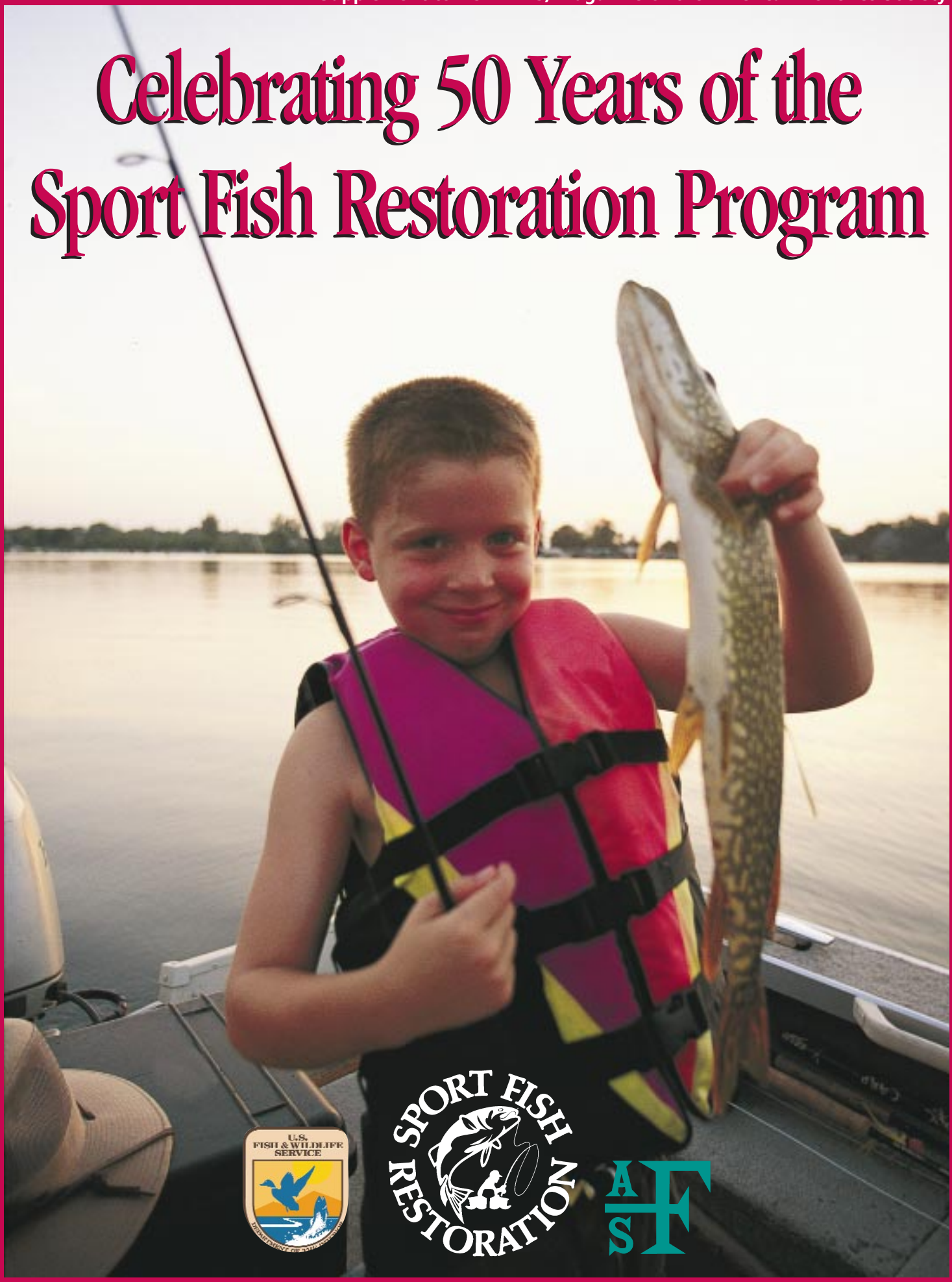
Supplement to *FISHERIES*, magazine of the American Fisheries Society

Celebrating 50 Years of the Sport Fish Restoration Program



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NATIONAL CELEBRATION ORGANIZERS

The national celebration of the 50th anniversary of the Sport Fish Restoration Program was conducted by a group representing the partners that make the program work; federal and state governments, private industry, the fisheries profession, and anglers and boaters.

