July, 1999, the Army Corps of Engineers and the South Florida Ecosystem Restoration Task Force presented to Congress a $7 billion, 20 year plan to restore more natural water flows throughout the South Florida ecosystem. Restoring natural flows to the estuaries is the single most important action needed to restore the hundreds of South Florida estuaries that have been severely damaged over the past century by man-made changes in the quantity, quality and timing of freshwater delivery to the coast. The proposed plan will restore natural flows to almost all the remaining estuaries in South Florida and significantly advance overall restoration of these valuable habitats. NOAA played a key role in helping shape the restoration plan for South Florida's estuaries and other coastal areas. Working with the State of Florida and Federal agencies, NOAA will also play a key role in monitoring the progress and results of the overall South Florida ecosystem restoration effort, much of which will focus on coastal estuaries.

- What role does NOAA anticipate for National Estuarine Reserves under H.R. 1775?

NOAA anticipates that the National Estuarine Research Reserves will play an important role in any effort to restore estuaries. The Reserves are located in 20 of 29 biogeographic subregions (including the Great Lakes), serving as representative areas to conduct research, monitoring and education on a number of topics, including habitat restoration. Restoration projects undertaken in estuaries in these same regions can use the lessons learned from the Reserves to improve restoration activities and techniques. National Estuarine Research Reserves provide many key opportunities for better estuarine habitat restoration in the Nation.

The Reserves provide lessons in ensuring the long-term success of restoration projects by taking watershed issues into consideration. Through management plans and other planning mechanisms, restoration is not undertaken in areas where activities upstream would cause degradation to restoration, thereby jeopardizing the success and viability of the projects.

One of the key opportunities that the Reserve System offers is to learn more about which restoration techniques are most effective. The ability to use reference locations within the Reserves as a basis for comparison—not only for Reserve projects, but also for projects in similar estuaries—will strengthen the science of restoration. The data sharing and the System-wide monitoring that are characteristic of the Reserves provide increased opportunities for useful comparisons within the Reserve System and with other estuarine projects.

H.R. 1775 recognizes that the Reserve System can play an important role and build upon their success from past estuarine habitat restoration projects by allowing the Council to give priority consideration to restoration needs within the Reserve System. This priority consideration comes about as part of the guidelines established for the Estuary Habitat Restoration Council in selecting sites. Since each Reserve develops a management plan that identifies restoration priorities, the Reserves qualify for priority consideration under Section 107(d)(1) when determining restoration projects.

Finally, Reserves are owned and operated by the states in partnership with NOAA and in cooperation with local communities. This Federal-State partnership helps to ensure that state preferences for estuarine habitat restoration are properly coordinated and that these priorities also incorporate local concerns and issues.

Additional comments on H.R. 1775, the Estuary Habitat Restoration Partnership Act of 1999.

In addition to the questions posed by the Subcommittee, NOAA would like to address several other aspects of the H.R. 1775.

- NOAA agrees that priority should be given to restoration projects in areas that have area-wide restoration plans currently in place. These plans, which identify restoration goals, sites and priorities, need to be based on sound science to enable scientists to determine which efforts would most benefit the ecosystem and fit best within the socioeconomic conditions of the area.
- NOAA supports the priority given to estuarine areas that already have strong and effective programs to manage point and nonpoint pollution and other activities that can adversely impact estuarine areas. These programs will help to ensure the long-term success of the restoration projects.
- NOAA strongly suggests that the Great Lake states and the island territories and commonwealths (American Samoa, Commonwealth of Northern Marianas Islands, Guam, Puerto Rico, and the U.S. Virgin Islands) be eligible for assistance as they have important estuarine habitats that need restoration.
- Consultation with state Coastal Zone Management programs should be mandatory to ensure consistency with state CZM policies, especially during development of state or local restoration strategies and during reviews of locally or privately sponsored project proposals. Early consultation with state CZM programs will result in a more streamlined process.

CONCLUSION

In conclusion, as the Nation's primary marine science agency, NOAA has the proven expertise and scientific capability to assist in making sound decisions about estuarine habitat restoration. The primary lesson we have learned from our restoration activities thus far is the importance of strong science and long-term monitoring to achieve successful estuarine restoration.

I believe the Subcommittee has taken an important step in addressing these significant issues by holding this hearing today. We applaud the Subcommittee's leadership and commitment to protecting our Nation's estuarine and coastal resources and we look forward to working with you.

Mr. GILCHREST. Thank you, Ms. Yozell. We appreciate your testimony. We have a vote on. There's two votes, one 15-minute vote and one five-minute vote. We won't be able to finish the panel.

So if you don't mind, what we'll do is we'll go down and vote and we'll come right back. So we'll recess for the vote. That will give you a little bit of a break and we'll see you all in about 20 minutes.

[Recess.]

Mr. GILCHREST. The Subcommittee will come back to order. We appreciate your patience.

Mr. Davis, you may begin.

STATEMENT OF MICHAEL L. DAVIS, DEPUTY ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, DEPARTMENT OF THE ARMY

Mr. DAVIS. Thank you, Mr. Chairman, members of the Subcommittee. I am Michael Davis, Deputy Assistant Secretary of the Army for Civil Works.

I am very pleased to be here today to present the Department of the Army's views on H.R. 1775.

For over 200 years, the nation has called upon the Army Corps of Engineers to solve many of its water resources problems. Historically, the Corps has emphasized its flood damage reduction and navigation missions.

In recent years, however, pursuant to Water Resources Development Acts, we have elevated our environmental restoration and protection mission to a level equal to our more traditional missions. The Corps now uses its engineering, project management, real estate and environmental expertise to address environmental restoration and protection problems.

The Corps, in fact, has a powerful toolkit of authorities and programs that can be brought to bear to help solve environmental problems.

Over the last decade alone, the Corps has helped to restore hundreds of thousands of acres of habitat, benefiting hundreds of fish and wildlife species. Examples include 28,000 acres of habitat restored along the upper Mississippi River, with 100,000 acres projected by the year 2005; 35,000 acres of flood plain and wetlands restoration under construction today along the Kissimmee River in Florida, and hundreds of acres of coastal wetlands restored by beneficially using dredge material, including an 1,100 acre project in the Chesapeake Bay, known as Poplar Island.

On July 1 of this year, the Army submitted to Congress a comprehensive plan to restore the Everglades. The world's largest ecosystem restoration project, this plan will help restore over 2.4 million acres of wetlands in the south Florida ecosystem, as well as improve the health of estuaries and Florida Bay.

Throughout the world, estuarine and coastal areas serve as focal points for human use and development. These same areas also perform critical functions from an ecosystem perspective. Estuaries help protect us from flooding, help maintain water quality, and provide habitat and food for a myriad of fish and wildlife species, many of them threatened or endangered.

These coastal environments generate billions of dollars annually through such industries as tourism, sport and recreational fisheries. There is, in fact, an urgent need to protect and restore these fragile ecosystems.

Recognizing the economic, social, cultural and environmental benefits that they provide, we applaud the co-sponsors of H.R. 1775 for their vision and leadership in this area. In particular, Mr. Chairman, we applaud you for your leadership.

If enacted, H.R. 1775 would enhance the Corps' ability to restore and protect estuarine habitat. In this regard, the Army supports enthusiastically H.R. 1775 and looks forward to working with you in enacting such legislation.

The goal of restoring one million acres of estuarine habitat by the year 2010 is consistent with the President's Clean Water Action plan goal of restoring 100,000 acres of wetlands annually beginning in the year 2005.

The proposed national framework and the national estuarine habitat restoration strategy should help partners identify and integrate existing restoration plans, integrate overlapping plans, and identify processes to develop new plans, where they are needed.

This framework document could help us maximize incentives for participation, leverage our very limited Federal resources, and minimize duplication of efforts. We recommend that the use of the existing organizational structure of the Coastal America Partnership be considered fully. Coastal America has national and regional teams already in place and many of the members of these teams will be the very same experts that we would need to consult under H.R. 1775.

The legislation is consistent with the Coastal Wetlands Preservation, Protection and Restoration Act. This legislation has created a unique multi Federal and state agency partnership which is working to restore and protect approximately 73,000 acres of coastal wetlands in Louisiana.

We are pleased to note that important changes that the Army requested at a Senate committee hearing on a companion legislation, S. 1222, last Congress, had been incorporated into H.R. 1775. These changes limit Federal assistance for each habitat project to 65 percent, strengthen and clarify the role of the Secretary of the Army, and allow the restoration council to consider, where appropriate, non-governmental organizations as sponsors for environmental restoration and protection projects.

We do suggest a few additional minor modifications to further improve H.R. 1775.

For example, we urge the Committee to revise the bill to make it clear that non-Federal sponsors are responsible for providing all lands, easements, rights-of-way, dredge material, disposal areas and locations, as is required for all Army Civil Works water resources projects.

We also believe that the Secretary of the Army should make the determination regarding the acceptability and evaluation of in-kind contributions for local cost-sharing.

In addition, like my colleague from NOAA, we believe that you should consider including the Great Lakes region, which is widely recognized as a coastal region of the United States, with unique, but very similar problems and opportunities.

Finally, Mr. Chairman, I would like to briefly mention an issue that you are very familiar with, an issue that seriously threatens our wetlands resources.

As a result of a court decision that invalidated the Army and EPA Tulloch rule, tens of thousands of acres of wetlands will be lost to unregulated drainage and excavation. While we recognize that this Committee does not have direct jurisdiction over this

issue, the Administration feels very strongly that H.R. 1775 and any bill designed to strengthen the protection of estuarine and coastal habitats should address what is perhaps the most serious threat to water quality and coastal and other waters of this country.

Otherwise, the current loophole promises to defeat the laudable goals of H.R. 1775.

Mr. Chairman, last night at midnight, I returned from a three-day trip in the panhandle of Florida, where I witnessed firsthand the ditching and drainage of thousands of acres of what was formerly Cypress Swamp. Not only do we have the direct impacts, loss of habitat, which is very valuable to our fish and wildlife species, the water draining from this land runs directly into Apalachicola Bay, which provides 10 percent of the oysters to this country. It's a very serious problem.

In conclusion, the Corps has been increasingly involved in recent years with efforts to protect and restore our estuaries. We have enjoyed very much working with you and your staff on H.R. 1775 and we look forward to continuing this relationship as we both move towards enacting this important piece of legislation.

Mr. Chairman, that concludes my testimony and I'd be pleased to answer any questions that you may have.

[The prepared statement of Mr. Davis follows:]

STATEMENT OF MICHAEL L. DAVIS, DEPUTY ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS

INTRODUCTION

Mr. Chairman and members of the Subcommittee, I am Michael L. Davis, Deputy Assistant Secretary of the Army for Civil Works. I am here today to discuss the Army Corps of Engineers environmental restoration and protection mission and present the Department of the Army's views on H.R. 1775, the Estuary Habitat Restoration Partnership Act of 1999.

ARMY CORPS OF ENGINEERS ENVIRONMENTAL MISSION

For over 200 years the Nation has called upon the Army Corps of Engineers to solve many of its water resources problems. Historically, the Corps has emphasized its traditional mission areas of improving our navigation and transportation system, protecting our local communities from flood damages and other disasters, and maintaining and improving hydropower facilities across the country. The Corps environmental activities have expanded over time with major changes in environmental law and policy, such as the National Environmental Policy Act of 1969, which requires each Federal agency to assess fully its actions affecting the environment, and the Federal Water Pollution Control Act of 1972 (now called the Clean Water Act) in which the Corps was given a major responsibility for regulating the discharge of dredged or fill material into all of our Nation's waters, including wetlands. In recent years, however, pursuant to the Water Resources Development Act (WRDA) of 1986 and subsequent WRDAs, the Corps has elevated its environmental restoration and protection mission to a status equal to its flood damage reduction and navigation missions. The Corps now uses its engineering, project management, real estate, and environmental expertise to address environmental restoration and protection opportunities.

The Corps has a powerful toolkit of standing authorities and programs that can be brought to bear to help solve environmental problems. Over the last decade alone the Corps has helped to restore hundreds of thousands of acres of habitat of many types which benefit thousands of fish and wildlife species, Examples include: 28,000 acres of habitat restored for the Upper Mississippi River (98,000 projected by 2005); hundreds of acres of coastal wetlands restored in Louisiana; 35,000 acres of restored flood plain under construction as part of the Kissimmee River Restoration Project in the Florida; and, hundreds of acres of coastal wetlands restored under authorities which authorize the Corps to beneficially use dredged material for ecosystem restoration.

On July 1, the Army submitted to Congress a comprehensive plan to restore the Everglades, the world's largest ecosystem restoration project. This plan will help protect, enhance and restore over 2.4 million acres of wetlands in the south Florida Ecosystem as well as improve the health of estuaries and Florida Bay.

We are especially proud of our efforts on all coasts in conjunction with the Coastal America initiative. Some examples of projects where the Corps, using its programs, led multi-agency, multi-level efforts (Federal, State, local and private) include: restoration of a coastal salt marsh area in the Galilee Bird Sanctuary, Rhode Island; the initial demonstration area for restoration of tidal wetlands in the Sonoma Baylands, California; the Sagamore Salt Marsh Restoration, Massachusetts; initiation of actions to restore 1100 acres to provide riparian and submerged habitat at Poplar Island, Chesapeake Bay, Maryland; and, shoreline stabilization and submerged aquatic vegetation restoration around Tangier Island in the Chesapeake Bay. Our FY 2000 budget request includes study funds for 12 potential projects directed at protecting or restoring the benefits of estuaries, as well as funding for many other activities that would be beneficial to the environment in or adjacent to our Nation's estuaries.

SIGNIFICANCE OF ESTUARINE AND COASTAL AREAS

Throughout the world, estuarine and coastal areas serve as focal points for human use and development. These same areas also perform critical functions from an ecosystem perspective, providing habitat and food for myriad fish and wildlife species. Estuaries are unique in that they serve as a transition zone between inland freshwater systems and uplands, and ocean marine systems. There is an urgent need to protect and restore these ecosystems recognizing the economic, social, and environmental benefits they provide. In this regard, we would add as a purpose of the bill the need to promote a greater public appreciation and awareness of the value of our estuary and coastal resources. As with many environmental issues, future generations depend upon our actions today.

Legislation to expand the authority of the Corps to use its unique skills and experience to restore and protect estuary habitat would add to the Corps environmental portfolio. Let me assure you that the Department of the Army therefore is prepared to take a leadership role in reaching the goals of H.R. 1775. Army would approach implementation of H.R. 1775 in accordance with the policies and procedures which grew out of the Water Resources Development Act (WRDA) of 1986, subsequent WRDAs, and long-standing partnership and public involvement practices.

Additionally, Army would explore the possibility of using the existing organization and structure of the Coastal America partnership to jump-start restoration efforts. Coastal America has National and Regional Implementation Teams already in place, and many of the members of these teams would be the very same experts we would consult with under H.R. 1775.

H.R. 1775

I would now like to focus on the Department of the Army views on H.R. 1775. The Department of the Army supports efforts to enhance coordination and efficiently finance environmental restoration and protection projects. The goal of restoring 1 million acres of estuary habitat by the year 2010 is in consonance with the President's Clean Water Action Plan and the goal of a net increase of 100,000 acres of wetlands, annually, beginning in the year 2005. We also agree with the philosophical basis for the legislation, that estuaries and coastal areas are being degraded rapidly, and that there is an urgent need to attain self-sustaining, ecologically-based systems that are integrated into surrounding landscapes. The proposed national framework, or national estuary habitat restoration strategy, to be completed at the end of the first year, should help partners identify and integrate existing restoration plans, integrate overlapping plans, and identify processes to develop new plans where they are needed. This framework document could help us maximize incentives for participation, leverage Federal resources, and minimize duplication of efforts. We support the requirement to publish the draft strategy in the *Federal Register* for review and comment to enhance public involvement. We believe that the legislation is consistent with the National Estuary Program (NEP), which was established to manage and protect aquatic ecosystems in coastal watersheds, and the National Estuarine Research Reserve System, which uses science to improve management of estuaries. The NEP strives to protect and restore habitat through consensus and initiatives which are community-based. The legislation also is consistent with the Coastal Wetlands Preservation Protection and Restoration Act, a unique multi-Federal and State agency partnership which is working to restore and protect approximately 73,000 acres of coastal wetlands in Louisiana over a 20-year period.

We are pleased to note that important changes that the Army requested at a Senate Committee hearing held on companion legislation, S. 1222, last Congress have been incorporated into H.R. 1775. These changes limit Federal assistance for each habitat project to 65 percent, strengthen the role of the Secretary of the Army commensurate with the need for accountability for appropriations received, and allow the Restoration Council to consider, where appropriate, non-governmental organizations as sponsors for environmental restoration and protection projects. H.R. 1775 is a bill that the Department of the Army could support.

We urge the Committee to revise the bill to make clear that non-Federal sponsors are responsible for providing all lands, easements, rights-of-way, dredged material disposal areas and relocations, as is required for Army Civil Works water resources projects. We also believe the Secretary should make the determination as to the acceptability and valuation of in-kind contributions for local cost sharing, rather than the proposed Council.

We urge you to consider expanding the geographic scope of the habitat protection and restoration activities proposed in H.R. 1775 to include the Great Lakes region, which faces many of the same challenges as coastal regions of the United States. This coastal region has many ecosystem problems that mirror those of more traditional coastal areas and has, for that reason, been included as a coastal region in the programs authorized under the Coastal Zone Management Act of 1972, as amended, and in the Administration's Coastal America Initiative. We believe that the addition of a regional council representing the Great Lakes region, to include the States of Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania and New York, merits serious consideration.

Many environmental restoration techniques and approaches are new, and when dealing with natural systems, there is a need to test new ideas, learn from successful and not so successful projects, and manage adaptively to adjust to ever-changing conditions. Environmental restoration efforts for the Everglades, the Upper Mississippi River System Environmental Management Program, and the Coastal Wetlands Preservation Protection and Restoration Act, all acknowledge, to varying degrees, the value of demonstration projects and adaptive assessment approaches. Adding to H.R. 1775 a demonstration component with a cost share that is consistent with that applied to habitat projects, and a requirement for non-Federal sponsors to manage adaptively, would encourage the partners to try out new ideas and learn more about how to restore and protect estuary and coastal areas.

While we recognize that this Committee does not have direct jurisdiction over this issue, it is important to note that the Administration feels strongly that H.R. 1775, and any bill purporting to strengthen protection of estuarine and coastal habitat, should address the most serious threat to water quality in coastal and other waters by closing a regulatory gap that threatens the loss of tens of thousands of acres of wetlands to drainage and excavation each year. This gap, which resulted from a court decision invalidating the U.S. Environmental Protection Agency and Army Corps of Engineers "Tulloch" rule requiring permits for drainage and channelization that affect our Nation's wetland resources, promises to defeat the laudable goals of H.R. 1775 unless Congress takes prompt action.

We applaud the co-sponsors of H.R. 1775 for their vision and leadership in this area. The Army supports H.R. 1775 and looks forward to working with you and your Senate counterparts in enacting such legislation.

CONCLUSION

The Corps has been increasingly involved in recent years with efforts to protect and restore the benefits of estuaries and their surrounding habitat. The Department of the Army is also looking forward to working with the Environmental Protection Agency, the Departments of Commerce, Agriculture, Interior, and Transportation, and the non-Federal participants in the designated coastal regions, to restore and protect our nation's estuary habitat. You can be assured that Army Civil Works is committed to making partnerships work. Mr. Chairman, this concludes my testimony. I would be pleased to answer any questions you or the Subcommittee may have.

WRITTEN TRESTIMONY OF GRANT DAVIS
EXECUTIVE DIRECTOR OF THE BAY INSTITUTE OF SAN FRANCISCO

BEFORE THE

SUBCOMMITTEE ON FISHERIES CONSERVATION, WILDLIFE AND OCEANS
1334 LONGWORTH HOUSE OFFICE BUILDING

REGARDING

HR 1775
THE ESTUARY HABITAT RESTORATION PARTNERSHIP ACT OF 1999

THURSDAY, SEPTEMBER 16, 1999

Good morning Mr. Chairman and members of the Subcommittee, my name is Grant Davis. I am the Executive Director of The Bay Institute of San Francisco (TBI), a non profit organization founded in 1981 and located in San Rafael, California, just north of the Golden Gate Bridge. TBI is dedicated to the protection and restoration of the ecosystems of the San Francisco Bay, the Sacramento-San Joaquin Delta and the rivers, streams and watersheds tributary to the estuary.

On behalf of the Board of Directors of The Bay Institute, and in my capacity as Vice Chair of the San Francisco Bay Joint Venture, I appreciate the opportunity to be here before you to provide testimony in support of H.R. 1775, the Estuary Habitat Restoration Partnership Act of 1999. My observations regarding the implementation of this Act, the proposed Councils, and the coordination required from the federal, state, regional, and local levels, reflect our organization's eighteen year-history working to protect and restore the San Francisco Bay-Delta ecosystem, one of the largest estuaries of the Western United States. These comments also represent the point of view of an organization devoted to the principal that sound science should inform the decision making process, particularly when determining what strategy will work best to restore our nation's critically important estuarine resources.

H.R. 1775 – Estuary Habitat Restoration Partnership Act of 1999
I have been asked to focus my remarks on implementation of H.R. 1775, the structure of the Councils that are proposed -- including non-governmental participation -- and in particular the types of restoration activities that could be undertaken in San Francisco Bay if this bill is enacted. Although I am not an expert on other national estuaries there are many features common to all of them in the United States. Sadly, one feature common to all our nation's estuaries is that they have been badly abused and have suffered substantial habitat loss, between 80 to 95 percent in many cases.

When healthy, estuaries are among the most critically important and productive natural systems on earth. They provide numerous opportunities for boating and business, fishing and hunting, strolling and swimming, wildlife viewing, and teaching about the natural world. Each year over 180 million Americans either visit or vacation in our nation's estuaries. Fishing, tourism, and recreational boating, which depend on viable estuaries, provide more than 28 million jobs for our nation. While commercial and sport fishing alone contribute $111 billion annually to our nation's economy.

Perhaps the most significant aspects of H.R. 1775 are that it reconfirms the federal government's commitment to these critically important estuarine resources, establishes a systematic approach for federal involvement regarding estuaries and coastal zones, and provides necessary funding in which to begin implementation of habitat restoration that is consistent with local plans. However, from previous experience, funding levels designated by this legislation may not be sufficient to adequately carry out such an ambitious program.

I also agree with previous testimony given by Deputy Assistant Secretary, Mike Davis that recommends adding as one of the purposes of this legislation the need to promote greater public appreciation and awareness of the value and benefits of our estuary and coastal resources.

The San Francisco Bay-Delta Ecosystem:
The Bay-Delta ecosystem is an intricate web of waterways created at the junction of the San Francisco Bay and the Sacramento and San Joaquin Rivers and the watershed that feeds them. The estuary, where fresh water from the Sacramento and San Joaquin Rivers flowing down toward the San Francisco Bay mixes with salt water from the Pacific Ocean, touches the lives of millions of Californians. Nearly two-thirds of all Californian's depend on this estuary for their water supply. Fresh water flows through the Delta – a network of natural and man-made waterways – helps to supply two thirds of the state's population with drinking water, and irrigate 200 different types of crops on the Central Valley, including 45 percent of the nation's fruits and vegetables.

The Bay-Delta is a distinctive estuary ecosystem that supports more than 750 species of fish, animals, and birds, including waterfowl migrating on the Pacific Flyway. It supplies and sustains fisheries, wildlife refuges, and 40,000 of critical wetlands. The biological health and biodiversity of the ecosystem depends upon the freshwater flows through the estuary.

However, historically the Delta was an incredibly vast region of wetlands teeming with wildlife. It was composed of huge tracts of intertidal wetlands transected by a complex network of waterways. The Delta today bears little resemblance to its historical condition. Today, over 95 percent of the original 550 square miles of tidal wetlands are gone. Many miles of tidal sloughs no longer exist, nor does most of the riparian vegetation. In its place is a patchwork on intensely farmed "islands", surrounded by elevated levees, straightened and deepened channels, permanently flooded remnants of former wetlands now too far underwater to allow the re-establishment of emergent vegetation, and the center of one of the largest man-made water delivery systems in the world. Massive Federal, State, and local agency pumping plants, and over 1,800 unscreened agricultural diversions now transfer water, fish, and drifting estuarine life out of the aquatic environment.

Pollution in the Delta is also a serious concern today, because it is the source of drinking water and occasionally toxic to aquatic organisms. Delta waters contain elevated concentrations of pathogens, pesticides, trace metals, salinity, and organic carbon. The combination of habitat loss and successful invasion by a virtual army of non-native species has almost completely destroyed the Delta's native biological community. The native resident fish fauna has been replaced by a largely introduced assemblage. Two of three historically dominant fish species are no longer found here.

Waterfowl, once extremely abundant in the Delta's tidal marshes, are now drastically reduced in numbers. Nutrient and important energy sources as well as food webs have been greatly modified.

Similarly, San Francisco Bay itself has undergone significant habitat alterations over the course of the last two centuries. About 75 percent of the estimated 242,000 acres of highly productive native tidal marshes and mudflats have been converted to a variety of urban and industrial uses. Although as a result of the Clean Water Act, raw sewage is no longer dumped in the Bay and Industry wastes are strictly regulated, agribusiness practices are not. Illegal dumping also remains a problem. We no longer see massive fish kills that accompanied unregulated dumping in the Bay, yet fish populations continue to decline.

Increasingly the problem today is non-point source pollution: the water that collects pollutants as it moves through or over the soil, runoff that is generated because either the soil is too compacted or the water is falling off an impervious surface, like a road, parking lot, or driveway. Simply stated non-point source pollution is you and me and the way we go about our everyday lives. In many ways this is a much more difficult pollution control dilemma than we faced twenty to thirty years ago and it will require a more sophisticated approach, like H.R. 1775 to help address.

The Bay Institute:
The Bay Institute was one of the three groups that signed the historic Bay-Delta Accord in 1994, which formed a multi-agency and stakeholder cooperative process known as the CALFED Bay-Delta Program to address the water management and environmental problems associated with the Bay-Delta system. The mission of the CALFED Program is to develop a long-term, comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.

CALFED's ecosystem restoration program is considered to be the most comprehensive and most inclusive environmental restoration program in the United States. It provides a new perspective to restoration science by focusing on the rehabilitation, protection or restoration of ecological processes that create and maintain habitats needed by fish, wildlife and plant species dependent on the Delta and its tributary systems. By restoring the natural processes that create and maintain diverse and vital habitats, CALFED aims to meet the needs of multiple plant and animal species while reducing the amount of human intervention required to maintain habitats.

Currently The Bay Institute's Program Director, Gary Bobker, Co-chairs a stakeholder group known as the Ecosystem Roundtable, which formally advises CALFED on its Ecosystem Restoration Strategy. Gary Bobker was one of signatories to the Bay Delta Accord and has been devoting a significant amount of his energy to improving this effort. Dr. Anitra Pawley, TBI's Aquatic Ecologist is a member of something known as the Integration Panel, a technical committee that advises CALFED on how best to allocate and prioritize the millions of dollars spent on ecosystem restoration. To date CALFED has funded 195 projects for a total of approximately $228 million.

Types of projects funded include fish screens, fish ladders, land acquisition, habitat restoration, and focused research and monitoring projects designed to provide information that will improve future restoration efforts. Funding for these projects has come from the Federal Bay-Delta Act, State Proposition 204 and water user fees. In short, the CALFED Bay-Delta Ecosystem Restoration Strategy provides a good working example of how ecosystem restoration targeted toward an estuary can be performed. It provides an appropriate scientific foundation and allows for the type of coordination required for truly comprehensive habitat restoration.

U.S. Army Corps of Engineers Ecosystem Restoration Mandate:
Historically, two main objectives of the Army Corps of Engineers have been the maintenance our navigational waterways and flood protection. Increasingly, under the National Environmental policy Act of 1969 and Federal Water Pollution Control Act of 1972, known as the Clean Water Act the Corps has been given more authority to regulate the discharge of dredged or fill material into our Nation's wetlands. More recently, Congress provided additional environmental protection authority to the Corps under the Water Resources Development Act (WRD A) of 1986 and subsequent WRDAs. Clearly, one of the more notable features of this legislation is the "ecosystem restoration" authority provided to the Corps that is closely linked to economic development.

Sonoma Baylands:
Perhaps one of the best examples of the positive aspects of the expanded role of ecosystem restoration for the Corps is the 400 acre Sonoma Baylands Wetlands Restoration and Demonstration Project in Sonoma, California. This pilot wetland restoration project put to beneficial reuse material that had been dredged from the Port Oakland's harbor -- material that would otherwise have been disposed of as waste inside San Francisco Bay or the Pacific Ocean beyond the Golden Gate Bridge. This pioneering project was only made possible by a comprehensive and coordinated approach, much like those being proposed in H.R. 1775, lead by the Corps and U.S. EPA called the Long Term Management Strategy (LTMS). The LTMS was designed to find long-term solutions for the disposal of dredge material for the San Francisco Bay area on a regional basis and has been formally adopted by the responsible agencies. The LTMS had the strong support from the Bay Area Congressional delegation and required broad-based support from all levels of government. The Sonoma Baylands has proven to be a win-win solution. The long-term monitoring program, like those being proposed in this Act, has also provide useful information regarding the science behind wetland restoration using dredge material. In fact, that monitoring information obtained as part of the Sonoma Baylands project has already been used to better inform and improve upon another related Corps project authorized earlier this year, the Hamilton Army Airfield Wetland Restoration Project.

Hamilton Army Airfield Wetland Restoration Project:
This wetland restoration project being constructed on an old 700 acre cement runway in Novato, California that is building upon the success of the Sonoma Baylands project. It is another good example of a Corps ecosystem restoration project that has the potential to add a significant amount of wetland habitat back to San Francisco Bay. This project also provides additional opportunities to link with other adjacent wetland restoration sites as part of a more comprehensive vision of ecosystem restoration.

San Pablo Bay Watershed Restoration Study:
The Bay Institute has been very involved in another Corps ecosystem restoration effort called the San Pablo Bay Watershed Restoration Study. This project grew out of a local planning process that included landowners in the area, much like H.R. 1775 is promoting. As part of my written testimony I am including a report entitled the San Pablo Baylands. This document describes the planning effort that led up to the Corps San Pablo Bay Watershed Restoration Study in great detail. Therefor, I will not elaborate much further about this process, except to say that I wholeheartedly agree with this approach and feel that because of the way it incorporated local landowners and numerous stakeholders, it represents the type of project that should be held up as your model.

Industrial Water Efficiency Program:
My final area of focus has to do with the efficient use of resources. This is an area that poses a promising opportunity for Congress. It is my hope that members of the Subcommittee will consider, as part of H.R. 1775, a means to provide greater incentives for innovative water conservation and recycling projects as they relate to estuaries.

The Bay Institute recently published a pilot report entitled the Industrial Water Efficiency Program targeting the City of Petaluma, California. The study is aimed at the commercial, industrial and institutional (CII) water sector and recommends the development a cost-effective public/private partnership designed to improve water efficiency and greatly reduce the mass of pollutants being discharged to the sewer system, and ultimately into San Francisco Bay.

The City of Petaluma has demonstrated true leadership with regard to water conservation over the years. This Industrial Water Efficiency Program builds upon that strong record of achievement. By implementing an Industrial Water Efficiency Program, the City has the potential to reduce water use by almost 400,000 gallons per day. This is roughly seven percent of the City's total estimated wastewater flow in the year 2010. The amount of pollutants entering the sewage treatment system will also be reduced.

As part of the Industrial Water Efficiency Program a "Case Study for Mishi Apparel, Inc." was developed. Mishi Apparel, Inc. manufacturers women's clothing and operates a dye house in Petaluma. Mishi has been in Petaluma for fifteen years and has 50 employees. The Case Study for Mishi verified that with the right combination of incentives it would be possible to reduce Mishi's demand for water by about 46% and process additives by as much as 72%. In Mishi's case, fewer materials required at the dyehouse translates into improved water quality and more dollars to invest. This program will enable the City to play a more constructive role in assisting local businesses.

I strongly urge Congress, through H.R. 1775, to continue supporting innovative water conservation measures. The most reliable new source of water in California lies with efficiency improvements among our existing users. Our Case Study of Mishi Apparel Inc, provides a wonderful opportunity to demonstrate that public investment in resource efficiency will provide highly cost-effective local economic development. The combination of pollution prevention with water conservation, particularly as it addresses the removal of metals at their source, will be especially beneficial for our nation's estuaries. The concept of approaching these goals within the context of local economic development creates additional opportunities.

Along with my original letter of support for the Estuary Habitat Restoration Partnership Act I have included two recent reports to accompany my testimony that I believe will be useful to the Subcommittee. The first report is *From Sierra to the Sea, The Ecological History of the San Francisco Bay-Delta Watershed*, published by the Bay Institute in 1998. The second is *San Pablo Baylands, A Plan to Protect and Restore the Regions Farms and Wetlands*, developed by the Partnership For The San Pablo Baylands and published earlier this year. I believe the Subcommittee will also find useful a document called *Baylands Ecosystem Habitat Goals*, which I have not included today. However, this report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project beautifully illustrates that there are numerous projects ready to be implemented in the San Francisco Bay Region. These reports also clearly demonstrate the significant amount of planning and coordination that has already taken place in the San Francisco Bay Area. What we need now is the type of financial support offered by the Estuary Habitat Restoration Partnership Act of 1999.

On behalf of The Bay Institute of San Francisco and the San Francisco Bay Joint Venture thank you again Mr. Chairman and members of the Subcommittee for the opportunity to testify before you here today.

Coastal Conservancy

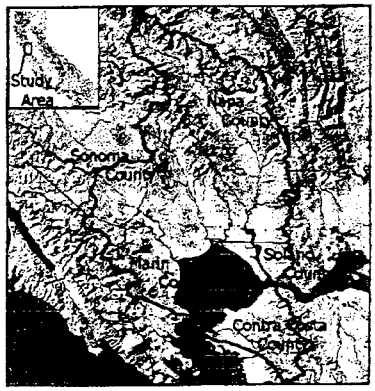
U.S. Army Corps of Engineers
San Francisco District
South Pacific Division

San Pablo Bay Watershed Restoration Study

The San Pablo Bay Watershed Restoration Study is a joint effort of the Coastal Conservancy, the U.S. Army Corps of Engineers, and several local partners to identify and design environmental restoration projects in the San Pablo Bay watershed. A principal purpose of the study is to enable local governments and nonprofit organizations to obtain federal funding to restore wetlands and other wildlife habitats.

The study area contains vast amounts of valuable wildlife habitat and restorable wetlands. The ecology of the region, however, is threatened by encroaching urbanization, and there is an urgent need to determine how to provide for urban and business needs while protecting and improving the natural environment.

The study will provide a comprehensive analysis of needs and opportunities for ecological restoration, building on the extensive body of information produced over many years through the efforts of several organizations. Specific restoration opportunities will be identified, and local partners will be encouraged to assist in the planning and design of restoration projects.



San Pablo Bay Watershed

Although the study will focus on ecological restoration, it will also consider associated benefits such as flood protection, farmland preservation, erosion control, and pollution abatement. Economic and recreational issues will also be addressed.

For inclusion in the study, a 50-percent share of planning and design costs must be provided to match available Corps funds. Study partners will work to assist in providing funding where necessary. Inclusion in the study may allow projects to be eligible for Corps funding of up to 75 percent of implementation costs.

The Corps has approved up to $2.6 million for the study, subject to the availability of non-federal matching funds. The Coastal Conservancy has provided $200,000 to begin the study.

Supporters of the study include, among others, the San Pablo Baylands Partnership, the Bay Institute, Save San Francisco Bay Association, and the San Francisco Bay Joint Venture.

For additional information, please contact

Corps of Engineers:	Roger Golden	(415) 977-8703
	Karen Rippey	(415) 977-8537
Coastal Conservancy:	Dick Wayman	(510) 286-4182

Mr. GILCHREST. Thank you, Mr. Davis. Mr. Frazer.

STATEMENT OF GARY D. FRAZER. ASSISTANT DIRECTOR FOR ECOLOGICAL SERVICES, U.S. FISH AND WILDLIFE SERVICE

Mr. FRAZER. Mr. Chairman and members of the Subcommittee, I'm Gary Frazer, Assistant Director for Ecological Services of the U.S. Fish and Wildlife Service.

The Service supports H.R. 1775 and commends you, Mr. Chairman, and the co-sponsors for introducing this important legislation. Estuaries provide vital habitat for a great many of our nation's fish, shellfish, migratory birds, and threatened and endangered species.

The Service has broad authority and extensive involvement in the protection of these important resources. The Service administers two grant programs that provide funding to states and local organizations to protect and restore coastal habitat. In addition, through the national wetlands inventory program, the service creates hard-copy and digital maps of all wetlands and deep water habitats of the United States, including estuaries.

The Service's primary program for on-the-ground restoration and protection of estuaries is our coastal program. Through the coastal program, Service biologists provide technical and financial assistance in coastal habitat protection and restoration to a host of partners, including other Federal agencies, states and local organizations. Such partnerships facilitate the efficient transfer of funds to on-the-ground restoration projects.

Over the past five years, the Service's coastal program partnerships have protected more than 97,000 acres of coastal habitats through conservation easements and acquisition. We opened almost 2,000 miles of coastal streams for anadromous fish passage, restored more than 28,000 acres of coastal wetlands, restored almost 16,000 acres of coastal upland habitat, and restored 235 miles of coastal stream habitat.

Such accomplishments have been made possible through extensive coordination with other agencies, initiation of interagency projects, and active participation with the Environmental Protection Agency and state partners in implementing fish and wildlife aspects of the national estuary program.

If H.R. 1775 were enacted, the Service anticipates that it would support coordinated efforts to carry out larger-scale restoration projects, such as restoration of submerged aquatic vegetation and oyster reefs in the Chesapeake Bay, removal of exotic plants to restore bird habitat in south Florida, restoration of salt marshes in coastal Louisiana, restoration of coastal wetlands critical to endangered species in Hawaii.

As the Federal lead for fish and wildlife conservation, the Service can bring a living resource focus to the council and promote the selection of projects that benefit fish and wildlife resources and their habitats.

The Service biologists can provide assistance and support to the regional councils throughout the grant proposal, selection, implementation and monitoring processes outlined in H.R. 1775.

The Service's coastal program biologists and joint venture coordinators have built trusting relationships with the numerous part-

ners in the field and have the delivery mechanisms in place to quickly convert grant funds to tangible results.

The Service can also play an important role in project monitoring and determining whether flora and fauna return successfully to the restored area, which is the ultimate test of whether restoration has truly been accomplished.

The Committee has asked if we believe that there is sufficient funding in the bill for the Service to carry out its activities. Our coastal program currently is not funded and staffed to adequately support the councils and provide the increased technical assistance that would be necessary to meet the needs from partners.

The Service is very sensitive to the issue of more money being targeted to support the grants program. We want the majority of funding under the bill to go toward on-the-ground restoration activities. However, we hope the Congress will provide a reasonable amount of funding to the Federal agencies to enable us to effectively implement this Act.

The Service endorses the bill's provision to reauthorize the Federal Interagency Chesapeake Bay program, in which the Service participates as an advisory member via the coastal and fisheries programs, and we also recommend that H.R. 1775 include the Great Lakes region by creating a seventh regional council under section 105 of the bill.

With these comments and suggestions, the Service believes that H.R. 1775 is a valuable bill that will encourage Federal agencies to work together and develop partnerships with states and communities for estuary habitat restoration. Much of the necessary planning has been done, but the improved coordination measures and funding authorizations provided in this legislation will speed the process of converting such plans to tangible, on-the-ground projects that benefit fish, wildlife, and the American people.

We strongly support the spirit and intent of H.R. 1775 and look forward to working with Congress to pass the legislation this year.

Thank you. I'll be happy to answer any questions you may have.

[The prepared statement of Mr. Frazer follows:]

Mr. GILCHREST. Thank you, Mr. Frazer.

Mr. Davis, just a quick question on restoring the Everglades and the Corps of Engineers' area of responsibility.

How do you restore the Everglades? If you could answer this in less than five minutes. How do you restore the Everglades, and then is the Corps of Engineers in any way responsible for—if you restore the Everglades, that means you have to—I would assume you have to have some land that will filter out some of the water that flows through it, straighten out some of the canals or rivers that were—I mean, take away the straight arrow shot of some of the rivers, put the curves back in.

How do you go through this process as far as—I would assume there's going to be some easements, there has to be some land purchase. There's got to be a great deal done to the physical infrastructure in order to implement this restoration.

Mr. DAVIS. The answer is yes, if you want a short answer. You can really sum up how you restore the Everglades with four words. It's the quantity, quality, timing and distribution of water. Those four factors are what it's all about.

We first have to capture some of the 1.7 billion gallons of water that goes out to the oceans wasted every day, on average.

Mr. GILCHREST. Is there a plan to do that now, a strategy?

Mr. DAVIS. Yes.

Mr. GILCHREST. With land purchase?

Mr. DAVIS. Yes.

Mr. GILCHREST. Between the state, private sector, the Federal Government and different Federal agencies.

Mr. DAVIS. Yes. There's a very extensive land acquisition program between the Corps, the Department of Interior, the South Florida Water Management District, county governments, like Dade County and others, where we're going to literally be buying hundreds of thousands of acres of land. In fact, we've already bought tens of thousands of acres of land right now, setting it aside so——

Mr. GILCHREST. Are these from willing sellers? Was the condemnation process used at all or may it be used in this process?

Mr. DAVIS. For the most part, the land that's been purchased to date has been from willing sellers. I would suspect, however, that before it's over, there would be some condemnation of land required, but I think for the most part, what's been purchased to date has been from willing sellers.

Mr. GILCHREST. How would this bill, H.R. 1775, and you said it would help enhance the Corps' ability to restore estuaries. How would it help restore estuaries, H.R. 1775?

Mr. DAVIS. First and foremost, I think it sends a signal that restoring estuaries would be a national priority, that it's something that is important to the nation, that it puts a spotlight on these important resources.

Secondly, it provides an organizing framework, so we can all be more efficient. It's not just the Corps. It will help all of the agencies, the Federal Government, state level, local level, the private sector, the non-profit organizations, help us coordinate so that we can very efficiently use our funds.

We've seen this happen. It's funny that it takes perhaps something as simple as some kind of organizational structure to make things work, but Coastal America is a very good example, where you have a program that required no additional Federal money, but it was a framework for Federal agencies, in particular, to sit at the table and set some priorities and look at the respective authorities and tools and coordinate, and we've put some real important projects on the ground doing that.

This would let us take another big leap and do it on a much larger scale.

Mr. GILCHREST. You mentioned Coastal America. Is the framework suitable? You had a couple of comments on it. But is the framework a pretty good reflection of the framework in which Coastal America now functions?

Mr. DAVIS. It's a fairly good reflection. I think Coastal America, like the bill, has a national body, a task force, if you will, that kind of oversees, from a policy perspective, and then you have regional implementation teams that are really out on the ground, the agency folks that are getting the work done.

So to that extent, it does mirror the national council, regional council structure that you have in your bill.

Mr. GILCHREST. Could the Coastal America framework be the framework of H.R. 1775?

Mr. DAVIS. I think perhaps with some modifications, that it could be, yes. I think, again, what I would suggest would happen is that the same people that are generally doing the Coastal America project, they're going to be the same types of people, at least within the Federal agencies that will be helping us implement H.R. 1775.

Mr. GILCHREST. You said that H.R. 1775 would create a more efficient system to implement the restoration projects. So the restoration projects that are now underway are hit-and-miss? They seem to be successful in Florida, with the massive effort there. They seem to be somewhat successful other places.