Chair: Dee Mazzarese, U.S. Fish and Wildlife Service
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The group would like to extend a special thanks to the Federal Aid Management Team of the U.S. Fish and Wildlife Service for their support of the Sport Fish Restoration 50th Anniversary Campaign.

Cover Photo: Mitch Kezar

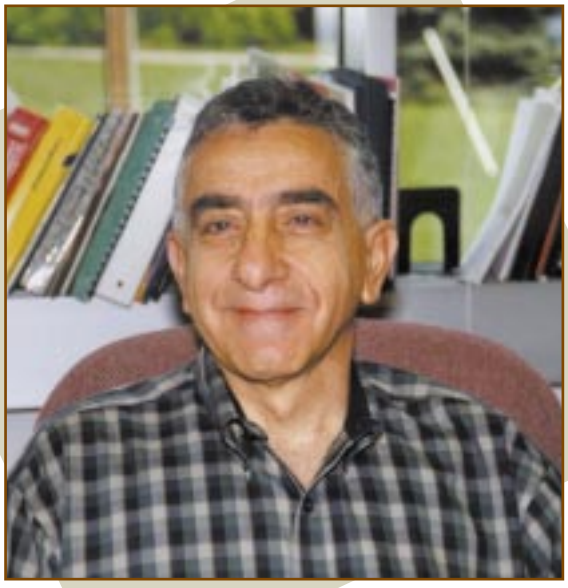
50 Years of Improving Sportfishing & Boating ...

Jamie Rappaport Clark, Director
U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service and the American Fisheries Society share a mission to conserve and restore the fisheries and aquatic resources of the United States. One of the most significant programs to support this mission is the Federal Aid in Sport Fish Restoration Act. This landmark legislation, enacted in 1950, enables America's anglers, boaters, tackle manufacturers, State fisheries managers and the Service to work together to enhance sport fish resources, aquatic habitats, boating opportunities and aquatic stewardship throughout this Nation and its territories and possessions.

The 50th anniversary provides an opportunity to celebrate this program's accomplishments. The highlights of successes in the following pages represent a small fraction of the improvements that have been realized from nearly $4 billion invested during the last half century. In addition to contributing to a healthier environment, the fishing and boating opportunities created through these projects provide recreational enjoyment and substantial economic returns throughout the country.

The Sport Fish Restoration Act is proof that strong partnerships between businesses, State and Federal agencies, and the American public can improve aquatic resources and recreational opportunities for all. As we begin a new century, we not only look back with great pride on our conservation achievements, but to building on them in the decades ahead.



Ghassan (Gus) N. Rassam, Executive Director
American Fisheries Society

United States Senate

WASHINGTON, DC 20510

THE SPORT FISH RESTORATION ACT
A MODEL FOR TODAY AND A LEGACY FOR THE FUTURE

United States Senators John Breaux and Malcolm Wallop

When we sponsored the amendments for the Sport Fish Restoration Act in 1984, we envisioned the creation of a stronger trust fund to benefit the anglers and boaters of the United States well into the future.

As the success stories on the following pages demonstrate,16 years after our amendments, and a full half a century after the initial Sport Fish Restoration Act was enacted, we can look back and see the tremendous benefits that have resulted from our legislation. We are pleased that thousands of acres of coastal wetlands have been restored and protected, millions of sport fish have been produced, vital fishery habitats have been restored and boating access has greatly increased across the United States. In short, the Sport Fish Restoration Act has become a model for the power of teaming anglers and boaters with the fish and wildlife management professionals across all 50 states.

We are pleased the American Fisheries Society and the U.S. Fish and Wildlife Service have joined forces to produce this publication honoring the achievements of the past 50 years.

And we are proud of the legacy of wise stewardship that the Sport Fish Restoration Act will leave to our children and grandchildren. We wish to thank all that have joined with us to make this great achievement possible.

John Breaux
United States Senator

Malcolm Wallop
United States Senator

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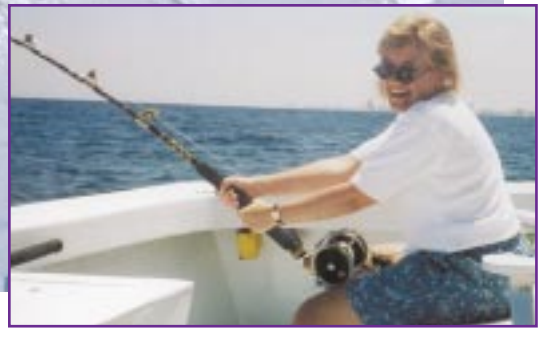

IMPROVING FISHERY RESOURCES AND HABITAT THROUGH SPORT FISH RESTORATION

In 1952, R.M. Rutherford, chief of the Branch of Federal Aid for the U.S. Fish and Wildlife Service, painted a bleak picture for many of this nation's waterways:

"... while fishing license sales have shown a three-fold increase in the last 15 years, the productivity of lakes and streams has declined. The result is that the average angler is catching fewer and smaller fish than he did a few years ago. Pollution and siltation have reduced or even eliminated the fish in many waters that once were highly productive. In other waters rough fish such as carp have destroyed habitat for game species until angler rewards are confined almost entirely to stunted fish." (Rutherford 1952)

In that same year, 48 states and the territories of Alaska, Hawaii, Puerto Rico, and the Virgin Islands received their first apportionment from the Federal Aid in Sport Fish Restoration (SFR) Program. Since that time, fisheries management across the country has greatly improved due to the solid and reliable funding provided through the program and angler license fees. State apportionments through the program have grown from $2.7 million in 1952 to over $212 million in 1999.

In the decades leading up to the establishment of the Sport Fish Restoration Program, there was a great realization of the degradation in both the land and water resources of the nation. Depression era programs such as the Civilian Conservation Corp and others were implemented not only to provide work for the growing number of unemployed, but also to begin rectifying environmental problems. Through habitat enhancements such as reforestation, erosion control, stream improvements, and lake construction, these programs set a foundation for conservation efforts to come. Unfortunately, the outbreak of World War II halted many of these efforts. Following the war, a robust economy and nearly full employment reduced the social need for these programs and many of them were disbanded. However, the need for aquatic resource conservation and restoration remained.

The passage of the Sport Fish Restoration Act of 1950 helped to alleviate these problems by providing states with funding for fisheries management. In Georgia and in many other parts of the country, state fish and wildlife agencies hired professional fisheries biologists for the first time. These new biologists quickly realized that the age-old practice of fish stocking was not going to solve all of the problems with fisheries resources. Using a more science-based approach, these professionals recognized that clean water, healthy habitat, and strong management principles were vital ingredients for successful fisheries programs. Thanks to this landmark legislation, states finally had the financial resources to begin addressing the problems facing the nation's aquatic resources.

In the past 50 years, Georgia alone has received over $62 million in funding through the SFR Program. This funding is used for projects such as sampling the state's major reservoirs and streams to detect potential problems and to monitor fish populations, conducting research and surveys, stocking hybrid and striped bass fingerlings, constructing and maintaining boat ramps, providing quality fishing opportunities at public fishing areas, and constructing aquatic education. Last year, Georgia received nearly $4 million through the Federal Aid in Sport Fish Restoration Program to fund these projects, accounting for 38% of the entire fisheries budget.