But on a national level, the framework, however it mirrors Coastal America or however this council system is structured, would provide a more efficient flow of information, dollars, implementation.

Mr. DAVIS. I think it will. I think that we have witnessed a lot of successful coastal restoration around the country currently and I would expect that would continue.

But what this bill could do is it pulls us together and it forces us to set priorities, perhaps looking at watersheds, stepping back from a project by project approach, looking at where we need to target our resources across Federal agencies, state agencies and other levels of government.

We do that at times now, but there's no real mandate to do that and I think this would help create that.

Mr. GILCHREST. I see. I have a couple more questions, but I'm going to yield right now to the gentleman from American Samoa.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. I certainly want to thank the members of the panel for their testimony. I do have a couple of questions.

I note with interest the proposed bill—perhaps many Americans don't realize it, but over 50 percent of our nation's population live in the coastal areas of our country; 75 percent of the commercial fishing industry is entirely dependent on these estuaries; and, 80 to 90 percent of the recreational fishing industry is also dependent on these very important areas.

In all the years that I've been in the Committee hearings, Mr. Chairman, I have never seen the Administration, three different Federal agencies, all agreeing to a bill within a three month period of when it was introduced. I've never heard of this ever happening, Mr. Chairman, and I certainly want to commend you for this proposed legislation, which I think is not only very important, but I certainly hope that we will move it with due speed.

I'm sure the Chairman and myself, we're very sensitive to the idea of duplication, the idea of being overly bureaucratic about any given issue in the problems that we deal with in the Federal Government.

So I suppose the bill is being introduced and now we have the Federal agencies coming to testify and say whether or not you already have the capabilities of handling this problem that we're addressing.

I wanted to ask Ms. Yozell. I had mentioned earlier in my statement that when you talk about estuaries, you're talking about a global total dollar value of about $4 trillion involved. Within our own country, what is it, $56,000 per acre, approximately, in terms of the dollar.

About how many acres are we looking at nationwide in our own country? Do we have any statistics on that?

Ms. YOZELL. We do. In fact, I was just looking at a report last night that EPA puts out, through their monitoring program. They have assessed the quality of about 72 percent of our estuaries, about 30,000 square miles, and they found that 38 percent are very impaired. If you use the ratio for the remaining percent to that would translate into about 11 million acres.

So this bill seeks to address 10 percent, which is a great start when you think of how many really there are.

Mr. FALEOMAVAEGA. This is just for starters, 11 million acres, that's just for starters.

Ms. YOZELL. The 11 million acres is what we estimate, and I'll have to say it's very rough. EPA has determined that roughly about 11 million acres are impaired, and the legislation before us aims to start out with addressing a million. So that's roughly about 10 percent, or 11 percent.

And we think that is a great start, because we know that it is going to be difficult by its very nature.

Mr. FALEOMAVAEGA. You had also indicated earlier, Ms. Yozell, that you spoke very highly of the Coastal Wetland Planning, Protection and Restoration Act program that is now ongoing in Louisiana. Can you elaborate on that? What are some of the features that perhaps we can take from Louisiana and incorporate on a nationwide basis, what the bill proposes?

Ms. YOZELL. Absolutely. And I will note that in the Senate side, we call it the Breaux Act, but on the House side, we call it the CWPPRA.

It's a fantastic process that we've developed there and I think the best part about it is the collaboration. It's collaborative amongst all of the Federal agencies you see here at the table, as well as others—the state, local partners—and it's really an on-the-ground effort.

For example, if one agency has a particular expertise in an area that's being restored, they sort of run that project. If another agency has expertise in another area, they do the same. So EPA will run a project, the Corps will run a project, or NOAA will run a project for expamle.

But overall, I think it's the collaborative nature, it's the on-the-ground nature, and most of the money goes to on-the-ground projects. I think it's about 10 percent that goes for administration.

Mr. FALEOMAVAEGA. What I'm most appreciative of is that we're seeing three Federal agencies all being very collaborative and being very positive in their approaches and saying let's solve the problem.

I've heard time and time in hearings the agencies fighting among themselves and then expecting us to solve the problem. Again, I wanted to ask Ms. Yozell, can you provide an example of where there are any current existing programs that are working together

in a way that perhaps——giving us some signals on how we can approach and develop this legislation, that could be most helpful.

Ms. YOZELL. Sure. I think Michael pointed to one that's very successful, which is the South Florida restoration effort. I sit on the task force and NOAA really offers our expertise in monitoring and the scientific issues as we replum the overall Everglades, and Interior has their expertise. So that's one that does work very well.

I think Michael also hit upon the Coastal America program, where we are all together, working together.

This is very, very beneficial to us to have us all sort of thrown together to develop a plan together, because we're all so busy and we have so many programs that are working to address estuary and wetland restoration, but we're not always certain what the other is doing. And I think bringing us together and developing a plan would be very effective.

Mr. FALEOMAVAEGA. Mr. Davis, there is a view among some circles that the Corps of Engineers, they tend to go out there and dredge things, build bridges, and make things dirty.

How could the Corps of Engineers ever be considered as an environmentalist, if your job is to go out there and destroy the reefs and make landfills and build airports and do all these kind of good things that supposedly destroy the estuaries, rather than restore them?

Mr. DAVIS. That's an interesting question. When I look at what the Corps is all about, I see something different. First of all, if you ask the people what the Corps is all about, they would say dredging and flood control and environmental destruction. I would submit to you that it's different. I submit to you what the Corps is about is solving problems. For over 200 years, this nation has called on its Army Corps of Engineers to solve problems and society asked the Corps of Engineers, in response to a couple of devastating hurricanes in 1947, to go down and drain the south Florida Everglades. The State of Florida, and the Congressional leadership, asked the Corps to go down there and do a project.

We did it and, fortunately, we were very successful. We drained the Everglades. And we've been asked all over the country to do those things. Today I think society and the Congress and certainly this Administration is asking the Corps of Engineers to do other things.

And I guess the biggest test of whether we're serious about that is where we're putting our money. If you look at 1992, about 2 percent of the Corps' Civil Works budget, which is typically about $4 billion a year, about 2 percent of that budget went to environmental restoration and protection.

In the President's fiscal year 2000 request, about 25 percent of the Corps' budget goes to environmental restoration and protection. So we are very serious today and you are absolutely right, we do have a little bit of a problem with our image and we're trying to rehabilitate that and show people we are very serious about this part of our mission.

Mr. FALEOMAVAEGA. Let's talk about the Everglades. I've been to the Everglades and, interestingly enough, I think the Corps of Engineers was—you built how many miles long ditches?

Mr. DAVIS. Hundreds of miles.

Mr. FALEOMAVAEGA. Hundreds of miles ditches and as a result, we're having a serious problem with the Miccosukee tribe, and the people there owned this whole area before westerners ever came to Florida, and we're having that very serious problem. How do you help this tribe that was there before we came?

Mr. DAVIS. We are working very closely not only with the Nukasukis, but the Seminole tribe, and they are represented on this task force that Sally and I serve on and they have an equal role to play in terms of helping us shape the overall restoration plan.

I can assure you that the Nukasuki and Seminole issues are in the front of our minds every time we make decisions about how to replum the water, how to move the water, and we're looking at their interests fully.

Mr. FALEOMAVAEGA. You notice that in the bill, there's authorization of $220 million for a five-year period. Do you consider that a sufficient and adequate amount to kind of get the program going, if this bill is enacted?

Mr. DAVIS. I think it's a very good start. There's a lot of very good work, with that amount of money. Many of the projects that we're talking about are not necessarily all that expensive. It involves things like changing culverts, getting tidal flow back into areas. So some of the things are not that expensive.

Others will be much larger projects and will take a lot more money, but I think that amount of money and it's cost-shared, the way the bill lays out, will be a very good start for us.

Mr. FALEOMAVAEGA. About what percentage of the entire budget of the Corps of Engineers is committed towards estuary considerations?

Mr. DAVIS. Of that 25 percent that goes to the environment, I couldn't tell you how much of that goes to estuarine and restoration, but I can get that number for you, for the record. It's a fairly large amount. We've got a lot of coastal projects going on right now., such as Sonoma Bay-lands in California. We've just completed a restoration project that Senator Chafee was involved in in Rhode Island.

So we've got dozens of these things around the country going on right now. So it's a fairly large amount of money.

Of the FY 2000 appropriated funds for environmental activities, over $33 million is committed to estuary related projects. Most of these are still in the planning and design stages.

Mr. FALEOMAVAEGA. Mr. Chairman, I know my time is up, but is all right if I ask another question? You're the boss. Thank you, Mr. Chairman.

Mr. Frazer, it's my understanding that a report was released last year that identified over 65 separate programs scattered over seven different Federal agencies, including the Fish and Wildlife Service, providing funding for estuary and coastal wetlands restoration.

Can you give us your sense of evaluation how that would fit into the provisions of H.R. 1775?

Mr. FRAZER. I think one of the strengths of H.R. 1775 is its national strategy to identify the various programs out there, the needs, and to put them into a coordinated framework so that the

pieces can become greater, when they become pulled together. You, in fact, have greater capability than individual parts could do in terms of advancing estuary restoration independently.

The Fish and Wildlife Service has got several programs that we administer. Many of our efforts, particularly through our coastal program, seek to work to coordinate the various restoration programs and to bring a living resource focus to those already. This bill would provide a framework, as well as additional dollars, to be able to advance large-scale and effective restoration projects.

Mr. FALEOMAVAEGA. With the assistance of our three most valued Federal agency representatives here before us, could you give us an idea that perhaps the Administration will be helpful in moving this legislation as expeditiously as possible? We would appreciate if you would let us know as soon as possible areas that you think that could be strengthened, areas that you think of the bill that we could work on, so that we can get this thing moving; do you foresee any problems ahead, as far as the Administration is concerned, on this?

Mr. Chairman, I think you've got a winner here. Thank you very much.

Mr. GILCHREST. Thank you, Mr. Faleomavaega. I know there is another panel. I just have a couple of very short questions. I know Ms. Woolsey is here in the back waiting to introduce somebody.

Ms. Yozell, could you tell us, in as a specific way as you can, how you think H.R. 1775 could help with an oyster restoration program, which I'm assuming now can be a part of this habitat restoration idea, how H.R. 1775 would help NMFS pool resources to build oyster reefs in the Chesapeake Bay?

Ms. YOZELL. Absolutely. As you pointed out earlier, 1 percent, that's pretty dismal when you think of what used to exist with regard to oyster sites throughout the bay. So there's a lot of work that can be done.

And I know that recently, in June, the Chesapeake Bay oyster restoration report came out and really highlighted three areas that are essential if we're going to get oyster restoration throughout the bay.

It talks about how we need three-dimensional reef habitat and that we need to create reef sanctuaries for the brood stock, and that we have to stop the practice of moving diseased oyster around the bay.

So those are the issues that have been identified. Now, you know that NOAA doesn't spend a lot of money or nowhere near the amount of money that we need to take on these kinds of issues and address it. I think we have $450,000 in an oyster bed restoration program and we do some research through Sea Grant.

So by having these funds, we can collaboratively, one, work with other agencies; and two, work with the Chesapeake Bay program, the states and the locals, and really benefit in doing strong and important restoration. Those three issues I outlined, they do take money, they do take time, and they take human resources, and this will enable us to do exactly that, and I think it's an excellent, excellent opportunity for us to help bring the oysters back to the bay.

Mr. GILCHREST. Thank you. Do you have an opinion on whether the money that would go through the councils and the agencies

that would implement these policies would be grant dollars or, like the quorum, I would ask Mike the same question, what is the difference between a grant program and a project program? Do you have an opinion on that?

Ms. YOZELL. Basically, the difference is, as we have under CWPPRA, an agency runs the project and so that's a program and that has worked very effectively. Under the grants program, it's a particular grant to an entity and there's criteria, but we may not be as involved or be able to offer our expertise and experiences.

I believe we've been leaning towards—and I'll let Michael answer that from the Corps' point of view, since he'll be sort of running the structure and they have their own issues there—I believe we're leaning towards a program setup through the Corps mechanism.

Mr. GILCHREST. Which would then be more project-oriented as opposed to grant-oriented.

Ms. YOZELL. Correct.

Mr. GILCHREST. Do you think there could be some formula where there could be a mix in the same legislation, a mix of projects and grants?

Ms. YOZELL. Yes. For example, let me use the example of our community-based restoration program. We provide grants, small grants, and, as Michael pointed out, it can be anything from just moving a culvert or a drain, and those are small projects and they're grants to communities, and I think they work very well.

So it would be good if we could somehow accommodate both grants and programs.

Mr. GILCHREST. Mike, any comment?

Mr. DAVIS. I think for the most part, the Army would prefer that it's a project-oriented program and there are several reasons. The science of ecosystem restoration is still relatively new and we're learning a lot of things as each project that we put on the ground, we're learning. We're also learning that things that look good on paper often don't work out that way on the ground. There are some unintended consequences, sometimes negative, sometimes positive.

So I would caution that we need to make sure that we have the right amount of analysis done before we just march off and start building something or doing something. So for the most part, I think that we need the analytical framework that we use to put projects on the ground and have the Federal Government, including the Corps and the other agencies, provide that technical type of review.

It may be possible, however, to build on your suggestion, there may be some threshold below which you could have a kind of a grant type of program for very, very small problems, where it was just obvious to everybody that that was the right thing to do and the results were going to be very positive to the environment.

But generally, I think that we ought to be very careful and make sure that we maintain kind of the Federal analysis that we think is needed to make sure that we end up with the right result.

Mr. GILCHREST. Thank you. Mr. Frazer, do you have a comment on that?

Mr. FRAZER. Well, restoration and coastal zone is technically difficult. It poses special challenges. Expertise in those sorts of restoration projects is very important to ensure success.

The Federal Government, Federal agencies certainly do have and have accumulated a great deal of expertise and some of the benefits of Federal agencies working together and managing projects are demonstrated through the Coastal America program.

But there is also a tremendous interest and desire for states and local governments to have the resources and assistance in carrying out their restoration programs.

So a melding of the two would have some great benefit. The diversity of approaches can provide a greater coverage than any one single approach.

Mr. GILCHREST. Thank you. If I may, this is the last question. Mr. Frazer, could you tell us, briefly, how do you restore an estuary and how do you keep it restored? Briefly.

Mr. FRAZER. Circumstances differ wherever you go, but basically the key to restoration is to understand what changes have occurred to the natural processes that are key to sustaining the function and productivity of an estuarine system. Sometimes it's modification of tidal flow.

An estuary really is an area in which salt water and fresh waters mix and the changes to the hydrology of an estuary can have dramatic effects on living systems.

Sometimes the changes have to do with development in adjacent uplands and pollutant inputs into the estuarine system. Sometimes it's related to invasion of exotic species.

So there's any number of threats of changes that occur to an estuary and the restoration is dependent upon being able to identify those threats and putting in place effective strategies and monitoring to ensure then that your restoration activities are, in fact, effective.

Mr. GILCHREST. Thank you very much. Each of you has mentioned the Great Lakes. We won't go into that at this point, but I'm sure we'll be in contact with you to further discuss that issue. We may have to change the timing of the bill, though, if we include or say "and the Great Lakes, restore estuary habitat and fresh water of the Great Lakes," but those are considerations that we'll take under advisement and do our best.

We certainly appreciate all your testimony here this morning. It has been extremely helpful. Thank you very much.

Mr. FALEOMAVAEGA. Mr. Chairman, I would like unanimous consent to allow our friend and good colleague, the gentlelady from California, to invite her to sit with us on the dais. I'd like to also ask unanimous consent that she be permitted to introduce our dear friend that is going to be also testifying at our Committee hearing this afternoon.

Mr. GILCHREST. Without objection. I would also like to ask unanimous consent that Chairman Saxton's statement be included in the record. Hearing no objection, that will be done.

[The prepared statement of Mr. Saxton follows:]

STATEMENT OF HON. JIM SAXTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Today we will hear testimony from our distinguished witnesses regarding Congressman Wayne Gilchrest's (MD 1st) bill, H.R. 1775, to catalyze estuary restoration and coordinate Federal estuarine activities. This is an excellent bill, and this action is long overdue from the Federal Government. I am a cosponsor of this measure,

and I commend Mr. Gilchrest for his leadership on this issue. I remain committed to attacking the problems facing this nation's estuaries and to restoring degraded coastal habitat.

Over a decade ago, Congress created the National Estuary Program to address serious environmental problems in estuaries of national significance. These problems include polluted runoff, habitat loss, development pressure, and harmful algal blooms. Unfortunately, despite a significant amount of planning, very little effort has been made to implement comprehensive conservation and management plans or to actively restore the most seriously degraded estuarine areas. I am pleased that today we are taking positive steps to improve this unacceptable situation.

H.R. 1775 will, for the first time, coordinate Federal agencies with the responsibility for estuary management. This is an idea whose time is long overdue. H.R. 1775 also provides funding to implement estuary management plans, undertake habitat restoration activities, and prevent further losses. H.R. 1775 requires a non-Federal partner to provide matching funds for estuary restoration projects. I am a strong supporter of requiring local or state matching funds for these types of activities. Building local support and including the citizens who live and work near these estuaries strengthens the program and will result in long-term benefits for the natural resources that are dependent on these areas.

I fully support Mr. Gilchrest's bill as well as other efforts to address problems in the coastal zone. Not only am I a cosponsor of H.R. 1775, but I have introduced a companion bill, H.R. 1237, that would allow the Environmental Protection Agency to use funds appropriated for the National Estuary Program to be used, for the first time, to implement comprehensive conservation and management plans. I will also continue to urge the reauthorization of the Coastal Zone Management Act. H.R. 2669, the Coastal Community Conservation Act, which this Subcommittee approved on August 5, 1999, includes provisions for increasing local involvement in coastal zone management and it reauthorizes the National Estuarine Reserve System. Together with H.R. 1775, these measures will have a positive impact on our coastal resources well into the 21st century.

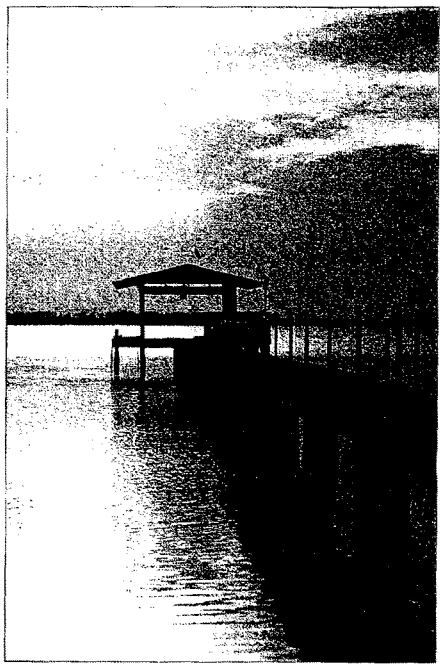
ANEP

ASSOCIATION OF NATIONAL ESTUARY PROGRAMS

The opinions expressed in this publication are those of the Association of National Estuary Programs members and staff. Assistance in compiling this publication was received from the U.S. Environmental Protection Agency and members of the National Estuary Programs. Mention of trade names, corporations or commercial products does not constitute endorsement or recommendation by the sponsoring agencies or the Association of National Estuary Programs.

Estuary - A semi-enclosed body of water, open to the ocean and diluted by fresh water

Watershed - The land area surrounding an estuary which collects and conveys fresh water to the estuary



South Florida sunrise along the Indian River Lagoon

Market Survey Reveals Americans Expect To Find Coasts Under Stress

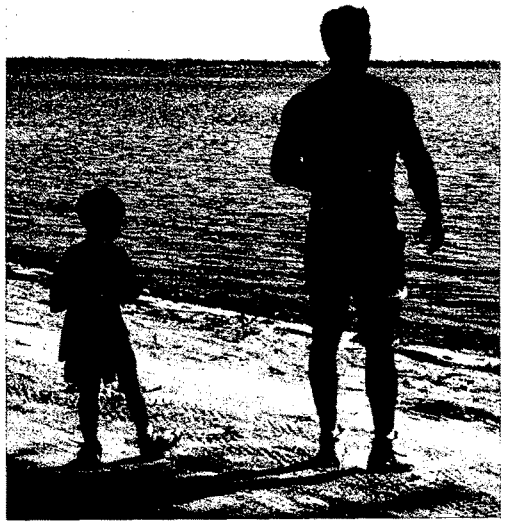
For millions of Americans, summertime means visits to the coast. The average American spends about 10 vacation days at the coast each year, and over half the U.S. population lives there. Yet this popularity can spell trouble.

As part of a nationwide effort to raise Americans' understanding of the stress on the coast, a national market research firm, Market Facts' TELENATION, donated survey services to find out what Americans think about coastal issues.

The random survey found significant concern about overbuilding, erosion, water pollution, overcrowded beaches and marine debris.

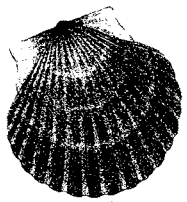
For example, 83 percent of respondents say they see overbuilding along the coast as a problem. Comparing conditions to 10 years ago, 56 percent of respondents said they see more trash; 47 percent see more dead fish washed up on beaches; 53 percent say the waters are dirtier, and 64 percent say they see more erosion.

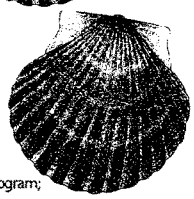
Still, the survey indicates that Americans seem unaware of an individual's impact on the coast.



A father and son stroll along one of Florida's sandy beaches near Sarasota Bay.

Front cover, kayakers paddling in Albemarle-Pamlico Sounds, North Carolina.





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Cape Canaveral Scientific, Inc.
of Melbourne Beach, Florida, Publication Design

Drawings by Bonnie Bower-Dennis, Vero Beach, Florida.

GIS map information provided by U.S. Environmental Protection Agency,
Office of Water, Washington, D.C.

Photo credits include:
Cover, Joan Giordano, Albemarle–Pamlico Sounds Estuary Program;
Inside front cover by Patrick Lynch, South Florida Water Management District;
Page 2, Heinz Gartlgruber of Tampa Bay NEP;
Page 3, Sarasota Bay NEP and Galveston Bay NEP;
Page 4, Charlotte Harbor NEP and Tillamook Bay NEP;
Page 5, Trust for Public Lands, NJ and Joan Giordano, Albemarle–Pamlico Sounds Estuary Program;
Page 6, Galveston Bay NEP and Barataria-Terrebonne NEP;
Page 7, San Francisco Bay NEP and Trust for Public Lands, NJ;
Page 8, New Hampshire Estuaries Project and Barnegat Bay NEP;
Page 9, Tillamook Bay NEP;
Page 10, and San Francisco Bay NEP and Patrick Lynch, South Florida Water Management District;
Page 11, Robert Day at Indian River Lagoon NEP and Tillamook Bay NEP;
Page 12, Florida Marine Research Institute at the Florida DEP and Robert Day, Indian River Lagoon NEP;
Page 13, Patrick Lynch, South Florida Water Management District;
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Page 15, Patrick Lynch, South Florida Water Management District;
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Page 18, Joan Giordano, Albemarle–Pamlico Sounds Estuary Program;
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Back cover, Sarasota Bay NEP.

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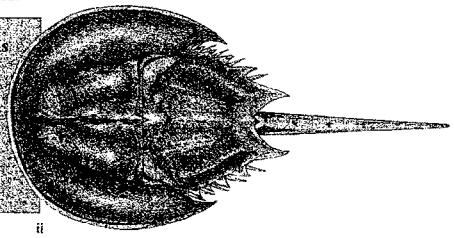

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An aerial view of the Tillamook Bay Estuary watershed in Oregon.

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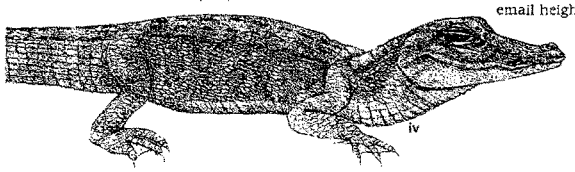

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Mr. GILCHREST. Our first, Richard Ribb, of Rhode Island, Narragansett Bay, is here with us this afternoon; Mike Hirshfield, from the Chesapeake Bay Foundation, thank you so much for coming. Richard and Mike, we appreciate all the work you've done in your particular areas to restore those estuaries. And now I will yield to you.

Ms. WOOLSEY. Thank you, Mr. Chairman. I am really honored and I thank you very much for letting me come here today to introduce somebody that is very important to me and to my district, to the State of California, and to the United States of America and our environmental protection.

But I also want to thank you because I am here to support H.R. 1775, and I want you to know that and I am on your bill and I know that it, too, is going to be very important for this nation.

Now, why is Grant Davis so important to me?

Mr. FALEOMAVAEGA. He's handsome.

Ms. WOOLSEY. Yes, he is handsome, but that's not why. Grant is either to blame or to be given credit, a great deal of it, for my running for Congress in the first place. So it depends on where you are on that, that you'll appreciate my appreciation for Grant.

Mr. GILCHREST. So Grant didn't support the Republican candidate.

Mr. DAVIS. Sorry, Mr. Chairman.

Mr. FALEOMAVAEGA. Great American, great American.

Ms. WOOLSEY. And then once I was elected, Grant came onto my staff, for over five years, and he was an extremely valuable member of my district staff, providing the essential help and information that our offices required and our district required regarding environmental issues.

Now he has gone on to be the Executive Director of the Bay Institute and in that position, it is a major step up, he is now helping the State of California, the entire Bay Area within the State of California, and it has direct results to what is going on in the United States of America regarding bay lands and estuaries and wetlands.

And as I said, Mr. Chairman, I also want to support your Estuary Habitat Restoration Partnership Act, because I see this as legislation that is an invaluable step toward the conservation of our estuaries and our nation's most prized resources.

I am certain that today Grant Davis' testimony will add credibility to H.R. 1775 and the great importance of this issue.

So thank you again for letting me do this, so I can personally let this young man know how valuable he is to all of us in my district.

Thank you very much.

Mr. GILCHREST. We thank the gentlelady from California. At this point, I guess we look forward to your testimony, gentlemen, and we can start with Mr. Ribb.

STATEMENT OF RICHARD RIBB, DIRECTOR, NARRAGANSETT BAY ESTUARY PROGRAM, RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Mr. RIBB. Mr. Chairman and members of the Subcommittee, my name is Richard Ribb. I'm the Director of the Narragansett Bay National Estuary Program in Rhode Island, and I am presenting

testimony regarding H.R. 1775 on behalf of the Association of National Estuary Programs, or ANEP, for short.

We appreciate the opportunity to present our views on the protection and restoration of our nation's estuaries and on the linkage between the NEPs and this bill.

ANEP is a non-profit organization dedicated to building a common vision for the protection and restoration of the nation's bays and estuaries. Members of ANEP include representatives of industry, agriculture, fisheries, tourism, trade, and citizen groups, who volunteer their time to develop and implement the estuary management plans created under the National Estuary Program.

We appreciate that the Subcommittee is turning its attention to the state of critical habitat in our estuaries through the introduction of this bill. The Estuary Habitat Restoration Partnership Act, introduced by Mr. Gilchrest, clearly recognizes the importance of estuarine habitat for the ecological and economic health of the nation.

ANEP strongly supports H.R. 1775. Those of us work with citizens and municipalities across the nation on coastal habitat restoration projects see the funding and support provided by this bill as a vital resource in meeting community goals for habitat restoration.

In passing this bill, Congress would make the Federal Government a real partner with the states in restoring these resources. In terms of local input, ANEP supports a regional council composition that is inclusive and broad-based, bringing many perspectives into decision-making, while building wide support for its actions.

You've heard from the Federal agency representives here on how this bill would impact their agencies. I'd like to speak a little to the other side of the coin, about how the National Estuary Programs represent a community-based approach to organizing and meeting local habitat restoration needs and how the program acts as a conduit between Federal, state and local restoration initiatives.

ANEP believes that the goals of this bill and the work that the estuary programs are doing are strongly linked, and I will briefly explain how.

First of all, the bill recognizes that estuary habitat restoration cannot take place in a vacuum. Restoration projects can be affected by other factors, like land use impacts, degraded water quality and invasive species, changes in water salinity. These are all issues that the NEP, with its broad-based, comprehensive, water-based approach are investigating and acting on.

This approach ensure that interrelated issues are considered and addressed in undertaking restoration projects.

Several of the purposes of the bill directly relate to the activities and goals of the national estuary program. These purposes include creating strategies to meet national and regional goals for habitat restoration. The bill will rely on existing plans or strategies for restoration, as well as estuary-specific scientific data as the foundation for effective projects.

The NEPs have taken a lead role in these areas. Most of their stakeholder-driven estuary management plans include specific science-based strategies for habitat restoration and the NEPs have completed dozens of restoration projects of many different types,

and I would ask you to refer, for more information on that, to the written testimony, where there's a list of a number of different restoration project types conducted by NEPs.

Another purpose in the bill is fostering communication and establishing effective partnerships between restoration programs, and the NEPs are built on local and regional partnerships for action and are often a technical and logistical support system for these partnerships. By bringing together Federal, state and local, as well as private sector stakeholders, pooling resources and targeting priority problems, the Estuary Program has enhanced the capacity of these partnerships to work together.

A further purpose in the bill seeks to ensure that restoration projects are based on sound science and that there's increased capacity for estuary habitat research and monitoring. The NEPs undertake detailed studies in each of their estuaries, creating a scientific basis for these plans and actions. These characterizations include baseline habitat data, developed by following well-designed criteria and protocols, setting standards, and providing direction for further monitoring programs.

The programs have pioneered innovative techniques, using new tools, like computer mapping and remote sensing technology, to analyze habitat and, with their partners, to prioritize projects.

In summary, the NEPs have been providing the scientific and management tools to support effective habitat restoration. They have collaboratively developed strategies and priorities for projects. They have been a communication and technical assistance resource for habitat restoration at the state and community level. They have been extremely effective at leveraging local resources to match Federal grants. For every Clean Water Act dollar the NEPs receive, they leverage at least two other dollars in state, local and other funding.

And the programs have the ability to present the council established by this bill with timely, prioritized restoration projects, with wide support from local stakeholders.

These are the primary ways in which this program supports the goals of this bill. We believe that, with continued Federal support, the NEPs can be a strong partner in implementing this Act, forming a chain of action stretching from the local watersheds up to the Federal level, that will result in the kind of measurable environmental progress that we are all working to achieve.

Thank you, Mr. Chairman and members of the Subcommittee, for the opportunity to express our endorsement of H.R. 1775 and to share our views on the connection between the National Estuary Program and this important bill.

The association stands ready to assist the Subcommittee in any way as it works on this important bill.

[The prepared statement of Mr. Ribb follows:]

STATEMENT OF RICHARD C. RIBB, ON BEHALF OF THE ASSOCIATION OF NATIONAL ESTUARY PROGRAMS

On behalf of the Association of National Estuary Programs (ANEP), we appreciate the opportunity to submit to the Subcommittee on Fisheries, Conservation, Wildlife and Oceans our views on the protection and restoration of the Nation's estuaries and on the strong linkage we see between the National Estuary Program (NEP) and the goals and process described in H.R. 1775. The Association of National Estuary

Programs is a non-profit organization dedicated to promoting stewardship and a common vision for the preservation of the nation's bays and estuaries. Our members include representatives of industry, agriculture, fisheries, tourism, and the greater business community who volunteer their time to develop and implement comprehensive management plans for a network of nationally significant estuaries.

We are pleased that this Subcommittee is turning its attention to the state of critical habitat in the Nation's estuaries, through the introduction of the bill being discussed today. Loss and degradation of estuary habitat has been identified as a priority problem in the 28 estuaries within the NEP—estuaries designated by Congress as of national significance. H.R. 1775, the Estuary Habitat Restoration Partnership Act of 1999, introduced by Mr. Gilchrest of Maryland, clearly recognizes the critical importance of estuarine habitat to the ecological and economic health of our Nation and to the quality of life of our citizens. This bill creates a national program with a strong regional component to fund estuary habitat restoration efforts in partnership with the States. non-governmental organizations and local communities.

The Association of National Estuary Programs strongly endorses H.R. 1775. Those of us who work every day with citizen groups and municipalities across the nation on habitat restoration projects would find the Federal funding and support for this issue that this bill would provide a critical resource in achieving restoration goals for our estuaries. In setting goals, committing funding, and including regional input to the process defined in this bill, Congress would make the Federal Government a real partner with the States in restoning the nation's estuarine resources.

H.R. 1775 and the National Estuary Program: A Complementary Approach to Estuary Restoration and Management

- H.R. 1775 lists the following among the purposes of the bill:
- To develop strategies to obtain national and regional objectives for estuary habitat restoration;
- To foster communication between Federal, state and community estuary habitat restoration programs;
- To establish effective estuary habitat restoration partnerships among public agencies at all levels of government and between public and private sectors;
- To develop and enhance monitoring and research capabilities to ensure that estuary habitat restoration efforts are based on sound scientific understanding.

This testimony will illustrate how the National Estuary Program is already fulfilling those purposes in estuaries across the nation and how this national program will be strongly connected to and support the goals of the Estuary Habitat Restoration Partnership Act.

The Estuary Habitat Restoration Partnership Act focuses on restoring degraded habitat, taking a targeted approach that focuses specifically on habitat restoration project selection and funding. However, the bill does recognize that successful estuary habitat restoration cannot take place in a vacuum. Even a painstakingly planned habitat restoration project can be undermined by other factors like serious water quality problems, land use impacts, changes in freshwater flows or invasive species. While H.R. 1775's mission is urgently needed, it is not broad enough to address the entire spectrum of pressures on our estuaries that can impact habitat restoration. Section 107 (d) of H.R. 1775 specifically assigns high priority to projects where there is "a program within the watershed of the estuary habitat restoration project that addresses sources of pollution and other activities that otherwise would re-impair the restored habitat" and it requires that estuary habitat restoration efforts funded under the bill be consistent with estuary management plans, referring to the Comprehensive Conservation and Management Plans created under the NEP. These issues and activities mentioned are ones that the NEPs are investigating and acting on, building collaborative solutions for estuary problems.

The NEP is broad-based, taking a comprehensive approach to addressing the wide range of problems facing the Nation's estuaries—preventing habitat degradation and loss of recreational and commercial fisheries, protecting and Improving water quality, pioneering watershed management techniques, controlling, sewage outfalls and septic system impacts, mitigating impacts from increasing coastal land development, developing strategies to deal with invasive species and harmful algal blooms—the list goes on and reflects the inter-related nature of these. Problems and the community-based nature of the NEP approach. The watershed-based perspective of the NEPs ensures that interrelated issues are considered and addressed in undertaking restoration projects.

The process established by H.R. 1775 would rely on existing plans or strategies for habitat restoration in the nation's estuaries, as well as on estuary-specific scientific habitat data as a foundation for effective restoration projects. The strength of the NEPs is comprehensive planning for restoration in a watershed context,

whereas the focus of H.R. 7755 is to provide Federal funding for local organizations to undertake specific restoration projects. The NEPs have taken a lead role in this type of planning. For example, the Narragansett Bay Estuary Program convened nearly 100 coastal stakeholders for a daylong workshop on habitat restoration, resulting in a set of clear recommendations for research, planning, management and legislation to further restoration goals. The NBEP also used the input of these participants to develop a comprehensive map and inventory of coastal restoration sites, identifying existing, planned and proposed projcts. Since 1994, the NBEP has been developing the scienfific data and methodology necessary for a statewide coastal habitat restoration plan—a plan with tremendous local support that now nears completion. The program is also conducting field-based research projects to develop detailed scientific criteria for evaluating estuary habitat restoration project success, aiding the development of monitoring protocols. The actions of this particular NEP reflect the work of NEPs across the nation in addressing this critical issue. As long-range planning and organizing entities, the NEPs have, through a consensus-based process, worked out the appropriate courses of action that will lead to coordinated and collaborative coastal habitat restoration actions.

The NEPs have the ability to present the Council established by H.R. 1775 With timely, prioritized projects with support from local stakeholders. Over the last decade, NEPs have conducted a wide variety of restoration projects and have plans for many more; refer to the attached NEP *Habitat Restoration Project List.* The programs provide an organizational framework to coordinate local restoration actions, state and Federal programs and the functions of the Council. In many cases, planning and logistical details have been worked out in advance; funding is the last necessary component. The programs have been working on this process for several years; H.R. 1775 would be a logical and well-timed receptor of the results of this work.

We believe that the passage of H.R. 1775 will allow the NEPs to move forward on the habitat restoration goals set forth in their community-based estuary management plans while providing the Regional Councils with a strong connection to local habitat restoration needs in our estuaries. The bill identifies a potential important role for the NEPs as non-voting members of Regional Councils. These programs can be an important partner and resource to the Regional Councils, providing organizational and technical advice and support. The abilities of the NEPs matched with the process and funding set up by H.R. 1775 will form a chain of action stretching from local watersheds to the Federal level that will result in the kind of measurable environmental progress that we are all working to achieve.

It is also clear that it will be a challenging task for States to consistently meet the 35 percent match requirement created in the bill. It will require a well-developed ability to secure non-Federal match and careful coordination of matching funds. This ability to leverage funds and resources is a hallmark of the NEPs. In fact, a recent report from the NEPs shows that, based on a conservative analysis, **for every Clean Water Act Section 320 dollar invested, the NEPs leverage at least 2 dollars from state, local, foundation and other funding sources and services.** There are few Federal programs that can show this kind of return on investment. This also reflects the level of State and local commitment to the NEPs as well as recognition that these programs are an effective catalyst for action in our nation's estuaries. The NEPs will no doubt play a critical role in planning for and securing local match for the funding provided by H.R. 1775.

ANEP has a specific comment regarding the language in H.R. 1775. We support a change that where in the bill "estuary management plans" are referred to, the CCMPs created under the NEP are specifically identified as such plans.

The National Estuary Program: Securing a Sound Future for the Nation's Estuaries

It is well established that estuaries are the biologically essential, economically priceless, but fragile connections between the continent and the oceans. The entire nation is served by coastal estuaries in numerous ways, such as commercial and recreational fishing, transportation, defense, boating, research and learning, and providing irreplaceable wildlife and fisheries habitat. The estuaries designated by Congress to be part of the NEP now include 42 percent of the continental United States shoreline and are among the most productive in the Nation. Economically, these estuaries of national significance produce over $7 billion in revenue from commercial and recreational fishing and related marine industries; tourism and recreation in these estuaries are valued at over $16 billion annually. Through the National Estuary Program, citizens, municipalities, environmental groups and interested business and industry organizations come together with State and Federal governments to

reach agreement on long-term management plans that seek to guarantee the economic and biological productivity of the nation's estuaries into the future.

The National Estuary Program has evolved into a leader in coastal watershed protection and restoration over the last decade and a half Each NEP serves as the primary technical and coordination support structure (and frequently the initiator) for a wide range of partnerships and actions to conserve and restore the estuary. Starting with four pilot programs in 1985, the success of and need for the program has led to the current status—28 estuaries in the national program of which 10 are in the developmental stage and 18 are in the implementation stage of their individual Comprehensive Conservation and Management Plans (CCMP). Local citizens guide the development and implementation of their plans, and, using the abilities of their local NEPs, work to leverage Federal and state dollars with contributions from local governments and the private sector.

The National Estuary Program is clearly not the "command-and-control" type of Federal program. Rather, it is a program where local governments, citizens and the private sector come together and agree on how to manage the Nation's estuaries and on how to craft local solutions to common coastal problems. Only with the full support of the local sector is the proposed CCMP submitted to the state governors and the EPA Administrator for approval. Thus, it is the states, in close coordination with the local stakeholders and the Federal Government, that create and implement new, non-adversarial and cost-effective estuary management plans, in contrast to the traditional, top-down approach to environmental protection, largely divorced from local

The NEP has a history of valuing community involvement and building support for initiatives. Citizens see these programs (and their staffs) as a part of a governmental structure that uses resources efficiently, is responsive to their needs, and is effective in solving problems and raising issues and awareness. NEPs have been particularly effective in identifying and funneling relevant resources (grants, technical assistance, etc.) to states, communities and citizen groups. The National Estuary Program is one of a handful of Federal non-regulatory programs that truly attempt to address local concerns. This effective national network of programs shares its experiences and lessons learned with each other and with other watershed and governmental organizations. It has been and, with continued support at the Federal level, will continue to be a national resource for the protection and improvement of the nation's estuaries.

We thank the Subcommittee for providing us the opportunity to express our support for H.R. 1775 and to share our views on the connection between the National Estuary Program and this bill. The Association of National Estuary Programs stands ready to assist the Subcommittee as it works to pass this vital legislation.

National Estuary Program Habitat Restoration Project List

Listed below are examples of NEP estuary habitat restoration projects, completed, ongoing and planned. The passage of H.R. 1775 would allow continuance and expansion of these efforts to better meet the Nation's estuary habitat restoration needs.

- The Massachusetts Bays Program led an interagency approach to shellfish bed restoration that will restore and protect 13 shellfish beds along Massachusetts and Cape Cod Bays. As part of this effort, the program has linked up with business interests to promote innovative technologies for pollution prevention and remediation. The program has also supported a comprehensive inventory of tidally restricted coastal wetlands in Massachusetts and is funding two fish passageway projects.
- Through the work of the Barnegat Bay NEP, more than 32,000 acres of critical coastal habitat area have been preserved in Barnegat Bay, New Jersey.
- Over 40,000 acres of impounded marsh and mangrove wetlands have been reconnected to the Indian River Lagoon on Florida's eastern coast, one of the most U.S. productive ecosystems in an area with high population growth and human pressures. On the Gulf Coast, the Sarasota NEP has helped achieve a 28-318 percent reduction in nitrogen loadings to the Bay, spurring a seven percent increase in the growth of seagrass beds.
- Maine's Casco Bay Estuary Program teamed up with local lobstermen to study habitat in Portland Harbor (discovering that the harbor supported a thriving lobster community, larger than anyone had thought) and then to relocate thousands of harbor lobsters to other areas while the harbor was dredged thereby protecting an important natural resource while supporting the increased economic development that the dredging allowed.
- The New York/New Jersey Harbor NEP, through its Habitat Workgroup, has prioritized and produced GIS coverages of habitat sites targeted for restoration and acquisition by the two states. This process has already resulted in the fund-

ing several millions of dollars worth of restoration projects. The data is being used to identify not just potential sites, but also other factors that can impair restoration such as erosion problems and incompatible land uses. A range of projects target saltmarshes, freshwater wetlands, stream corridors, waterfowl foraging areas, fish runs, invasive plant removal, dredge material reuse, artificial reefs, coastal grasslands, oyster and shellfish beds and upland forest.

• Leading a partnership effort the Charlotte Harbor NEP has restored over 700 acres on public lands through removal of non-native plant species such as Melaleuca, Brazilian pepper, and Australian pine as well as the restoration of natural hydrology. These plants were over-running and out-competing native plants. Another priority is the restoration of heavily damaged seagrass beds using innovative techniques to promote rapid re-growth.

• On November 6, 1998, the Seabrook Middle Ground clam flat in coastal New Hampshire was reopened to clamming for the first time in nearly 10 years due to work coordinated by the New Hampshire NEP. The reopening points to marked water quality improvements in the Harbor largely due to increased municipal sewerage coverage in the Town of Seabrook and other smaller scale pollution control measures around the Harbor.

• The Barataria-Terrebone Estuary Program has led a local planning effort to restore oyster-growing areas to safe harvest conditions. The program sponsored local stakeholder meetings which idenfified 61 candidate restoration sites and a smaller set of priority sites were selected for immediate action.