Two Georgia projects funded by the Sport Fish Restoration Program have received national recognition from the American Fisheries Society (AFS). The state's first public fishing area, Big Lazer Creek, received the inaugural award from this organization in 1990. Today, this 195-acre lake provides fishing opportunities for more than 10,000 anglers annually. In 1998, the AFS named the Georgia Department of Natural Resources as the recipient of the Sport Fish Restoration Project of the Year in the category of Aquatic Education for its work at the Marben Public Fishing Area. More than 40,000 anglers visit this area each year, and thousands of children learn ecology, water conservation and protection, and the basics of fishing through programs offered at this facility.

Georgia is blessed with over 4,000 miles of trout streams, 12,000 miles of warmwater streams, and half a million acres of impoundments that are enjoyed by more than 1.15 million anglers. But Georgia is not the only state that is using the funding provided through the Sport Fish Restoration Program for conducting sound scientific research, improving fishing opportunities, and developing innovative management and outreach programs. As the following case studies attest, a wide variety of habitat enhancement and fisheries restoration activities occur across this nationwide thanks to the Sport Fish Restoration Program.

BY DAVID WALLER

David Waller is director of the Wildlife Resources Division of the Georgia Department of Natural Resources and President of the International Association of Fish and Wildlife Agencies.

A HISTORY OF SPORT FISH RESTORATION'S IMPACT ON FLORIDA'S FRESHWATER FISHERIES

Since its inception in 1950, Federal Aid in Sport Fish Restoration (SFR) has provided vital funding for Florida's freshwater recreational fisheries. Over the last decade, these funds generated approximately $2.3 million annually for freshwater fisheries management (Figure 1). This constitutes a quarter of the budget for the Division of Freshwater Fisheries (Division), Florida Fish and Wildlife Conservation Commission (FWC), which is responsible for managing 1.2 million hectares of lentic water, and more than 19,000 kilometers of lotic water. The resulting freshwater recreational fishery generates nearly $1.5 billion in economic output and keeps approximately 19,000 people employed. Without this funding, programs directed at aquatic habitat restoration, fish stocking, fishing access, aquatic education, urban fisheries, and applied fisheries research would be severely curtailed.

The first freshwater fishing regulation was passed in Florida in 1855, 10 years after Florida became a state and 58 years before the first Florida fisheries agency was created. It was not until 1999 that voters decided to include saltwater species under the constitutional umbrella, resulting in creation of the FWC.

The first fishery biologist was hired in 1946, and at the time funding was based entirely on fishing license sales. Hence, it was a great boon when the Dingell-Johnson (DJ) Federal Aid to Sport Fish Restoration Act passed in 1950 and began returning federal excise tax money to Florida. The Division's stated goals for the money were: (1) to improve sport fish catch and (2) to use aquatic resources on a sustained yield basis.

Today, our goals are similar: (1) to provide healthy resources and (2) to ensure satisfied customers. More specifically, we seek to create angler satisfaction by improving the sport fish catch and by enhancing the overall quality of the fishing experience. More market-based research is conducted to complement research on fish biology, population management, and habitat enhancement. The question is not just "do we provide more or bigger fish?" It is "how do we identify diverse customer segments, in specific fishing areas, and what they want from their fishing experience?"

"Optimum-sustained use" is now our basic management philosophy, rather than "maximum-sustained yield." This philosophical evolution has been demonstrated by emphasizing quality fishing access (e.g., boat ramps, fishing piers, bank fishing opportunities at urban ponds), outreach programs (e.g., aquatic education centers, urban fishing clinics, family fishing events), and maintaining healthy fish populations (through habitat management, regulations tailored to local needs, and appropriate stocking programs).

BY BOB WATTENDORF

Bob Wattendorf, Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600; 850-488-0520; wattenr@gfc.state.fl.us.

Current programs funded by SFR demonstrate how anglers benefit from the "user-pays, user-benefits" philosophy. Freshwater fisheries in Florida have received approximately $2.3 million each year since 1988 (Figure 1), but this has been adversely affected by inflation.

In FY 1999-2000, the allocation of monies is as follows:

1. Fishing Access Development ($530,000)—The FWC and its predecessor built more than 300 freshwater boat ramps since 1950 and currently maintains 211. Our objective is to provide quality fishing access by annually building two new ramps and three fishing piers, and renovating six ramps. It is evident from boat registrations and creel surveys that freshwater boating usage has increased and, on some water bodies, the only public boating access is via our ramps; without Federal Aid funds this access would not exist.
2. Community-Based Fisheries ($373,000)—More than 10 million of Florida's 15 million residents live in metropolitan areas. With this high degree of urbanization, servicing these residents is a necessity. In 1947, the old Game and Fresh Water Fish Commission (GFC) held its first "fishathons" to interest children living in urbanized areas in fishing. As a result of the increased SFR funding through the Wallop-Breaux amendments, an official "Urban Pond Program" was developed in the Jacksonville area. The program's success resulted in its recognition as the SFR project of the year, after which three additional urban fishing projects were added in the Orlando, Tampa and Miami areas. These programs provide 1,000-3,000 hours of fishing pleasure per hectare per year, by using intensive management techniques including put-grow-take stockings, supplemental feeding of fish, and aeration. The total water area included in the program is 300 hectares, constituting 32 sites ranging from 0.8 hectares to 64 hectares each. Urban fisheries projects integrated with fishing clinics and rodeos are cornerstones of our outreach program,

and are showcases for cooperation with local governments and conservation groups. In 1998-99, these projects hosted 181 clinics (8,270 youth participated), 44 fishing derbies (11,373 anglers) and 47 presentations (117,975 attendees).

3. Aquatic Education ($256,000)—These programs attempt to alter people's behavior to help conserve aquatic habitats and promote ethical freshwater fishing. Efforts are focused in two FWC aquatic education centers and we also utilize programs such as: Aquatic Wild, 4-H, Hooked on Fishing—Not on Drugs, Becoming an Outdoors Woman, and FWC's "Ladies Bait Your Own Hook." In 1998–99, our aquatic education efforts reached 1.9 million citizens, up from 1.5 million just two years earlier. These efforts are fundamental to achieving our goals of ensuring healthy resources and satisfied customers.
4. Tenoroc Fish Management Area ($237,000)—Central Florida has been heavily mined for phosphate, resulting in a series of pits whose natural productivity and isolation create outstanding trophy bass fisheries. Unfortunately, most are not accessible to the public. Tenoroc Fish Management Area is an exception. This 2,590-hectare tract of land was donated to the State in 1982. The FWC manages the area for multiple uses, including fishing and fisheries outreach. In particular, 11 managed pits (336 ha) provide outstanding public fishing, and one lake, Hydrilla Lake, is set aside as a special opportunity fishery. Hydrilla Lake is open only on Friday and Sunday and is limited to one boat, with a maximum of three anglers. All bass must be released, but the odds of catching a quality bass and experiencing a peaceful fishing trip are high. Anglers enter a random drawing to use the lake and pay $50 if selected. This is an example of providing a specific group of customers with the type fishing they want and represents the "user-pays, user-benefits" philosophy, with revenue staying on-site to improve fishing.
5. Commission-Managed Impoundments ($136,000)—In the 1970's the GFC created six impoundments totaling 572 hectares in the western panhandle of Florida, a region lacking natural lakes. These impoundments have been intensively managed to create extremely popular fisheries. Fertilizer and habitat management programs have tripled production of harvestable-sized fishes. Creel surveys document panfishing success rates approaching six fish per hour, and 34% of harvest occurs around artificial spawning beds and attractors. Typical springtime creels reveal nearly 500 hours of fishing pressure per hectare on these waters. With the current value of an hour of fishing estimated at being worth $18.20 to the local community (for non-resident bass anglers the figure is $43.89 and for local subsistence anglers it is $5.94), this provides an exceptional return on investment.
6. Everglades Fisheries Management ($93,000)—The Everglades Water Conservation Areas (WCAs) cover 3,500 km2 and are impacted by agriculture and water-level stabilization. An understanding of how WCA fisheries react to various water-level scenarios is necessary to make wise management decisions for the southern third of the state. As a result, this project is providing critical applied research to ensure that freshwater fish populations and recreational fisheries are properly considered during restoration of the Everglades system.
7. Fisheries Data Base Management ($88,000)—Information management is critical to effectively and efficiently meet our goals. Data bases correlating water quality, aquatic habitat and fish populations can be matched to creel data to provide realistic expectations and to help design and validate appropriate management programs. This project also helps evaluate customer desires, constraints on participation, and satisfaction, so the information can be used to set management goals and measure success.
8. The remaining funds were allocated to administration and fixed-capital outlay (FCO) projects, such as restoration of Commission-managed impoundment structures this year.