• The Narragansett Bay Estuary Program has been the state point-of-contact for a multi-million dollar Army Corps of Engineers Ecological Restoration Initiative. The NBEP organized a stakeholder group to work with the Corps to develop a list of priority coastal wetland and anadromous fish run restoration sites. The NBEP persuaded the Corps to also provide basic engineering studies for a number of the identified sites. The program has two saltmarsh restoration projects in this year's workplan and recently secured over $200,000 from the R.I.'s Oil Spill and Response Fund to support coastal habitat mapping and restoration equipment purchases.

• The Tampa Bay NEP set an initial goal of restoring 100 acres of low-salinity wetland habitat—this goal has already been met through the combined efforts of local, state and Federal programs, and non-profits groups such as Tampa Baywatch. The program has set an overall seagrass restoration goal of 12,000 acres. The San Francisco Estuary Project's top priority is to expand, restore and protect wetlands. Working with state, Federal and local agencies, as well as private organizations, this NEP developed the Baylands Ecosystem Habitat Goals Report—a scientific guide for restoring and improving the baylands and adjacent habitats of the San Francisco estuary.

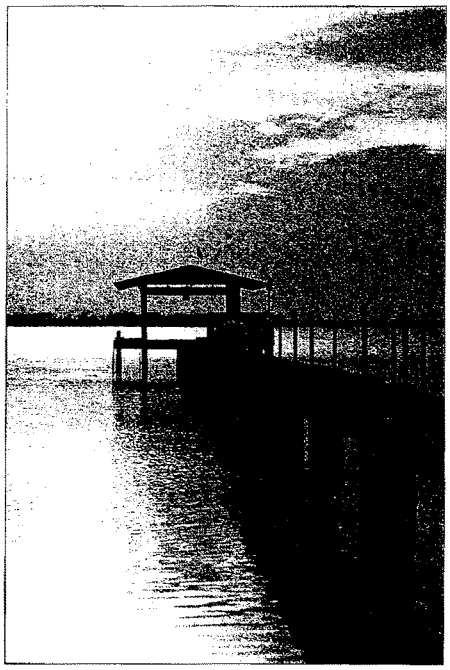
ANEP

ASSOCIATION OF NATIONAL ESTUARY PROGRAMS

The opinions expressed in this publication are those of the Association of National Estuary Programs members and staff. Assistance in compiling this publication was received from the U.S. Environmental Protection Agency and members of the National Estuary Programs. Mention of trade names, corporations or commercial products does not constitute endorsement or recommendation by the sponsoring agencies or the Association of National Estuary Programs.

Estuary - A semi-enclosed body of water, open to the ocean and diluted by fresh water

Watershed - The land area surrounding an estuary which collects and conveys fresh water to the estuary



South Florida sunrise along the Indian River Lagoon

Market Survey Reveals Americans Expect To Find Coasts Under Stress

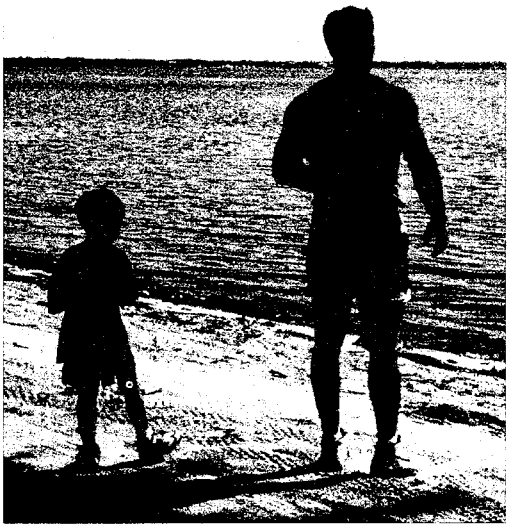
For millions of Americans, summertime means visits to the coast. The average American spends about 10 vacation days at the coast each year, and over half the U.S. population lives there. Yet this popularity can spell trouble.

As part of a nationwide effort to raise Americans' understanding of the stress on the coast, a national market research firm, Market Facts' TELENATION, donated survey services to find out what Americans think about coastal issues.

The random survey found significant concern about overbuilding, erosion, water pollution, overcrowded beaches and marine debris.

For example, 83 percent of respondents say they see overbuilding along the coast as a problem. Comparing conditions to 10 years ago, 56 percent of respondents said they see more trash; 47 percent see more dead fish washed up on beaches; 53 percent say the waters are dirtier, and 64 percent say they see more erosion.

Still, the survey indicates that Americans seem unaware of an individual's impact on the coast.



A father and son stroll along one of Florida's sandy beaches near Sarasota Bay.

Front cover, kayakers paddling in Albemarle-Pamlico Sounds, North Carolina.

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Washington, D.C.

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Cape Canaveral Scientific, Inc.
of Melbourne Beach, Florida, Publication Design

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GIS map information provided by U.S. Environmental Protection Agency,
Office of Water, Washington, D.C.

Photo credits include:
Cover, Joan Giordano, Albemarle–Pamlico Sounds Estuary Program;
Inside front cover by Patrick Lynch, South Florida Water Management District;
Page 2, Heinz Gartigruber of Tampa Bay NEP;
Page 3, Sarasota Bay NEP and Galveston Bay NEP;
Page 4, Charlotte Harbor NEP and Tillamook Bay NEP;
Page 5, Trust for Public Lands, NJ and Joan Giordano, Albemarle–Pamlico Sounds Estuary Program;
Page 6, Galveston Bay NEP and Barataria-Terrebonne NEP;
Page 7, San Francisco Bay NEP and Trust for Public Lands, NJ;
Page 8, New Hampshire Estuaries Project and Barnegat Bay NEP;
Page 9, Tillamook Bay NEP;
Page 10, and San Francisco Bay NEP and Patrick Lynch, South Florida Water Management District;
Page 11, Robert Day at Indian River Lagoon NEP and Tillamook Bay NEP;
Page 12, Florida Marine Research Institute at the Florida DEP and Robert Day, Indian River Lagoon NEP;
Page 13, Patrick Lynch, South Florida Water Management District;
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Page 15, Patrick Lynch, South Florida Water Management District;
Page 16, Tampa Bay NEP and Sarasota Bay NEP;
Page 17, Galveston Bay NEP and Tillamook Bay NEP;
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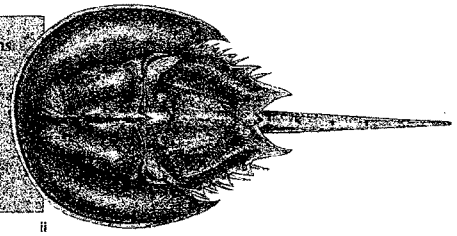

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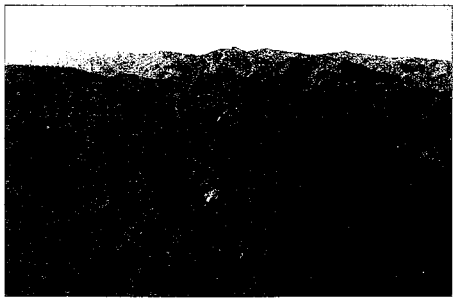

An aerial view of the Tillamook Bay Estuary watershed in Oregon

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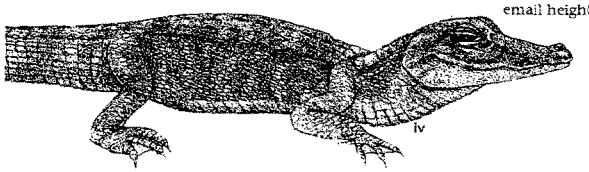

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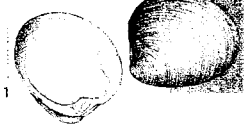


PREFACE

Havens for wildlife. Gateways of commerce. Aquatic supermarkets teeming with fish, crabs and other seafood. Living reflections of America's diverse cultural heritage. Estuaries are all these ... and more.

These special places where fresh water from rivers and streams mixes with salty seawater are among the most biologically productive areas in the world. They are also among the most imperiled. In recent decades, both scientists and citizens have noticed alarming declines in the fish and wildlife that live in or near our estuaries, in the diversity of habitats that provide ecological richness, and in the clarity and quality of the waters that flow into and out of these dynamic systems.

In 1987, Congress established the National Estuary Program (NEP) to restore and preserve these unique bodies of water. The NEP's creation was both an acknowledgment of the vital role estuaries play in our nation's prosperity, and a challenge to environmental managers to look beyond institutional boundaries by addressing the needs of entire ecosystems.

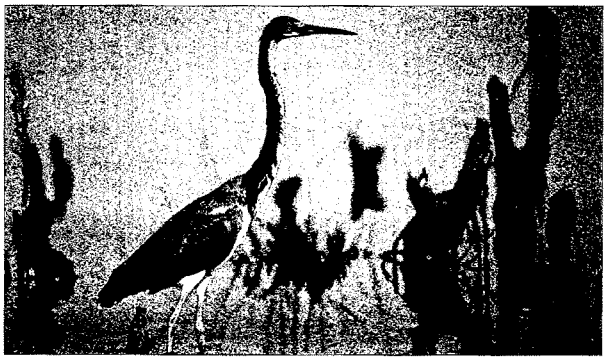
More than 42 percent of the continental U.S. shoreline is now included in the National Estuary Program, and 15 percent of all Americans live within NEP-designated watersheds.

In the 11 years since its establishment, the Program has expanded to embrace 28 estuaries from throughout the United States. More than 42 percent of the continental U.S. shoreline is now included in the National Estuary Program, and 15 percent of all Americans live within NEP-designated watersheds. New residents arrive by the thousands every day, their sheer numbers threatening to overwhelm these delicately balanced systems.

If we want to ensure that our children and grandchildren have the same opportunities that we do now to swim, fish, sail or just enjoy these magnificent waterways, we must act now to develop solutions that make sense for both our estuaries and the people who cherish them.

The Association of National Estuary Programs is committed to promoting responsible stewardship of our bays and estuaries. "Preserving Our Heritage, Securing Our Future" is our first report to you, the citizens of the United States. After reading this, we hope you will share our vision of a bright, healthy future for these most precious places.

A Louisiana or tri-color heron searches for prey in Tampa Bay, Florida.



OUR ESTUARIES: CRADLES OF THE NATION

A group of volunteers walks along a stream bank near a factory, stooping along the way to pick up plastic bags, rusting bicycle parts and other trash that has been carelessly tossed into the creek. A local scientist teaches the volunteers how to take water samples and collect small aquatic insects and fish that live in the creek. These citizens are learning firsthand about pollution's effect on natural systems.

Top photo, Kevin Smalley picks up trash along the shores of Sarasota Bay in Florida. Bottom photo, Galveston Bay-area children in Texas get a lesson in planting wetland plants.

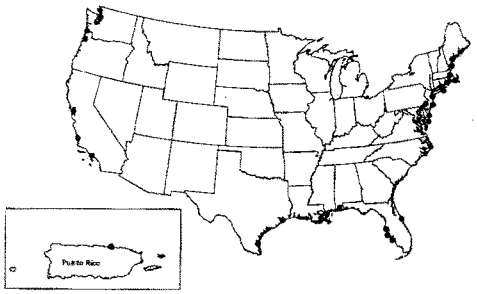
A father wades into a shallow bay, showing his son and daughter how to feel with their toes for clams buried in the muddy bottom, just as he did as a boy. These waters had been closed to shellfish harvesting for nearly a generation, and now the father is thrilled to relive this experience with his own children. Thanks to the united efforts of business owners, citizens and officials from federal, state and local environmental agencies, illegal sewage discharges to the bay have been halted and the clams are once again safe to eat.

Homeowners and local health officials gather in a field near a test well to study how pollution carried in groundwater affects the adjacent bay. The health officials explain how septic tanks work and that poorly maintained septic systems may harm both the community's drinking water and its estuary. The homeowners express their desire for an economical and efficient solution to septic tank pollution.

These are glimpses of the National Estuary Program at work. From the salmon-rich waters of Puget Sound in Washington to the mangrove-fringed coves of Florida's Charlotte Harbor, this far-sighted program is building innovative community partnerships that seek proactive solutions to the serious problems facing one of our nation's most prized possessions: its estuaries.

The National Estuary Program was established by Congress in 1987 to recognize and protect "estuaries of national significance." The Program is adminis-

Estuaries of the National Estuary Program

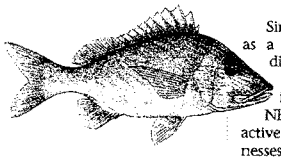


NEP locations, for more detail see inside back cover.

The National Estuary Program was established by Congress in 1987 to recognize and protect "estuaries of national significance."

tered by the U.S. Environmental Protection Agency (EPA), which provides seed money to local communities to develop and implement comprehensive management plans for their estuaries.

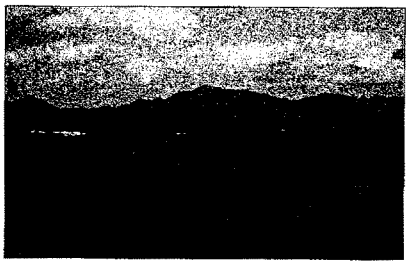
Today, the NEP encompasses 28 selected estuaries, located in every coastal region of the country (see map at above left.) Many of the estuaries participating in the Program are in good health, but need additional protection if they are to remain so. Others are suffering the consequences of rapid growth and development, and require a helping hand to repair damage to habitats, fisheries or water quality. All are cornerstones of their community's economic and environmental well-being – as well as its cultural identity.



Since its inception, the NEP has served as a catalyst for bringing people with diverse interests together to address the threats facing America's estuarine ecosystems. In fact, one of the NEP's greatest strengths has been the active involvement of citizens and businesses who have a substantial investment in the health and sustainability of local waterways. This report highlights our accomplishments as we look back on a decade of success – and ahead to the challenges that remain.

The Sanibel-Captiva Conservation Foundation and the Charlotte Harbor National Estuary Program's Citizen's Advisory Committee tour the Venus Lake restoration project on Sanibel Island, Florida.

Tillamook Bay watershed in Oregon

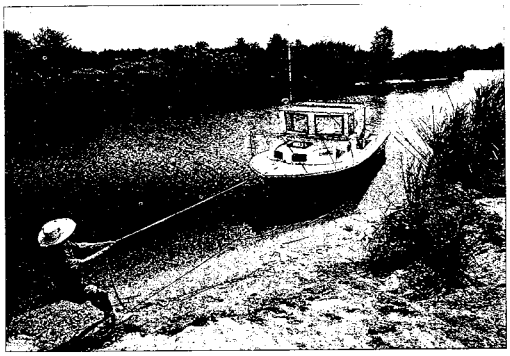


What is an estuary?

Estuaries are places where fresh and salt water mix. Whether they are called bays, estuaries, harbors, sounds or lagoons, these fertile junctions of sea and stream are among the most productive areas on earth. As many as 80 percent of the fish that we catch for food or fun depend on estuaries for all or part of their lives. This is why estuaries are often called the "cradles of the sea."

Many of the nation's most celebrated water bodies are estuaries: Chesapeake Bay, San Francisco Bay, Puget Sound and Long Island Sound, for example. Although each estuary is unique, they all share common characteristics such as constant mixing of salt and fresh water by tides and winds, as well as common problems such as excessive nutrient pollution and loss of natural habitats.

There is more to an estuary than you might think just by looking at a shaded area on a map. n fact, estuaries encompass broad ecosystems that usually extend many miles beyond the open waters of a bay or lagoon to encompass surrounding wetlands, rivers and streams. Anything that happens on land within this sprawling watershed has a direct impact on the estuary itself.



A boater hauls his boat onshore along Herring Point in New York-New Jersey Harbor, NJ.

As many as 80 percent of the fish we catch for food or fun depend on estuaries for all or part of their lives.

What's an estuary worth?

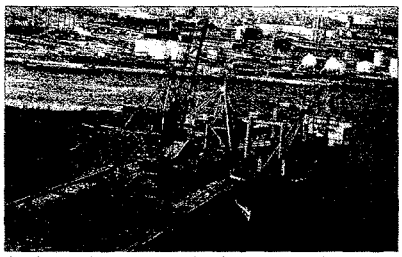
It's impossible to put a dollar figure on all the benefits an estuary provides. However, some of the economic impacts derived from estuaries have been well documented.

For example, estimates developed by the National Estuary Program indicate that commercial and recreational fishing contribute about $4.3 billion to the nation's economy each year, while the marine industries supported by these activities add another $3 billion annually.

Tourism and recreation associated with estuaries participating in the NEP generate an estimated annual economic impact of $16.3 billion. For many communities, estuaries are the focal point of tourist-related

Commercial and recreational fishing contribute $4.3 billion to the nation's economy each year. Tourism and recreation generate an estimated annual economic impact of $16.3 billion.

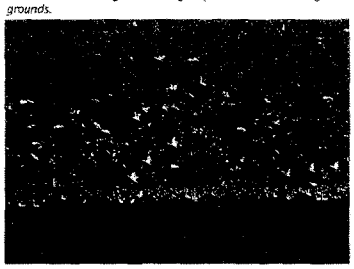
North Carolina fisherman with companion in Albemarle-Pamlico Sounds



Port of Houston, Texas, a major port in the Galveston Bay watershed area

A recreational angler raises a red drum in Galveston Bay, Texas.

Waterfowl use the Barataria-Terrebonne estuarine system in Louisiana as a resting and feeding stop in route to wintering grounds.



activities. In the Albemarle-Pamlico Sounds of North Carolina, for example, 10 percent of the local workforce is employed in tourism-related businesses. Tourists visiting Southwest Florida's scenic Charlotte Harbor spend more than $1 billion every year.

Ports established in estuaries contribute billions of dollars to local economies and employ hundreds of thousands of people. More than $40 billion worth of goods passed through ports in Puget Sound last year, while the Port of Tampa in Tampa Bay directly or indirectly provides jobs for 5,000 people and consistently ranks among the top 10 in the nation in trade activity.

Other benefits bestowed by estuaries are less tangible, but are equally important. Estuaries are critical habitats for a magnificent array of fish, birds and other creatures; they provide unparalleled recreational opportunities for people; and the wetlands that border estuaries serve as natural filters for pollutants and buffers against punishing storms. Consider these facts:

- More than 45 percent of the nation's surface waters are contained in estuarine systems, making these areas an important source of drinking water for many Americans. In fact, two-thirds of the residents of California obtain their drinking water from freshwater rivers, streams and marshes associated with the San Francisco Bay-Delta Estuary;

- The Lower Columbia River Estuary is the most valuable spawning and nursery area for salmon in the continental United States;

- The Buzzards Bay Estuary in Massachusetts provides critical nesting habitat for 98 percent of North America's endangered roseate terns;

- Mangrove islands in Tampa Bay in Florida are among the nation's most important waterbird nurseries, annually hosting as many as 40,000 nesting pairs of 25 different species.

- Fish, oysters, crabs and crawfish are so abundant in the Barataria-Terrebonne estuarine complex in Louisiana that it is known as the "nation's fish market."

In summary, our nation's estuaries, like anything else that cannot be replaced, are priceless.

Gateways to a new nation

The Golden Gate Bridge and San Francisco Bay, California

Estuaries have played a central, if often unheralded, role in the history of the United States. The first colonists in the New World settled along the fertile shores of estuaries, joining Native Americans who long before had set down roots on these waterways.

From our earliest beginnings, Americans have always flocked to the coast, dredging the fertile wetlands for farmlands, clearing vast forests of cypress, oak, redwood and pine for timber products, harvesting oysters, clams, shrimp and fish, and hunting beaver, otter and other animals that sustained a thriving fur trade. Only in recent decades have we come to realize that the bounty provided by our estuaries is not endless.

The Statue of Liberty greeted immigrants as they sailed through one of the nation's gateways, the New York-New Jersey Harbor, New Jersey.

But our fascination with the coast has not waned, and the waterward migration continues. Today, most Americans live within 50 miles of the coast, and thousands of newcomers arrive every day. Ironically, these beautiful places are imperiled by their own popularity, since more people and development often mean more pollution, habitat destruction and pressure on fish and wildlife populations.

Today, most Americans live within 50 miles of the coast, and thousands of newcomers arrive every day.

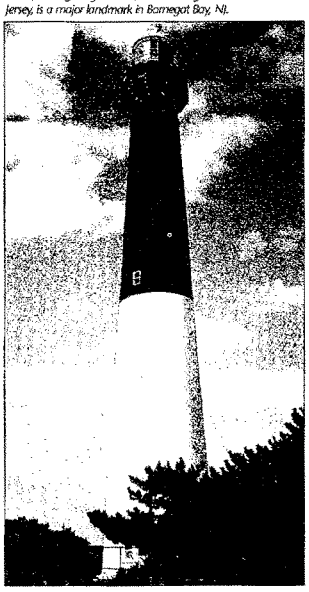
Many coastal communities now recognize the necessity for "smart growth," a concept promoted and supported by the National Estuary Program. This new approach acknowledges that a strong economy and a healthy environment go hand in hand. The NEP also recognizes that environmental protection is most successful when those directly affected by the health of an ecosystem – local citizens, local officials and other stakeholders – have a strong voice in decisions about their estuary's future.

The NEP approach: promoting partnerships for progress

Because estuaries are by definition dynamic, evolving

Above, researchers conduct environmental monitoring in the productive marshes of the New Hampshire Estuaries.

Below, Barnegat Lighthouse, the tallest lighthouse in New Jersey, is a major landmark in Barnegat Bay, NJ.



systems, the National Estuary Program advocates a holistic view that assesses the cumulative impacts of human actions on entire watersheds. This approach, called "ecosystem management," reduces duplication of work, encourages cooperation among various stakeholders and regulators, and promotes practical solutions that provide the maximum environmental benefit in the most cost-effective manner.

In general, each National Estuary Program involves the following steps:

- Characterization, or identification of the major threats facing an estuary. This is accomplished by reviewing existing technical information, sponsoring new research into suspected or poorly understood problems, and enlisting citizens, business groups and other stakeholders in creating a common vision for their estuary's future.

- Development of a Comprehensive Conservation and Management Plan that sets specific goals for protecting or improving the estuary and that fairly allocate responsibility for achieving those goals to NEP partners, including regulatory agencies, local governments and citizen or special interest groups.

- Implementation of the Management Plan by the various NEP partners. Flexibility is emphasized during the implementation process, allowing local governments to choose the most cost-effective and environmentally beneficial solutions for their communities – as long as overall goals are met.

- Monitoring to determine progress made toward the achievements of the Plan's goals. A monitoring review is typically completed every two years following the Plan's adoption. This assessment provides a useful report card for estuary managers and citizens, and allows the NEP partners to focus their attention on areas where the problems are the greatest.

Although each estuary has a unique local character and heritage, the NEP has served to highlight problems common to all – namely water quality degradation, fish and wildlife habitat loss and alteration of freshwater flows. The knowledge that these threats are shared nationwide has helped to increase awareness of estuaries as significant national resources and galvanized support for preserving and restoring these "cradles of the sea."

Although estuaries are resilient systems well equipped to deal with floods, droughts, storms and other natural events, the consequences of human activity can be far more devastating – and often irreversible.

Pollution comes from many sources and takes many forms. Rain, snow, evaporation and the steady flow of rivers, streams and groundwater toward the ocean provide pathways for manmade pollutants to reach estuaries. Rain and melting snow pick up oil, chemicals and fertilizer residues from farms, roads and residential neighborhoods and carry them to the estuary. Toxic chemicals seep into groundwater supplies, which also flow toward estuaries. Nitrogen and sulfur emissions from power plants and industrial smokestacks mingle with moisture in the atmosphere and fall on land, where they too are funneled in runoff to estuarine waters.

Pollutants such as wastewater, toxic chemicals and untreated boat waste also can be directly discharged to an estuary, creating or worsening water quality problems. Clearing, ditching and draining of the wetlands bordering estuaries to allow development can accelerate the flow of freshwater and associated pollutants to these sturdy, but vulnerable ecosystems.

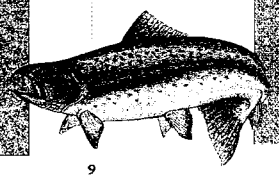
In February 1997, the Association of National Estuary Programs sponsored a national workshop on issues facing estuaries. Participants included representatives of business and industry, private organizations, individual citizens, federal and state agencies and local governments. The following is a summary of the most pressing problems identified during the workshop, with specific examples of how issues affect the 28 National Estuary Programs.

The issues can be placed into three general categories: water quality degradation, fish and wildlife habitat loss, and alterations of natural water flows.

Water quality degradation

Many different human activities affect water quality. Excess nutrients in water can come from lawn fertilizers used in residential areas; urban stormwater that contains human and animal waste; agricultural runoff; uncapped wells; airborne particles from the exhaust of power plants, industrial facilities, and

Agriculture along the Miami River in Tillamook Bay, Oregon



Farmland water project in San Francisco Bay watershed

automobiles; and poorly operating septic tank systems or municipal wastewater systems.

Bacterial contamination that can cause public health problems may be caused by animal feedlots, leaky wastewater and stormwater systems, boaters who do not properly dispose of on-board waste, and malfunctioning septic tank systems. Pollutants like heavy metals and other toxic contaminants have many sources such as automobiles, industrial facilities, oil spills, and the mishandling of hazardous materials during production or transport.

All of these pollutants – excess nutrients, bacteria, heavy metals, and toxics – can degrade water quality and make the water unsafe for human contact or drinking. Poor water quality also affects the birds, fish, and other animals that live in and near the water. Water quality problems can make oysters and scallops unsafe to eat, cause massive fish kills, or create deformities and lesions in birds, fish, and other creatures.

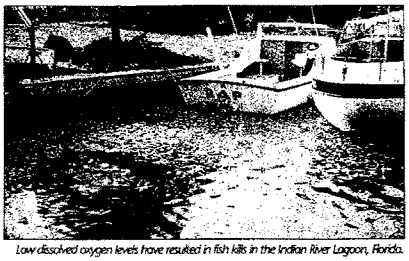
Seagrass meadow in the Indian River Lagoon, Florida. Surface water runoff is promoting the loss of this important habitat.

Maintaining a minimum level of water quality is therefore an important issue for both people and wildlife. When water quality is degraded, drinking water supplies, commercial fisheries, human health, and fish and wildlife can be damaged.

Examples of water quality degradation

- The Petaluma River, a tributary to San Francisco Bay, has experienced seasonal algal blooms, low oxygen levels and fish kills resulting from municipal waste discharges.
- Low dissolved oxygen levels are problematic in Corpus Christi and Galveston bays in Texas and in Mobile Bay, Alabama. Low oxygen levels are especially prevalent where wastewater discharges and surface runoff occur to areas that are poorly flushed or have little circulation.
- In 1990, nitrogen loads to Sarasota Bay, Florida were estimated to be three times greater than pre-development levels.
- Pollution from surface runoff has been implicated in nearly thirty percent reduction in seagrass coverage that

occurred in the Indian River Lagoon, Florida between 1970 and 1990. If no action is taken it is estimated that pollution from surface runoff will increase by more than thirty percent by the year 2010 due to increasing human population.



Low dissolved oxygen levels have resulted in fish kills in the Indian River Lagoon, Florida.

- Runoff from the land contributes more than fifty percent of nitrogen loadings to Marylands' Coastal Bays. Fifty percent of these loadings come from agricultural feeding operations (primarily poultry) which make up less than one percent of the watershed.
- A citizen-based water quality sampling effort in Buzzards Bay, Massachusetts reports that nine of the Bays' 30 embayments experience poor water quality (primarily from over enrichment of nutrients) during the summer months. Another eight embayments are in transition from good to poor water quality. At least fifty percent of all the embayments have shown a slight to moderate decline in water quality during four years of monitoring.
- From mid-July through September each year, up to half of Long Island Sound in New York experiences dissolved oxygen levels insufficient to support healthy populations of marine life. Nitrogen loads are more than twice those estimated during pre-colonial times with 57 percent of nitrogen entering the Sound each year attributable to human activities.

Fish & wildlife habitat loss

Coho salmon smolt in Tillamook Bay, Oregon

Every animal requires places to feed, raise young and hide from predators. Most species require different habitats at different stages of their lives and the ability to move freely from one habitat to another as their needs dictate. For fish, manatee, wading birds, and other water-dependent animals, runoff from farms and cities can alter aquatic habitats and eliminate food sources. Conversion of wetlands, swamps, and other coastal areas to dryer lands for agriculture, residential communities, and roads is a chief cause of habitat loss.

For terrestrial animals, the destruction or conversion of their usual places to hide, feed,

Manatee in Tampa Bay, Florida

nest, and sleep decreases the number of animals that survive and reproduce. Pressures from harvesting of animals, such as overfishing, can remove so many fish from an area that not enough mature adult fish remain to spawn a new generation to replace the ones that were lost.

Also, the accidental or intentional introduction of plant and animal species from other locations can upset the delicate natural balance of reproduction and population control. Introduced plant species typically do not provide the same food sources and shelter for local wildlife that they receive from native plants. Exotic interlopers often out-compete native species and drive native species out of the area. If no local predators exist to control the spread of exotic species of plants and animals, they can spread into vast areas and become difficult to control or to remove.

Examples of fish and wildlife habitat loss

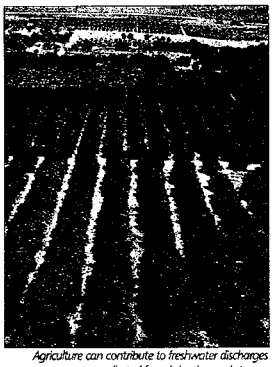
Twenty-three of the 28 National Estuary Programs have identified habitat loss and damage as a high priority management issue. Listed below are some specific examples of habitat loss and the pressures that are facing fish and wildlife populations:

Development along the shores of the Indian River Lagoon, Florida

- In the Indian River Lagoon, Florida, the amount of land devoted to urban uses increased by 895 percent between 1940 and 1987. The amount of land dedicated to agricultural uses increased by 352 percent during the same time period.
- The amount of finfish harvested from Peconic Estuary, New York, has dropped from 2.9 million pounds in 1980 to less than 340,000 pounds in 1989 – an 88 percent decrease.
- In Charlotte Harbor, Florida, important pine flatwood habitats

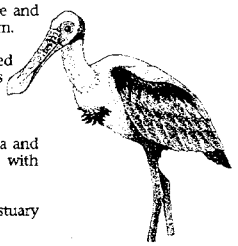
have been reduced to less than half their former range. These upland areas that are dominated by pine trees, wax myrtle, and saw palmetto plants are critical habitat for animals such as deer, pileated woodpeckers, gopher tortoises, and sandhill cranes.

- In the Maryland Coastal Bays region, oyster beds have shrunk from more than 2,000 acres to approximately 200 acres, while fish populations are shifting to less desirable species tolerant of polluted waters, especially in the northern bays.
- Santa Monica Bay, California, provides habitat for at least 5,000 plants and animals. However, residential development, pollution and over-harvesting are whittling away the numbers and diversity of plants and animal species in the area.
- Coastal areas around Massachusetts Bay, including wetlands, are steadily damaged or depleted by development. Eelgrass meadows in some Cape Cod embayments are being replaced by undesirable macroalgal communities. Declines in populations of fish that spawn in freshwater are attributed to the construction of dams and other structures that restrict access to upstream nursery areas.



Agriculture can contribute to freshwater discharges collected from irrigation and storms.

- Between 1780 and 1980, nearly half of all North Carolina's wetland areas were destroyed. These losses are placing a severe strain on the many rare and endangered plants and animals of the Albemarle-Pamlico Sounds system.
- Between one and three million bushels of oysters were harvested yearly in the Delaware Estuary at the turn of the century. Viruses and diseases associated with pollution decimated oyster stocks in the 1950's, and today the oyster harvest is almost zero.
- Since 1950, about half of the natural shoreline of Tampa Bay, Florida and nearly 40 percent of its seagrass beds have been destroyed, along with significant portions of upland habitat.
- About 90 percent of the historic wetland acreage in San Francisco Estuary area has been converted to farmland, urban areas, or other uses.



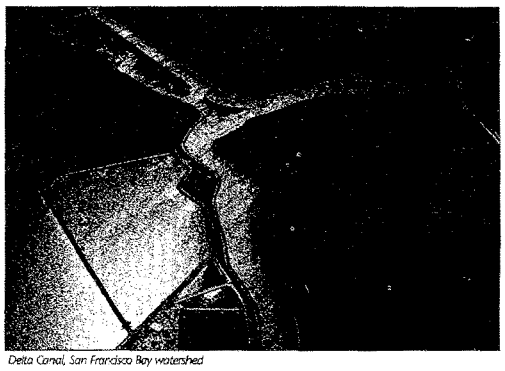
Agriculture often uses and discharges significant amounts of fresh water to estuaries.

Alterations in freshwater flows

The dynamic and productive habitats associated with estuaries have evolved due to the naturally occurring and highly variable changes in freshwater flows from the land to coastal waters. These systems have evolved gradually and over extended periods of time. When humans undertake activities which rapidly and permanently change the amount and timing of freshwater flowing to estuaries, it can have devastating effects.

Some ways in which humans alter freshwater flows include:

- Constructing dams, reservoirs and flood control structures that divert surface and groundwaters thereby preventing water from



Delta Canal, San Francisco Bay watershed

reaching the estuary in historical quantities, and

- Ditching, draining, paving and clearing wetlands, forests and other natural areas for urban and agricultural development that increases the amount of freshwater reaching estuaries beyond the amounts they can tolerate.

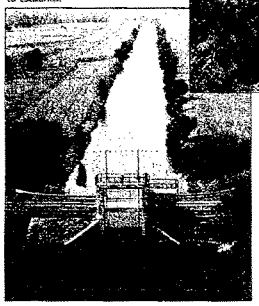
Examples of alteration of natural flow regimes

Eleven of the National Estuary Programs have identified human-caused changes in the timing and amount of freshwater flowing to the system – resulting in either too much or too little freshwater – as a highly significant issue.

- Forty percent of the total miles of streams in North Carolina's coastal counties have been modified to some extent.

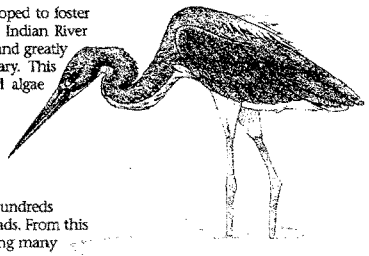
To right, a naturally meandering river

Below, canals like this one carry excessive freshwater and agricultural runoff to estuaries.



- In recent years, more than half the San Francisco Estuary's natural river flows have been diverted for agricultural, municipal and industrial uses. Millions of fish eggs, larvae, and young are sucked into the powerful intake pumps of the water supply project.
- During the 20th century, 23 reservoirs have been constructed within the Delaware River Basin.
- Damming of four major rivers for flood control and water supply development, along with hydrologic modifications in the watersheds of numerous tidal creeks, has significantly reduced the amount of productive, low-salinity habitat in the Tampa Bay ecosystem in Florida.
- Both of the creeks entering Morro Bay, California, are heavily siphoned for municipal and agricultural uses, sparking contentious water rights battles between competing interest groups that have long divided the region.
- Diversions of surface water have caused massive kills of steelhead trout in Oregon and California.

- Since the turn of the century, drainage works developed to foster agriculture and urban development within Florida's Indian River Lagoon have doubled the size of the drainage basin and greatly increased the amount of pollutants entering the estuary. This has increased the number and extent of harmful algae blooms and fish kills.



A Case for Ecosystem Management

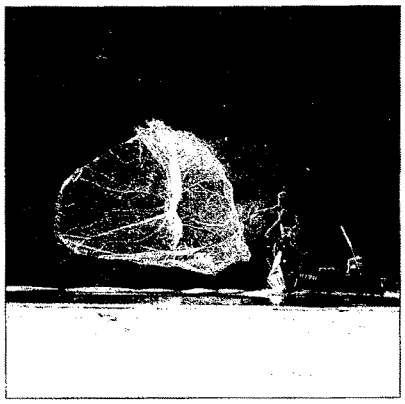
Think of an estuary as a heart served by dozens or even hundreds of arteries and veins in the form of rivers, creeks and wetlands. From this perspective, it is easy to understand how activities occurring many miles away can affect an estuary's health.

Traditional environmental management approaches often viewed an estuary as a series of separate compartments, and parceled responsibility for those compartments to many different organizations. While this philosophy recognized the importance of individual components, it did not address the needs of the overall system – and all too often resulted in inefficient gaps and overlaps in management.

In contrast, the National Estuary Program approach of ecosystem management is akin to looking at the world through a wide-angle rather than a macro lens. It recognizes the critical connection between an estuary and its vast watershed, and assesses the cumulative impacts of human actions on entire natural systems. A key component of ecosystem management is the use of living resources as a meaningful measure of an estuary's health. Instead of measuring progress by rigid laboratory standards alone, success is centered on restoring or improving natural communities and the marine life they support. This broad focus allows estuary managers the flexibility they need to achieve realistic, cost-effective solutions with tangible results.

The National Estuary Program has been a national leader in implementing ecosystem-based management plans that account for the needs of an estuary's individual "threads," while preserving the integrity and diversity of the overall tapestry that defines it.

A commercial fisherman tosses his cast net.



U.S. EPA Administrator Carol Browner lends a hand to Lakewood High School students planting marsh grass in Tampa Bay, Florida.

Taking action for our future

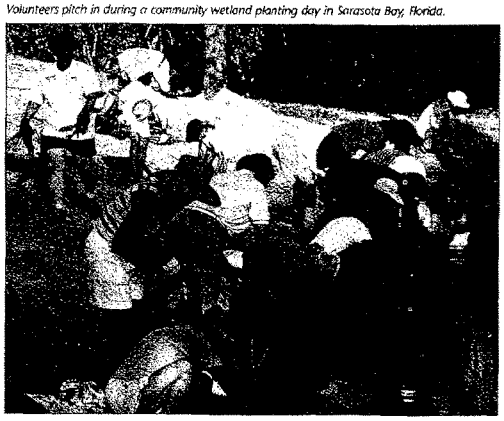
Congress created the National Estuary Program to collect and analyze data needed to assess trends in water quality, and then develop and implement Comprehensive Conservation Management Plans that recommend corrective remedies for identified problems in individual estuaries. The Management Plans that each NEP produces are designed to produce meaningful, measurable results. Community support and involvement are critical components of this process.

The overall goals of the NEP are to protect and improve water quality and enhance the living resources of an estuary. To achieve these goals, the NEP:

Establishes working partnerships among all levels of government and the private sector;

- The Massachusetts Bay Program's interagency approach to shellfish bed restoration seeks to restore and protect 13 oyster, clam, scallop and mussel beds along Massachusetts and Cape Cod bays. The restoration program combines the regulatory and enforcement efforts of the Massachusetts Division of Marine Fisheries and local health boards with the pollution identification, cleanup and public outreach skills of various federal and state agencies and community groups. This coalition also works with area businesses to promote the use of innovative pollution reduction and prevention strategies. What was a widely scattered, inefficient "hit-or-miss" effort is now a systematic, goal-oriented resource management program.

Volunteers pitch in during a community wetland planting day in Sarasota Bay, Florida.



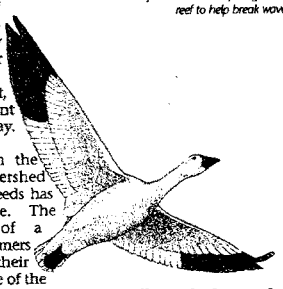
- Groundbreaking research sponsored by the Tampa Bay NEP has identified air pollution as a major source of the bay's nitrogen burden and focused national attention on the strong connection between air and water quality. Many other communities are applying this pioneering work to their estuaries, while Tampa Bay is moving to address the problem through an interlocal agreement that commits local

governments and private industries to reducing their nitrogen contributions to the bay, with support from federal and state regulatory agencies.

Volunteers from the Natural Resources Conservation Service, Americorps and the Galveston Bay National Estuary Program in Texas erect fencing to create an oyster reef to help break wave action on newly planted shore grasses.

Promotes the transfer of scientific information and expertise to Program partners, including agricultural interests, businesses, industries and homeowners.

- The Narragansett Bay Estuary Program, Rhode Island, has enlisted scientific expertise from Brown University, NASA, the U.S. Department of Energy and the private sector to assess the health of the bay. The team is using state-of-the-art satellite and aerial imagery to quantify the overall water quality impacts of the largest fossil fuel power plant in the Northeast, located at Brayton Point on Mount Hope Bay, a part of Narragansett Bay.



- A project that helps farmers in the Delaware Inland Bays watershed determine their crop's nitrogen needs has received increasing acceptance. The project promotes the use of a chlorophyll meter that shows farmers how much nitrogen fertilizer their crops require at any given time. Use of the meter reduces the potential for harmful nitrogen runoff into the bays and saves farmers money. At its debut, Sussex Conservation District personnel demonstrated the device to area growers. All responded positively and several participants plan to purchase meters of their own.

Citizens and scientists conduct water quality testing in Tillamook Bay, Oregon

Enlists public participation in programs to increase community awareness of pollution problems and remedies;

- Paterson Creek Pals, a volunteer stewardship group in Tillamook Bay, Oregon, has monitored water quality and conducted restoration projects in Paterson Creek since the summer of 1995. With a small grant from the Tillamook Bay NEP, the Pals already have planted more than 2,000 trees to create shady havens for fish; collected monthly baseline water quality data; monitored insect and fish populations; sponsored annual

State and local officials in the Albemarle-Pamlico Sounds Estuary Program address the public about estuary issues in North Carolina.

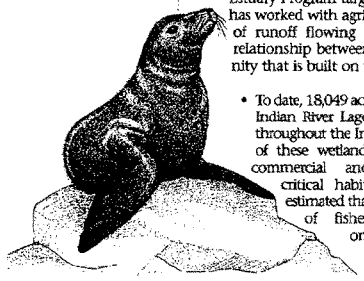
community creek cleanups; and provided educational brochures and library poster updates to the community.

- The Albemarle-Pamlico Estuarine Study Program, North Carolina, promotes nature-based tourism and education to facilitate environmentally sound economic development. The Program helped initiate the non-profit Partnership for the Sounds in 1993. The Partnership, overseen by a Board of Directors comprised of local governments, community groups and business interests, promotes eco-cultural tourism, environmental stewardship and education as key components of sustainable growth in the Albemarle-Pamlico area.

Encourages basin-wide or ecosystem planning to control pollution and manage living resources.

- The Wetlands Ecosystem Goals Project is a collaborative effort spearheaded by the San Francisco Estuary Program, California, to identify the types, locations and specific acreages of wetlands needed to sustain healthy fish and wildlife communities in the San Francisco Bay watershed. The Project, which involves representatives of various public agencies and public interest groups concerned with wetland protection have developed goals and recommendations for effective planning and design of restoration projects.

- Because so much of the Corpus Christi Bay, Texas, watershed is used for agricultural purposes, partners working with the Corpus Christi Bay National Estuary Program targeted agricultural runoff as a priority issue. The Program has worked with agricultural interests to investigate the quality and quantity of runoff flowing into the watershed. This effort is creating a strong relationship between resource agencies and the entire agricultural community that is built on trust and cooperation.



- To date, 18,049 acres of impounded salt marshes have been reconnected to the Indian River Lagoon, Florida. The total acreage targeted for reconnection throughout the Indian River Lagoon basin is 27,000 acres. The reconnection of these wetland areas has resulted in increased habitat for important commercial and recreational fish species and has improved critical habitat for migratory and wading birds. It has been estimated that each acre of reconnected impoundment results in $10,000 of fishery production and that each dollar expended on marsh reconnections provides $25 in economic benefit to the Lagoon region.