In conclusion, Florida has immensely valuable and popular freshwater recreational resources but only limited funding to ensure the health of fish populations and aquatic ecosystems. Since SFR's inception in 1950 the excise taxes and motor boat fuel monies expended by Florida anglers and returned to the state via SFR have served Florida's resources exceptionally well, and will hopefully continue into the foreseeable future.

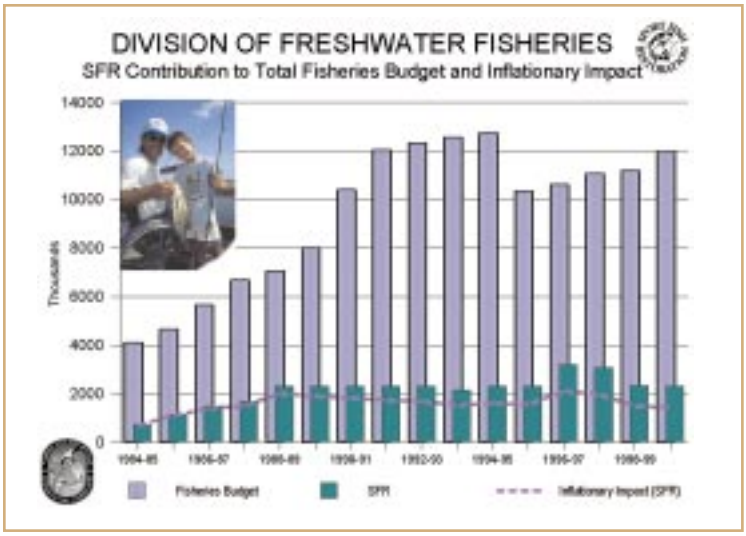

Figure 1. Since 1988 the Florida freshwater fisheries apportionment has remained relatively stable, as a result of Congress' 1988 actions to recalculate the allocation between fresh and saltwater programs while protecting the historic freshwater apportionments. However, inflation has taken a toll on the revenue's buying power.

COAST 2050
MAKING A DIFFERENCE FOR LOUISIANA

Louisiana's story is compelling. It's about an irreplaceable part of America's coast that is disappearing at a catastrophic rate. If the loss is not stopped and reversed, fisheries along with the state's economy, infrastructure, wildlife habitat, communities and the unique culture of south Louisiana will be at risk.

Louisiana's coastal wetlands represent 40 percent of all the salt marshes in the contiguous United States. During the past 50 years more than 1,000 square miles have disappeared. During this decade, our coastal wetlands are being lost at the rate of 25 to 35 square miles a year, or the equivalent of a football field every 15 minutes. Even with current restoration efforts, we expect to lose almost one thousand more square miles by the year 2050. This dramatic loss represents 80 percent of all coastal wetland loss in the entire continental U.S. The effects of natural processes like subsidence and storms combined with human actions, including impacts from offshore oil and gas exploration and development, have led to an ecosystem on the verge of collapse.

Louisiana's coastal wetlands contribute 28 percent to the total volume of U.S. fisheries.

If nothing is done, the loss to Louisiana by the year of 2050 is phenomenal.

America is losing much more than acreage. Louisiana's coastal wetlands contribute 28 percent to the total volume of U.S. fisheries and provide winter habitat for one-half to two-thirds of the Mississippi Flyway waterfowl population. These wetlands are home for many threatened and endangered species and the nursery grounds for fish and shellfish consumed by much of the nation. In addition, 40 percent of the nation's fur harvest comes from here. These wetlands provide for 400 million tons of waterborne commerce annually, and support and protect the multi-billion dollar a year oil and gas industry. The state's coastal wetlands are home to more than two million people and serve as a buffer from hurricanes and storms.

Louisiana began work in earnest to restore its coast in 1989 with the passage of the Coastal Wetlands Planning Protection and Restoration Act (CWPRA), also known as the Breaux Act. Funds for this Act come from the excise tax on small engine fuels that are deposited in the Sport Fish Restoration account (as authorized in the 1990 amendments to the Sport Fish Restoration Act). Since 1992, $40 million has been made available annually to Louisiana, allowing more than 80 restoration projects to be initiated or completed. Louisiana has gained the technical know-how, and, by working with our federal partners, we are cementing long-term partnerships as we build projects together. In addition, more than 134 projects in 25 other coastal states have restored, created, or protected vital wetlands through the

BY SIDNEY COFFEE AND CYNTHIA POLAND

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Coastal Wetlands Conservation Act and the North American Wetlands Conservation Act, which are also funded as part of the Breaux Act.

In order to improve coordination of wetlands restoration between the Breaux Act programs and other initiatives, the Coast 2050 Plan was developed in partnership with the public. It is a technically sound strategic plan to sustain Louisiana's coastal resources and to provide an integrated multiple-use approach to ecosystem management.

Coast 2050 has received unanimous approval from all 20 Louisiana coastal parishes, the federal Breaux Act Task Force, the State Wetlands Authority, and various environmental organizations, including the Coalition to Save Coastal Louisiana. This approval is unprecedented.

Improving hydrology, drainage and water levels are key to the COAST 2050 ecosystem strategies and the preservation of a national treasure.

The main strategies of the plan are watershed structural repair, such as restoration of ridges and barrier islands, and watershed management, such as river diversions and improved drainage. In making recommendations, the process did not view the number of coastal wetland acres saved as the only priority, but considered other resources as well, such as roads, levees, fish and wildlife resources, and public safety and navigation, in making recommendations.

The Breaux Task Force, the Louisiana Wetlands Authority, and the state's Coastal Zone Management Authority have established a unifying strategic plan of action. It has become the CWPPRA restoration plan and Louisiana's overall strategic coastal plan. Proposed projects are measured against the strategies in the Coast 2050 Plan before being approved.

In one way or another, everyone in the nation will feel the enormous loss of land along Louisiana's coast, and current restoration efforts will only prevent 22 percent of the land loss projected to occur within the next 50 years. However, we know that a comprehensive restoration program, using the Coast 2050 Plan as a guide, could restore and maintain more than 90 percent of the coastal land existing today.

Wetlands provide life cycle needs to many species, including fish and waterfowl.

The price tag is $14 billion to construct more than 500 projects that would be needed, but the price of infrastructure alone that would be lost is more than $100 billion. Although the Breaux Act, with funding through the Sport Fish Restoration Act, has provided a solid start toward needed restoration, we have a long way to go. Louisiana and America cannot afford to wait.

TRAGEDY TO TRIUMPH: ESTABLISHMENT OF THE MICHIGAN GREAT LAKES SALMONID FISHERY

More than two million anglers age 16 years and older fished in the Great Lakes in 1996, pursuing salmon and trout in more than half of their trips (USDI and USDC 1998). The world class salmon and trout fishery that the Great Lakes supports is one of the greatest fishery management feats ever accomplished, combining resources of state and federal agencies, as well as funding from the Sport Fish Restoration (SFR) Program. To put the management history in context requires a review of the evolution of the Great Lakes fish populations, particularly since the settlement of the European explorers.