Develops and implements pollution reduction and prevention programs.

- The amount of nitrogen entering Sarasota Bay, Florida, as a result of human activities has been reduced by an estimated 28-38 percent since 1988. Through implementation of policies set forth by the Sarasota Bay National Estuary Program, the amount of life-sustaining seagrasses has increased 7 percent in that same time, and Sarasota Bay now supports an estimated 38 million more fish, 114 million more crabs and 58 million more shrimp than it did a decade ago. Large-scale wetland restoration projects that are planned, under way or completed will repair more than 400 acres of saltwater wetlands and create a network of artificial reefs in the Sarasota Bay.

- Clark's Cove is located on the western shore of Massachusetts' Buzzards Bay, between the towns of Dartmouth and New Bedford. Raw sewage discharged to the cove from antiquated sewer systems had forced the closure, nearly a century ago, of all of New Bedford's shellfish harvesting beds to protect public health. Work supported by the Buzzards Bay NEP provided for enhanced water quality sampling and analysis that more precisely defined the nature of the contamination and led to development of a shellfish harvest management strategy. Resulting improvements to dry-weather bacteria counts prompted the Massachusetts Division of Marine Fisheries to reopen Clark's Cove to conditional shellfish harvesting after 91 years of closure.

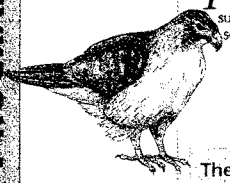
The National Estuary Program is unique in its emphasis on solving problems at the watershed level and its focus on local decision-making. Each Program is governed by a management conference composed of stakeholders with a vested interest in the future health of their estuary.

The NEP process identifies the most critical problems within the estuarine system and the responsibility that federal, state and local entities have for addressing those problems. This approach allows local communities to target their efforts more effectively and efficiently within the constraints of dwindling government funds and competing community needs. Only when the Program has produced a Management Plan that is fully supported by the local citizenry is that Plan submitted to the state's Governor and the EPA for approval.

The NEP is not a "command and control" program in which the federal government imposes costly and complex regulations that local communities can ill afford and which often do not achieve their desired result. It is a consensus-building process that takes into account the needs, wishes and limitations of local citizens whose livelihoods and lifestyles depend upon healthy, sustainable natural resources.

A great blue heron searches for food in Albemarle-Pamlico Sounds, NC.

The National Estuary Programs



The following pages contain summaries of the status and corrective actions happening within each of the national estuary programs. Turn to your program summary to learn what's happening and who to contact to get involved with securing its future.

Albemarle-Pamlico Sounds National Estuary Program

Fast Facts

Second largest estuarine system in nation, including five major river basins draining more than 30,000 square miles of land in NC and VA.

Includes 7 sounds, characterized by wind-driven tides and relatively shallow water.

Total population is rapidly approaching 2 million people.

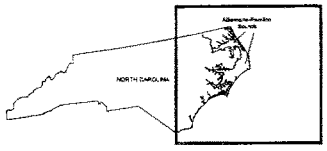
Pamlico Sound is the cornerstone of NC's famous inshore fishery, generating millions of dollars annually.

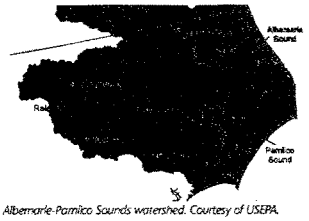
17 kinds of waterfowl winter in Albemarle Sound.

ANEP
Association of National Estuary Programs

Status Update & Next Steps

One of the first National Estuary Programs to complete its management plan. Four primary components: water quality, vital habitats, fisheries, and stewardship.

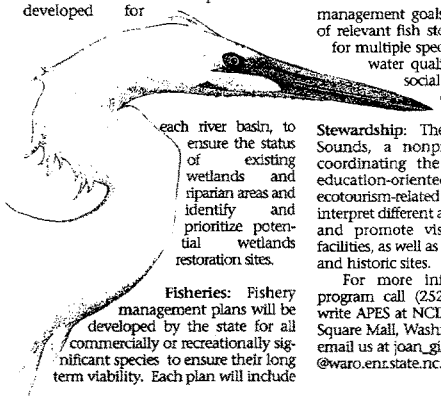




Albemarle-Pamlico Sounds watershed. Courtesy of USEPA.

Water Quality: Through basin-wide management, the state will identify water quality problems, develop appropriate management strategies, maintain water quality standards and aquatic habitat, ensure equitable distribution of waste assimilative capacity for dischargers, and improve public awareness and involvement in management of surface waters.

Vital Habitats: Comprehensive basin-wide wetlands restoration plans will be developed for each river basin, to ensure the status of existing wetlands and riparian areas and identify and prioritize potential wetlands restoration sites.



Fisheries: Fishery management plans will be developed by the state for all commercially or recreationally significant species to ensure their long term viability. Each plan will include management goals and objectives, status of relevant fish stocks, stock assessments for multiple species, fishery habitat and water quality considerations, and social and economic impacts of the fishery.

Stewardship: The Partnerships for the Sounds, a nonprofit organization, is coordinating the development of six education-oriented sites and other ecotourism-related projects. Each site will interpret different aspects of the ecosystem and promote visitation to the other facilities, as well as associated natural areas and historic sites.

For more information about the program call (252) 946-6481, ext. 269, write APES at NCDENR, 943 Washington Square Mall, Washington NC 27889 or email us at joan_giordano @waro.enr.state.nc.us.

Barataria Terrebonne National Estuary Program

Fast Facts

4.2 million-acre system between the Mississippi and Atchafalaya Rivers in Louisiana.

No where else in the world is disappearing as quickly.

A half-acre of coastal wetland turns to open water every 15 minutes.

Supports a commercial harvest of over 600 million pounds of fish and shellfish each year.

Sustains the oldest French-speaking culture in the nation.

ANEP
Association of National Estuary Programs

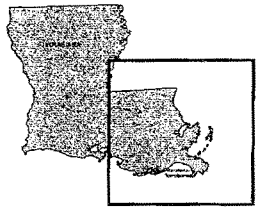
Status Update & Next Steps

Barataria-Terrebonne is facing a serious crisis with a land loss rate of 21 square miles every year. The area's natural plumbing has been altered in many ways:

- by river levees along the Mississippi and Atchafalaya Rivers;
- by extensive dredging of straight canals, many of which are deeper than natural water bodies;
- by breaching of natural ridges;
- by laying of pipelines; and
- by impoundments created by levees, dikes, roadbeds, and embankments,

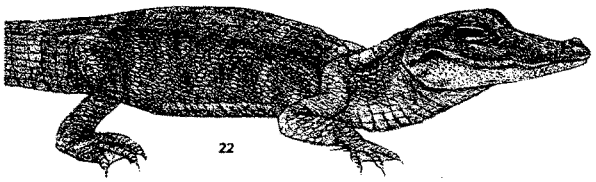
making hydrologic modification the "linchpin" issue. This priority problem directly impacts other identified problems of sediment and habitat loss, and water quality issues of nutrient-enrichment, pathogen contamination and toxic substances.

Barataria-Terrebonne Program's nationally-recognized, award-winning management plan addresses methods to re-establish the natural flow of water and improve water quality. In addition, the Program has partnered with the Gulf of Mexico Program to demonstrate shellfish restoration strategies.



Barataria-Terrebonne watershed. Courtesy of USEPA.

For more information about the Barataria-Terrebonne Estuaries Program call 800-259-0869/(504) 447-0868, write P.O. Box 2663, Thibodaux LA 70310, or email us at btep-smk @nich-nsunet.nich.edu.



Barnegat Bay Estuary Program

Fast Facts

Consists of Barnegat Bay and Little Egg Harbor in southern NJ.

660 square mile watershed located largely in Ocean County.

Total year round population in county is 466,500 but can double in summer. Fastest growing county in state.

Tourism brings in an estimated $1.65 billion annually.

Supports a $2.7 million commercial fishery and playground for tens of thousands of recreational boaters and anglers.

ANEP
Association of National Estuary Programs

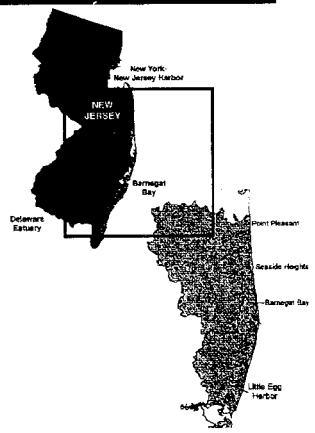
Status Update & Next Steps

The primary environmental concern is nonpoint source pollution, particularly pathogens, nutrients, and sediments. The potential impact of these pollutants is significant as the residence time for water moving through the bay is 50 days.

Activities include a Nonpoint Source Pollution Partnership to coordinate demonstration projects, the NJ Clean Vessel Program which has identified the Bay as a priority area for the installation of marine sewage pumpouts, and progress on a No Discharge Zone application for portions of the estuary.

Habitat loss and alteration is also an environmental concern because of land development. There is a growing network of organizations and agencies working on open space and habitat acquisition in the watershed.

More than 32,000 acres have been set aside in the last 10 years, putting a total of 117,000 acres in parks, forests, and refuges–nearly 1/3 of the county. A recent citizen initiative increased property taxes to add about $3.8 million a year to the public land trust fund.



Barnegat Bay watershed. Courtesy of USEPA.

For more information about the Barnegat Bay Estuary Program write to the program at New Jersey Department of Environmental Protection, P.O. Box 418, Trenton, NJ 08625 or call us at (609) 633-1205 or email us at tfowler@dep.state.nj.us.

Buzzards Bay Program

Fast Facts

Bordered by southeast Massachusetts, Elizabeth Islands and Cape Cod.

Watershed includes 236,000 people, 40% in the city of New Bedford.

Produces nearly 40% of world's cranberry harvest.

Combined quahog, bay scallop, soft shell clam, and oyster harvest valued at $6 million (1994).

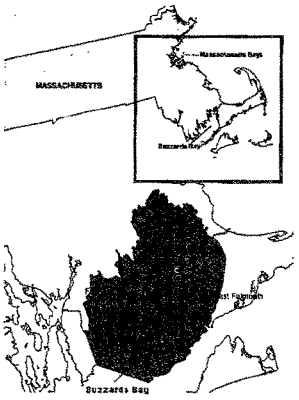
Nearly 20,000 marine vessels pass through Cape Cod Canal annually, with some 10,000 vessels anchoring in the Bay throughout summer.

Status Update & Next Steps

Buzzards Bay has avoided many of the Baywide water quality problems that plague other more urbanized watersheds on the eastern seaboard.

Nevertheless, current land use practices and a growing population have degraded natural resources, particularly the 32 small embayments and harbors. The limited flushing capacity of these areas further intensifies the decline of valuable resources such as eelgrass, a valuable shellfish habitat.

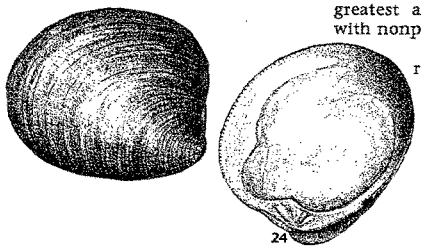
The major threats are excessive nutrient loadings from polluted stormwater runoff and groundwater and bacterial contamination from improper sewage disposal and stormwater runoff. One result of these problems is the closure of shellfish beds, which has a significant negative impact on the local economy.



Buzzards Bay watershed. Courtesy of USEPA.

The vast majority of actions in the plan are directed at local governments, a reflection of the fact that this level of government in Massachusetts has the greatest authority for dealing with nonpoint source impacts.

For more information regarding the Buzzards Bay Project, call (508) 291-3625, write 2870 Cranberry Hwy., East Wareham, MA 02538 or visit or email us at tracy.warncke @state.ma.us.



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Casco Bay Estuary Project

Fast Facts

Watershed is 985 square miles and includes 41 municipalities.

Only 3% of Maine's land mass, but 25% of state's population.

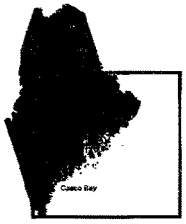
Tourism-related expenditures exceed $250 million per year.

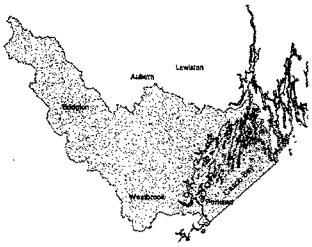
Soft shell clams provide estimated income of $4.66 million to about 270 commercial diggers (1994).

Status Update & Next Steps

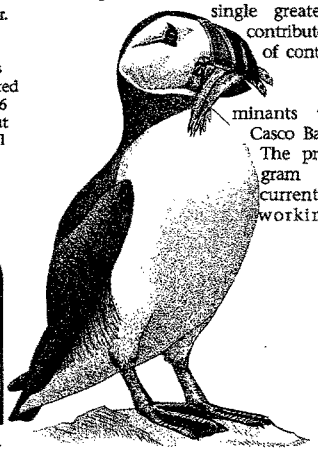
The program is focusing on the most significant problems facing the Bay today: toxic pollution, habitat disruption and loss, nutrient enrichment, and pathogen contamination.

These problems are the result of development, stormwater runoff, combined sewer overflows, failing septic systems and discharges from boats, or existing sediment contamination. Storm-water runoff is thought to be the single greatest contributor of contaminants to Casco Bay. The program is currently working to implement recommendations that aim to reopen clam flats in the Bay, address the combined sewer overflows of the City of Portland, and educate the public about pollution prevention from homes and boats.





Casco Bay watershed. Courtesy of USEPA.



For more information about the program call (207) 780-4820, write Casco Bay Estuary Project, University of Southern Maine, Room 408, Law School Building, P.O. Box 9300, Portland, ME 04104 or email us at kgroves@usm.main.edu.

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Charlotte Harbor National Estuary Program

Fast Facts

One of the largest Florida watersheds, covering 4,400 square miles.

Includes 18 cities and several important basins: Lemon Bay, Myakka River, Peace River, tidal Caloosahatchee, Estero Bay and Charlotte Harbor proper.

The area supports a wide variety of economic uses such as tourism, ranching, citrus, phosphate mining, vegetable crops, residential development and urban areas.

Current population of 1.1 million (1997) expected to grow to 1.65 million by 2020.

World famous for tarpon and snook fisheries.

ANEP
Association of National Estuary Programs

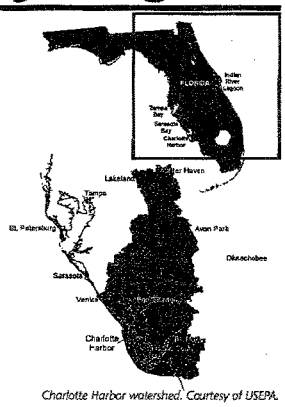
Status Update & Next Steps

The Charlotte Harbor National Estuary Program is developing a Comprehensive Conservation and Management Plan to address the following local issues:

- **Hydrologic Alterations**
  Adverse changes to amounts, locations, and timing of freshwater flows, the hydrologic function of floodplain systems, and natural river flows.

- **Water Quality Degradation**
  Including but not limited to pollution from agricultural and urban runoff, point source discharges, septic tank system loadings, atmospheric deposition, and groundwater.

- **Fish and Wildlife Habitat Loss**
  Degradation and elimination of headwater streams and other habitats caused by development, conversion of natural shorelines, cumulative impacts of docks and boats, and invasion of exotic species. The development of the management plan has included a thorough review of existing scientific information,



Charlotte Harbor watershed. Courtesy of USEPA.

compiling a directory of public and private monitoring programs, assessing the programs and agencies that manage resources, and holding a public and technical conference.

The Citizen's Advisory Committee has been active in setting resource objectives, providing information about local issues, volunteering to give presentations to civic organizations, and targeting public education efforts.

Together with the Technical Advisory Committee, resource managers, and local governments, the plan will detail specific actions to be implemented, the cost of these actions, the partners who are responsible, and the expected environmental benefits.

For more information regarding the Charlotte Harbor NEP, call (941) 995-1777, write us at 4980 Bayline Dr., 4th Floor, No. Fort Myers, FL 33917, or email at chnep upton@mindspring.com.

Corpus Christi Bay National Estuary Program

Fast Facts

Includes 3 of 7 estuaries in Texas: Aransas, Corpus Christi, and upper Laguna Madre.

12 county region known as the Coastal Bend is more than 11,500 square miles; over 22,500 square miles in drainage basin.

Population of nearly 600,000 projected to double within 35 years.

Nation's 6th largest port and 3rd largest petrochemical complex.

More than 490 species of birds and 234 species of fish.

Bay-related economic activities provided over $4.1 billion in sales, $2.3 billion in value-added, and generated more than 53,000 jobs for local residents (1995).

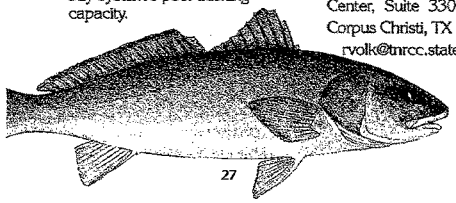
ANEP
Association of National Estuary Programs

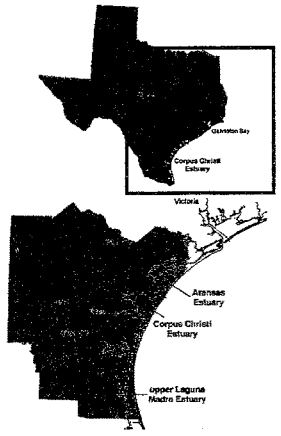
Status Update & Next Steps

Seven priority issues are being addressed: altered freshwater inflows, condition of living resources, loss of wetlands and other estuarine habitats, degradation of water quality, altered estuarine circulation, bay debris, and public health issues.

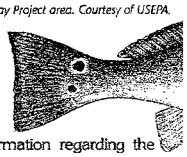
Using a collaborative, consensus-building process, the program is working toward:

- a politically acceptable strategy to achieve the freshwater inflow needs of the estuaries;
- completion of a long-term (20 to 50 year) dredged material placement plan that incorporates beneficial use concepts to the maximum extent possible;
- habitat conservation and management at the regional, landscape scale; and
- completion and acceptance of a "total loadings" plan for the bay system that will reconcile projected regional population growth and the bay system's poor flushing capacity.





Corpus Christi Bay Project area. Courtesy of USEPA.



For more information regarding the Corpus Christi Bay NEP, call (512) 980-3420, write us at Natural Resources Center, Suite 3300, 6300 Ocean Dr., Corpus Christi, TX 78412, or email us at rvolk@tnrcc.state.tx.us.

Delaware Estuary Program

Fast Facts

Includes 3 states, 2 USEPA regions, 22 counties, and over 500 municipalities.

Drainage basin is home to almost 8 million people and spreads about 13,500 square miles -- population projected to increase by 14% by 2020.

World's largest freshwater port and second largest refining-petrochemical center in nation.

Provides 10% of U.S. with drinking water.

Over 200 fish species and largest horseshoe crab population in world.

Hosts millions of migrating birds each spring and fall.

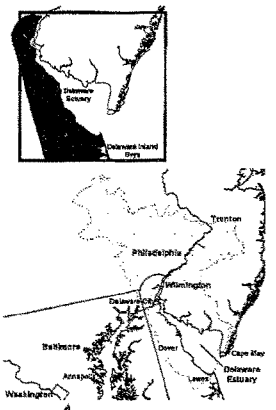
Status Update & Next Steps

Water quality is improving. Most strikingly, dissolved oxygen levels have improved enough to see the return of anadromous fish, including striped bass and American shad, and resident species of fish to the urban river region.

Lower bacterial levels now permit contact recreation in all regions of the estuary except for occasional high levels associated with combined sewer overflows in urban areas.

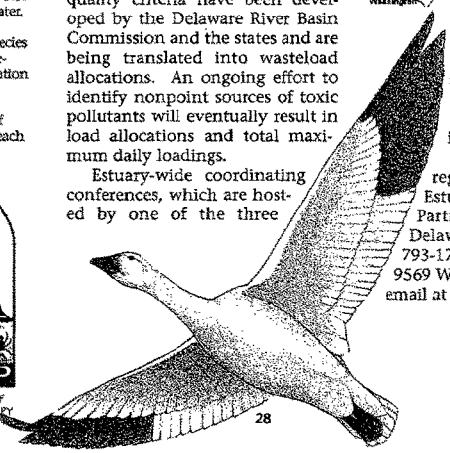
New, more stringent toxic water quality criteria have been developed by the Delaware River Basin Commission and the states and are being translated into wasteload allocations. An ongoing effort to identify nonpoint sources of toxic pollutants will eventually result in load allocations and total maximum daily loadings.

Estuary-wide coordinating conferences, which are hosted by one of the three states on an annual rotating basis, provide a primary forum for implementation.



Delaware Estuary watershed. Courtesy of USEPA.

For more information regarding the Delaware Estuary Program, call the Partnership for the Delaware Estuary at (302) 793-1701, write us at P.O. Box 9569 Wilmington, DE 19809 or email at partners@udel.edu.



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Delaware Inland Bays Program

Fast Facts

Three interconnected bodies of water – Indian River Bay, Little Assawoman Bay, and Rehoboth Bay – in the southeastern part of Delaware.

Total population of Sussex County is over 127,000, projected to be near 140,000 by 2000.

300 square miles of surface water.

Poultry industry along the Delmarva peninsula valued at $1.5 billion.

72 million broilers (chickens) produced per year in the watershed.

ANEP
Association of National Estuary Programs

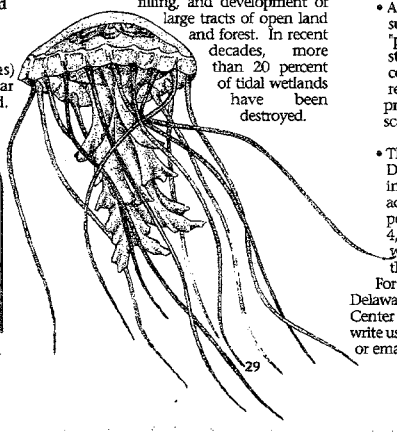
Status Update & Next Steps

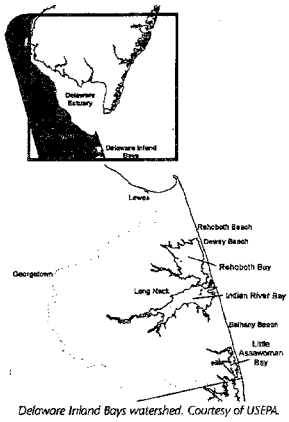
The Inland Bays Watershed Enhancement Act of 1994 established the Center for the Inland Bays to oversee and facilitate both the implementation of the management plan and a long term approach to the wise use and enhancement of the watershed.

The Center is tackling two major problems in the Delaware Inland Bays:

- Nutrient over-enrichment, resulting in waters without underwater grasses and a lower diversity of fish species. Harmful algal blooms, like "Pfisteria" are a major concern which maybe linked to excess nutrients.

- Habitat loss due to eutrophication, sedimentation, and past and present land disturbing activities, such as bulkheading, dredging and filling, and development of large tracts of open land and forest. In recent decades, more than 20 percent of tidal wetlands have been destroyed.





Delaware Inland Bays watershed. Courtesy of USEPA.

- A new method of transplanting submerged aquatic vegetation using "peat pot plugs" has reduced plant stress. This program will be continued in the Center's habitat restoration efforts, as well as a program to re-introduce bay scallops.

- The Farmland Preservation Demonstration Project has resulted in the preservation of almost 3,400 acres of land within 11 farms. If all pending requests are approved, over 4,500 acres of farmland and woodland will be preserved within the watershed.

For more information regarding the Delaware Inland Bays Program, call the Center for Inland Bays at (302) 645-7325, write us at P.O. Box 297, Nassau, DE 19969 or email at brichards@udel.edu.

Galveston Bay Estuary Program

Fast Facts

Over 3.3 million people live within the 5 Texas counties, 20% within 2 miles of the bay or its tributaries.

Port of Houston is second largest port in U.S. and 8th in world based on tonnage, generating $5.5 billion annually.

Travel-generated dollars within watershed exceed $4.2 billion (1994).

Third largest concentration of recreational boats in U.S.

Contributes 1/3 of state's commercial fishing income and over 1/2 of state's recreational fishing expenditures.

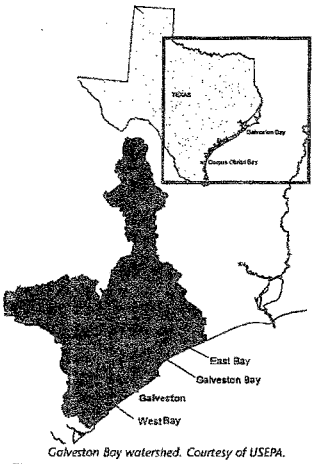
ANEP
Association of National Estuary Programs

Status Update & Next Steps

Habitat destruction has emerged as the single greatest environmental problem. 30,000 acres of wetland habitat (almost 20 percent) have been lost since the 1950s and almost 90 percent of the bay's sea grasses. Declines in habitat threaten future seafood productivity and the capacity for Galveston Bay to function as a healthy ecosystem. The highest priority of the Galveston Bay Plan is to reverse the historical trend of wetland loss by restoring or creating 15,000 acres of wetlands.

Freshwater inflow is another key issue. Over 1.4 billion gallons of freshwater are used each day in the five counties bordering the Bay. The estuarine ecosystem depends on freshwater, and changes in salinity can negatively affect habitat as well as the distribution and numbers of fish and shellfish. One objective of The Plan is to assure that freshwater is available to sustain ecological productivity in balance with human uses.

The open Bay has relatively good water, while urbanized tributaries and enclosed areas with poor circulation show water quality problems.



Galveston Bay watershed. Courtesy of USEPA.

Though these areas have improved over the past 20 years because of wastewater treatment, they still suffer from urban stormwater runoff contamination. Nonpoint source pollution contributes oil and grease, fecal coliform bacteria, excess nutrients, and pesticides. The Plan includes implementation of a nonpoint source program for local entities to reduce pollutant loadings from residential neighborhoods, septic tanks, new development and road construction, and from industrial and agricultural activities.

For more information about the Galveston Bay Estuary Program write to 711 W. Bay Area Blvd., Suite 210, Webster, TX, 77598, call us at (281) 332-9937, or email us at mbrown@tnrcc.state.tx.us.

Indian River Lagoon Program

Fast Facts

156 miles long -- 40% of Florida's east coast.

Includes 31 municipalities, Palm Bay is the largest.

Population growth: 700,000 in 1990 to more than 1 million by 2010.

More than 4,000 plants and animal species.

7 species of seagrass out of 50 represented worldwide.

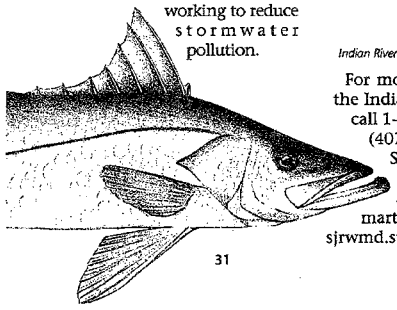
Lagoon-related activities, including fishing, swimming and tourism, pump $731 million into the regional economy.

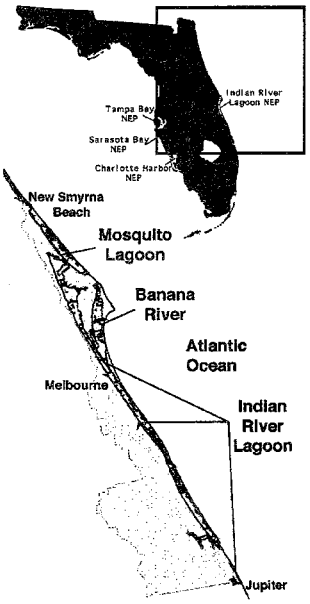
ANEP
Association of National Estuary Programs

Status Update & Next Steps

Here is a brief update on the status and trends of the Indian River Lagoon systems located on Florida's east central coast:

- Seagrass is the primary ecological community of concern in the Indian River Lagoon (IRL).
- With declining water quality, primarily due to stormwater runoff, seagrass acreage has decreased in many areas.
- Stormwater runoff will increase by more than 30% by the year 2010.
- The establishment of poliutant load reduction goals for the Lagoon will promote improvements in water quality which will improve the growth of seagrasses.
- Government and citizens are working to reduce stormwater pollution.





Indian River Lagoon watershed. Courtesy of USEPA.

For more information regarding the Indian River Lagoon Program, call 1-800-226-3747 (in Florida), (407) 984-4950 , write 1900 South Harbor City, Suite 107, Melbourne FL 32901 or email us at martin_smithson@district.sjrwmd.state.fl.us

Long Island Sound Study

Fast Facts

15 million people within 50 miles of its shores, and projected to grow another 4.1% by 2010.

Estimated annual value of boating, sportfishing, swimming, commercial fishing, and intrinsic is $5.5 billion (1990).

Receives more than 1 billion galions per day of treated effluent.

ANEP
Association of National Estuary Programs

Status Update & Next Steps

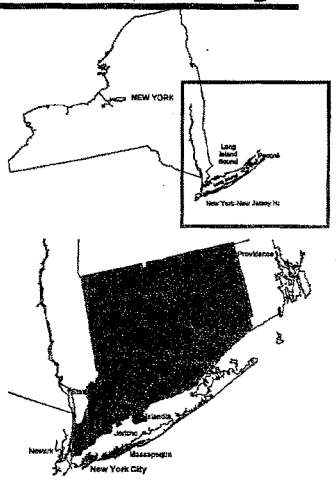
In 1994, the States of New York and Connecticut and USEPA approved a plan to restore the ecosystem and improve the water quality-dependent uses so important to the regional economy.

Environmental Goals:

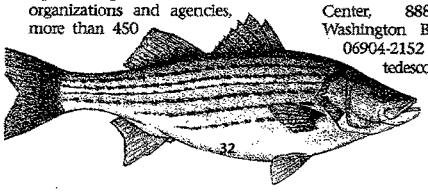
1. Reduce the load of nitrogen by 58.5% within 15 years.
2. Restore 2,000 acres of coastal habitat and 100 river miles used by migratory fish over the next 10 years.

Low dissolved oxygen (hypoxia) is the most significant problem in the Sound, and a phased approach is being used to reduce levels of nitrogen which will result in improved oxygen levels. Having capped nitrogen loads from certain point sources and implemented low-cost improvements at sewage treatment plants, nitrogen loads are now 5,000 tons per year below peak levels.

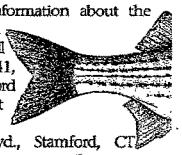
The Habitat Restoration Initiative will complement nitrogen reduction efforts, as healthy habitats help filter nitrogen and other pollutants. Through a partnership of local, state, and federal organizations and agencies, more than 450 degraded sites have been identified and prioritized. Restoration work has been funded at 8 of these sites.



Long Island Sound watershed. Courtesy of USEPA.



For more information about the Long Island Sound Study call (203) 977-1541, write us at Stanford Government Center, 888 Washington Blvd., Stamford, CT 06904-2152 or email us at tedesco.mark@epamail.epa.gov.



Lower Columbia River Estuary Program

Fast Facts

146 river miles from Astoria to Bonneville Dam and up the Willamette River to Willamette Falls.

Tributaries drain 15,100 square miles.

Home to 2 million people, with 600,000 more expected by 2015.

5 major deep water ports, contributing $28 billion annually to economy.

27 major dams and generating facilities.

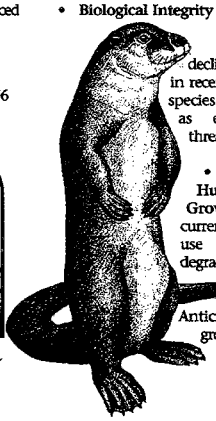
Historically produced largest chinook salmon run in world. Now 67 species are endangered and 76 are at risk.

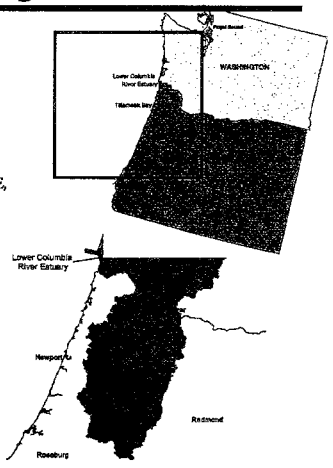
ANEP
Association of National Estuary Programs

Status Update & Next Steps

Seven priority issues have been identified including:

- **Toxic Contaminants in Sediments and Fish Tissue:** Levels of PCBs, DDE, and dioxin may be linked to reproductive failure in bald eagles, mink, and river otter.
- **Habitat Loss and Modification:** Dams, dikes, maintenance dredging, and land use practices over the last 100 years have significantly altered the estuary.
- **Conventional Pollutants:** Point and nonpoint source pollution have changed Ph, temperature, and dissolved oxygen levels.
- **Biological Integrity of Species:** Anadromous fish runs have declined significantly in recent years. Several species are listed as endangered or threatened.
- **Impacts of Human Activity & Growth:** Certain current and past land use practices have degraded habitat and water quality. Anticipated future growth could lead to further degradation.
- **Public Awareness & Stewardship:** There is a continual need to connect people to the river. Greater awareness will lead to stronger protection of the river.
- **Institutional Constraints:** Currently, many agencies and levels of government are involved in managing and protecting the estuary; coordination of these efforts is important.





Lower Columbia River estuary watershed. Courtesy of USEPA.

For more information regarding the Lower Columbia River Estuary Program, call (503) 229-6066, write us at 811 SW Sixth Avenue, Portland, OR 97204 or email us at lcrep@deq.state.or.us.

Maryland Coastal Bays Program

Fast Facts

Shallow coastal lagoons located behind Fenwick (Ocean City) and Assateague Islands including Isle of Wight and Assawoman bays in the north, and Chincoteague, Newport, and Sinepuxent bays in the south.

Watershed of 175 square miles within Worcester County.

Population of 21,781 swells to over 300,000 in summer; expected to double within 30 years.

19 animal species and 89 plant species currently on state's rare, threatened, or endangered list.

Important wintering, staging, and breeding habitats for more than 360 bird species.

ANEP
Association of National Estuary Programs

Status Update & Next Steps

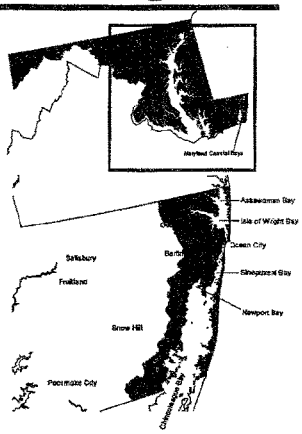
The northern bays, major tributaries, and artificial canals are degraded while the southern bays are in relatively good health. Eutrophication is the single greatest environmental problem.

Loss of terrestrial and aquatic habitat has contributed to the degradation of the bays and, in some locations, chemical contaminants occur at levels that are likely to cause harm to living resources.

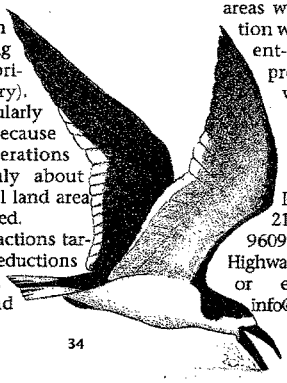
The amount of nutrients entering the coastal bays today is significant.

Approximately one-third of the nutrients come from the wastes produced in animal feeding operations (primarily poultry). This is particularly impressive because these operations constitute only about 1% of the total land area of the watershed.

Corrective actions target nutrient reductions from septics, lawns and farms. Enhancement of riparian areas with natural vegetation will help filter nutrient-rich runoff and provide habitat for wildlife.



Maryland Coastal Bays watershed. Courtesy of USEPA.



For more information regarding the Maryland Coastal Bays Program, call (410) 213-BAYS, write us at 9609 Stephen Decatur Highway, Berlin, MD 21811 or email us at info@mdcoastalbays.org.

Mobile Bay National Estuary Program

Fast Facts

Includes most of Mobile and Baldwin Counties, where population increased 27% from 1970 to 1990.

Watershed drains 44,170 square miles.

Nationally significant for minerals, fisheries, forestry products, diverse wildlife, submerged aquatic vegetation, and vegetated wetlands.

Port of Mobile ranked 13th largest in nation in amount of tonnage shipped and 8th in foreign waterborne commerce (1995).

Sportfishing contributes over $260 million annually to local economy, commercial fishing over $300 million and tourism another $415 million (1995).

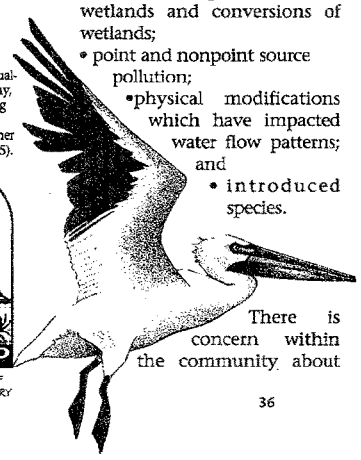
ANEP
Association of National Estuary Programs

Status Update & Next Steps

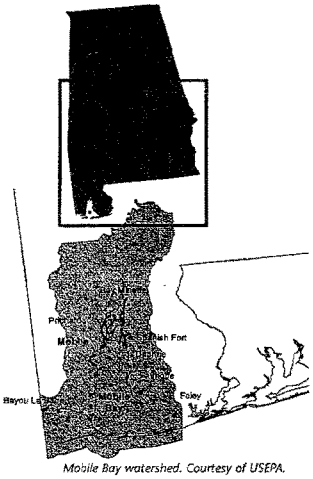
As one of the newest National Estuary Programs, technical and citizen committee members are refining priority issues and developing action plans for human uses, habitat loss, living resources, and water quality.

Some of the program's issues include:

- declines in feeding and breeding bird habitat;
- losses of marshes and submerged aquatic vegetation;
- declines in the quality of coastal wetlands and conversions of wetlands;
- point and nonpoint source pollution;
- physical modifications which have impacted water flow patterns; and
- introduced species.



There is concern within the community about introduced species that could be delivered via ship ballast discharges. The program has joined in a cooperative effort with the Coast Guard to check ship bridge logs for compliance with voluntary maritime offshore exchange policies. This analysis will help determine what type of action might be required.



Mobile Bay watershed. Courtesy of USEPA.

For more information about the Mobile Bay NEP write to the program at 440 Fairhope Avenue, Fairhope, AL 36532 or call us at (334) 990-3565.

Morro Bay National Estuary Program

Fast Facts

Located entirely within San Luis Obispo County, CA -- includes communities of Morro Bay, Los Osos, and Baywood Park.

48,000-acre watershed.

Supports most significant wetland system on state's south-central coast.

Essential link in Pacific Flyway, supporting one of state's largest waterfowl habitats.

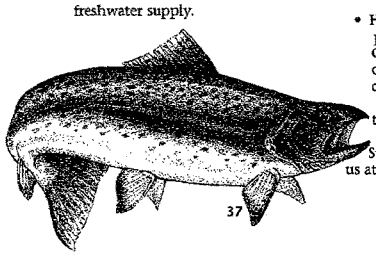
Provides habitat for many endangered and threatened species.

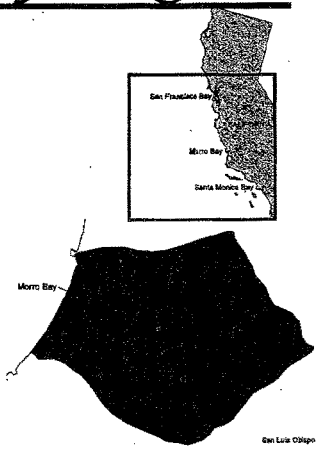
ANEP
Association of National Estuary Programs

Status Update & Next Steps

Morro Bay is facing the following priority problems:

- **Rapid Sedimentation:** The rate of sediment delivery has increased due to changes in land use, changes brought on by wildfire, changes in sediment deposition areas, and reduced circulation .
- **Increased Bacterial Concentrations:** Portions of shellfish harvesting lease areas are always restricted, and other areas are closed for several days following storm events.
- **Increased Nutrient Concentrations:** Agricultural land, grazing land, roadside, and lawn runoff are resulting in increased nutrient concentrations. Fertilizers, septic systems, and animal waste are believed to be contributing to this problem.
- **Freshwater Flow Reductions:** Increases in surface and groundwater diversions directly affect the quantity and timing of the flow of creeks into the bay, and the wildlife and botanic values associated with freshwater supply.





Morro Bay watershed. Courtesy of USEPA.

- **Increased Heavy Metal Concentrations:** Inactive mines in the upper watershed are believed to have contributed to high levels of heavy metals found in sediments eroding from these areas. Some mussel samples from the bay have toxic contamination.
- **Habitat Loss:** Development pressures steadily increasing. Greater population density and changing land use threaten water quality and wildlife habitat.

For more information regarding the Morro Bay NEP, call (805) 528-7746, write us at 1400 Third Street, Los Osos, CA 93402, or email us at mjmooney.mbnep@the grid.net.

Narragansett Bay Estuary Program

Fast Facts

One of the most densely populated estuaries in the nation, with almost 2 million people in the watershed.

Watershed is 1,657 square miles and includes the cities of Providence and Newport, RI, and Worcester MA.

Although statewide population has been stable from 1988 to 1997, some coastal towns have experienced 20% growth rates.

Over 100 fish species and 20 shorebird species.

Tourism, the state's 2nd largest industry, contributed $1.7 billion to the economy in 1996.

ANEP
Association of National Estuary Programs

Status Update & Next Steps

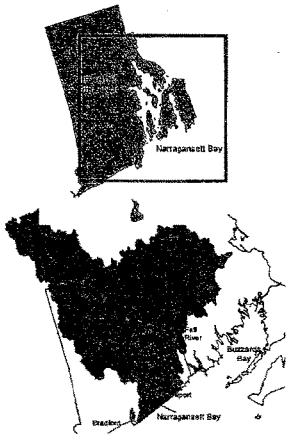
The management plan focuses on conserving and restoring natural resources and protecting and enhancing water quality. Two approaches are being used.

First, bay-wide planning tools and practical, results-oriented projects are being developed that create a basis for informed decisions

The Program is working with coastal municipalities to incorporate new GIS resource mapping data into local planning processes.

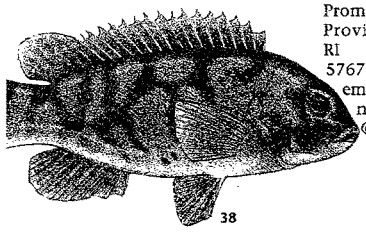
Second, watershed-based projects find pollution "hot spots" and develop effective and innovative ways to correct them. This activity is using technical assistance and outreach to communities and citizens to build critical local support for action.

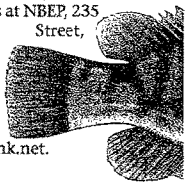
A primary role of the Narragansett Bay Estuary Program is coordination – a critical need because resources for environmental action are becoming increasingly scarce. The program is successfully leveraging state, federal, and local efforts to further common goals.



Narragansett Bay watershed. Courtesy of USEPA.

For more information regarding the Narragansett Bay Estuary Program, call (401) 222-4700, ext. 7270, write us at NBEP, 235 Promenade Street, Providence, RI 02908-5767 or email us at narrabay @earthlink.net.





New Hampshire Estuaries Project

Fast Facts

Combined population of the 43 Great Bay and Seacoast watershed communities is over 350,000 (1990) -- projected to grow to over 443,000 by 2015.

Nearly 1 in 5 jobs directly related to travel and tourism - the region's second largest industry.

73% of watershed is forested or open lands.

Recreational shellfishing contributes an estimated $3 million annually to state and local economies.

Recreational saltwater fishermen spent $52 million in 1990.

ANEP
Association of National Estuary Programs

Status Update & Next Steps

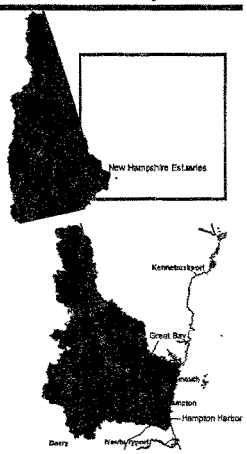
The program is currently refining its list of priority issues.

Most activities are directed at enhancing estuarine water quality through the identification, abatement, and prevention of nonpoint source pollution. Bacterial contamination introduced through stormwater runoff and faulty septic systems are priority management issues.

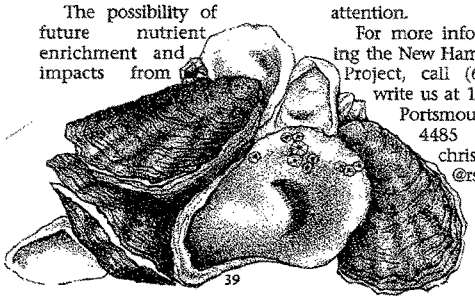
The decline and management of shellfish resources will be addressed in light of pathogen contamination and habitat degradation.

Changes in shoreline/riparian buffers are environmental management issues that impact both water quality and habitat values.

The possibility of future nutrient enrichment and impacts from the resuspension of sediments containing toxic contaminants are also issues drawing management attention.



New Hampshire Estuaries watershed. Courtesy of USEPA.



For more information regarding the New Hampshire Estuaries Project, call (603) 433-7187, write us at 152 Court Street, Portsmouth, NH 03801-4485 or email us at chrisnash@rscs.net.

New York-New Jersey Harbor Estuary Program

Fast Facts

Drainage basin encompasses about 16,300 square miles, including much of New York and New Jersey, and small parts of Connecticut, Massachusetts, and Vermont.

Population increased from approximately 4 million people in 1880 to over 14.5 million people in 1990.

Port of New York and New Jersey is largest port on U.S. East coast and among the largest in the world.

Over 100 species of fish in the Harbor.

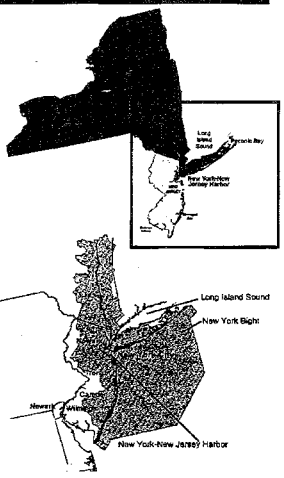
Heron populations in the Harbor represent up to 25% of all nesting wading birds along the coast, from Cape May, NJ to RI line.

ANEP
Association of National Estuary Programs

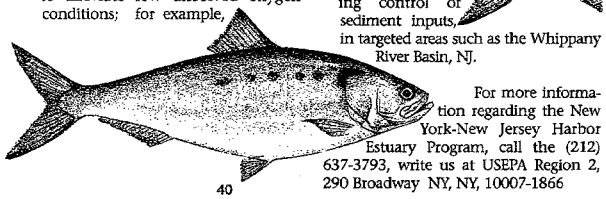
Status Update & Next Steps

The Harbor Estuary Program has developed over 300 specific actions, through a consensus-based process. Commitments are in place for approximately 75% of the actions. Many actions are being implemented through partnerships among public agencies and with the private sector, including the following:

- Identify significant habitats and develop targeted plans to protect them, including the watersheds of the Arthur Kill in NY and NJ and Jamaica Bay in NY.
- Track down and clean up discharges of toxic contaminants; for example, discharges of polychlorinated biphenyls (PCBs) from municipal sewage treatment plants.
- Control pollutant discharges from combined sewer overflows; for example, by implementing management practices consistent with USEPA's National CSO Control Policy.
- Control nutrient loadings as necessary to alleviate low dissolved oxygen conditions; for example, by using low cost nitrogen removal methods at municipal sewage treatment plants.
- Develop nonpoint source management programs, including control of sediment inputs, in targeted areas such as the Whippany River Basin, NJ.



NY-NJ Harbor Estuary watershed. Courtesy of USEPA.



For more information regarding the New York-New Jersey Harbor Estuary Program, call the (212) 637-3793, write us at USEPA Region 2, 290 Broadway NY, NY, 10007-1866

Peconic Estuary Program

Fast Facts

Located at eastern end of Long Island in Suffolk County, NY.

Over 100,000 acres of surface waters and 110,000 acres of groundwater contributing area.

Nursery and spawning ground for nationally significant "Peconic Bay scallop".

173 rare species.

Over 7,000 jobs and $450 million in direct revenues dependent on estuary.

ANEP
Association of National Estuary Programs

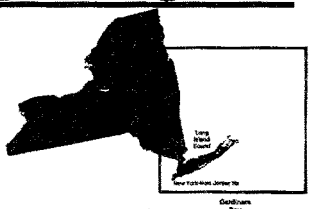
Status Update & Next Steps

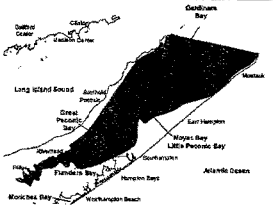
Priority water quality issues include nutrient over-enrichment, coliform contamination of shellfish beds, toxic chemical contamination, and the Brown Tide, a recurring algal bloom which has destroyed the nationally significant "Peconic Bay Scallop" crop.

Priority living resource issues include shellfish (especially scallops and hard clams), submerged aquatic vegetation (especially eelgrass), wetlands, finfish/habitat, and priority species.

The program has adopted a nitrogen guideline and a point source nitrogen freeze for the western estuary, and a water quality preservation policy goal for the eastern estuary.

Millions of dollars in funding commitments have been made by NOAA, New York Sea Grant, Suffolk County, and Brookhaven National Laboratory to support the Brown Tide Workplan. Already, as a result of the process, a bacteria-free culture has been isolated and a plausible hypothesis has been advanced regarding the onset of Brown Tide.

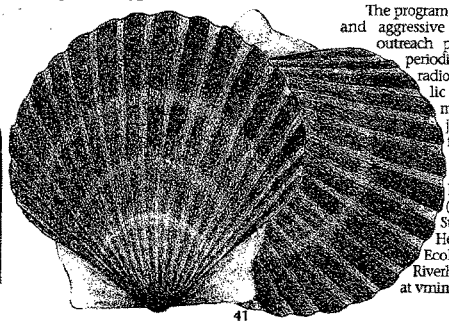




Peconic Estuary watershed. Courtesy of USEPA.

A submerged aquatic vegetation strategy and a "critical areas" process has been developed for habitat and living resources.

The program has implemented a broad and aggressive public education and outreach program, which includes periodic television shows/videos, radio and print materials, public opinion polls, citizens monitoring and action projects, and children's conferences.



For more information on the Peconic Estuary Program, call the (516) 852-2077, write us at Suffolk County Dept. of Health Services, Office of Ecology, County Center, Riverhead, NY 11901 or email at vminei@suffolk.lib.ny.us.

Puget Sound National Estuary Program

Fast Facts

Over 2,200 miles of shoreline; over 900 feet deep.

Daily tidal range of almost 12 feet.

Projected population growth: 3.2 million (1990) to 4.3 million in 2010.

Status Update & Next Steps

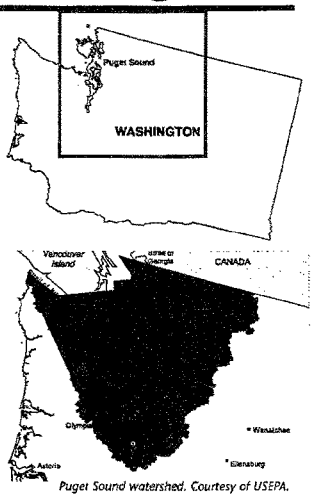
Overall Puget Sound is in very good condition, but there are patterns of problems associated with human activities.

Principal problems are loss of habitat, contamination of sediments and marine life by toxic compounds, and contamination of water and shellfish growing areas by fecal material.

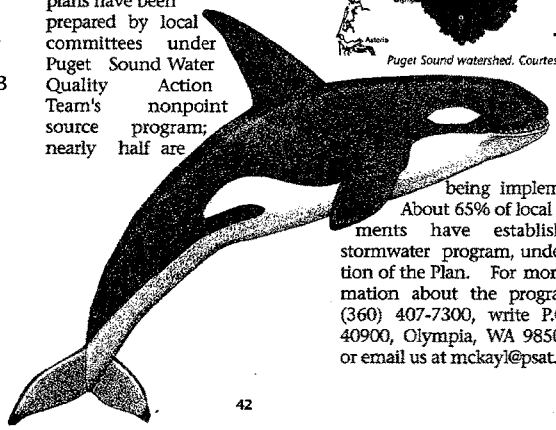
State Department of Ecology has established standards for sediments, the first of their kind in the nation.

Thirty-six watershed plans have been prepared by local committees under Puget Sound Water Quality Action Team's nonpoint source program; nearly half are being implemented.

About 65% of local governments have established a stormwater program, under direction of the Plan. For more information about the program call (360) 407-7300, write P.O. Box 40900, Olympia, WA 98504-0900 or email us at mckayl@psat.wa.gov.



Puget Sound watershed. Courtesy of USEPA.



ANEP
Association of National Estuary Programs

San Francisco Estuary Project

Fast Facts

Roughly 1,600 square miles, draining about 40% of California's landscape.

Provides drinking water to 20 million Californians and irrigates 4.5 million acres of farmland.

Nearly 8 million people live in the 12 county region.

Water projects, the largest in the world, divert water for agricultural, municipal, and industrial uses.

Commercial fisheries valued at $20 million annually.

130 fish species and 380 wildlife species.

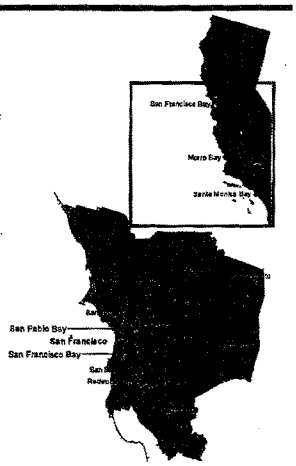
ANEP
Association of National Estuary Programs

Status Update & Next Steps

Five priority management issues are being addressed: decline of biological resources, pollutants, impacts from freshwater diversions and altered flow regime, intensified land use, and increased dredging and waterway modification.

Ten priorities are currently being pursued, to focus limited dollars and energy on activities considered most important for the Estuary's health:

- Expand, restore, and protect Bay-Delta wetlands;
- Integrate and improve regulatory, planning, management, and scientific monitoring programs;
- Create economic incentives that encourage local government to take protection and enhancement actions to protect and enhance the Estuary;
- Improve the management and control of urban runoff;
- Prepare and implement watershed management plans throughout the Estuary;
- Reduce and control exotic species introductions and spread via ship ballast and other means;



San Francisco Bay watershed. Courtesy of USEPA.

- Build awareness about CCMP implementation;
- Increase public awareness about the Estuary's natural resources and the need to protect them;
- Implement the Regional Monitoring Program and integrate the results of scientific monitoring into management and regulatory decisions;
- Work with federal and state agencies to include CCMP recommendations in other planning and restoration efforts and funding decisions.

For more information about the San Francisco Estuary Project call (510) 622-2465 or write us at San Francisco Estuary Project, c/o RWQCB, 1515 Clay Street, Suite 1400, Oakland, CA 94612, or email us at marciab@abag.ca.gov.

San Juan Estuary Program

Fast Facts

Only NEP outside continental U.S.

Part of 8 municipalities form the watershed, with a population of approximately 622,000.

Largest tourist area in Puerto Rico–approximately 1.1 million cruise ship passengers and 9.8 million air travelers in 1997.

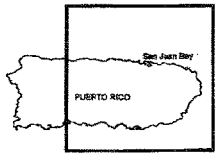
Over 161 bird species, 19 reptile species, 87 fish species, and 300 wetland plant species.

Over 324,500 lbs. of finfish caught in 3 municipalities in 1995, with a value of over $600,000.

Over 20,900 lbs. of shellfish caught in 6 municipalities, with a value of over $108,600.

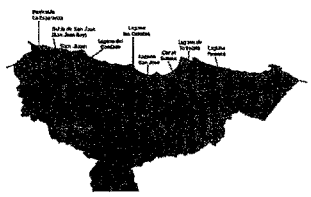
ANEP
Association of National Estuary Programs

Status Update & Next Steps

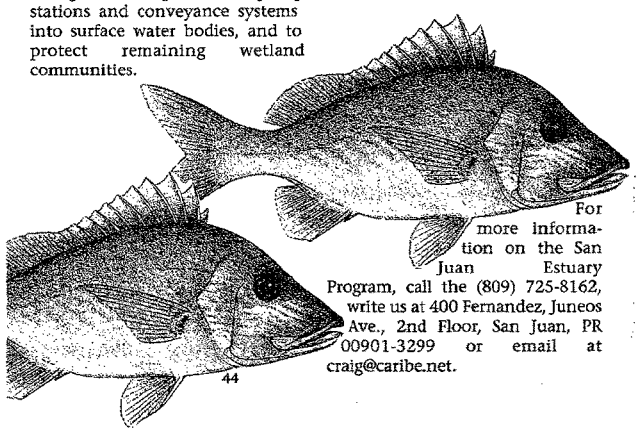


One of the main challenges is the restoration of the Martin Pena Channel and associated communities. Its restoration includes relocation of families living in areas associated with the channel, flow restoration by deepening and widening the channel, construction of sewer laterals, rehabilitation of storm sewers in the vicinity, and establishment of a solid waste management and recycling program in associated areas.

Other challenges are to eliminate or significantly reduce the number of unauthorized raw sewage discharges from pump stations and conveyance systems into surface water bodies, and to protect remaining wetland communities.



San Juan Estuary watershed. Courtesy of USEPA.



For more information on the San Juan Estuary Program, call the (809) 725-8162, write us at 400 Fernandez, Juneos Ave., 2nd Floor, San Juan, PR 00901-3299 or email at craig@caribe.net.

Santa Monica Bay Restoration Project

Fast Facts

Watershed is 414 square miles, including 20 cities.

3 major cities have combined population of 3.24 million.

Tourism, 2nd largest industry in the region, provides approximately 400,000 jobs and contributes nearly $7 billion annually to economy.

Bay is region's primary recreational resource, drawing approximately 50 million visitors annually.

World's largest small craft harbor, with 6,000 slips.

5,000 different species of plants and animals.

ANEP
Association of National Estuary Programs

Status Update & Next Steps

There are four areas of concern: human health risks associated with eating contaminated seafood, human health risks associated with disease-causing pathogens in the surfzone, loss and degradation of essential habitats and endangered species, and impact of pollution on the bottom-dwelling and open-ocean communities.

Significant progress has been made in implementing the Bay Restoration Plan. As of June 1997, an estimated 80% of the priority actions are being realized at some level. A primary challenge of the program is securing funding to ensure full implementation of the Plan. This is a particular concern in the area of stormwater/urban runoff pollution control, since many municipalities lack the resources to implement extensive stormwater Best Management Practices.

Santa Monica Bay watershed. Courtesy of USEPA.

Additional challenges include remediating the DDT contamination on the Palos Verdes Shelf, restoration of Ballona Wetlands (one of the few remaining bay wetlands, and reducing the number of yearly beach closures to zero (through improved stormwater management, reduction of wastewater flows from treatment plants, and extensive public education activities).

For more information on the Santa Monica Bay Restoration Project, call the (213) 266-7572, write us at 101 Centre Plaza Drive Monterey Park, CA 91754 or email at smbrp@earthlink.net, visit our webpage at www.smbay.org.

Sarasota Bay National Estuary Program

Fast Facts

The Bay area has pollution control infrastructure presently valued at more than a billion dollars.

The area supports more than 50 water-dependent industries; tourism is number one (more than $820 million annually).

The restoration plan is based on $2.5 million in technical studies and recommends a capital investment of approximately $160 million.

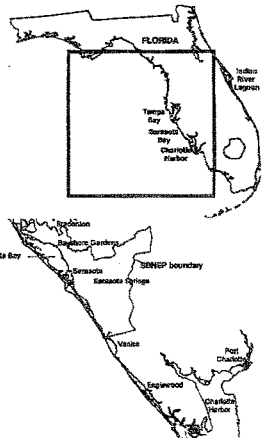
ANEP
Association of National Estuary Programs

Status Update & Next Steps

Released in November 1995, the comprehensive management plan focuses on improving Bay water quality and productivity.

Community efforts to improve water quality are focusing on controlling nitrogen. Since 1988, it is estimated that nitrogen loading has been reduced by 28%-38% due to improved wastewater treatment, re-use of wastewater and the construction of stormwater control projects. Reduced pollution has in-turn resulted in a 7% increase in seagrasses and an estimated 38 million more fish, 114 million more crabs and 58 million more shrimp than in 1988.

Wetlands restoration and artificial reef creation (for juvenile fish) are also major features of the management plan. Since 1989, more than $8.5 million in wetlands restoration projects (400 acres) are completed or are planned. Nine additional artificial reef sites have been permitted or are in the permitting process; two reefs have been refurbished since 1995.



Sarasota Bay watershed and program boundary. Courtesy of USEPA.

Significant land acquisition efforts to protect bay habitat are underway.

Changes in local landscaping and maintenance practices are also proposed to reduce fertilizer and pesticide runoff. The Florida Yards and Neighborhoods Program is being implemented with twelve model yards created. "The Gulf Coast Heritage Trails" system has been conceptually adopted by the community as a mechanism to develop stewardship and promote eco-tourism.

For more information about the Sarasota Bay NEP call (941) 359-584 or write us at SBNEP, 5333 N. Tamiami Trail, #104, Sarasota, FL 34234 or email us at sbnep@gate.net.

Mr. GILCHREST. Mr. Ribb, thank you very much. Since there are so few people in the room, I don't think we need the lights. We appreciate the technology and under certain circumstances, if the dais up here was filled, I guess we would need them, but since it's just Eni and myself, we'll forego the lights.

Mr. Ribb, thank you very much.

Mr. Hirshfield.

STATEMENT OF MICHAEL HIRSHFIELD, SENIOR VICE PRESIDENT, CHESAPEAKE BAY FOUNDATION

Mr. HIRSHFIELD. Thank you, Mr. Chairman. I will try to nevertheless be brief.

On behalf of the Chesapeake Bay Foundation and Restore America's Estuaries, I would like to thank the Subcommittee for the opportunity to present testimony in strong support of H.R. 1775, the Estuary Habitat Restoration Partnership Act. I would especially like to thank you, Mr. Chairman, for introducing this bill.

My name is Mike Hirshfield. I'm the Senior Vice President of the Chesapeake Bay Foundation, which has its headquarters in Annapolis, Maryland and offices in Virginia and Pennsylvania. CBF is a member-supported, non-profit environmental education and advocacy organization, with over 80,000 members throughout the bay watershed and nationwide.

Our mission is to save the bay, period; to restore and protect the Chesapeake Bay and its watershed.

I'm also here as a member of the Board of Restore America's Estuaries, which is a coalition of 11 regional environmental organizations that all have estuary protection and restoration at the core of their missions.

We've heard a lot about the legislation and what I'd like to do is depart from my written remarks for a couple of minutes, ask that they be included in the record, and——

Mr. GILCHREST. Without objection.

Mr. HIRSHFIELD.[continuing] talk about a couple of the things that I've heard this morning.

You asked how one restores an estuary, and I would say that our perhaps overly simplistic perspective is that you stop pollution, you manage your fisheries sustainably, and you protect and restore habitat, and those three elements have been what has been recognized by the Chesapeake Bay Program as critical to bringing back the health of the Chesapeake Bay, and, as you've heard, there are critical elements in all of the national estuary program efforts to restore estuaries.

If you look, however, at the history of a lot of these programs, (I've been involved with the Chesapeake Bay Program for over 20 years now, from the beginning, first as a researcher, then as a state employee, and now with the Chesapeake Bay Foundation), the focus really historically was on stopping pollution. That was the first thing that people started to work on and for a long time, the vast majority of the resources going to restoring our bays has been focused on stopping pollution.

In the last few years, we've got our arms around fisheries management a little bit better, in part because of the legislation that you worked so hard on to get the states working better together, and really restoring habitat I see as the eye-opening moment for the next 10 years or so.

We've seen the need. We realize that just stopping pollution and just managing fisheries isn't enough. We've actually got to fix things. We've got to put things back. We've got to unstraighten rivers. We've got to put oyster reefs back into three dimensions. And in order to do that, we need resources and coordination beyond what we've had to date.

We are very supportive of the Bay Program. I testified in favor of its reauthorization on the Senate side a couple of months ago. We see this legislation as being in no way duplicative, but as being complimentary, providing resources and coordination that will really help to take the bay and all the other bays in the country to the next level.

I'm sure if any of my colleagues from RAE were here, they would say the same thing.

A year ago, we issued the first Chesapeake Bay Foundation report card, State of the Bay. We gave the bay a 27 out of 100. People said we're tough graders, but we think that that's really where the bay is compared to what it has been. In fact, we said it had come back a little bit, maybe up from a 22, from when it bottomed out in the early '80s.

This year, a couple of weeks ago, we released the 1999 State of the Bay report and we gave the bay a 28; not exactly a huge improvement, but we're still pretty tough graders and we look at a lot of factors, and having a bay get better at all in the face of all the threats that are facing it we think is pretty remarkable.

And one of the things that we're the most excited about is the potential for oyster restoration. A bunch of scientists got together, as Ms. Yozell talked about, a few months ago, and came up with a consensus document, that is pretty rare. If you think three agencies getting together and agreeing on something is tough, getting 20 scientists together to agree on anything is almost unheard of.

And they agreed that what we needed were oyster sanctuaries, set-aside for brood stock, three-dimensional reefs, and more attention to how we manage the oyster fishery. We think that with that kind of a framework, with the funding and coordination provided by the legislation that we're talking about here, we'll be able to take oysters back from the two that we gave them this year to a 10 or a 20 in the next decade, and we think the Chesapeake Bay, from its 28, will be able to be taken back to a 70 or so.

We're not going to get to that 100, we're not that naive, but we think a 70 is possible. And, again, this is a perspective that I know is shared by all of the other members of Restore America's Estuaries; that if we can get in there, get our hands dirty and start fixing the pieces of the bays that are broken, we can bring it back.

One last comment. We've heard a lot about the importance of technical expertise in this program and we at the Bay Foundation certainly think that doing it right is better than doing it too quickly. However, there is an extraordinary energy all over this country related to habitat restoration. We have hundreds of our members who are growing oysters on their docks and taking them—not eating them, but taking them and putting them back on oyster reefs.

There are similar stories that could be told all over this country of citizens taking their time and their money and putting it into estuarine habitat restoration. And we hope that as we set up the

process for implementing this legislation, that an appropriate role for private citizen organizations, such as CBF and the other RAE members, would be taken into account, because it would be tragic if we lost that enthusiasm and that energy.

In summary, on behalf of all the RAE members, I want to applaud you and the members of this Committee for the vision and leadership on this critical issue. We look forward to working with you to move this legislation forward and to turn a very good bill into very good law.

Thank you.

[The prepared statement of Mr. Hirshfield may be found at the end of the hearing.]

Mr. GILCHREST. Thank you very much, Mr. Hirshfield. We share your enthusiasm. Now, Ms. Woolsey's former staffer, who I'm sure she misses a great deal at this point, but glad you're in the place where you are, Mr. Davis.

STATEMENT OF GRANT DAVIS, ASSISTANT SECRETARY, U.S. ARMY

Mr. DAVIS. Thank you, Mr. Chairman. I think I'm still blushing from her introduction. A little bit embarrassing. But I truly appreciate the opportunity to be here before you today and appreciate your introduction of this piece of legislation, as well as Mr. Faleomavaega, the Ranking Member, sitting through the testimony. It really is quite inspiring to see the panel before us speak in relative unanimity, three different Federal agencies talking about implementation of legislation like this, because you have hit upon something, I think, that is a recipe for success.

As the Congresswoman mentioned, I have been the Executive Director of the Bay Institute of San Francisco for a little over two years. Our sole mission is the protection and restoration of the San Francisco Bay Delta Estuary and I submitted a document that we released last year for members of the Committee called The Sierra to the Sea, which is essentially the area that we cover.

In that, the second to last page, is an historical compilation of the San Francisco Bay delta, 150 years ago, which documents what we used to have and what we now have today, which puts a dramatic picture in front of us of what we've lost and how we have to re-double our efforts, in particular, in the San Francisco Bay delta.

And I don't claim to be an expert on any other estuary, but I do know one of the sad common features is that all estuaries in the nation are, in fact, being abused and are in need of repair.

The bright spot, however, is the fact that you have colleagues that are before you today, non-profit, non-government organizations, as well as local, state and Federal agencies, that are willing to re-double efforts to get engaged and do implementation.

One of the beauties of going last is that I will say I'll be brief and that I'd like to obviously include my full remarks into the record, but would like to paraphrase that I've heard today and comment and give some feedback based on members' questions and the responses that I heard earlier.

With all due respect, the first one is your analogy of a funnel. It's a very good one. However, the idea of transmission fluid for an

estuary is probably one—I would recomend using another analogy, like fresh water, because the one area that——

Mr. GILCHREST. The reason I use that, though, is when I communicate my ideas to other members of Congress, that seems to take hold. But I'll take your ideas into consideration.

Mr. DAVIS. The funnel works. It's just what you put down it. I used that because my colleague to the right here did mention there is a fourth element besides the wonderful features you talked about, restoring estuaries. In our case in California, clearly fresh water flows are an equally important ingredient to restoring our estuaries and when you look at a dry state like ours, which is in need of water, our continuing challenge is making sure we have enough fresh water flows into the system.

So in order to restore the physical process, which is what our document suggests is needed, you need fresh water flow and that would be the summation in terms of what we find at the Bay Institute is our biggest challenge; that is, working with, in a collaborative way, the Federal agencies, the state and local bodies, working toward a very comprehensive vision of restoration.

My message today is that in San Francisco, we're ready to implement. A great deal of work has been done to plan and we're fortunate enough in our region that there is a great deal of collaboration going on with the Federal, state and local entities that are responsible for regulation and designing and ultimately implementing projects.

I didn't include this, because it's too big for the record, but there is a document called The Bay-lands Ecosystem Habitat Goals, which thoroughly documents—this has been a five-year effort of all the best scientists that we have in our institutions, documenting project by project very ambitious goals for restoration of the entire watershed.

I'd like to make sure that I get both Committee staff and the members get this document, because it's basically a template for how to implement the work that your bill is suggesting needs to be done in estuaries all across the U.S.

One other document——

Mr. GILCHREST. What is the title of that?

Mr. DAVIS. This document is called The Bay-lands Ecosystem Habitat Goals, it's a report of the habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project, very informative and years of work went into this.

Closer to home, we did have a document called San Pablo Bay Lands. This is the northern part of San Francisco Bay, where we're located and very involved. This is a plan to protect and restore the region's farms and wetlands, because in our region, we have the nexus of agriculture and the estuary and truly significant work needs to be done in collaboration. We need landowner support and voluntary cooperative means for the agencies to work with the NGOs and the landowners to ultimately implement restoration.

So that document I did insert for the record, because it, too, provides numerous opportunities, with the right funding mechanism, for us to implement and begin restoring upwards, in this area, of around 50,000 acres of wetlands in the San Francisco Bay, which would be a phenomenal step.

Lastly, just to move forward, Mike Davis, who testified earlier, because your legislation provides the Corps with the primary responsibility for ecosystem restoration here, we support that actually. It's been our experience that that new mission that they're moving into, contrary to what their old mission was, is one in which they are equipped to work.

I have submitted a document called the San Pablo Bay Watershed Restoration Study. It's a currently authorized project that the Congress has had now for three years, going into its fourth year, and we are fortunate to be able to work with them in designing the restoration strategy.

That means they have found a way, and I suggest that this could be your model for other estuaries and partnerships around the nation, where the Corps has the authorization for ecosystem restoration, but what's unique with the San Pablo Bay Area is they're providing what they do best; that is, technical assistance and implementation planning to state and local and non-government agencies and organizations working to implement projects.

So if you have the scientific advisory panels put in place that would encompass groups like ours and the local, state and other agencies responsible for regulation, working with the Federal agencies under the Corps' leadership, I think you do have a model that can work. And what we heard today is that NOAA and EPA and U.S. Fish and Wildlife are prepared to operate under that rubric.

So I think the theme today is collaboration, it's a major step forward, were you to be able to pass this out in a bipartisan manner. It's something that the Bay Institute, as well as the San Francisco Bay Joint Venture, which I currently am Vice Chair, wholeheartedly support, and if there is any work that we can do to help assist in moving this bill forward, one of the ways to do that would be to get additional co-sponsors and I plan to go back and do just that, to get the Bay area Congressional delegation to come on this bill and hopefully this will be the vehicle that we use this year.

So thank you very much for the opportunity to testify.

[The prepared statement of Mr. Davis follows:]

WRITTEN TRESTIMONY OF GRANT DAVIS
EXECUTIVE DIRECTOR OF THE BAY INSTITUTE OF SAN FRANCISCO

BEFORE THE

SUBCOMMITTEE ON FISHERIES CONSERVATION, WILDLIFE AND OCEANS
1334 LONGWORTH HOUSE OFFICE BUILDING

REGARDING

HR 1775
THE ESTUARY HABITAT RESTORATION PARTNERSHIP ACT OF 1999

THURSDAY, SEPTEMBER 16, 1999

Good morning Mr. Chairman and members of the Subcommittee, my name is Grant Davis. I am the Executive Director of The Bay Institute of San Francisco (TBI), a non profit organization founded in 1981 and located in San Rafael, California, just north of the Golden Gate Bridge. TBI is dedicated to the protection and restoration of the ecosystems of the San Francisco Bay, the Sacramento-San Joaquin Delta and the rivers, streams and watersheds tributary to the estuary.

On behalf of the Board of Directors of The Bay Institute, and in my capacity as Vice Chair of the San Francisco Bay Joint Venture, I appreciate the opportunity to be here before you to provide testimony in support of H.R. 1775, the Estuary Habitat Restoration Partnership Act of 1999. My observations regarding the implementation of this Act, the proposed Councils, and the coordination required from the federal, state, regional, and local levels, reflect our organization's eighteen year-history working to protect and restore the San Francisco Bay-Delta ecosystem, one of the largest estuaries of the Western United States. These comments also represent the point of view of an organization devoted to the principal that sound science should inform the decision making process, particularly when determining what strategy will work best to restore our nation's critically important estuarine resources.

H.R. 1775 – Estuary Habitat Restoration Partnership Act of 1999

I have been asked to focus my remarks on implementation of H.R. 1775, the structure of the Councils that are proposed – including non-governmental participation -- and in particular the types of restoration activities that could be undertaken in San Francisco Bay if this bill is enacted. Although I am not an expert on other national estuaries there are many features common to all of them in the United States. Sadly, one feature common to all our nation's estuaries is that they have been badly abused and have suffered substantial habitat loss, between 80 to 95 percent in many cases.

When healthy, estuaries are among the most critically important and productive natural systems on earth. They provide numerous opportunities for boating and business, fishing and hunting, strolling and swimming, wildlife viewing, and teaching about the natural world. Each year over 180 million Americans either visit or vacation in our nation's estuaries. Fishing, tourism, and recreational boating, which depend on viable estuaries, provide more than 28 million jobs for our nation. While commercial and sport fishing alone contribute $111 billion annually to our nation's economy.

Perhaps the most significant aspects of H.R. 1775 are that it reconfirms the federal government's commitment to these critically important estuarine resources, establishes a systematic approach for federal involvement regarding estuaries and coastal zones, and provides necessary funding in which to begin implementation of habitat restoration that is consistent with local plans. However, from previous experience, funding levels designated by this legislation may not be sufficient to adequately carry out such an ambitious program.

I also agree with previous testimony given by Deputy Assistant Secretary, Mike Davis that recommends adding as one of the purposes of this legislation the need to promote greater public appreciation and awareness of the value and benefits of our estuary and coastal resources.

The San Francisco Bay-Delta Ecosystem:
The Bay-Delta ecosystem is an intricate web of waterways created at the junction of the San Francisco Bay and the Sacramento and San Joaquin Rivers and the watershed that feeds them. The estuary, where fresh water from the Sacramento and San Joaquin Rivers flowing down toward the San Francisco Bay mixes with salt water from the Pacific Ocean, touches the lives of millions of Californians. Nearly two-thirds of all Californian's depend on this estuary for their water supply. Fresh water flows through the Delta – a network of natural and man-made waterways – helps to supply two thirds of the state's population with drinking water, and irrigate 200 different types of crops on the Central Valley, including 45 percent of the nation's fruits and vegetables.

The Bay-Delta is a distinctive estuary ecosystem that supports more than 750 species of fish, animals, and birds, including waterfowl migrating on the Pacific Flyway. It supplies and sustains fisheries, wildlife refuges, and 40,000 of critical wetlands. The biological health and biodiversity of the ecosystem depends upon the freshwater flows through the estuary.

However, historically the Delta was an incredibly vast region of wetlands teeming with wildlife. It was composed of huge tracts of intertidal wetlands transected by a complex network of waterways. The Delta today bears little resemblance to its historical condition. Today, over 95 percent of the original 550 square miles of tidal wetlands are gone. Many miles of tidal sloughs no longer exist, nor does most of the riparian vegetation. In its place is a patchwork on intensely farmed "islands", surrounded by elevated levees, straightened and deepened channels, permanently flooded remnants of former wetlands now too far underwater to allow the re-establishment of emergent vegetation, and the center of one of the largest man-made water delivery systems in the world. Massive Federal, State, and local agency pumping plants, and over 1,800 unscreened agricultural diversions now transfer water, fish, and drifting estuarine life out of the aquatic environment.

Pollution in the Delta is also a serious concern today, because it is the source of drinking water and occasionally toxic to aquatic organisms. Delta waters contain elevated concentrations of pathogens, pesticides, trace metals, salinity, and organic carbon. The combination of habitat loss and successful invasion by a virtual army of non-native species has almost completely destroyed the Delta's native biological community. The native resident fish fauna has been replaced by a largely introduced assemblage. Two of three historically dominant fish species are no longer found here.

Waterfowl, once extremely abundant in the Delta's tidal marshes, are now drastically reduced in numbers. Nutrient and important energy sources as well as food webs have been greatly modified.

Similarly, San Francisco Bay itself has undergone significant habitat alterations over the course of the last two centuries. About 75 percent of the estimated 242,000 acres of highly productive native tidal marshes and mudflats have been converted to a variety of urban and industrial uses. Although as a result of the Clean Water Act, raw sewage is no longer dumped in the Bay and Industry wastes are strictly regulated, agribusiness practices are not. Illegal dumping also remains a problem. We no longer see massive fish kills that accompanied unregulated dumping in the Bay, yet fish populations continue to decline.

Increasingly the problem today is non-point source pollution: the water that collects pollutants as it moves through or over the soil, runoff that is generated because either the soil is too compacted or the water is falling off an impervious surface, like a road, parking lot, or driveway. Simply stated non-point source pollution is you and me and the way we go about our everyday lives. In many ways this is a much more difficult pollution control dilemma than we faced twenty to thirty years ago and it will require a more sophisticated approach, like H.R. 1775 to help address.

The Bay Institute:
The Bay Institute was one of the three groups that signed the historic Bay-Delta Accord in 1994, which formed a multi-agency and stakeholder cooperative process known as the CALFED Bay-Delta Program to address the water management and environmental problems associated with the Bay-Delta system. The mission of the CALFED Program is to develop a long-term, comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.

CALFED's ecosystem restoration program is considered to be the most comprehensive and most inclusive environmental restoration program in the United States. It provides a new perspective to restoration science by focusing on the rehabilitation, protection or restoration of ecological processes that create and maintain habitats needed by fish, wildlife and plant species dependent on the Delta and its tributary systems. By restoring the natural processes that create and maintain diverse and vital habitats, CALFED aims to meet the needs of multiple plant and animal species while reducing the amount of human intervention required to maintain habitats.

Currently The Bay Institute's Program Director, Gary Bobker, Co-chairs a stakeholder group known as the Ecosystem Roundtable, which formally advises CALFED on its Ecosystem Restoration Strategy. Gary Bobker was one of signatories to the Bay Delta Accord and has been devoting a significant amount of his energy to improving this effort. Dr. Anitra Pawley, TBI's Aquatic Ecologist is a member of something known as the Integration Panel, a technical committee that advises CALFED on how best to allocate and prioritize the millions of dollars spent on ecosystem restoration. To date CALFED has funded 195 projects for a total of approximately $228 million.

Types of projects funded include fish screens, fish ladders, land acquisition, habitat restoration, and focused research and monitoring projects designed to provide information that will improve future restoration efforts. Funding for these projects has come from the Federal Bay-Delta Act, State Proposition 204 and water user fees. In short, the CALFED Bay-Delta Ecosystem Restoration Strategy provides a good working example of how ecosystem restoration targeted toward an estuary can be performed. It provides an appropriate scientific foundation and allows for the type of coordination required for truly comprehensive habitat restoration.

U.S. Army Corps of Engineers Ecosystem Restoration Mandate:
Historically, two main objectives of the Army Corps of Engineers have been the maintenance our navigational waterways and flood protection. Increasingly, under the National Environmental policy Act of 1969 and Federal Water Pollution Control Act of 1972, known as the Clean Water Act the Corps has been given more authority to regulate the discharge of dredged or fill material into our Nation's wetlands. More recently, Congress provided additional environmental protection authority to the Corps under the Water Resources Development Act (WRD A) of 1986 and subsequent WRDAs. Clearly, one of the more notable features of this legislation is the "ecosystem restoration" authority provided to the Corps that is closely linked to economic development.

Sonoma Baylands:
Perhaps one of the best examples of the positive aspects of the expanded role of ecosystem restoration for the Corps is the 400 acre Sonoma Baylands Wetlands Restoration and Demonstration Project in Sonoma, California. This pilot wetland restoration project put to beneficial reuse material that had been dredged from the Port Oakland's harbor -- material that would otherwise have been disposed of as waste inside San Francisco Bay or the Pacific Ocean beyond the Golden Gate Bridge. This pioneering project was only made possible by a comprehensive and coordinated approach, much like those being proposed in H.R. 1775, lead by the Corps and U.S. EPA called the Long Term Management Strategy (LTMS). The LTMS was designed to find long-term solutions for the disposal of dredge material for the San Francisco Bay area on a regional basis and has been formally adopted by the responsible agencies. The LTMS had the strong support from the Bay Area Congressional delegation and required broad-based support from all levels of government. The Sonoma Baylands has proven to be a win-win solution. The long-term monitoring program, like those being proposed in this Act, has also provide useful information regarding the science behind wetland restoration using dredge material. In fact, that monitoring information obtained as part of the Sonoma Baylands project has already been used to better inform and improve upon another related Corps project authorized earlier this year, the Hamilton Army Airfield Wetland Restoration Project.

Hamilton Army Airfield Wetland Restoration Project:
This wetland restoration project being constructed on an old 700 acre cement runway in Novato, California that is building upon the success of the Sonoma Baylands project. It is another good example of a Corps ecosystem restoration project that has the potential to add a significant amount of wetland habitat back to San Francisco Bay. This project also provides additional opportunities to link with other adjacent wetland restoration sites as part of a more comprehensive vision of ecosystem restoration.

San Pablo Bay Watershed Restoration Study:
The Bay Institute has been very involved in another Corps ecosystem restoration effort called the San Pablo Bay Watershed Restoration Study. This project grew out of a local planning process that included landowners in the area, much like H.R. 1775 is promoting. As part of my written testimony I am including a report entitled the San Pablo Baylands. This document describes the planning effort that led up to the Corps San Pablo Bay Watershed Restoration Study in great detail. Therefor, I will not elaborate much further about this process, except to say that I wholeheartedly agree with this approach and feel that because of the way it incorporated local landowners and numerous stakeholders, it represents the type of project that should be held up as your model.

Industrial Water Efficiency Program:
My final area of focus has to do with the efficient use of resources. This is an area that poses a promising opportunity for Congress. It is my hope that members of the Subcommittee will consider, as part of H.R. 1775, a means to provide greater incentives for innovative water conservation and recycling projects as they relate to estuaries.

The Bay Institute recently published a pilot report entitled the Industrial Water Efficiency Program targeting the City of Petaluma, California. The study is aimed at the commercial, industrial and institutional (CII) water sector and recommends the development a cost-effective public/private partnership designed to improve water efficiency and greatly reduce the mass of pollutants being discharged to the sewer system, and ultimately into San Francisco Bay.

The City of Petaluma has demonstrated true leadership with regard to water conservation over the years. This Industrial Water Efficiency Program builds upon that strong record of achievement. By implementing an Industrial Water Efficiency Program, the City has the potential to reduce water use by almost 400,000 gallons per day. This is roughly seven percent of the City's total estimated wastewater flow in the year 2010. The amount of pollutants entering the sewage treatment system will also be reduced.

As part of the Industrial Water Efficiency Program a "Case Study for Mishi Apparel, Inc." was developed. Mishi Apparel, Inc. manufacturers women's clothing and operates a dye house in Petaluma. Mishi has been in Petaluma for fifteen years and has 50 employees. The Case Study for Mishi verified that with the right combination of incentives it would be possible to reduce Mishi's demand for water by about 46% and process additives by as much as 72%. In Mishi's case, fewer materials required at the dyehouse translates into improved water quality and more dollars to invest. This program will enable the City to play a more constructive role in assisting local businesses.

I strongly urge Congress, through H.R. 1775, to continue supporting innovative water conservation measures. The most reliable new source of water in California lies with efficiency improvements among our existing users. Our Case Study of Mishi Apparel Inc, provides a wonderful opportunity to demonstrate that public investment in resource efficiency will provide highly cost-effective local economic development. The combination of pollution prevention with water conservation, particularly as it addresses the removal of metals at their source, will be especially beneficial for our nation's estuaries. The concept of approaching these goals within the context of local economic development creates additional opportunities.

Along with my original letter of support for the Estuary Habitat Restoration Partnership Act I have included two recent reports to accompany my testimony that I believe will be useful to the Subcommittee. The first report is *From Sierra to the Sea, The Ecological History of the San Francisco Bay-Delta Watershed*, published by the Bay Institute in 1998. The second is *San Pablo Baylands, A Plan to Protect and Restore the Regions Farms and Wetlands*, developed by the Partnership For The San Pablo Baylands and published earlier this year. I believe the Subcommittee will also find useful a document called *Baylands Ecosystem Habitat Goals*, which I have not included today. However, this report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project beautifully illustrates that there are numerous projects ready to be implemented in the San Francisco Bay Region. These reports also clearly demonstrate the significant amount of planning and coordination that has already taken place in the San Francisco Bay Area. What we need now is the type of financial support offered by the Estuary Habitat Restoration Partnership Act of 1999.

On behalf of The Bay Institute of San Francisco and the San Francisco Bay Joint Venture thank you again Mr. Chairman and members of the Subcommittee for the opportunity to testify before you here today.

Mr. GILCHREST. Thank you, Mr. Davis. Could each of you comment on the structure, the regional structure we've created in this legislation, whether you think you can tap into that structure?

Also, if you could comment on the question that was posed to the Corps, Fish and Wildlife, and NMFS about grants versus projects and how that is oriented. They seem to think that there could be some formula or some measure for grant projects as opposed to just having everything done through the Corps, through a project-oriented.

I'm just wondering where do each of you think you might fit into that scheme. Mr. Ribb?

I also want to thank—unless you really like to fly, I want to thank Mr. Ribb and Mr. Davis. I don't think Mike flew from Annapolis.

Mr. HIRSHFIELD. Although I wish I had. It would have been quicker.

Mr. GILCHREST. It was a little stormy last Thursday. But I really want to thank both of you for coming back this week. It's very appreciated.

Mr. RIBB. Well, I got to see the storm firsthand, so that was really interesting. I think the regional council concept is important. Our experience in our watershed is we have worked in collaboration with the Army Corps on a number of initiatives—in fact, we have a couple of investigations going on where our estuary program is the point program of contact for them, and, through us, the Corps has been able to work with all of our local stakeholders.

So I think a process that includes a diversity of interests work best having, experienced this on our watershed level. Diversity in the regional councils is important; to have the various governmental agencies, but to also have the other groups, like representation from RAE, which certainly is critical.

I think it also builds broader support. And if the local people are involved it gets back to the question you asked, how do you restore and estuary and keep it that way. I think one of the critical ways is to have the public support for it and to build the kind of political will to do those things.

In our state, we've been to bat three times on a state estuary habitat restoration bill that would use oil spill proceeds as a funding source and each time it was defeated for purely political reasons. Strong support, but not quite enough articulated at the citizen level to say to state legislators, hey, we want this to happen.

So we're working very hard to try and get that to happen, but I think, as I said, if people feel connected to the Council, the people in the neighborhood down the street from you who want to restore their salt marsh, you're likely to have a connection to the Council that's very powerful.

So I believe that's a critical component to the success of the Council. And I've forgotten the second question.

Mr. GILCHREST. Projects v. grants.

Mr. RIBB.I think the grant process, in my mind, would be better, because we have a lot of capacity right now at our regional and local level to do this kind of work. We have people who want to be involved in it.

We have universities, we have state agencies, we have citizen groups who want to be involved and have some expertise. We think that's a real good way to go at it.

Admittedly, I know a grant process, administratively, is more work, having spent a lot of time on administration myself, but I do believe that when people have the ability to do work themselves, in collaboration with the Federal, state and local groups, again, it's very powerful and it's long-lasting.

Mr. GILCHREST. Thank you. Mike?

Mr. HIRSHFIELD. I think the regional council mechanism is the way to go. I think that I'd have to go back and look at the language and see how prescriptive it is about participation of groups like ours, but whether it's prescriptive or not, as long as everybody understands that we have a real stake in this and real interest in it and that we should have a seat at the table at the beginning, I think our folks would be satisfied.

On grants or projects, I think Grant Davis really hit it right. It's figuring out—it's less about whether you call it a project or a grant than it is about figuring out the appropriate roles and responsibilities for all the participants.

If we're going to be moving a culvert, I'm really not sure that we'd need a really long Corps analysis. If we're going to be moving an island, I'd probably want a little bit longer planning process.

But just as in San Francisco Bay, a lot of work has gone into developing the plans, finding the sites, figuring out what the projects are, in many cases, with the collaboration of folks like the Corps, I'm not sure that going through what I seem to hear as being a checklist of a project approach is necessarily the way to go.

We are using an old analogy from the movie MASH, where they talked about doing not hospital surgery, but doing meatball surgery. We're talking about meatball restoration. We don't have time to satisfy the purists and academia or perhaps the engineers who are counting everything. We need to get out there and get the job done.

Mr. GILCHREST. Thank you. Grant?

Mr. DAVIS. Briefly, never to pass up a moment. It might be the last time I get to testify here, and it is getting late.

But again, there are two projects I wanted to call attention to in part of that. With all due respect to Mr. Davis with the Corps, his one item that I totally agree with is in his earlier testimony on this bill, he talked about another purpose for this legislation, which essentially was greater public appreciation and awareness for the value of the benefits of estuaries and our coastal resources.

Adding that as one of the purposes gets to the point of gaining public awareness and appreciation, and part of that then is who is engaged in the implementation.

So going back to our region, you mentioned the Sonoma Bay Lands project. That was a huge wetlands restoration, 400 acres, and it encompassed the reuse of dredge material, a beneficial reuse of material that came from the Port of Oakland that would have gone into the Bay or into the ocean. We reused it for wetland restoration. That's the model that I would like to point to.

More importantly, you have a component in here for monitoring and we're learning from the Sonoma Bay Lands project, just down

the way in Novato, California, at the Hamilton Army Air Field, and this is in my testimony. It's a 700-acre wetland restoration, again, but what's unique is it's a cement runway that's four feet below sea level, and what we're going to do is take the valuable material that's coming out of the dredge projects, put them into beneficial reuse at that site. We'll take what we learned from the Sonoma Bay Lands.

So what you've managed to do here is put the Corps into the proper place. They can move material and they can design projects and they can have the technical resources, but they require a local partner, a local cost-share, and a local vibrant community interest to help implement, and that's the power of this.

What we're hoping to do there is with NOAA, you'll have a bank where you will learn, we'll be able to tap into NOAA's database for restoration and, quite frankly, that's the missing ingredient here. When I recommend who should go and how, it depends on the project.

You can't just provide the authority to the Corps to give the opportunity to grant. If it's a grant-making project, I would concur with my colleague here that it makes sense for smaller projects to go to an NGO or a state or a local entity. For big projects, let's use the Corps, and contain it so it doesn't get out of hand.

The cost-share is what you've given here. In a nutshell, we'd be happy to work with them on implementing projects.

Mr. GILCHREST. Thank you very much, Mr. Davis. I yield now to the gentleman from American Samoa.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. I do want to thank the three panelists for their excellent statements that have been presented before the Committee.

Just a couple of questions, for the record, if I may. And I do appreciate the gentlemen's support and their endorsement of the proposed bill.

Mr. Ribb, as you are aware, there are currently 28 national estuary programs administered by the EPA and one of the things that has really made the program so outstanding, as all of you have indicated earlier, the involvement of the local communities.

Can you share with us any more elaboration on how this works within your Narragansett national estuary?

Mr. RIBB. In particular, as an example, and it's included in my written testimony, our program has worked closely with local interests—we pulled together the habitat restoration stakeholders from across that whole spectrum, university, agency, local, citizen groups, last fall, and we held a symposium on coastal habitat restoration. Out of that we came up with policy directions, research needs, and legislation that's needed.

We have a consistent team that meets on a regular basis and right now we've put together a GIS map of all of the sites, habitat restoration sites planned, proposed and completed, and we have this to work from.

Now we're working on a prioritization scheme that is right for our estuary. We've also been doing the science behind it by analyzing what's been lost, where is our best bang for the buck, but also building in what Mr. Hirshfield is saying, recognition of a will-

ingness to act. We need to recognize that and we need to take advantage of those people, programs and projects.

So at the same time that we're building the science and the consensus, we want to get out there and act and do projects, and we're doing that now on a limited level. This bill would really help meet those local needs.

In respect to the issue of the grants versus projects, we have been working closely with the Army Corps right now on a restoration planning, and they have also been involved in some of the smaller projects and I think that it's hard for them. They're not geared up for small projects, at least the way we work. So I think that they need to have that connection, as Grant said, but ned to determine the proper role of how they can work together with local intersts for these smaller projects. That's a critical component of their involvement.

I think that we've built a support system that is ready to work with this process, if this bill becomes law. We have prioritized the list of projects, we have the players, we have people ready to go, we have local funding sources, and that is not an unusual situation for the NEPs. That is a model that all NEPs use.

Mr. FALEOMAVAEGA. This is just testing the mettle of the proposed provisions of my good friend's bill here. As you all know, we've got the regional councils, but my question is that we've got 28 programs that are very successful. It seems that the key here is involvement of the local communities. I was wondering, do you think that putting the regions, like Florida, Alabama, Mississippi, Louisiana, Texas together, do you think that they have a commonality of their needs, where we put them together, or does this add another layer of more bureaucratic involvement in establishing a council or regional councils?

Mr. RIBB. I think the needs are common across those estuaries, although some are different because of their ecological situation. The difference between Louisiana and Portland, Maine, for example. But recently things, the Estuary Programs did a report on common problems across the country of different estuaries and there were six or seven priority ones that come up in every estuary, issues like habitat loss, water quality degradation, and invasive species, nutrient overloading.

So the programs, estuaries share these problems. I'm not so sure that its a big a problem, having a regional setup as ther bill describes.

Mr. FALEOMAVAEGA. And, Mr. Hirshfield, I notice that you got your doctorate from the University of Michigan. Do you think I might have any problem with the Great Lakes connotation that we're trying to take on here?

Mr. HIRSHFIELD. Well, it's funny, we were talking about the Great Lakes a little bit earlier and, as a scientist, I do have a little bit of a definitional problem with including places that have no salt in their water in a program that is fundamentally about where the salt water meets the fresh water.

But that's perhaps, in this context, a picky scientific distinction of no real importance.

Mr. FALEOMAVAEGA. I wanted just to——

Mr. HIRSHFIELD. I appreciate it. I was raised near the coast and as fast as I could leave Michigan, I got back first to California, then back here to the east.

Mr. FALEOMAVAEGA. How important do you think, Mr. Hirshfield, is the idea of monitoring the process? Maybe I'm kind of asking a leading question, but sometimes we tend to forget.

Mr. HIRSHFIELD. We are very happy to see the monitoring provisions in this legislation.

Although I was just the person who said maybe we should perhaps even cut a few corners and get out there doing restoration projects, that's, in part, reflective of my belief that the best way that scientists learn about this new discipline is by doing it.

And if you're not going to have good monitoring of the projects, then you're not going to be learning. We've all seen, over the years, lots of projects go back. The straightened rivers were, after all, designed for some, at that time, believed public good.

So having a monitoring program that really does keep an eye on what's happening, and to make sure that the benefits that we're all looking for are actually achieved I think is essential.

Mr. FALEOMAVAEGA. We've got a $280 billion military budget that we now have pending and we're only proposing $220 million for a five-year period to provide for the needs of 50 percent of our nation's population residing in the coastal areas and the 70 percent or whatever of the commercial fisheries, 90 percent of the recreational fisheries.

Maybe this is something, Mr. Chairman, that I would suggest that we ought to look at the investment, because $220 million for a five-year period is pittance. Probably not even the cost of one B-1 bomber. But to look at the difference of what this means in human needs and also our appreciation for the environment is just unbelievable.

I want to ask Mr. Davis. You know, every time I go through San Francisco, I—and, by the way, we really appreciate your coming here twice now for the course of the span of one week. I know what it means to be on a five- hour flight between the west coast and here.

But every time I come through San Francisco, I see this huge dirty area that is just absolutely muddy or whatever, clay, or whatever, and it looks like no organism lives or survives in this. It's about five miles away from the San Francisco Airport.

Am I making any inroads into what an estuary is or shouldn't be?

Mr. DAVIS. You are making the most relevant point. It's where the waters mix, and that's why I brought up fresh water flow. We have the Sacramento River and the San Joaquin that form the main tributaries that flow through the delta, out the bay, and you have the mixing zone, a nutrient zone where the animal life and the food web is really, really rich.

So when you destroy that, the physical process, all of the the species that rely on that are threatened.

My colleague here, Mr. Ribb, mentioned something about the real challenge being sedimentation and some of the non-point source pollutions and in my written testimony I talk about two other areas that we ought to look at this vehicle possibly being relevant.

One of them is to help the collaborations of the municipalities that are responsible for keeping the non-point source pollution, this is human, that are contributing toward that, the folks that live in and around these estuaries, we're all part of the problem and all part of the solution.

So addressing non-point source pollution through this vehicle may, in fact, be one other benefit that I see out of this.

In addition, there is a great deal of work going on right now through the CalFed process and work that the Bay Institute is doing on industrial water use efficiency. I bring this up because it's important to note that you can combine economic incentives from municipalities and state and local government to provide more efficient use of our resources, and that would be reducing the discharge into our estuaries, that's the sewage and the municipal load that's added into our estuaries, and combine that with an incentive for water conservation, and we're showing some dramatic numbers, where the Congress could provide just an additional incentive to local governments that are responsible for heavy loads and reducing the discharge.

This could be a vehicle, and I felt compelled to raise it because it's exciting pioneering work and, as Mr. Hirshfield said, this is an ongoing process.

It's scientific in nature. It means it's evolving and we have to practice adaptive management. We need to learn as we restore, and that's why that data bank is so darn important, because that would be our resource to evolve our understanding of how best to restore our nation's estuaries.

Mr. FALEOMAVAEGA. Gentlemen, I thank you. And, Mr. Chairman, again, I want to commend you for proposing a bill that I feel so comfortable and very confident that it will shortly have very strong bipartisan support. I want to commend you for this. And, gentlemen, thank you again for coming.

Mr. GILCHREST. Thank you, Mr. Faleomavaega, for your support and for your questions.

Gentlemen, once again, thank you for your testimony. It has been extremely helpful for us to formulate this piece of legislation and it is our hope, and I think you've done a great deal to help in that effort, to get it passed out of the House before we recess or adjourn, and passed out of the Senate.

So we'll be working to that end. If there is any other member that you think you need to call in the country to encourage them to co-sponsor or vote for this, we would appreciate it.

Thank you very much. The hearing is adjourned.

[Whereupon, at 1:06 p.m., the Subcommittee was adjourned.]

Additional material submitted for the record follows.]

I

106TH CONGRESS
1ST SESSION

H. R. 1775

To catalyze restoration of estuary habitat through more efficient financing of projects and enhanced coordination of Federal and non-Federal restoration programs, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 12, 1999

Mr. GILCHREST (for himself, Mrs. TAUSCHER, Mr. FORBES, Mr. GOSS, Mr. BILBRAY, Mr. SHAYS, Mr. CARDIN, Mr. PRICE of North Carolina, Mrs. MORELLA, Mr. SAXTON, Mr. FOLEY, Mr. BENTSEN, Mr. MCDERMOTT, Mr. METCALF, Mr. SMITH of Washington, Mr. GREENWOOD, Mr. INSLEE, Mr. DICKS, Ms. DELAURO, Mrs. LOWEY, Mr. ENGLISH, Mrs. KELLY, Mr. TAUZIN, and Mr. LAMPSON) introduced the following bill; which was referred to the Committee on Transportation and Infrastructure, and in addition to the Committee on Resources, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To catalyze restoration of estuary habitat through more efficient financing of projects and enhanced coordination of Federal and non-Federal restoration programs, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Estuary Habitat Restoration Partnership Act of 1999".

(b) TABLE OF CONTENTS.—

TITLE I—ESTUARY HABITAT RESTORATION

SEC. 101. FINDINGS.

Congress finds that—

(1) estuaries provide some of the most ecologically and economically productive habitat for an extensive variety of plants, fish, wildlife, and waterfowl;

(2) the estuaries and coastal regions of the United States are home to one-half the population of the United States and provide essential habitat for 75 percent of the Nation's commercial fish catch and 80 to 90 percent of its recreational fish catch;

(3) estuaries are gravely threatened by habitat alteration and loss from pollution, development, overuse, sea level rise, and the introduction of harmful nonindigenous species;

(4) successful restoration of estuaries demands the coordination of Federal, State, and local estuary habitat restoration programs; and

(5) the Federal, State, local, and private cooperation in estuary habitat restoration activities in existence on the date of enactment of this Act should be strengthened and new public and public-private estuary habitat restoration partnerships and strategies established.

SEC. 102. PURPOSES.

The purposes of this Act are—

(1) to promote the restoration of 1,000,000 acres of estuary habitat by 2010;

(2) to develop strategies to obtain national and regional objectives for estuary habitat restoration;

(3) to foster coordination of Federal, State, and community estuary habitat restoration programs, plans, and studies;

(4) to establish effective estuary habitat restoration partnerships among public agencies at all

levels of government and between the public and private sectors;

(5) to promote efficient financing of estuary habitat restoration activities; and

(6) to develop and enhance monitoring and research capabilities to ensure that estuary habitat restoration efforts are based on sound scientific understanding.

SEC. 103. DEFINITIONS.

In this Act, the following definitions apply:

(1) COUNCIL.—The term "Council" means the Estuary Habitat Restoration Council established by section 104.

(2) DEGRADED ESTUARY HABITAT.—The term "degraded estuary habitat" means estuary habitat where natural ecological functions have been impaired and normal beneficial uses have been reduced.

(3) ESTUARY.—The term "estuary" means a part of a river or stream or other body of water that has an unimpaired connection with the open sea and where the sea water is measurably diluted with fresh water derived from land drainage.

(4) ESTUARY HABITAT.—

(A) IN GENERAL.—The term "estuary habitat" means the physical, biological, and

chemical elements associated with an estuary, including the complex of physical and hydrologic features and living organisms within the estuary and associated ecosystems.

(B) INCLUDED HABITAT.—The term "estuary habitat" includes salt and fresh water coastal marshes, coastal forested wetlands and other coastal wetlands, maritime forests, coastal grasslands, tidal flats, natural shoreline areas, shellfish beds, sea grass meadows, kelp beds, river deltas, river and stream banks under tidal influence, and beds of submerged aquatic vegetation.

(5) ESTUARY HABITAT RESTORATION ACTIVITY.—

(A) IN GENERAL.—The term "estuary habitat restoration activity" means an activity that results in improving degraded estuary habitat (including both physical and functional restoration), with the goal of attaining a self-sustaining system integrated into the surrounding landscape.

(B) INCLUDED ACTIVITIES.—The term "estuary habitat restoration activity" includes—

(i) the reestablishment of physical features and biological and hydrologic functions;

(ii) except as provided in section 107(e), the cleanup of contamination related to the restoration of estuary habitat;

(iii) the control of nonnative and invasive species;

(iv) the reintroduction of native species through planting or natural succession; and

(v) other activities that improve estuary habitat.

(6) ESTUARY HABITAT RESTORATION PROJECT.—The term "estuary habitat restoration project" means an estuary habitat restoration activity under consideration or selected by the Council, in accordance with this Act, to receive financial, technical, or another form of assistance.

(7) ESTUARY HABITAT RESTORATION STRATEGY.—The term "estuary habitat restoration strategy" means the estuary habitat restoration strategy developed under section 106.

(8) ESTUARY MANAGEMENT OR HABITAT RESTORATION PLAN.—The term "estuary management

or habitat restoration plan" means any plan for restoration of degraded estuary habitat that—

(A) was developed by, or in cooperation with, a public body with the substantial participation of appropriate public and private stakeholders; and

(B) reflects a community-based planning process.

(9) GULF REGION.—The term "Gulf region" means the region consisting of the States of Florida, Alabama, Mississippi, Louisiana, and Texas.

(10) MIDDLE ATLANTIC REGION.—The term "Middle Atlantic region" means the region consisting of the States of New Jersey, Delaware, Maryland, Pennsylvania, and Virginia.

(11) NORTHEAST REGION.—The term "Northeast region" means the region consisting of the States of Maine, New Hampshire, New York, Massachusetts, Rhode Island, and Connecticut.

(12) NORTHWEST REGION.—The term "Northwest region" means the region consisting of the States of Oregon, Washington, and Alaska.

(13) REGIONAL COUNCIL.—The term "Regional Council" means a Regional Council of the Estuary

Habitat Restoration Council established by section 105.

(14) SECRETARY.—The term "Secretary" means the Secretary of the Army (or the Secretary's designee).

(15) SOUTHEAST REGION.—The term "Southeast region" means the region consisting of the States of North Carolina, South Carolina, Georgia, and Florida.

(16) SOUTHWEST REGION.—The term "Southwest region" means the region consisting of the States of California and Hawaii.

SEC. 104. ESTABLISHMENT OF ESTUARY HABITAT RESTORATION COUNCIL.

(a) COUNCIL.—There is established a council to be known as the "Estuary Habitat Restoration Council".

(b) DUTIES.—The Council shall be responsible for—

(1) reviewing project applications forwarded to the Council from the Regional Councils and selecting from the project applications projects that are eligible for assistance made available under this Act;

(2) developing a national strategy for restoration of estuary habitat; and

(3) periodically reviewing the effectiveness of the national strategy in meeting the purposes of this

Act, and making recommendations for improvements in the national strategy.

(c) MEMBERSHIP.—The Council shall be composed of 12 members as follows:

(1) The Secretary (or the Secretary's designee).

(2) The Under Secretary for Oceans and Atmosphere of the Department of Commerce (or the Under Secretary's designee).

(3) The Administrator of the Environmental Protection Agency (or the Administrator's designee).

(4) The Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service (or the Secretary's designee).

(5) The Secretary of Agriculture (or the Secretary's designee).

(6) The Secretary of Transportation (or the Secretary's designee).

(7) One representative from each of the 6 Regional Councils established under section 105 to be appointed by the Secretary from among individuals who are not officers or employees of the United States.

(d) APPOINTMENT AND TERMS.—

(1) IN GENERAL.—Except as provided in paragraph (2), members of the Council under subsection (c)(7) shall be appointed for a term of 3 years.

(2) INITIAL MEMBERS.—Of the members first appointed under subsection (c)(7)—

(A) 2 shall be appointed for a term of 1 year;

(B) 2 shall be appointed for a term of 2 years; and

(C) 2 shall be appointed for a term of 3 years.

(3) VACANCIES.—Whenever a vacancy occurs among members of the Council appointed under subsection (c)(7), the Secretary shall appoint an individual in accordance with such subsection to fill that vacancy for the remainder of the applicable term.

(e) PROHIBITION OF COMPENSATION.—Members of the Council may not receive compensation for their service as members of the Council.

(f) NONVOTING MEMBERS.—The Secretary is authorized and encouraged to include as nonvoting members of the Commission representatives of nonprofit charitable organizations and Native American interests, including tribal organizations, that undertake estuary habitat restoration activities.

(g) CHAIRPERSON.—The chairperson shall be elected by the Council from among its members for a 3-year term, except that the first elected chairperson may serve a term of less than 3 years.

(h) CONVENING OF COUNCIL.—The chairperson shall—

(1) convene the first meeting of the Council not later than 30 days after the date of enactment of this Act; and

(2) convene additional meetings as often as appropriate to ensure that this Act is fully carried out, but not less often than annually.

(i) COUNCIL PROCEDURES.—

(1) QUORUM.—A majority of the voting membership of the Council shall constitute a quorum for the transaction of business.

(2) VOTING AND MEETING PROCEDURES.—The Council shall establish procedures for voting and the conduct of meetings by the Council.

(3) PUBLIC PARTICIPATION.—Council meetings shall be open to the public. The Council shall provide notice to the public of such meetings.

(4) REMOVAL OF MEMBERS.—If a Council member appointed under subsection (c)(7) misses 3 consecutive regularly scheduled meetings, the Sec-

retary may remove that individual in accordance with subsection (d)(3).

(j) COORDINATOR.—The Secretary shall appoint a Coordinator who shall—

(1) be educated and experienced in estuary protection, restoration, and program management;

(2) be responsible, with assistance from the Secretary, for facilitating consideration of estuary habitat restoration projects by the Council and Regional Councils and otherwise assisting the Council and Regional Councils in carrying out their responsibilities under this Act; and

(3) be compensated with funds available under section 110(b).

SEC. 105. ESTABLISHMENT OF REGIONAL COUNCILS.

(a) REGIONAL COUNCILS.—There are established 6 Regional Councils of the Estuary Restoration Council. Each Regional Council shall represent a different one of the following regions:

(1) The Gulf region.

(2) The Middle Atlantic region.

(3) The Northeast region.

(4) The Northwest region.

(5) The Southeast region.

(6) The Southwest region.

(b) MEMBERSHIP.—A Regional Council shall be composed of the Governor of each State in the region represented by the Regional Council (or the Governor's designee) and such other members as the Governors shall jointly designate.

(c) NONVOTING MEMBERSHIP.—A Regional Council may appoint nonvoting members of the Regional Council from relevant agencies, programs, and organizations, including—

(1) relevant State agencies and regional and field staff of relevant Federal agencies;

(2) representatives of relevant coastal and estuary programs, such as those developed according to the Coastal Zone Management Program and the National Estuary Program; and

(3) representatives of nonprofit and charitable organizations that undertake estuary habitat restoration activities.

(d) CHAIRPERSON.—A Regional Council shall select a chairperson from among its members.

(e) DUTIES.—A Regional Council shall be responsible for—

(1) developing a regional strategy that is consistent with the national strategy for the selection

and prioritization of project proposals within the region;

(2) establishing technical criteria for project proposals, which are consistent with the goals and priorities of the regional and national strategies;

(3) soliciting, evaluating, and forwarding to the Council applications for estuary habitat restoration projects; and

(4) periodically reviewing the effectiveness of the regional strategy toward meeting the goals and objectives of the national strategy and recommending and implementing improvements.

(f) TECHNICAL SUPPORT.—Technical support shall be provided to a Regional Council by regional and field staff of the Corps of Engineers, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the United States Fish and Wildlife Service, and the Department of Agriculture. The Secretary shall coordinate the provision of such assistance.

(g) ADMINISTRATIVE SUPPORT SERVICES.—Upon the request of a Regional Council, the Secretary shall provide to the Regional Council the administrative support services necessary for the Regional Council to carry out its responsibilities under this Act.

SEC. 106. ESTUARY HABITAT RESTORATION STRATEGY.

(a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Council, in consultation with State and other non-Federal entities, including non-profit entities, as appropriate, shall develop an estuary habitat restoration strategy designed to ensure a comprehensive approach to maximize benefits derived from estuary habitat restoration projects and to foster the coordination of Federal and non-Federal activities related to restoration of estuary habitat.

(b) INTEGRATION OF ESTUARY HABITAT RESTORATION PLANS, PROGRAMS, AND PARTNERSHIPS.—In developing the estuary habitat restoration strategy, the Council shall—

(1) conduct a review of—

(A) estuary management or habitat restoration plans; and

(B) Federal programs established under other laws that authorize funding for estuary habitat restoration activities;

(2) develop a set of proposals for—

(A) using programs established under this Act or any other Act to maximize the incentives for the creation of new public-private partnerships to carry out estuary habitat restoration projects; and

(B) using Federal resources to encourage increased private sector involvement in estuary habitat restoration activities; and

(3) ensure that the estuary habitat restoration strategy is developed and will be implemented in a manner that is consistent with the estuary management or habitat restoration plans.

(c) ELEMENTS TO BE CONSIDERED.—Consistent with the requirements of this section, the Council in the development of the estuary habitat restoration strategy, shall consider—

(1) the contributions of estuary habitat to—

(A) providing healthy ecosystems in order to support—

(i) wildlife, including endangered and threatened species, migratory birds, and resident species of an estuary watershed; and

(ii) fish and shellfish, including commercial and recreational fisheries;

(B) surface and ground water quality and quantity, and flood control;

(C) outdoor recreation and other direct and indirect values; and

(D) other areas of concern that the Council determines to be appropriate for consideration;

(2) the estimated historic losses, estimated current rate of loss, and extent of the threat of future loss or degradation of each type of estuary habitat; and

(3) the most appropriate method for selecting a balance of smaller and larger estuary habitat restoration projects.

(d) ADVICE.—The Council shall seek the advice of experts in restoration of estuary habitat to assist in the development of an estuary habitat restoration strategy.

(e) PUBLIC REVIEW AND COMMENT.—Before adopting a final estuary habitat restoration strategy, the Council shall publish in the Federal Register a draft of the estuary habitat restoration strategy and provide an opportunity for public review and comment.

(f) PERIODIC REVISION.—Using data and information developed through project monitoring, management, and other relevant information, the Council shall periodically review and update, as necessary, the estuary habitat restoration strategy.

SEC. 107. APPLICATIONS FOR ESTUARY HABITAT RESTORATION PROJECTS.

(a) IN GENERAL.—An application for an estuary habitat restoration project shall originate from a State or other non-Federal entity and shall require the approval of the appropriate State or local agencies, if such approval is required under State or local laws.

(b) REVIEW BY REGIONAL COUNCILS.—

(1) IN GENERAL.—An application for an estuary habitat restoration project shall first be submitted to the appropriate Regional Council for review.

(2) TECHNICAL ASSISTANCE.—A Regional Council receiving an application from an applicant under paragraph (1) shall provide, as necessary, technical assistance to the applicant to ensure that the application is complete.

(3) SELECTION.—A Regional Council shall select for each fiscal year those applications for estuary habitat restoration projects that the Regional Council determines are eligible for funding under the factors specified in subsection (c) and shall transmit such applications to the Council for further review.

(4) CONSIDERATION BY COUNCIL.—The Council may provide financial assistance to an estuary habitat restoration project under this Act only if the

project has been transmitted to the Council by a Regional Council under paragraph (3).

(c) FACTORS TO BE TAKEN INTO ACCOUNT.—In determining the eligibility of an estuary habitat restoration project for financial assistance under this Act, the Council shall consider the following factors:

(1) Whether the proposed estuary habitat restoration project meets the criteria specified in the estuary habitat restoration strategy.

(2) The technical merit and feasibility of the proposed estuary habitat restoration project.

(3) Whether the non-Federal entities proposing the estuary habitat restoration project provide satisfactory assurances that they will have adequate personnel, funding, and authority to carry out and properly maintain the estuary habitat restoration project.

(4) Whether the proposed estuary habitat restoration project will encourage the increased coordination and cooperation of Federal, State, and local government agencies.

(5) The amount of private funds or in-kind contributions for the estuary habitat restoration project.

(6) Whether the proposed habitat restoration project includes a monitoring plan that is consistent

with standards for monitoring developed under section 109 to ensure that short-term and long-term restoration goals are achieved.

(7) Other factors that the Council determines to be reasonable and necessary for consideration.

(d) PRIORITY ESTUARY HABITAT RESTORATION PROJECTS.—An estuary habitat restoration project shall be given a higher priority in receipt of funding under this Act if, in addition to meeting the selection criteria established by the Council—

(1) the estuary habitat restoration project is part of an estuary management or habitat restoration plan; or

(2) there is a program within the watershed of the estuary habitat restoration project that addresses sources of pollution and other activities that otherwise would re-impair the restored habitat.

(e) EXCLUDED ACTIVITIES.—An activity shall not be considered to be an estuary habitat restoration activity under this Act if the activity—

(1) constitutes mitigation for the adverse effects of an activity regulated or otherwise governed by Federal or State law; or

(2) constitutes restoration for natural resource damages required under any Federal or State law.

SEC. 108. ADMINISTRATIVE PROVISIONS.

(a) COOPERATIVE AGREEMENTS; MEMORANDA OF UNDERSTANDING.—In carrying out this Act, the Council may—

(1) enter into cooperative agreements with Federal, State, and local government agencies and other entities; and

(2) execute such memoranda of understanding as are necessary to reflect the agreements.

(b) DISTRIBUTION OF APPROPRIATIONS FOR ESTUARY HABITAT RESTORATION ACTIVITIES.—The Secretary shall allocate funds made available to carry out this Act based on the need for the funds and such other factors as are determined to be appropriate to carry out this Act.

(c) COST SHARING OF ESTUARY HABITAT RESTORATION PROJECTS.—

(1) IN GENERAL.—No financial assistance in carrying out an estuary habitat restoration project shall be available under this Act from any Federal agency unless the non-Federal applicant for assistance demonstrates that the estuary habitat restoration project meets—

(A) the requirements of this Act; and

(B) any criteria established by the Council under this Act.

(2) FEDERAL SHARE.—The Federal share of the cost of an estuary habitat restoration and protection project assisted under this Act shall not exceed 65 percent.

(3) NON-FEDERAL SHARE.—The non-Federal share of the cost of an estuary habitat restoration project may be provided in the form of land, easements, rights-of-way, services, or any other form of in-kind contribution determined by the Council to be an appropriate contribution equivalent to the monetary amount required for the non-Federal share of the estuary habitat restoration project.

(d) INTERIM ACTIONS.—

(1) IN GENERAL.—Pending completion of the estuary habitat restoration strategy developed under section 106, the Council may pay the Federal share of the cost of an interim action to carry out an estuary habitat restoration activity.

(2) FEDERAL SHARE.—The Federal share of the cost of an estuary habitat restoration activity assisted under this Act before the completion of the estuary habitat restoration strategy shall not exceed 25 percent.

(e) COOPERATION OF NON-FEDERAL PARTNERS.—

(1) IN GENERAL.—The Council shall not select an estuary habitat restoration project until a non-Federal interest has entered into a written agreement with the Secretary in which the non-Federal interest agrees to provide the required non-Federal cooperation for the project.

(2) NONPROFIT ENTITIES.—Notwithstanding section 221 of the Flood Control Act of 1970 (42 U.S.C. 1962d–5b(b)), for any project undertaken under this section, the Secretary may, after coordination with the appropriate State and local officials responsible for the political jurisdiction in which a project would occur, allow a nonprofit entity to serve as the non-Federal interest.

(3) MAINTENANCE AND MONITORING.—A cooperation agreement entered into under paragraph (1) shall provide for maintenance and monitoring of the estuary habitat restoration project to the extent determined necessary.

(f) AGENCY CONSULTATION AND COORDINATION.—In carrying out this Act, the Council shall, as the Council determines it to be necessary, consult with, cooperate with, and coordinate its activities with the activities of other Federal agencies.

(g) BENEFITS AND COSTS OF ESTUARY HABITAT RESTORATION PROJECTS.—The Council shall evaluate the benefits and costs of estuary habitat restoration projects in accordance with section 907 of the Water Resources Development Act of 1986 (33 U.S.C. 2284).

(h) ALLOCATION OF FUNDS BY STATES.—With the approval of the Secretary, a State may allocate to any local government, area-wide agency designated under section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 (42 U.S.C. 3334), regional agency, interstate agency, or nonprofit entity a portion of any funds disbursed in accordance with this Act for the purpose of carrying out an estuary habitat restoration project.

SEC. 109. MONITORING AND MAINTENANCE OF ESTUARY HABITAT RESTORATION PROJECTS.

(a) DATABASE OF RESTORATION PROJECT INFORMATION.—The Under Secretary for Oceans and Atmosphere of the Department of Commerce shall develop and maintain an appropriate database of information concerning estuary habitat restoration projects funded under this Act, including information on project techniques, project completion, monitoring data, and other relevant information.

(b) MONITORING DATA STANDARDS.—The Council shall develop standard data formats for monitoring

projects, along with requirements for types of data collected and frequency of monitoring.

(c) REPORT.—

(1) IN GENERAL.—The Council shall biennially submit a report to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure and the Committee on Resources of the House of Representatives on the results of activities carried out under this Act.

(2) CONTENTS OF REPORT.—A report under paragraph (1) shall include—

(A) data on the number of acres of estuary habitat restored under this Act, including the number of projects approved and completed that comprise those acres;

(B) the percentage of restored estuary habitat monitored under a plan to ensure that short-term and long-term restoration goals are achieved;

(C) an estimate of the long-term success of varying restoration techniques used in carrying out estuary habitat restoration projects;

(D) a review of how the information described in subparagraphs (A) through (C) has

been incorporated in the selection and implementation of estuary habitat restoration projects;

(E) a review of efforts made to maintain an appropriate database of restoration projects funded under this Act; and

(F) a review of the measures taken to provide the information described in subparagraphs (A) through (C) to persons with responsibility for assisting in the restoration of estuary habitat.

SEC. 110. FUNDING.

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) ESTUARY HABITAT RESTORATION ACTIVITIES.—There is authorized to be appropriated to the Secretary for estuary habitat restoration activities—

(A) $40,000,000 for fiscal year 2001;

(B) $50,000,000 for fiscal year 2002; and

(C) $75,000,000 for each of fiscal years 2003 through 2005.

(2) MONITORING.—There is authorized to be appropriated to the Under Secretary for Oceans and Atmosphere of the Department of Commerce for the acquisition, maintenance, and management of monitoring data on restoration projects funded under this

Act, $2,000,000 for each of fiscal years 2001 through 2005.

(b) SET-ASIDE FOR ADMINISTRATIVE EXPENSES OF THE COUNCIL AND REGIONAL COUNCILS.—Not to exceed 3 percent of the amounts appropriated for a fiscal year under subsection (a)(1) or $2,000,000, whichever is greater, may be used by the Secretary for administration and operation of the Council and Regional Councils.

SEC. 111. GENERAL PROVISIONS.

(a) ADDITIONAL AUTHORITY FOR ARMY CORPS OF ENGINEERS.—The Secretary may carry out estuary habitat restoration projects in accordance with this Act.

(b) INAPPLICABILITY OF CERTAIN LAW.—Sections 203, 204, and 205 of the Water Resources Development Act of 1986 (33 U.S.C. 2231, 2232, and 2233) shall not apply to an estuary habitat restoration project selected in accordance with this Act.

(c) ESTUARY HABITAT RESTORATION MISSION.—The Secretary shall ensure that restoration of estuary habitat is included as a primary mission of the Corps of Engineers under section 306 of Water Resources Development Act of 1990 (33 U.S.C. 2316).

(d) FEDERAL AGENCY FACILITIES AND PERSONNEL.—

(1) IN GENERAL.—Federal agencies may cooperate in carrying out scientific and other programs necessary to carry out this Act, and may provide facilities and personnel, for the purpose of assisting the Council in carrying out its duties under this Act.

(2) REIMBURSEMENT FROM COUNCIL.—Federal agencies may accept reimbursement from the Council for providing services, facilities, and personnel under paragraph (1).

(e) ADMINISTRATIVE EXPENSES AND STAFFING.—Not later than 180 days after the date of enactment of this Act, the Comptroller General of the United States shall submit to Congress and the Secretary an analysis of the extent to which the Council needs additional personnel and administrative resources to fully carry out its duties under this Act. The analysis shall include recommendations regarding necessary additional funding.

TITLE II—CHESAPEAKE BAY PROGRAM

SEC. 201. REAUTHORIZATION OF CHESAPEAKE BAY PROGRAM.

Section 117(d) of the Federal Water Pollution Control Act (33 U.S.C. 1267(d)) is amended to read as follows:

"(d) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section such sums as may be necessary for fiscal years 1991 through 2000 and $30,000,000 for each of fiscal years 2001 through 2005, of which no more than $3,000,000 is authorized to be appropriated for any such fiscal year to carry out subsection (a). Such sums shall remain available until expended.".

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106TH CONGRESS
1ST SESSION

H. R. 2821

To amend the North American Wetlands Conservation Act to provide for appointment of 2 additional members of the North American Wetlands Conservation Council.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 9, 1999

Mr. DINGELL (for himself and Mr. WELDON of Pennsylvania) introduced the following bill; which was referred to the Committee on Resources

---

A BILL

To amend the North American Wetlands Conservation Act to provide for appointment of 2 additional members of the North American Wetlands Conservation Council.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "North American Wetlands Conservation Council Expansion Act of 1999".

SEC. 2. ADDITIONAL MEMBERS OF THE NORTH AMERICAN WETLANDS CONSERVATION COUNCIL.

(a) ADDITIONAL MEMBERS.—Section 4(a)(1)(D) of the North American Wetlands Conservation Act (16

U.S.C. 4403(a)(1)(D)) is amended by striking "three" and inserting "five".

(b) INITIAL TERMS.—Of the members of the North American Wetlands Conservation Council first appointed under the amendment made by subsection (a)—

(1) one shall be appointed to an initial term of 1 year; and

(2) one shall be appointed to an initial term of 2 years,

as specified by the Secretary of the Interior at the time of appointment.

(c) RELATIONSHIP TO EXISTING APPOINTMENT REQUIREMENTS.—This section shall not affect section 304 of the Wetlands and Wildlife Enhancement Act of 1998 (112 Stat. 2958; 16 U.S.C. 4403 note).

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106TH CONGRESS
1ST SESSION

H. R. 2496

To reauthorize the Junior Duck Stamp Conservation and Design Program Act of 1994.

IN THE HOUSE OF REPRESENTATIVES

JULY 13, 1999

Mr. ORTIZ introduced the following bill; which was referred to the Committee on Resources

---

A BILL

To reauthorize the Junior Duck Stamp Conservation and Design Program Act of 1994.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. REAUTHORIZATION OF JUNIOR DUCK STAMP CONSERVATION AND DESIGN PROGRAM ACT OF 1994.

Section 5 of the Junior Duck Stamp Conservation and Design Program Act of 1994 (16 U.S.C. 719c) is amended by striking "for each of the fiscal years 1995

through 2000" and inserting "for each of the fiscal years 2001 through 2005".

○

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September 14, 1999

The Honorable Jim Saxton
Chair Fisheries Conservation, Wildlife & Oceans Subcommittee
1324 Longworth
US House of Representatives
Washington, DC 20515

Dear Chairman Saxton:

At the request of Congressman Gilchrest's office, I am enclosing the testimony of Will Baker, President of Chesapeake Bay Foundation, in support of HR 1775. Your subcommittee (Fisheries Conservation, Wildlife & Oceans) is holding hearings on this bill on Thursday, September 16, 1999 on HR 1775. I hope that you will accept this written testimony in that regard.

Please do not hesitate to contact me if you have any questions. Thank you for your efforts in support of HR 1775.

Very Truly Yours,

David R. Anderson
Senior Counsel
Director of Federal Affairs

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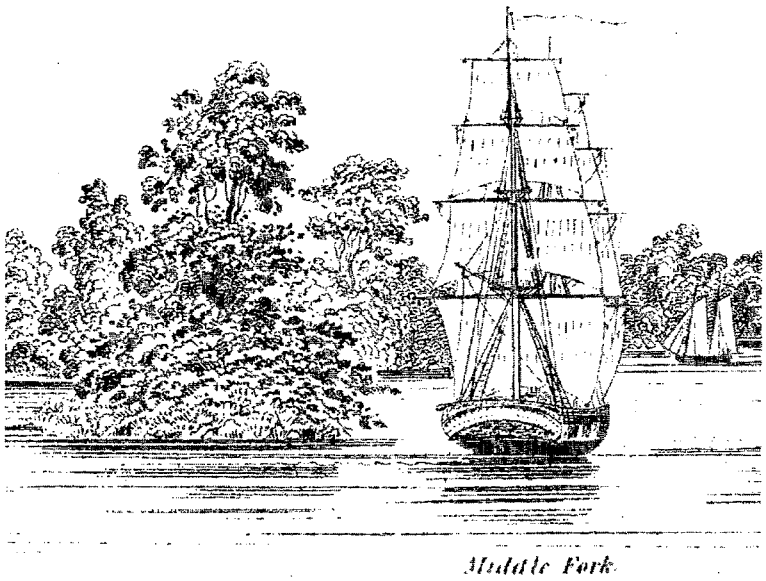
From the Sierra to the Sea

The Ecological History of the San Francisco Bay-Delta Watershed



The Bay Institute of San Francisco

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The Bay Institute of San Francisco is a non-profit research and advocacy organization which works to protect and restore the ecosystem of the San Francisco Bay/Delta estuary and its watershed. Since 1981, the Institute's policy and technical staff have led programs to protect water quality and endangered species, reform state and federal water management, and promote comprehensive ecological restoration in the Bay/Delta.

Copies of this report can be ordered for $40.00 (includes sales tax, shipping and handling) from:

The Bay Institute of San Francisco
55 Shaver Street, Suite 330
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Fax: (415) 721-7497

The cover is taken from an engraving showing the entrance to the middle fork of the Sacramento River near modern-day Steamboat Slough, in C. Ringgold's 1852 series of navigational charts and sailing directions for San Francisco Bay and Delta.

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From the Sierra to the Sea

The Ecological History of the San Francisco Bay-Delta Watershed

Executive Summary and Color Maps

(The enclosed outline details the contents of the full 238-page report. To order the complete document, please see the inside of the front cover.)

July 1998

The Bay Institute

FROM THE SIERRA TO THE SEA: THE ECOLOGICAL HISTORY OF THE SAN FRANCISCO BAY-DELTA WATERSHED

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CONTRIBUTORS AND ACKNOWLEDGEMENTS

This report would not have been possible without the generous financial support of the David and Lucile Packard Foundation, the United States Environmental Protection Agency, the CalFed Bay-Delta Program, the Metropolitan Water District of Southern California, and California Urban Water Agencies. We would also like to acknowledge the Marin Community Foundation, the William and Flora Hewlett Foundation, and the Fred Gellert Family Foundation for their generous contributions to The Bay Institute's general operating budget.

This report is the product of the dedicated effort of many individuals and organizations. We want to acknowledge the patience and perseverance of all the individuals who contributed. Bill Alevizon (formerly Staff Ecologist, The Bay Institute; currently consulting ecologist) was the senior author and editor, and project manager for the early drafts of the report. Peter Vorster (Staff Hydrologist, The Bay Institute) was the project manager for the final report and provided technical editing, GIS and figure preparation, historical conditions research, and water balance development. Alison S. Britton Consulting/Design Services produced the report with the assistance of Kent Sumrall of the Bay Institute. Kate Britton compiled and proofed the references.

The GIS maps were produced by Brian Cohen of GreenInfo Network with contributions and data provided by John Cain of the Natural Heritage Institute, Steve Greco of the University of California at Davis, Jo Ann Gronberg of the United States Department of the Interior, Robin Grossinger of the San Francisco Estuary Institute, Dave Hanson of the United States Bureau of Reclamation, Dan Scollon of the Bay Institute, Steve Skartvedt of Golden Gate National Recreation Area, Jennifer Vick of Stillwater Sciences, and Paul Viesze of the California Department of Fish and Game.

The final report built upon contributions by the original drafting and research team composed of Bill Alevizon and Nicole Wainwright (The Bay Institute), Jennifer Vick, Michelle Orr, and Phil Williams (Philip B. Williams and Associates), and Rod Fujita and Karen Levy (Environmental Defense Fund). Valuable contributions were also provided by the reviewers of the various drafts of this report. The reviewers included Elaine Archibald (Archibald and Wallberg), Gary Bobker and Grant Davis (The Bay Institute), Richard Denton (Contra Costa Water District), Phyllis Fox (Environmental Management), Robert Nuzum (East Bay Municipal Utilities District), Pete Rhoads (Metropolitan Water District of Southern California), Doug Shields (United States Department of Agriculture, Sedimentation Laboratory), Randy Bailey (Bailey Environmental), and Charles Simenstad (University of Washington). Bruce Herbold (United States Environmental Protection Agency), Elise Holland (The Bay Institute), Brian Atwater (University of Washington), Judd Monroe (consulting environmental planner), Steve Johnson (the Nature Conservancy), and Fred Nichols (United States Geological Survey) reviewed sections of the report. Several reviewers provided

significant additional information and many constructive revisions to the final draft. In particular we wish to acknowledge the efforts of Phyllis Fox and Elaine Archibald in that regard. Although the contributions of all the persons mentioned above were invaluable, none of the foregoing are responsible for the final version of this report.

We also want to acknowledge contributions from the following organizations and individuals who supplied data and other information used in the report: the California Department of Water Resources (Tariq Kadir and others), Roger Putty (Montgomery Watson), David Dawdy, the United States Geological Survey, the Water Resources Archives and the Bancroft Library at the University of California at Berkeley. Phyllis Fox made her extensive personal collection of archival material available. Many other individuals too numerous to list answered our questions and provided information. We thank you.

EXECUTIVE SUMMARY

I. Background and Introduction

A vast watershed connects the mountain streams surrounding California's Central Valley with San Francisco Bay and the ocean beyond. Over the course of the last two centuries, much of the natural productivity, biodiversity and ecological integrity of the watershed has been destroyed by modifying the environment without fully understanding the long-term environmental consequences. Long the site of some of the nation's most intensive conflicts over the use of land and water resources, this system is now emerging as the focus of one of the most ambitious ecological restoration efforts ever undertaken in the United States.

This report was designed to provide a coherent and defensible *ecological framework* and information base for restoration. The need for such an historical, broad-scale perspective on system ecology stems from two fundamental principles of ecological restoration - the need to manage toward a natural template and to manage at ecosystem and landscape levels.

(1) ***Manage toward the natural template.*** Natural conditions and processes shaped the life history requirements of native species. While we may not fully understand the requirements or inherent adaptability of any particular species, we do know that these were closely tied to the historic attributes and variability of the systems in which they lived and evolved. Therefore, this report attempts to provide a description of the natural ecosystem. The period prior to 1850 - a time before the system was significantly altered by human activities - was chosen as the basis for the "natural" undisturbed watershed. Comprehensive restoration in the truest sense of the term - a return to pre-disturbance conditions - is *not* a realistic goal, or even a possibility, for most of the watershed. Nonetheless, careful consideration of environmental conditions at a time when the system was in a relatively undisturbed state provides a necessary baseline from which to develop the conceptual framework and practical tools necessary for effective restoration and management planning at the ecosystem and landscape levels.

(2) ***Manage at ecosystem and landscape levels.*** The basic conservation and management unit for aquatic systems should be an area large enough to support self-sustaining populations of native species. Ecosystem and landscape-level approaches to restoration/management efforts focus upon large-scale spatial areas, and the habitats contained within. This

fundamentally differs from species-level efforts, which instead are based upon attempts to identify and address the "needs" or "limiting factors" of particular *species*. Broad-scale, area-based approaches address a number of essential conservation needs that single-species approaches do not. They provide a means to protect species about which little is known, and a means to protect a wide variety of species while they are still common. Nonetheless, it must be emphasized that broad ecosystem-level conservation strategies and restoration programs are meant to *complement* rather than *replace* species-level conservation strategies. Both are necessary to address conservation needs.

To provide the information necessary to support restoration efforts, this report addresses four fundamental areas:

(1) The natural system prior to 1850 is described in Chapter 2,

(2) Changes to the natural system are documented in Chapter 3,

(3) The resulting ecological response and contemporary system are described in Chapter 4, and

(4) Recommendations for guiding system-wide restoration efforts are presented in Chapter 5.

II. The Watershed: Two Centuries of Change

The watershed is far too large and ecologically heterogeneous to be considered a single ecosystem in the usual sense of the term. Rather, it is more appropriately (for management purposes) considered a mosaic of a number of different ecosystems that are integrated into a larger landscape. The watershed (and this report) are divided into five separate aquatic ecosystems -- upland river-floodplain, lowland river-floodplain, the Delta, San Francisco Bay, and the nearshore ocean. This report addresses only aquatic ecosystems, because the impetus for habitat restoration in this system is to provide habitat for declining fishes. The report also focuses on the lowland-river floodplain and the Delta because these are the current targets of most restoration activities. Other habitats not directly connected to these principal aquatic ecosystems, such as lowland prairies or mountain forests, are not addressed. This report documents each of these aquatic ecosystems and factors causing their decline using eyewitness accounts, scientific investigations, historic maps, and local and regional histories.

The Sacramento and San Joaquin Rivers collect water from a vast drainage area, stretching from the Cascades to the Tehachapi, and from the Sierra to the sea. These rivers first begin to mix with ocean waters in the Delta. From there, water flows into and through a series of large embayments collectively known as greater San Francisco Bay. The estuary discharges to the Pacific Ocean through the Golden Gate. This aquatic "circulatory system" is the life blood of the five major, interactive aquatic "ecosystem types" described in this report.

The natural landscape and associated biological communities have been drastically altered by California's population boom of the last 150 years. Harvest of plants and animals, the introduction of exotic species, livestock raising, farming, mining, urbanization, development of navigable waterways, flood control, and the redistribution of water resources have altered the landscape and its native biota in many ways, both directly and indirectly. The precise linkages and mechanisms that have mediated any particular population or species-level change are unknown in many cases, but in total the effects of these combined human interventions on system ecology is staggering. The most severe of these are summarized below, at both the landscape and ecosystem levels.

II.A. A Watershed-Scale Perspective

Under natural conditions, flood waters in the lowland Central Valley spilled over natural levees and coursed through an intricate network of distributary sloughs into vast tule marshes that flanked the main river channels. Enormous flood plains and natural flood basins functioned similar to reservoirs, filling and draining every year. This delayed the transmission of flood flows, reducing peak flows and velocities, and increased summer flows as the waters spread out over the floodplain slowly drained back into the river later in the year. At the watershed scale, changes in system hydrology appear to have had the greatest and most pervasive effects. These changes include reclaiming the marshes to make way for agriculture, replumbing the entire valley to control flooding, and constructing one of the largest water delivery systems in the world. These changes, along with more localized interventions, have substantially altered the ecology of each of the watershed's aquatic ecosystems, as summarized below.

Native vegetation was the first casualty of the rapid growth that followed in the wake of the Gold Rush. Riparian forests or woodlands occurred along virtually all of the streams and rivers of the Central Valley, including the broad natural levees of the Sacramento and Feather Rivers. These forests and woodlands were the most accessible woody vegetation on the valley floor and were rapidly used for fencing, lumber, and

fuel by early settlers; they were also cleared to make way for farms. By the 1880s, a significant portion of the riparian forest had been harvested.

The freshwater marshes, which stretched from Willows to Bakersfield in a continuous swath of green, were nestled in river bottoms, in the Sacramento Valley flood basin, and in the Delta. They proved more intractable to the plow and engineering prowess than the riparian forests and did not succumb to the advance of civilization until the turn of the century. These marshes originally functioned as vast floodplains that were inundated by the tides in the Delta and overbank flooding in the Sacramento and San Joaquin Valleys, and were sustained throughout the year by an intricate network of sloughs that connected them with the main channels. The Delta marshes with their rich peat soil were reclaimed first. The valley marshes were not reclaimed until natural flooding was controlled in the 1920s by the complex system of weirs and bypasses that now drain the Central Valley, dredging technology and engineering skills advanced, and state laws were passed to finance and organize reclamation districts to carry out the work on a large scale. Most of the marshes were under cultivation by 1930, ushering in the rush to supply water to the farms and cities that replaced them.

Today, this once richly-endowed landscape is crisscrossed with a maze of aqueducts and canals that deliver water to farms and cities where formerly wildlife thrived. This "aqueduct empire," comprising some 31 million acre feet of reservoir storage, 100,000 groundwater pumps and 1,300 miles of aqueducts and canals, redistributes and transports 30 million acre feet of water every year, and together with marsh reclamation and flood control, has transfigured the "circulatory system" of the watershed. Almost no natural floodplain storage remains. Nearly every major waterway draining the encircling mountains has been interrupted by a series of dams, in most cases terminating in the foothills in a large "terminal" storage reservoir. These have disrupted wetland and riparian corridors and their native fishes and wildlife that formed the natural biological links among aquatic ecosystems. The main changes evident below the terminal storage dams are a pronounced reduction and temporal shift in flows, reduced monthly and inter-annual variability, and shifts in water quality. Average winter/spring flows are now substantially lower, and summer/fall flows slightly higher than they were under natural conditions, except in those drainages, particularly in the San Joaquin and Tulare Lake Basins, where much of the flow is diverted into canals.

On a valley-wide basis, the volumes of large floods remain largely unchanged, although only in very heavy snowpack years do flood flows approach historic levels in the San Joaquin Valley. Rather than regularly spilling out onto floodplains, flood flows today

are instead confined to riprapped and artificially leveed river channels (or bypass channels) and quickly conveyed out of the river systems and into the lower estuary and the Pacific Ocean.

In addition to hydrologic changes, sediment transport through the system has been greatly altered. Sediment delivery rates for the upland rivers of the heavily-mined basins remain two to eight times greater than natural, and large deposits remain in some channels from hydraulic mining in the 19th century. Today, rivers below the dams have no source from which to replace sediments removed from their channels.

II.B. Upland River-Floodplain Systems

Riparian forest was naturally distributed along most of the entire length of upland river and stream channels, supporting highly diverse assemblages of insects, amphibians, reptiles, birds and mammals. There has been a widespread and substantial loss and degradation of riparian zones throughout the region. Perhaps as many as 25% of the species dependent upon riparian habitat of the upland region are now at risk of extinction.

It has been estimated that due to dams and other barriers, about 90% of historical salmon spawning habitat in the Sacramento-San Joaquin system is no longer accessible to these fishes. The amount of large woody debris in streams, which normally originates in nearby forests, has declined markedly throughout much of the Sierra, degrading in-stream habitat by reducing complexity. Non-native fishes are now widespread and abundant throughout much of the upland system, and continue to adversely affect the distribution of a wide range of native species.

Water quality problems plague much of the upper watershed. Downstream of dams, altered channel morphology and benthic sediment characteristics, as well as elevated turbidity and temperatures are widespread. Mining, logging, urbanization, and recreational use have increased sediments, nutrients, and bacterial and chemical pollution of once pristine mountain streams.

II.C. Lowland (Alluvial) River-Floodplain Ecosystems

Under natural conditions, vast riparian forests teeming with wildlife inhabited natural levees along every stream channel in the Central Valley, stretching like a green ribbon for miles on both sides of the channel in some areas. Permanent marshes, choked with tules, dotted with lakes, and crisscrossed with distributary sloughs, nestled between the

riparian forests and oak woodlands/savannas and vernal pools that stretched across the plains as far as the eye could see.

This report estimates that there were about one million acres of potential riparian habitat, about 900,000 acres of tule marsh, and 415,000 acres of vernal pools in the Sacramento and San Joaquin Basins alone, and additional unquantified acreages of oak woodland/savanna. Huge expanses of this vegetation were also present in the Tulare, including some 477,000 acres of tule marsh and 256,000 acres of riparian oak woodland in the Kaweah delta alone. Today, this vegetation has been almost entirely lost, mostly converted to agricultural production. Less than 5% of historical wetlands, 11% of vernal pools, and about 6% of the riparian zone remain in a quilt of disconnected patches too small to sustain dependent species. Remaining patches of riparian forest, for example, exist as narrow, fragmented corridors less than 100 yards wide, and only a small fraction of those are in nearly pristine condition.

The naturally meandering rivers described above are today generally constrained in straightened leveed sections. Confinement of the main channel between riprapped levees eliminated most meander cutoffs and oxbows, pool/riffle sequences, sunken woody debris and other habitat complexities. Water quality remains severely degraded, due to the combined effects of inactive mine discharges and urban and agricultural runoff. The Tulare Basin lakes are but a faint memory, having been converted to agriculture and hydrologically disconnected from the east side tributaries and San Joaquin River, except in unusually wet years. Floodplain habitat that supported this landscape has been dramatically altered. Most of the natural flood basins are now effectively isolated from the river, except during major floods. Once miles-wide active floodplains are now limited to narrow terraces between levees and flood bypass channels.

Herds of large mammalian herbivores - deer, antelope and elk - and their mammalian predators once depended upon the forests and marshes. They have been reduced to a few scattered remnant populations, as have many of the small mammals that typically occupied these habitats. Birds have been particularly hard-hit, with many once-common species now reduced to remnant populations or extinct. Waterfowl no longer blacken the skies above the Central Valley marshes. Fish populations have dramatically declined due to a long succession of assaults, including marsh reclamation, hydraulic mining, pollution, flood control, and water resource development. The lowland rivers are now dominated by introduced species rather than native fish assemblages.

II.D. The Delta

Prior to 1850, the Delta was probably the richest ecosystem of the watershed in terms of abundance and diversity of game animals and birds. It was largely a vast, sea-level swamp, composed of huge tracts of intertidal wetlands transected by a complex network of waterways. The Delta of today bears little resemblance to its historical condition. Today, over 95% of the original 550 square miles of tidal wetlands are gone. Many miles of tidal sloughs no longer exist, nor does most of the riparian vegetation that once bordered the larger waterways. In its place is a patchwork of intensely-farmed "islands," riprapped and elevated levees, straightened and deepened channels, permanently flooded remnants of former wetlands now too far underwater to allow the re-establishment of emergent vegetation, and the center of one of the largest man-made water delivery systems in the world. Massive State, Federal, and local agency pumping plants, and over 1,800 unscreened agricultural diversions now transfer water, fish and drifting estuarine life out of the aquatic environment.

Pollution in the Delta is a serious concern today, because it is a source of drinking water and is occasionally toxic to aquatic organisms. Delta waters contain elevated concentrations of pathogens, pesticides, trace metals, salinity, and organic carbon which is a disinfection by-product precursor.

The combination of habitat loss and successful invasion by a virtual army of non-native species has almost completely obliterated the Delta's native biological community. Benthic assemblages are dominated by non-natives. The native resident fish fauna has been replaced by a largely introduced assemblage. Two of the three historically dominant fish species are no longer found here. Waterfowl, once extremely abundant in the Delta's tidal marshes, are now drastically reduced in numbers. Of the diverse and abundant native mammalian assemblage formerly found in the Delta, only a few aquatic species - otter and beaver , along with the raccoon - are still seen, though in vastly reduced numbers and at scattered locations. Nutrient and energy sources, and food webs have been greatly modified.

II.E. Greater San Francisco Bay

San Francisco Bay has undergone major habitat alterations over the course of the last two centuries. About 75% of the estimated 242,000 acres of highly productive native tidal marshes and mudflats has been converted to a variety of urban/industrial uses, altering trophic dynamics and food webs. Native biological assemblages of the Bay have been drastically altered by a combination of overharvesting, habitat loss and degradation, pollution, and the introduction of exotics. The topography of the Bay floor

continues to be periodically disturbed by dredging to maintain shipping channels. Changes in upstream hydrology and erosion, sediment transport and deposition rates have affected sediment types and distribution - and therefore benthic invertebrate assemblages - throughout the Bay.

II.F. The Nearshore Ocean

Most substantive interactions (regular exchange of water, nutrients, and organisms) between the nearshore ocean and the rest of the watershed are concentrated within a comparatively restricted area near the Golden Gate. Some oceanic processes or events may occur beyond these boundaries that influence watershed ecology. These may include, for example, changes in oceanic conditions such as temperatures, currents, and water quality that affect the migration patterns of anadromous fish or marine density-dependent mechanisms, such as food supplies or predation, that limit populations. However, while these are generally considered well beyond the scope of practical management or restoration efforts, they must be recognized to understand the probable success of restoration efforts.

Shoreline habitats throughout the region have been severely modified in many cases. Pollution offshore is generally not high relative to inshore coastal sites of Central California but nevertheless exists from historic dumping. Over-harvesting of once-plentiful abalone and other shellfish has undoubtedly affected rocky intertidal communities. Ocean harvest of salmon has steadily increased at a rate of about 0.5% per year for the last 40 years, for a total increase of about 20%.

III. Applications: Building a Practical Framework for Ecosystem Restoration and Management

Restoration efforts in this highly developed and populated watershed must necessarily reflect a compromise between conflicting needs. Ensuring the long-term protection of the watershed's ecosystems and habitats requires comprehensive, ecosystem-level efforts. The comprehensive restoration of the *entire* geographic range of the watershed is neither feasible nor desirable. It is incompatible with the needs of 30 million human inhabitants of the state, needs which *also* must be met. Further, the degree of disturbance and (in some cases) irreversible changes in the watershed render it technically and economically unfeasible to undo two centuries of unchecked damage. What then might be the strategic solution to this apparent conflict? Two fundamentally different options are available: A limited number of particularly desirable ecological characteristics (e.g., increased population levels or production) can be rehabilitated.

This approach, called partial restoration or rehabilitation may provide substantial *"ecological benefits even though full restoration is not attained"* (NRC 1992). Alternatively, comprehensive restoration to full ecological integrity throughout the watershed can be attempted.

Planning efforts to date suggest that only *a combination of both approaches* - full-scale restoration at selected sites, and rehabilitation throughout the entire watershed - will achieve the diverse long and short-term biological conservation/resource enhancement goals encompassed by the CALFED program in a manner compatible with current and projected human population levels and their resource needs.

IV. Concluding Recommendations

This report examines the ecological history of the Bay-Delta-River watershed, and considers alternative strategic approaches to ecological restoration that might lead to long-term protection of the system's native species, ecological structure and function. Based upon these analyses, we make the following broad recommendations:

(1) An ecosystem approach to natural resource restoration and management is the most effective available means to meet the need for long-term protection of ecological integrity and biodiversity within the watershed. Specific long-term restoration actions should be primarily (although not exclusively) aimed at enhancing and protecting essential ecosystem processes and structural features. This approach must be complemented with efforts that address the immediate needs of threatened and endangered species. The granting of protected status and preparation of recovery plans for individual species must remain a viable tool in our comprehensive species protection strategies.

(2) A restoration strategy should be adopted to assure a connected network of representative areas of each of the ecosystem and habitat types defined herein.

(3) Flows, sediments, and water quality conditions must be adequate to support essential ecosystem functions. Sufficient connectivity must be provided among restored sites to allow the natural migration and movement of wide-ranging species.

(4) New restoration/management actions must address the needs of surviving remnant populations.

Adopting the recommendations of this report will not resurrect the rich, complex, undisturbed ecosystems of the San Francisco Bay-Delta-River system of 200 years ago. Nonetheless, applying an understanding of "natural" watershed ecology will serve as an invaluable guide to comprehensive restoration. The most successful restoration program for this watershed will ultimately be one that applies the precepts of modern restoration ecology within the practical limits of resources available and the constraints set by other legitimate societal needs. Such efforts - properly designed and executed - have the capacity to protect, restore and sustain native ecosystems, and the full range of remaining native plants and animals that depend on them. They will also reduce conflicts over protection of endangered species, provide for more economically and environmentally sound flood management, enhance recreational opportunities, ensure high water quality for urban and industrial uses, and create an aesthetically more pleasing environment. It is our best opportunity to preserve the unique ecological heritage of California's Bay-Delta-River watershed for ourselves and future generations.

APPENDIX A
Geographical Information System (GIS) Maps

Introduction

Map Legends

Maps

Introduction

An integral part of this report is the production of color maps that display, at a landscape level, the historical and current distribution of aquatic habitats in the five ecologically different regions. The maps also locate the geographic features that are mentioned in the main text. The maps are produced with "layers" from digitally based geographic information systems (GIS) so that different kinds of information from different sources can be displayed and analyzed. With GIS the extent of the historical and current aquatic habitats can be readily compared and displayed on one map.

The intent is to use available regional GIS databases that are suitable for landscape level analysis of historical and current habitat and hydrography. A number of completed and in-process GIS databases were evaluated for suitability. Not unexpectedly, the biggest gap is digital geographic information for the extent of historical (pre-disturbance) aquatic habitat and hydrography. For the San Francisco Bay and portions of the Delta hydrography, historical information is digitally available. For the Central Valley lowland and Delta habitats, it is necessary to interpret and digitize 19th century maps or use indirect indicators of habitat (e.g., riparian soils) from existing databases.

The historical maps are useful for showing the broad scale distribution and extent of the floodplain and intertidal habitats, but must be used with caution for interpreting the precise location or areal extent of a particular habitat. The historical maps that are digitized are very small scale (at least 1:500,000) and the accuracy of the map information used for georeferencing is unknown. The indirect indicators of aquatic habitat, such as soils, provide a highly generalized view of where a particular habitat could potentially occur. Locational discrepancies can also result from actual changes over time between historical and modern conditions (e.g. river location), or differences in two different digital data sets.

A total of fourteen color maps are produced for this report. The lowland ecosystem was divided into the three sub-basins (Sacramento Valley, San Joaquin Valley, Tulare Lake Basin) because the data availability for each area was different. One map for the entire region would have been too large to make a meaningful comparison of the historical and current aquatic habitats. Even at the sub-basin level it is difficult to distinguish the small acreage of aquatic habitats that currently exist.

All of the maps except for G1 and G14 should be viewed as pairs: the left-hand side provides the historical view of the aquatic ecosystem and the right-hand side shows the current aquatic ecosystem. The current ecosystem maps also show the former extent of the historical aquatic ecosystem. Each map has a corresponding legend that follows this introduction which provides an overview of the map and the sources used to develop it. Where appropriate further elaboration is provided for the individual map categories or "layers" of information.

On all the maps the digital hydrography is provided by the California Department Fish and Game under license from the Teale Data Center, unless noted otherwise.

G1 The San Francisco Bay-Delta Aquatic Ecosystem Distribution

The watershed may be subdivided into five broad regions with respect to dominant aquatic ecosystems present in each. The distribution and extent of these are presented in a watershed-scale perspective. The map also sub-divides the Central Valley into its three basins: the Sacramento River, the San Joaquin River, and the Tulare Lake Basins.

Legend Categories:
Upland - The upland watershed delineation is constructed from the California Department of Fish and Game hydrologic unit code (HUC) basins, 250,000 scale. The total area is 38,296 square miles.

Lowland - The lowland (alluvial) valley delineation is constructed from the HUC basins. This map was cross-checked against geologic maps depicting valley floor alluvial deposits. The boundary generally corresponds with the 300 foot contour line in the central part of the lowland region. The total area is 20, 609 square miles.

Delta - The Delta delineation is based on the legal definition of the Delta under Section 12220 of the water code. This places the Delta's western boundary approximately four miles west of the confluence of the Sacramento and San Joaquin Rivers. The legal Delta extends northward to near Sacramento and southward to near Vernalis. The digital boundary is from the REGIS database at the University of California at Berkeley. The total area is 1,154 square miles

San Francisco Bay - This region is defined as the water and land within the historical (pre-development) tidal zone in and around San Francisco Bay and Suisin Bay. The outer boundary is the landward margin of the historical extent of the tides not including the tidal reaches of the major creeks and rivers. It does not include the watershed area contributing runoff to the Bay. The outer tidal boundary is derived from the historical bayland coverage in the Bay Area EcoAtlas Version 1.50, San Francisco Estuary Institute. The total area is 815 square miles.

Nearshore Ocean - The area for this region is bounded to the north by Point Reyes, to the south by the southernmost end of Half Moon Bay, and to the west by the continental shelf break. The total area is 1,439 square miles.

Sub-basin Boundary - The basin boundaries are from the HUC database.

G2 Connected Waterways of the Central Valley

The connected waterways of the Central Valley transported water, nutrients, and sediment to the San Francisco Bay-Delta estuary. The waterways also provided habitat and transport corridors for the native biota, in particular the anadromous salmon. Not shown are the many sloughs and waterways that accommodated overflow from the main stem of the lowland Sacramento and San Joaquin Rivers. The surface water connection of Goose Lake in northeastern California into the Sacramento River watershed and of Tulare Lake in the southern Central Valley into the San Joaquin River watershed usually occurred only in the seasonal high water period or in a series of wet years.

Legend Categories:
Historically Connected Reach - Except for the lowland Tulare Basin, major rivers are represented with modern hydrography from the Department of Fish and Game which adequately represents the historical reaches. The modern hydrography of the lowland Tulare Basin is so altered that portions of the major rivers were replaced by that shown on the Map of Public Surveys in California to Accompany Report of Surveyor General, 1859. The historical river courses were converted to digital form by ocular estimation.

Salmon Historically Present - A sub-set of the historically connected reaches are the river reaches of the major Central Valley rivers and streams used by salmon for transport, holding, and spawning. These are mapped by Yoshiyama et al. 1996 and digitized by staff of the Sierra Nevada Ecosystem Project. Yoshiyama et al. 1996 note that additional streams such as Thomes, Paynes, Cache, and, Putah creeks and perhaps a dozen other minor Sacramento Valley streams historically supported intermittent salmon runs when streamflows were adequate. Fresno Slough, although intermittent, is part of the historic range because it was used as transport corridor for the salmon that spawned on the Kings River.

Historical Lake - Clear Lake and Goose Lake in northeastern California are derived from the modern hydrography. Tulare Basin lakes are digitized from Hall, 1887 (Buena Vista and Kern Lakes) and Alexander et al. 1874 (Tulare Lake).

G3 The Transformed Watershed

The transformation of the aquatic environment of the San Francisco Bay-Delta watershed is seen in this watershed view of the lost historical aquatic habitats and the major disconnected reaches. Nearly 5000 square miles of lowland floodplain and estuarine intertidal habitat, including 900 square miles of historical lake, has been lost in the past 150 years. Because of the barriers imposed by dams over a thousand miles of upland river is no longer available as salmon habitat; additional lowland river mileage is lost to salmon because of the dewatering of the San Joaquin River. Not all of the transformed habitat is lost to the system forever. Restoration of natural processes and rehabilitation of degraded habitats can bring some of this habitat back into the aquatic system.

Legend Categories:
Major Barrier - This represents the large, terminal storage reservoirs and dams that block the major rivers near the upland/lowland boundary. It does not include the thousands of smaller dams that occur throughout the watershed.

Disconnected Reach - This shows both disconnected upland and lowland river reaches. The upland rivers are disconnected from the lowland rivers by the large dams which block fish, sediment, and nutrient passage and create other discontinuities in water characteristics. Lowland barriers in the form of dewatered reaches and diversion dams disconnect river reaches within the lowlands.

Lost Salmon Habitat Due to Disconnection or Dewatering - A sub-set of the disconnected river reaches are the river reaches that no longer provide salmon habitat because they are disconnected by the major barriers or are dewatered. These are mapped by Yoshiyama et al. 1996 and digitized by staff of the Sierra Nevada Ecosystem Project. The disconnected reaches historically provided much of the spawning habitat for the salmon. As a result about 82% of the historical spawning habitat is no longer available to the salmon.

The white area represents the areal sum of all the former historical aquatic habitats identified in the other maps (Maps G3 through G13) including the riparian zone, freshwater tidal and non-tidal wetland, estuarine tidal wetland, and other floodplain habitat. It is assumed that the historical floodplain habitat that is currently not subject to inundation is no longer floodplain habitat.

G4 Sacramento Valley Historical River Floodplain Ecosystem

The dynamic functioning of rivers and streams in the Sacramento Valley over the last 10,000 years created a diversity of floodplain habitats which covered a large area of the Sacramento Valley. The map delineates the areal extent of tule-dominated wetlands, the riparian zone, which represents potential riparian habitat, and the additional mixed habitat that was occasionally to frequently inundated by winter runoff. The wetland habitat was directly observed and mapped in the 19th century while the riparian zone and other floodplain habitats are derived indirectly from soils and historical accounts. Too small to show in this map view are riparian forests and woodlands along some of the smaller streams.

Legend Categories:

Riparian Zone Habitat - The riparian zone consists of the three habitat categories indented below. The riparian zone is defined by the soils mapped by Holmes et al. 1916 that are associated with riparian vegetation based upon the vegetation and location descriptions given in the Holmes text. In addition the riparian zone includes the riparian forest mapped by Dutzi 1979 that extends upstream of the riparian soils mapped by Holmes. The Holmes and Dutzi map were digitized by Steve Greco at the University of California at Davis. The riparian zone covers about 637,000 acres and represents the area that riparian forest and woodland could have occupied sometime in the last 10,000 or more years. It thus represents a potential maximum habitat area and includes about 87,000 acres that were mapped as wetlands in the 19th century (see below). Along the lower Sacramento and Feather Rivers the riparian soils generally correspond with the extent of the natural levees.

> Riparian Forest Along Major Rivers and Streams - The forest area along the major rivers and streams is digitized from a map of "Native Woodlands of the Sacramento Valley circa 1800" prepared by Dutzi 1979 and shown in Figure II-F. The map was prepared mainly from soil surveys and the 19th century general land office field survey notes. This area, which covered about 364,000 acres, was primarily occupied by a heavy forest growth of willow, sycamore, and cottonwood along the immediate stream margins and by valley oak on the higher surfaces.
>
> Riparian Soils with Woodland and Other Floodplain Habitat - This is the area within the riparian zone but outside the riparian forest and outside the area of wetlands mapped within the riparian zone. It covers about 186,000 acres. Much of it is located along the main-stem Sacramento extending out beyond the riparian forest. Historical accounts and the Dutzi 1979 map indicate that a considerable portion of this was occupied by valley oak woodland and savanna. Bunch grasses and other herbaceous vegetation as well as seasonal wetlands also occupied this part of the riparian zone.
>
> Wetlands Mapped within Riparian Zone - These are tule dominated wetlands that are mapped on Columbia silt loams, a riparian soil in Holmes et al. 1916. They are digitized from a map in Alexander et al. 1874 which displays the swamp lands with a distinctive symbol that signifies the area had relatively permanent wetland vegetation, most commonly tule marsh. The Holmes soil

map shows wetlands on the riparian soils. They cover about 87,000 acres out of a total mapped wetland acreage of 301,000 acres. In addition to the tule marsh, this area included a range of habitats including semi-permanent shallow lakes, areas of wet meadow, and the occasional drier islands of valley oak and grass.

Wetlands Mapped Outside of Riparian Zone - These are tule dominated wetlands that are located on flood basin clay soils and other soils not considered to be riparian soils. These are the wetlands that occupied the lowest area of the flood basins that are assumed to have been flooded nearly every year. They are digitized from the map in Alexander et al. 1874. They cover about 214,000 acres or about 71% of the total mapped wetland acreage of about 301,000 acres in the Sacramento Valley.

Other Floodplain Habitat - This category is delineated by the soils that Holmes et al. 1916 described as occasionally to frequently inundated by local stream runoff or overflow from bigger streams and is not covered by mapped wetlands or the riparian zone. The Holmes soils were correlated to the soils in the State Soil Geographic Data Base (STATSGO) prepared by the Natural Resources Conservation Service (NRCS) in 1994. The STATSGO soils were then used to map the areal extent of this habitat which covers about 450,000 acres. The habitat was a mix of oak woodland and savanna, perennial bunch grass, and seasonally wet meadow and other wetland species. The Dutzi 1979 map shows that much of the other floodplain habitat to the north and east of the Sutter Buttes, and along the Feather River was covered with oak woodland and savanna.

G5 Sacramento Valley Current River Floodplain Ecosystem

This map shows both the current, circa 1993, riparian and wetland habitat of the Sacramento Valley and the former extent of the historical river-floodplain habitat. The former habitat is shown by subtraction: the historical river floodplain habitat that does not have current wetland or riparian habitat is shown in white. Most of this "absent" habitat has been converted to agricultural or urban land. A small amount of the historical other floodplain habitat still contains oak woodland and savanna and is occasionally inundated. The map also shows the major reservoirs in the upland portion of the watershed.

Legend Categories:
Current Wetland - The current wetlands are derived from the Wetlands and Riparian GIS database prepared for the California Department of Fish and Game (CDFG) by Ducks Unlimited. It is a combination of the two categories "seasonally flooded palustrine emergents" and "permanently flooded palustrine emergents," which cover a total of about 68,000 acres. Less than half of that or about 28,000 acres remains on lands that were historically mapped as wetland, thus there has been about a 90% reduction in the historically mapped wetland acreage. The other 40,000 acres are on lands that were categorized in the historical map as "other floodplain habitat."

The current wetlands mainly consists of highly managed areas that can vary in seasonality, location, and extent based on varying management schemes. Much of the current wetland is managed in federal or state protected areas; the privately owned wetlands are mainly in duck clubs or nature preservers. There is relatively little current unmanaged wetland that exists as a result of the natural overflow of the principal rivers. The historical wetlands on the clay soils in the flood basins have been largely replaced by agriculture, primarily ricelands.

Current Riparian - The current riparian is also from the CDFG Wetlands and Riparian GIS database and represents the category "riparian woody." The 30 meter resolution allows relatively small patches of riparian vegetation to be mapped. The distribution of the current riparian is scattered in small patches and generally confined to the immediate stream margins. This patchiness makes it difficult to see the extent. Larger, more continuous extents are found on the upper reaches of the lowland Sacramento and Feather Rivers.

About 38,000 acres of current riparian exists which represent about 7% of the historic riparian zone or about 10% of the riparian forest shown on Map G4. This comparison must be interpreted very cautiously because the habitat quality of the current riparian is not described (some of it is impacted human activities and is degraded) and the historical riparian zone does not represent the actual historical riparian acreage but rather the potential riparian acreage as explained in the text.

G6 San Joaquin Valley Historical River Floodplain Ecosystem

The San Joaquin Valley's river floodplain ecosystem was geographically more heterogeneous and not quite as extensive as that found in the Sacramento Valley. The San Joaquin Valley did not have the Sacramento's large flood basins and high and wide natural levees. The nearly continuous area of marsh and other floodplain habitat in the trough of the San Joaquin Valley occurred around the main stem river, the multiple branching sloughs, and the confluence with tributary streams. The riparian forests were relatively narrow compared to the Sacramento Valley but wide plains of oak woodlands occurred broadly beyond the rivers in the northern part of the valley. The wetlands were mapped by 19th century surveyors and the riparian zone and other floodplain habitat were determined indirectly from soil surveys and geologic maps.

Legend Categories:

Riparian Zone Habitat - The riparian zone consists of the two habitat categories indented below. The riparian zone is delineated by a combination of soils and riverine (stream channel) deposits. The soils are from the STATSGO database prepared by the Natural Resources Conservation Service (NRCS) and were chosen to correspond to the soils described by Nelson et al. 1915 as having riparian vegetation (The Nelson map has not been digitized unlike the corresponding one for the Sacramento). The Quaternary stream channel deposits (Qsc) were digitized from the California Division of Mines and Geology (CDMG), 250K series and corresponded fairly well with the soil units. The stream channel deposits were used in addition to the soils because they extend beyond the soil units into areas along the tributaries where it is known from historical documents that riparian vegetation occurred. The riparian zone covered about 329,000 acres. As in the Sacramento, the riparian soil zone represents the area that riparian forest and woodland could have occupied sometime in the last 10,000 years. It thus represents a potential maximum habitat extent along the major rivers and streams and includes about 43,000 acres of wetlands mapped by 19th century surveyors.

> Riparian Soils with Forest, Woodland and Other Floodplain Habitat - This is the area within the riparian zone but outside the area of wetlands mapped on riparian soils (see below). There was no map for the San Joaquin that differentiated the riparian forest from the woodland and other floodplain habitat. Historical accounts indicate that the area along the stream and slough margins had dense riparian forest or willow thickets while on higher surfaces further away from the stream, oak woodland would tend to occur. The areal extent of the riparian vegetation along the upstream reaches of the Merced, Toulumne, and Stanislaus was limited by confining bluffs. Relatively narrow areas of riparian vegetation surrounded by a vast marsh occurred along the multiple waterways around the main-stem San Joaquin River.
>
> Wetlands within Riparian Zone - These are tule dominated wetlands that are mapped on the stream channel deposits and riparian soils. They are digitized from a map in Alexander et al. 1874. The marsh in this area was interlaced with stream and slough channels with bordering riparian vegetation. It covered 43,000 acres out of the total mapped wetland acreage of 93,000 acres.

Wetlands outside of Riparian Zone - These are tule dominated wetlands that are located on basin deposits of clay and silt. They are digitized from the map in Alexander et al. 1874. They cover about 50,000 acres out of the total mapped wetland acreage of 93,000 acres in the San Joaquin Valley. Considerably more acreage of wetlands occurred along the lower San Joaquin River but that area was within the legal Delta boundary.

Other Floodplain Habitat - This area is delineated by the basin deposits on the CDMG maps and is not already covered by the riparian zone or mapped wetlands. The basin deposits result from flood waters that deposited mostly fine silt and clay and some fine sand. They correlate well with the soils that are described in Nelson et al. 1915 as occasionally to frequently inundated by local stream runoff and overflow from bigger streams. The habitat was a mix of oak woodland and savanna, perennial and annual grasses, and seasonally wet meadow and other wetland species.

G7 San Joaquin Valley Current River Floodplain Ecosystem

This map shows both the current, circa 1993, riparian and wetland habitat of the San Joaquin Valley and the former extent of historical river floodplain habitat. The former habitat is shown by subtraction: the historical river floodplain habitat that does not have current wetland or riparian habitat is shown in white. Most of this "absent" habitat has been converted to agricultural or urban land. A small amount of the historical other floodplain habitat still contains oak woodland and savanna and is occasionally inundated. The map also shows the major reservoirs in the upland portion of the watershed although a digital outline of a full New Melones Reservoir was not available.

Legend Categories:
Current Wetland - The current wetlands are derived from the Wetlands and Riparian GIS database prepared for the California Department of Fish and Game (CDFG) by Ducks Unlimited. It is a combination of the two categories "seasonally flooded palustrine emergents" and "permanently flooded palustrine emergents," which cover a total of about 55,000 acres. A small portion of that or about 4,200 acres remains on lands that were historically mapped as wetland, thus there has been about a 95% reduction in the historically mapped wetland acreage. The other 51,000 acres are on lands that were categorized in the historical map as "other floodplain habitat."

Compared to the Sacramento Valley far more of the current wetland acreage in the San Joaquin Valley is privately managed wetlands, usually in duck clubs. Another difference is that most of the current wetlands in the San Joaquin Valley is not found in areas that were historically mapped as wetlands but rather are found in what is historically classified as "other floodplain habitat" in the clay and silt basin deposits. These areas had perched water tables and were inundated occasionally historically but probably did not receive the surface water overflow as frequently as the wetlands closer to the main-stem river. As in the Sacramento Valley the current wetlands mainly consist of highly managed areas that can vary in seasonality, location, and extent based on varying management schemes. There is relatively little current unmanaged wetland that exists as a result of the natural overflow of the principal rivers.

Current Riparian - The current riparian is also from the CDFG Wetlands and Riparian GIS database and represents the category "riparian woody." The 30 meter resolution allows relatively small patches of riparian vegetation to be mapped. The distribution of the current riparian is scattered in small patches and generally confined to the immediate stream margins. This patchiness makes it difficult to see the extent. Larger extents of riparian vegetation can found on the lower Stanislaus and San Joaquin Rivers and the upper Tuolumne River.

About 16,000 acres of current riparian exists which represent about 5% of the historic riparian zone shown on Map G6. This comparison must be interpreted very cautiously because the habitat quality of the current riparian is not described (some of it is impacted human activities and is degraded) and the historical riparian zone does not represent the actual historical riparian acreage but rather the potential riparian acreage as explained in the text.

G8 Tulare Lake Basin Historical Wetland Ecosystem

The aquatic environment of the Tulare Lake Basin was dominated by large, fluctuating lakes which were circumscribed and connected by tule dominated wetlands. These lakes were the termini of the runoff from the watershed except when wet years caused them to overflow in a cascading fashion starting with Kern Lake which overflowed into Buena Vista Lake which overflowed into Tulare Lake which could overflow into the San Joaquin River via the Fresno Slough. The map shows Tulare Lake at a relatively high stand with an area of about 700 square miles. There was no reliable or easily digitizable information on the historical extent of riparian vegetation in the Tulare Lake Basin; reliable and consistent indirect indicators through soils or geology were also lacking. As a result only the extent of the wetland habitat and the lakes is shown. Historical accounts indicate that riparian vegetation occurred along the major rivers and streams and a large area of oak woodland stretched from the Tule River north to the Kings River (see text).

Legend Categories:
Wetland - The wetland extent is derived from the Hall 1887 map. The Tulare Lake Basin wetlands in Hall 1887 and Alexander et al. 1874 are very similar in extent. Hall 1887 is used because it had better registration with the hydrography. The wetlands displayed on the map covered about 428,000 acres. Considerable variation in wetland acreage occurred because the lake and wetland boundary fluctuated with the climate.

Historical Lake - Tulare Lake area is digitized from Alexander et al. 1874 because it shows Tulare Lake at a relatively high stand, covering about 700 square miles. The Buena Vista and Kern Lake area is from Hall 1887 because it had more detailed mapping in that part of the basin.

G9 Tulare Lake Basin Current Wetland Ecosystem

This map shows both the current, circa 1993, wetland habitat of the Tulare Lake Basin and the former historical wetland and lake habitat. The former habitat is shown by subtraction: the historical wetland or lake habitat that does not have current wetland or lake is shown in white. Most of this "absent" habitat has been converted to agricultural or urban land. The Tulare Basin has the most altered environment and greatest amount of lost habitats of the three sub-basins. The historical lakes are essentially gone, only re- surfacing as flooded cells in wet years. The current wetland acreage is less than occurs in the San Joaquin and Sacramento Valleys and is much smaller in comparison to the historical acreage. Although not shown on this map the remaining riparian forest along the primary stream channels of the Kings, Kern, and Kaweah and the oak woodlands on the intervfluves of the Kaweah and Tule River are a fraction of what is estimated to have existed historically.

Legend Categories:
Current Wetland - The current wetlands are derived from the Wetlands and Riparian GIS database prepared for the California Department of Fish and Game by Ducks Unlimited. It is a combination of the two categories "seasonally flooded palustrine emergents" and "permanently flooded palustrine emergents," which cover a total of about 23,000 acres. A small portion of that or about 7,300 acres remains on lands that were historically mapped as wetland, thus there has been about a 98% reduction in the historically mapped wetland acreage.

G10 The Delta Historical Aquatic Ecosystem

The Delta is defined by both its habitat and hydrography. This map shows the inter-tidal and non-tidal wetlands, the supra-tidal elevated landforms and the sub-tidal channels that carry the riverine and tidal water. The scale of the map view and source data limitations masks the heterogeneity of the dominant tule marsh environment. Not shown because of the scale are some of the small islands of elevated land, mainly dunes, in the Central Delta and areas of riparian vegetation along the San Joaquin, Mokelumne, and Sacramento Rivers and their distributaries. In addition there were perennial lakes throughout the Delta and extensive areas of mudflats around the mouth Cache Slough displayed on historical maps that were not digitized.

Legend Categories:
Intertidal Wetlands - The approximate upstream boundary of the intertidal wetlands was mapped by Atwater 1982 and digitized for this report. That boundary is the upstream extent of tidal action within the wetlands. Tidal influence in the sub-tidal waterways, by, for example, raising the river stage, could go further upstream. The intertidal wetlands on this map cover about 380,000 acres.

Non-tidal Wetlands - The non-tidal wetland area is digitized from Alexander et al. 1874 and covers about 145,000 acres. It includes Merrit and Sutter Islands in the northern Delta, which were encircled by levees that protected them from normal high tides.

Elevated Landforms/Riparian Zone - This area was topographically above the perennial wetlands in the surficial geology maps made by Atwater 1982 who mapped that area as levee and splay deposits. The Alexander et al. 1874 map also demarcates the same approximate area as being free of marsh vegetation. Historical accounts and the Holmes et al. 1916 soil survey indicate that some of this area is covered with riparian vegetation. The areal extent was digitized from the Atwater maps and taken from the soils in the STATSGO database (prepared by the Natural Resources Conservation Service) that correlate with the riparian soils in Holmes et al. 1916. It covered about 42,000 acres.

Other Floodplain Habitat - This category is delineated by the soils that Holmes et al. 1916 described as occasionally to frequently inundated by local stream runoff or overflow from bigger streams and is not covered by mapped wetlands or the riparian zone. The Holmes soils were correlated to the soils in the STATSGO database. The STATSGO soils were then used to map the areal extent of this habitat. It is a mixed habitat of seasonally wet meadow grass, emergent vegetation, and drier islands of perennial bunch grass and oak woodland and savanna.

Other Delta Habitat - This is the unclassified upland area of the Delta.

Subtidal Waterways - The principal historical river and slough courses were initially derived from the hydrography in the 1985 National Wetlands Inventory (NWI) by the U. S. Fish and Wildlife Service. The detailed channel mapping inside the red box was digitized from the maps in Atwater 1982 by the U. S. Bureau of Reclamation. Outside the red box additional historical hydrography was converted to digital form by ocular estimation of the maps in Atwater 1982.

G11 The Delta Current Aquatic Ecosystem

This map shows the current aquatic habitat and hydrography and the dramatic loss in the historical aquatic Delta habitat. The large white area represents the historical aqua-tic habitat that has been converted mostly to farmland or are now flooded islands. The current hydrography is much simpler and shorter compared to the complex network of historical tidal sloughs that twice daily " bathed" the historical wetlands have been largely eliminated by reclamation. The large river channels and man-made channels are the principal means of dispersing and transporting water through the Delta.

Legend Categories:
Remaining Historical Sub-Tidal Waterways - These represent the river and distributary channels that have not been straightened, dug-out, or deepened. Historical hydrography of the major channels from the 1985 National Wetlands Inventory (NWI) database and Atwater 1982. Changes interpreted from existing topographic maps. The smaller tidal channels that are shown on Map G10 in the interior Delta no longer exist on the modern hydrography.

New Sub-Tidal Waterways, Channelized, and Open Water - These represent new pathways for water by straightening existing channels (e.g. Stockton ship channel), creating new channels (Sacramento ship channel), or permanently former islands (e.g. Frank's Tract). All the new water areas are identified by comparing the historical hydrography on the Atwater 1982 maps with the underlying modern hydrography on those maps and the NWI database.

Current Intertidal and Nontidal Wetland - The current wetlands are derived from the Wetlands and Riparian GIS database prepared for the California Department of Fish and Game (CDFG) by Ducks Unlimited. It includes the seasonal and permanent palustrine emergents for the area east of the confluence at Collinsville, which cover about 20,000 acres. Between Collinsville and the western side of the legal Delta boundary it includes only the tidal estuarine emergents and which cover about 1,600 acres. The total current wetland acreage of about 21,600 acres represents about 4% of the historical intertidal and non-tidal wetland acreage. Most of the current wetland is the managed and diked palustrine wetlands in the northern Delta. The largest remaining area of naturally inundated intertidal wetland is in the western Delta.

Riparian on New or Historical Waterways - The current riparian is also from the CDFG Wetlands and Riparian GIS database and represents the category "riparian woody." They are generally small, narrow patches and are thus hard to see at the scale of the map. Except for a patch at the confluence of the Sacramento River and Steamboat Slough, most of the current riparian is located on the upstream reaches of the main-stem and distributary channels of the principal rivers of the Delta. Most of the historical riparian zone has been converted to farmland and other land uses.

Other Delta Habitat - This is upland Delta habitat that has not been classified by the 1985 NWI.

G12 San Francisco Bay Historical Aquatic Ecosystem

The historical distribution of and tidal wetland, tidal mudflat, and shallow and deep open water circa 1770-1820 is based upon the Native Landscape View of the Bay Area EcoAtlas (San Francisco Estuary Institute 1998). The Native Landscape View is a composite of thousands of historical data integrated by SFEI to illustrate native conditions in the Estuary. Major data sources include the U. S. Coast Survey Hydrographic and Topographic Sheets, other early federal maps, Mexican land-grant surveys and diseños, city and county surveys, explorers' journals, and oral histories. For further documentation, view the Bay Area EcoAtlas at www.sfei.org.

Legend Categories:
Tidal Wetland - Tidal wetland occurs mostly between mean lower low water (MLLW) and mean higher high water (MHHW) and supports at least 10% cover of vascular vegetation. It combines the categories of old high tidal marsh, young low/mid tidal marsh, muted tidal marsh, and salt pond in muted tidal marsh in the SFEI database. The total area was approximately 192,000 acres or about 37% of the total land and water area in the historical Bay ecosystem as defined in the native landscape view of the Bay Area EcoAtlas.

Tidal Mudflats - Tidal mudflats occurred between MLLW and the lower edge of marsh vegetation. Where no marsh is present, tidal flats extend to the natural edge of dry land. It includes the categories of bay flat, channel flat, and shell flat in the SFEI database. The total area was approximately 51,000 acres or about 10% of the total land and water area in the historical Bay ecosystem.

Shallow Bay and Channel - Shallow bay and tidal channels occurs between MLLW and 18 feet below MLLW. It occupied approximately 174,000 acres or about 33% of the total land and water area in the historical Bay ecosystem.

Deep Bay and Channel - Deep bay and tidal channel is deeper than 18 feet below MLLW. It occupied approximately 100,000 acres or about 19% of the total land and water area in the historical Bay ecosystem.

G13 San Francisco Bay Current Aquatic Ecosystem

This map shows the current, circa 1997, aquatic habitat and the former extent of the historical aquatic habitat. The combined historical wetland, tidal, and open water that no longer exists is shown by subtraction: historical habitat areas that do not have current aquatic habitat is shown in white and have been converted to urban, industrial, and agricultural uses. The current distribution of deep bay, shallow bay, tidal flat, and tidal wetland is based upon the Modern Landscape View of the Bay Area EcoAtlas (San Francisco Estuary Institute 1998). Major data sources for the Modern Landscape View are the 1985 National Wetlands Inventory, winter 1995-96 NASA infra-red (IR) photography, and intensive "truthing sessions" conducted by SFEI to involve regional and local experts in the revision of earlier versions of the EcoAtlas. For further documentation, view the Bay Area EcoAtlas at www.sfei.org.

Legend Categories:

Remaining Historical Tidal Wetland - This represents the wetland, principally the old high tidal marsh in the SFEI database, that was present historically and still remains. It occupies about 16,000 acres which is about 3 % of the current Bay ecosystem and about 8 % of the former extent of about 192,000 acres (map G12). This category did not include approximately 6,200 acres of muted tidal marsh since that marsh receives less than full tidal flow as a result of a physical impediment. The historical tidal wetland has been converted to diked and managed wetlands mainly in Suisin Bay (63,000 acres), farmed and grazed wetlands in North Bay and Suisin Bay (32,000 acres), salt evaporators in North and South Bays (37,000 acres), and most of the balance (20,000 acres) to urban uses in the Central and South Bay. The loss of tidal wetland represents the greatest area of aquatic habitat loss in the Bay ecosystem

Tidal Wetland Formed Since Historical Period - This represents the wetland that occurs today but was not historically present. This newly created wetland formed in historical tidal flats and shallow water. It occupies about 18,000 acres which is about 4 % of the current Bay ecosystem

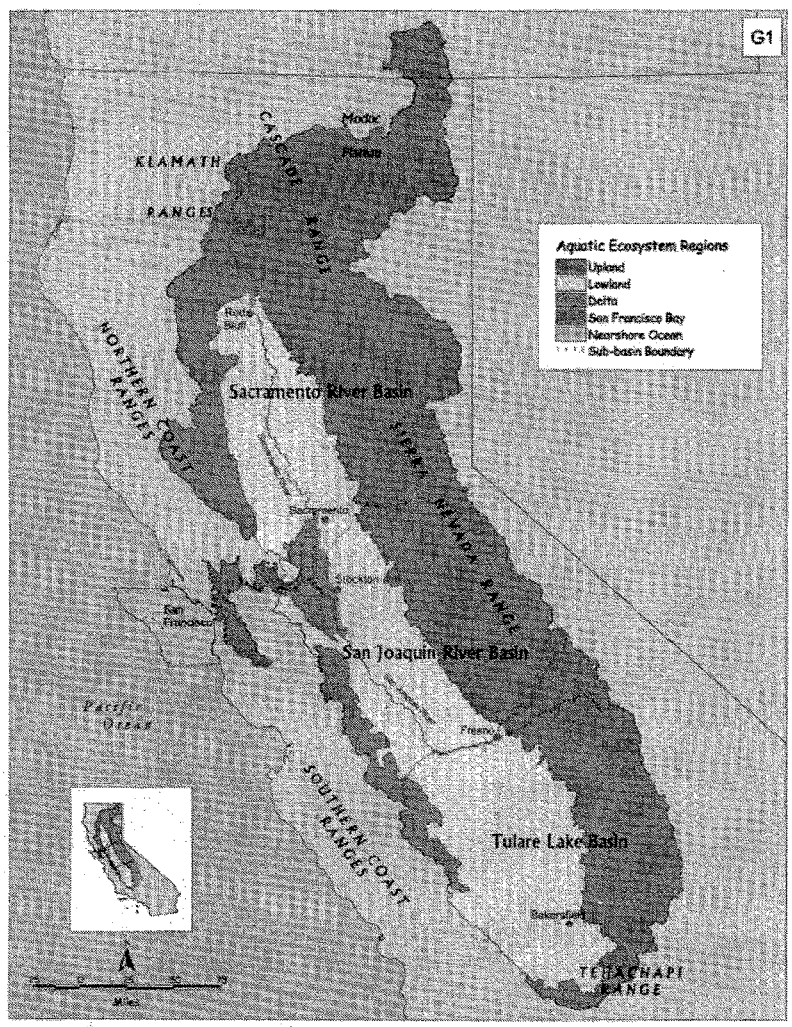
Current Tidal Mudflats - This represents both channel and bay flat that existed historically and has been created since the historical period. The newly created tidal mudflat occurs in the North and South Bay. The total area of the current tidal mudflat is about 29,000 acres or about 6% of the current Bay ecosystem compared to about 51,000 acres or about 10% of the historical ecosystem.

Shallow Bay and Channel - Shallow bay and channel occurs between MLLW and 18 feet below MLLW. It currently occupies about 172,000 acres or about 33% of the Bay ecosystem. There has been only a slight decrease in this category despite significant areas of it being reclaimed for human uses. It has gained area at the expense of deep bay and channels as those areas accumulate sediment.

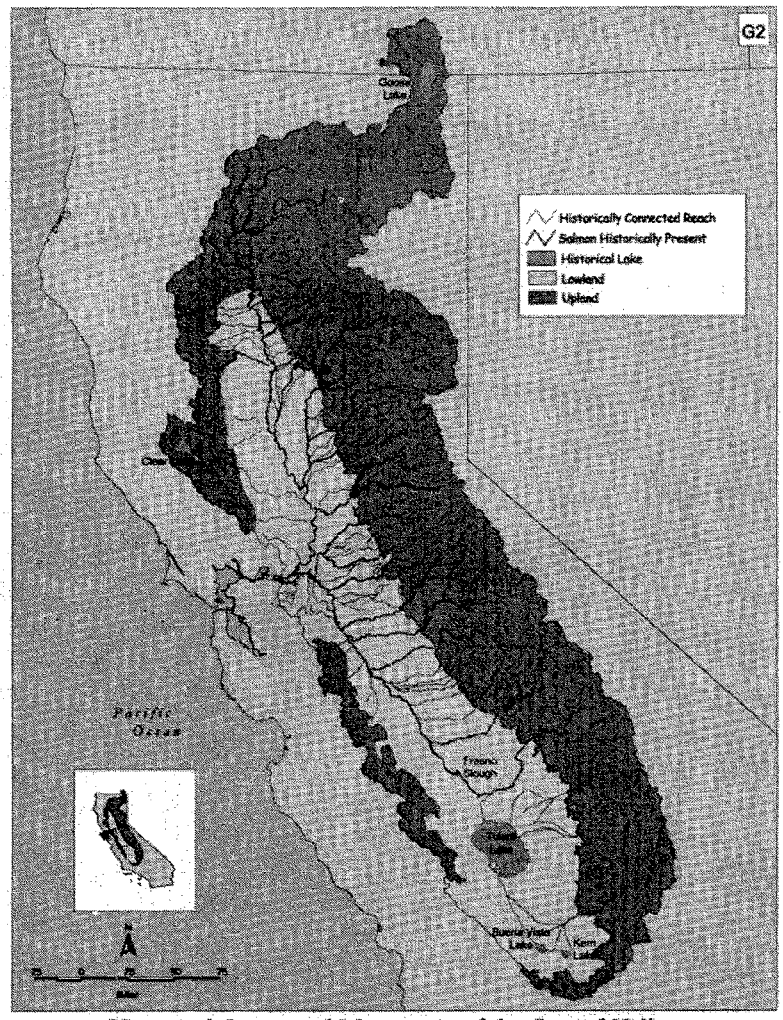
Deep Bay and Channel - Deep bay and channel is deeper than 18 feet below MLLW. It currently occupies about 83,000 acres or about 16% of the Bay ecosystem. There has been about a 17,000 acre decrease in deep bay and channel as those areas became shallower through sedimentation. Dredging for navigation maintains the deep bay.

G14 Nearshore Ocean: Habitat and Bathymetry.

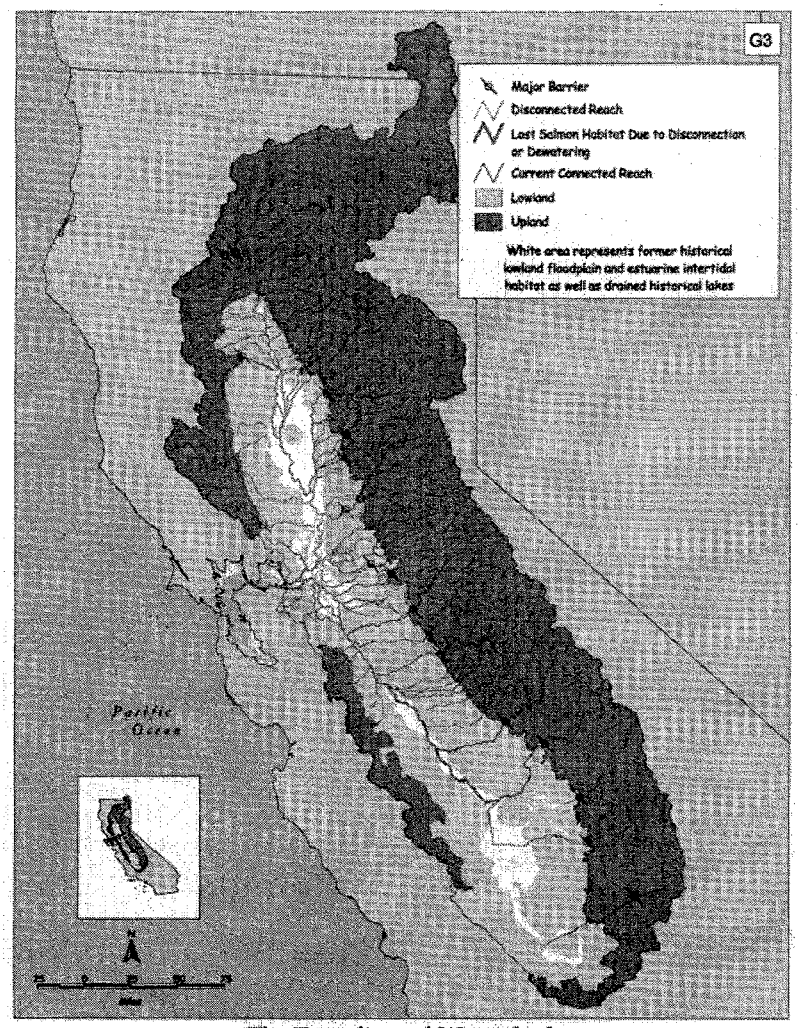
The defined portion of the ocean environment is meant to depict that most interactive, in terms of exchange of water, sediments, and dissolved materials, and organisms, with the remainder of the watershed. It is bounded to the north by Point Reyes, to the south by the southernmost end of Half Moon Bay, and to the west by the continental shelf break. Depth contours (bathymetry) and natural habitat distribution are taken from modern surveys, but probably do not differ greatly from conditions at the time of the Gold Rush. The bathymetry is from the United States Environmental Protection Agency. The shoreline habitat is from the Farallons National Marine Sanctuary.



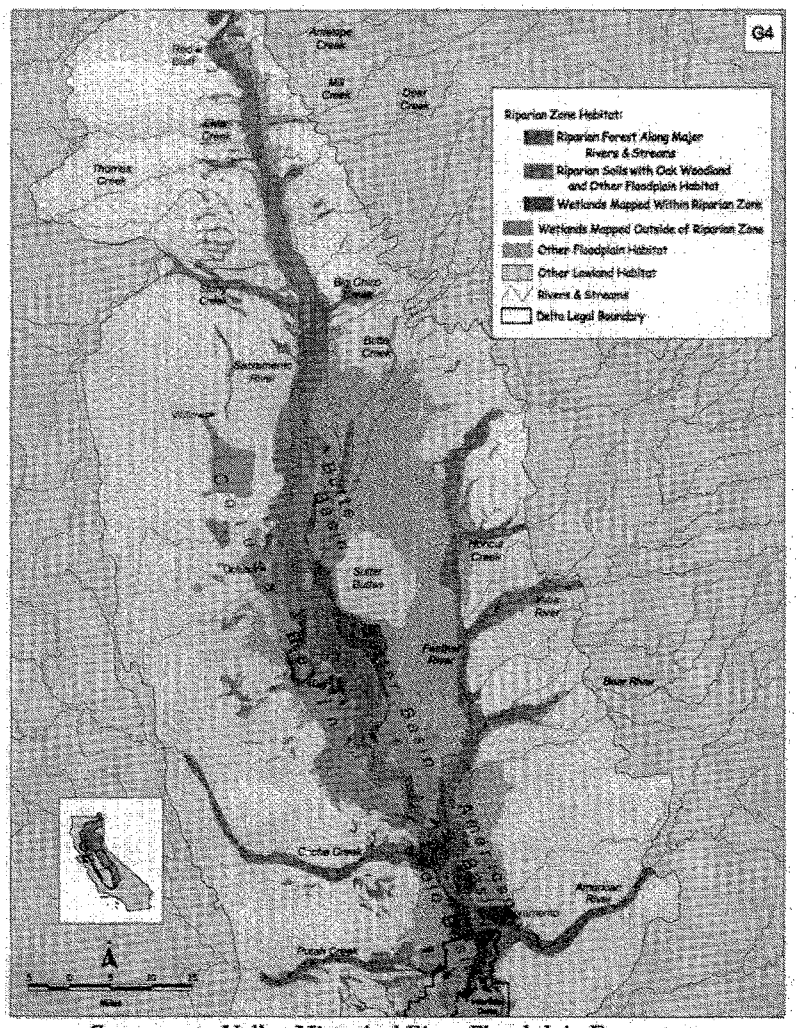
The San Francisco Bay-Delta Aquatic Ecosystem Distribution



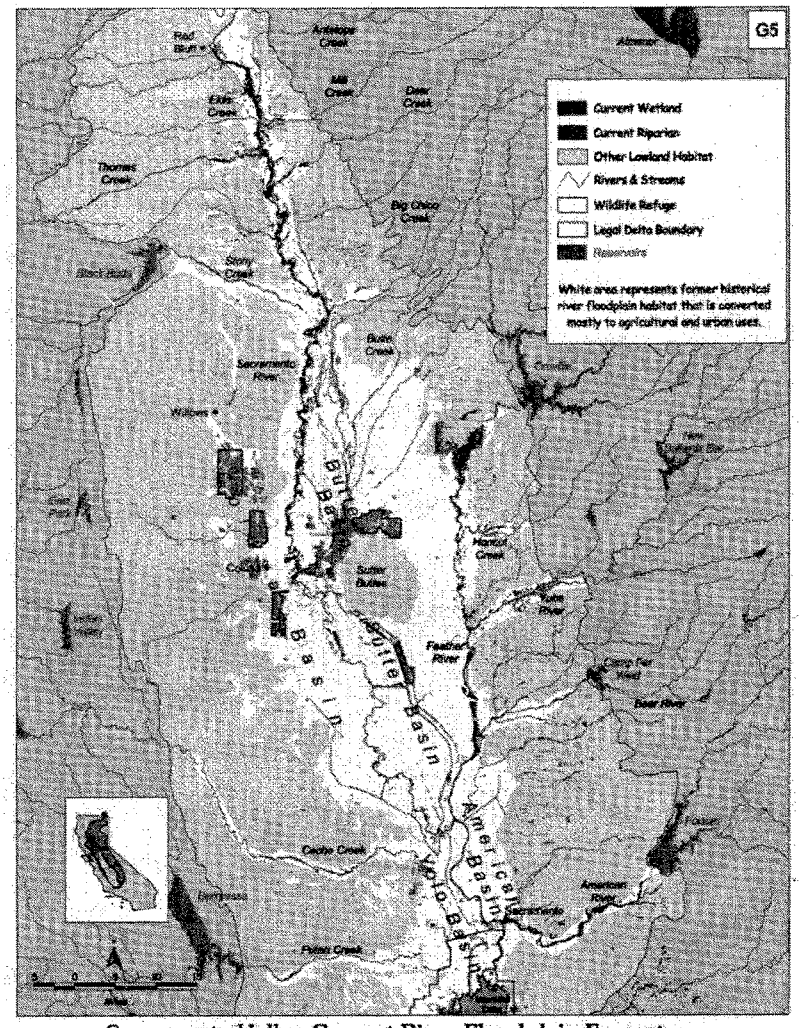
Historical Connected Waterways of the Central Valley



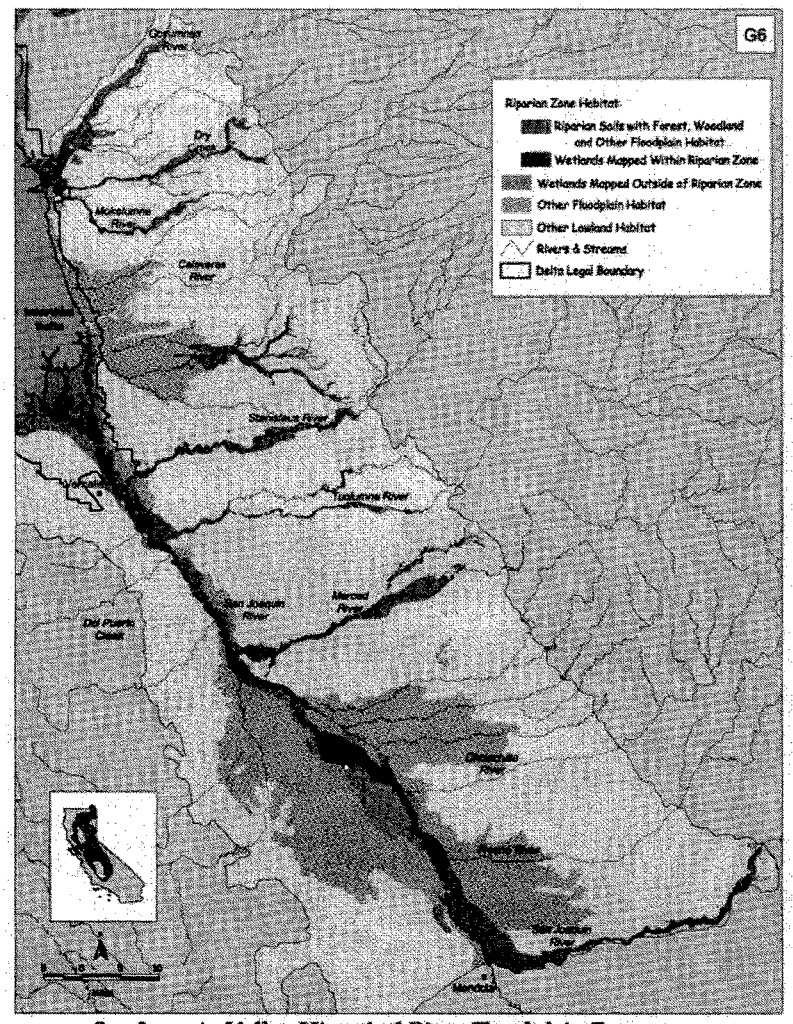
The Transformed Watershed



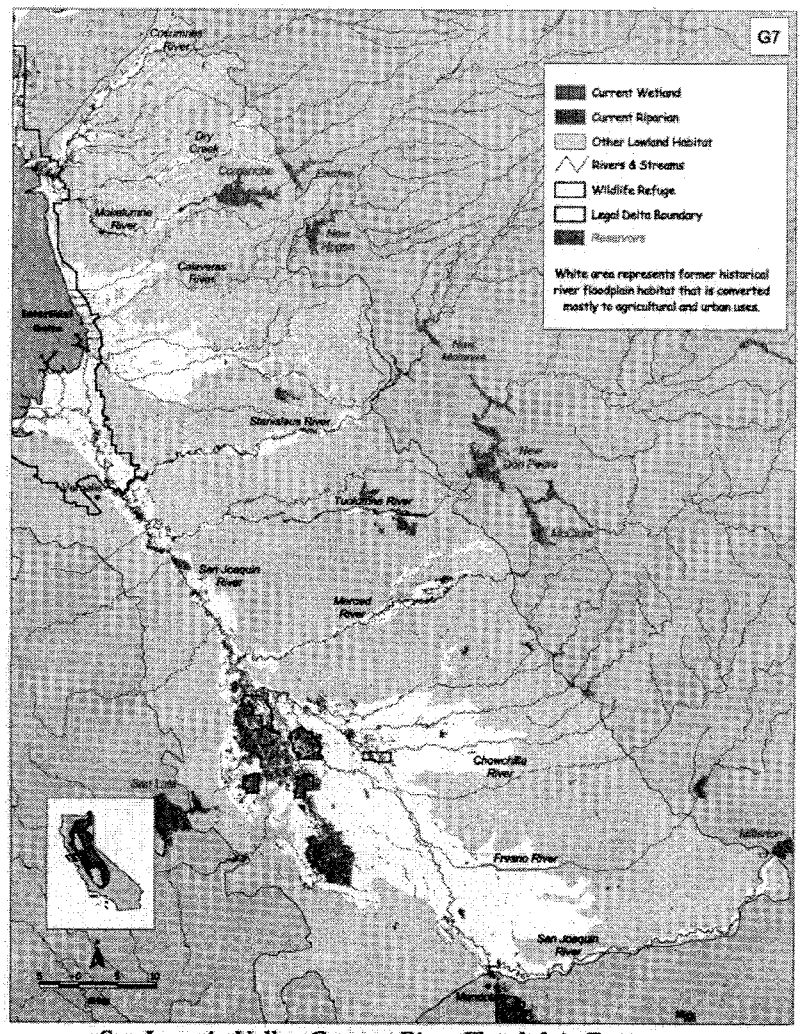
Sacramento Valley Historical River Floodplain Ecosystem



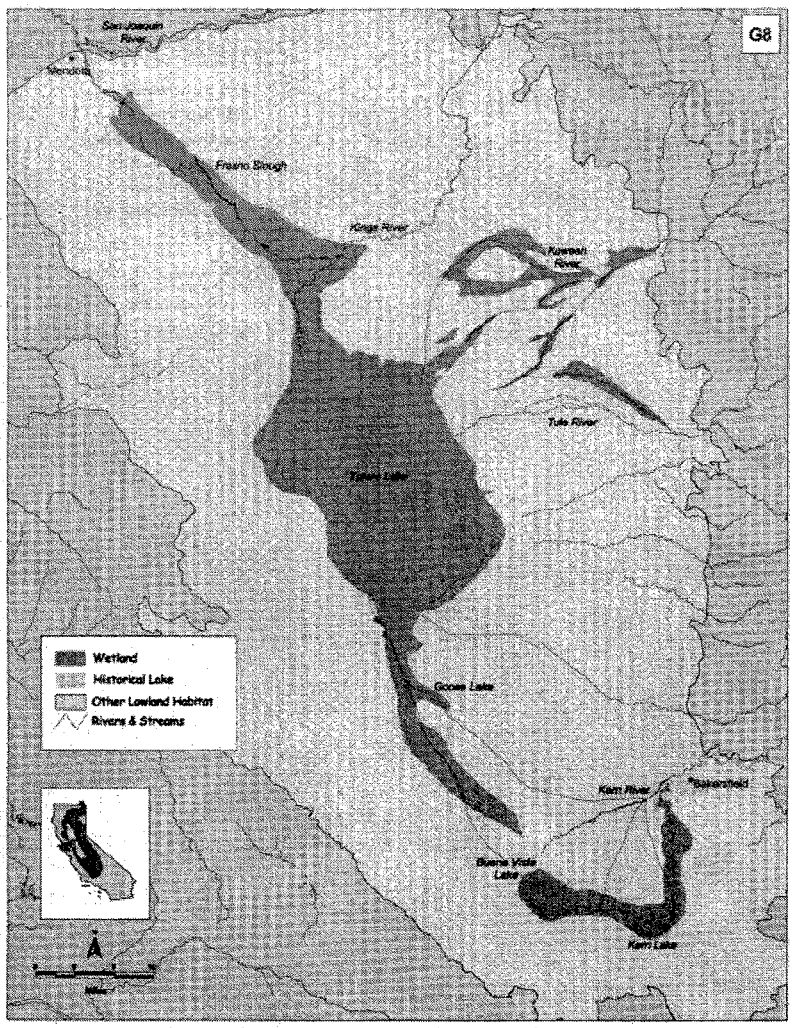
Sacramento Valley Current River Floodplain Ecosystem



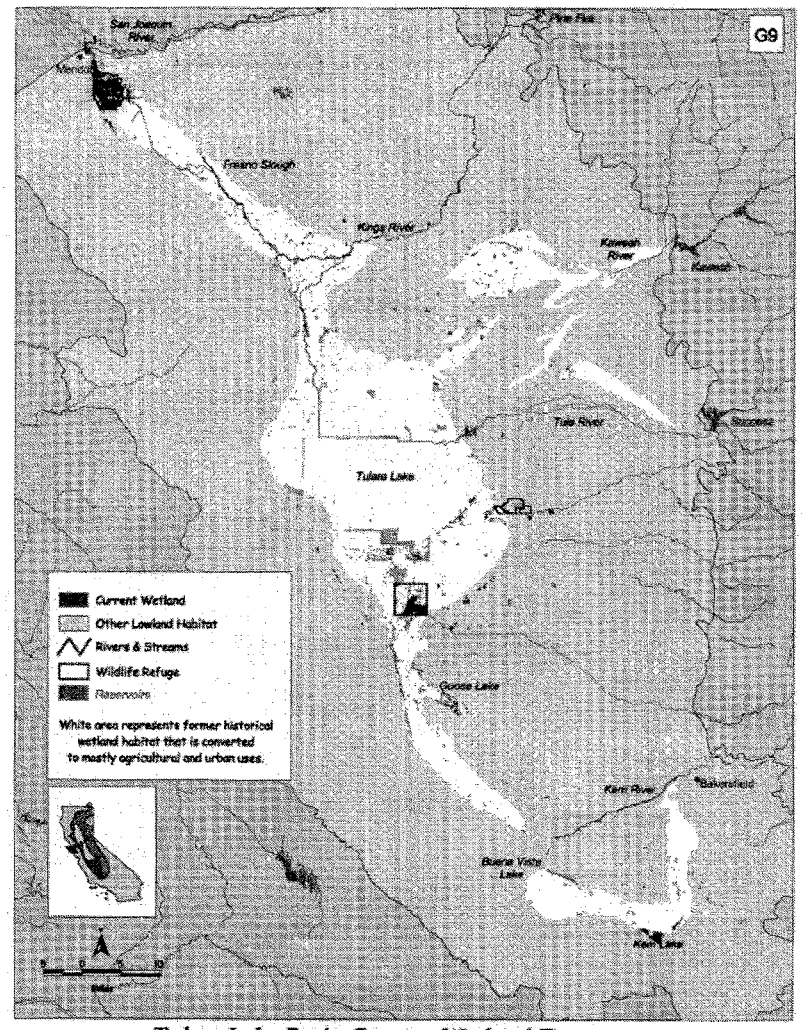
San Joaquin Valley Historical River Floodplain Ecosystem



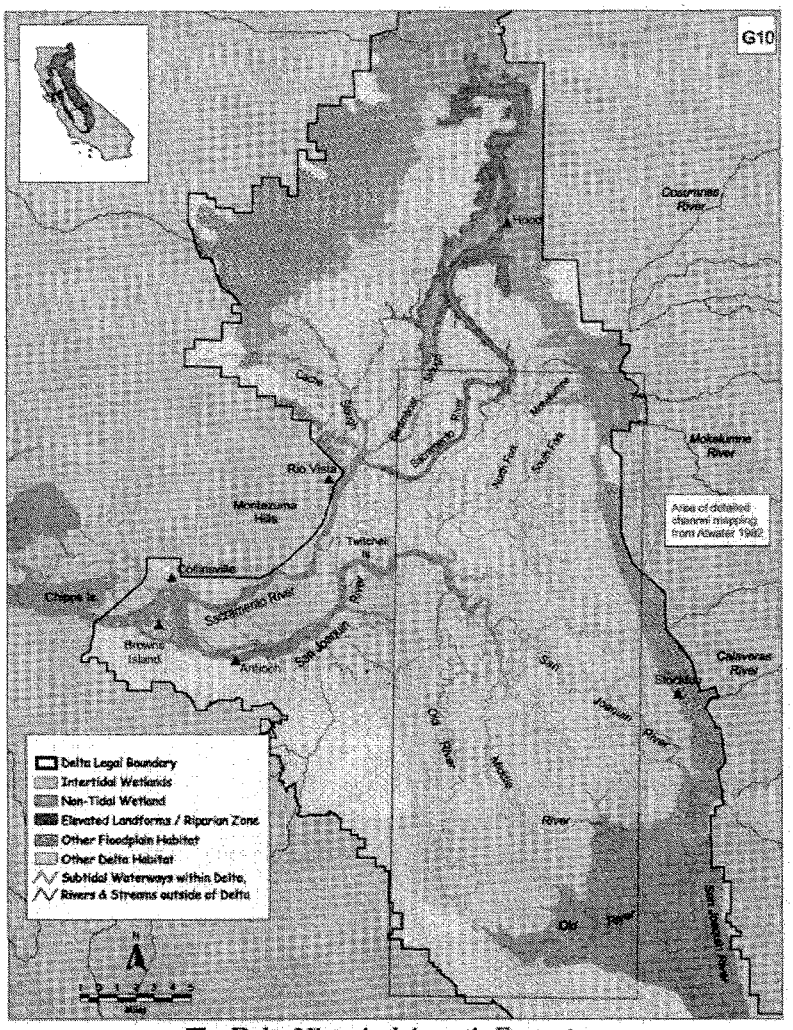
San Joaquin Valley Current River Floodplain Ecosystem



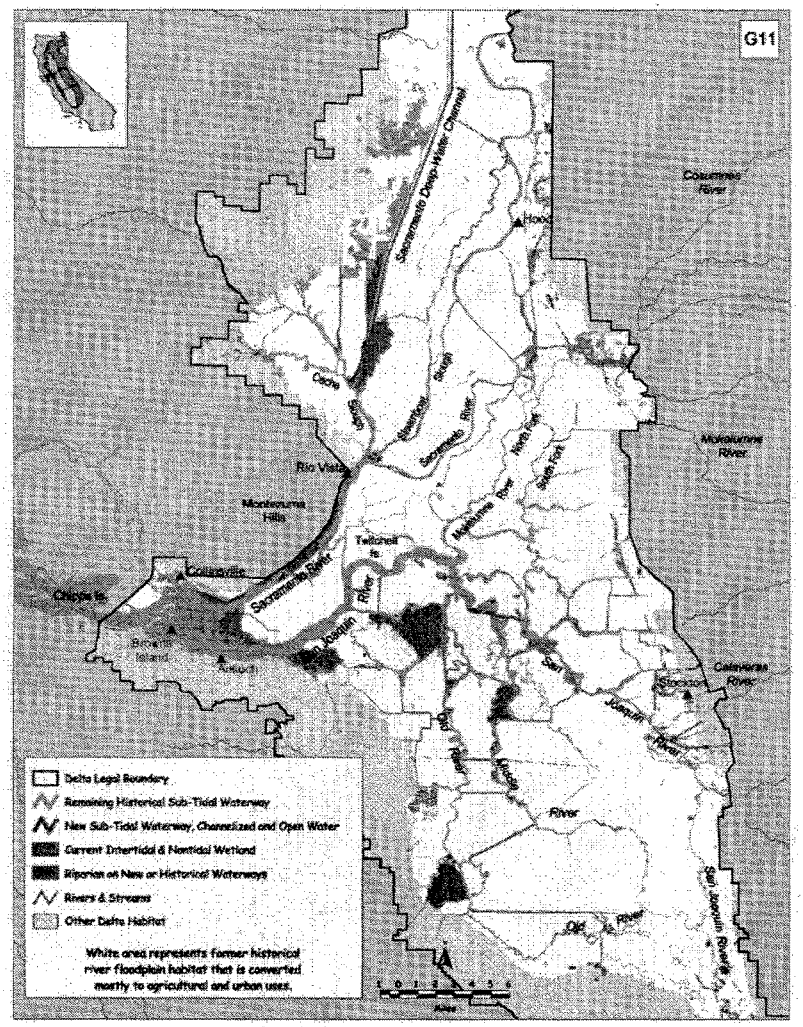
Tulare Lake Basin Historical Wetland Ecosystem



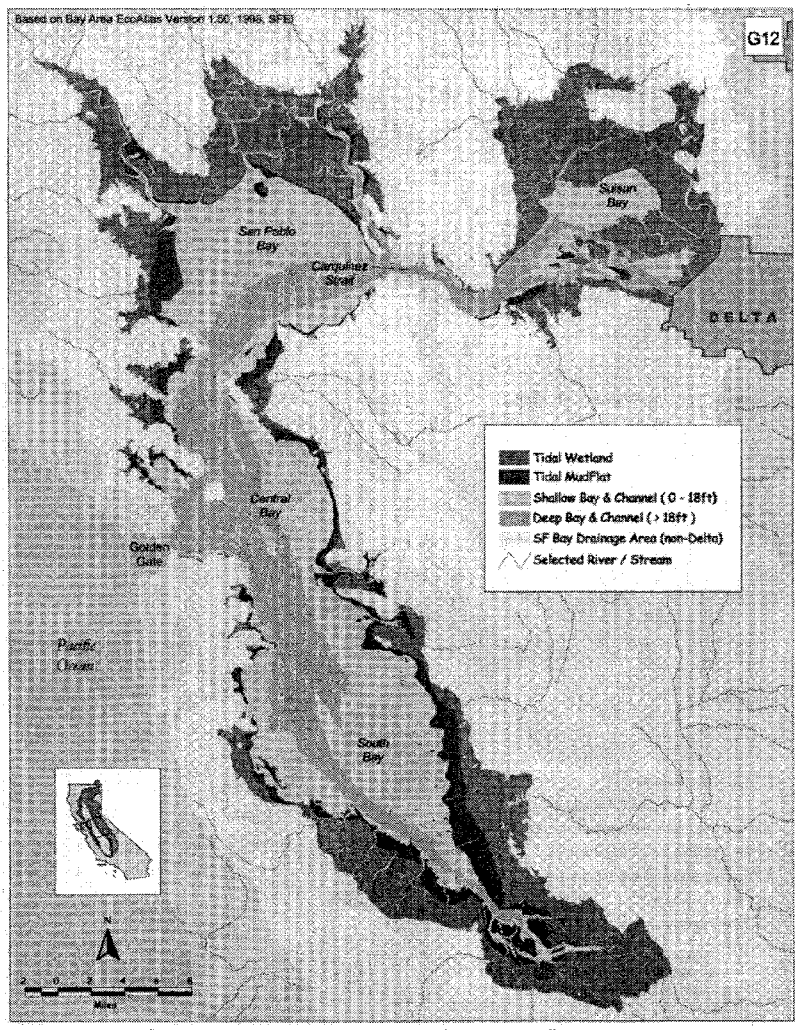
Tulare Lake Basin Current Wetland Ecosystem



The Delta Historical Aquatic Ecosystem



The Delta Current Ecosystem



San Francisco Bay Historical Aquatic Ecosystem