The Great Lakes emerged from beneath the retreating glaciers of the last Ice Age less than 15,000 years ago. As the ice retreated, various species of fish began to arrive. Most of the 160 species considered native to the Great Lakes came via the Mississippi River system, while about 20 percent arrived from tributaries to the Atlantic Ocean. For centuries, sparse populations of native people harvested fish for personal consumption without affecting their abundance. Their fishing efforts were limited to using fragile, primitive nets and canoes. Following the War of 1812, a tide of European settlers arrived. Many had long-established traditions of commercial fishing, using large, sturdy boats and efficient, durable nets. They fished for the market, with the means to preserve fish and ship them great distances. Boats increased in size. First steam, then gasoline, and then diesel replaced arm and wind power. Steel replaced wood. Nets became more sophisticated as nylon, then monofilament, replaced cotton.

In less than 100 years, unrestricted fishing threatened the destruction of once-stable fish populations. By 1920 the once abundant whitefish (*Coregonus clupeaformis*) had been nearly eliminated. Sturgeon (*Acipenser fulvescens*) were reduced to near extinction throughout the Great Lakes system. Blue pike (*Stizostedion vitreum glaucum*) became extinct, the larger chub species (*Coregonus sp.*) were eliminated and herring populations collapsed. The harvest of lake trout (*Salvelinus namaycush*) had declined throughout the lakes by more than half, even before the appearance of the sea lamprey (*Petromyzon marinus*).

BY DR. HOWARD TANNER

Howard Tanner is professor emeritus at the Department of Fisheries and Wildlife, Michigan State University, 13 Natural Resources Building, East Lansing, MI 48823; 517-353-6647. He served as chief of fisheries and departmental director for the Michigan Department of Natural Resources in the 1960s and 1970s during the initial establishment of the salmonid fishery in the Great Lakes.

Over-harvesting was only one factor that contributed to decline of the fish populations. European settlers quickly stripped the land of forests, wetlands were drained and filled, dams prevented fish from reaching spawning habitat in most streams, and industrial and urban pollution became a factor.

With settlement came canals. In 1828, the Welland Canal opened the upper four Great Lakes to the ocean, bringing the American eel (*Anguilla rostrata*), alewife (*Alosa pseudoharengus*) and the infamous sea lamprey to our freshwater seas. Other non-native species were deliberately introduced, including carp (*Cyprinus carpio*), rainbow and brown trout (*Oncorhynchus mykiss* and *Salmo trutta*, respectively), and smelt (*Osmerus mordax*). By 1940, Pacific salmon (*Oncorhynchus sp.*) had been introduced 35 times without success. These "exotic" species all played a part in the collapse of the whole community of Great Lakes fishes.

The commercial harvest peaked in the 1890s and steadily declined after that. The eruption of sea lamprey in the 1940s and 1950s doomed already greatly suppressed whitefish, lake trout and burbot (*Lota lota*). Without lake trout predation to keep them in check, alewife numbers rocketed. By 1966, alewives made up 95 percent, by weight, of the fish in Lake Michigan and Lake Huron. Through both competition and predation the alewife depressed most other species including the yellow perch (*Perca flavescens*). In the relatively short span of less than 150 years, rapacious, unrestricted commercial fishing, non-native species, and habitat deterioration had doomed a fish community that had thrived for aeons.

Commercial fishermen, with few exceptions, were "on the beach," with little left to fish for. The sport fishery had virtually disappeared. But there were signs that recovery was possible. By the 1950s, when the SFR program was in its fledgling years, the emerging science of fisheries began to unlock the formula on which to base good fisheries

SFR investments are integral to managing the salmon and lake trout fisheries in the Great Lakes, which provide enjoyment to anglers of all ages and contribute billions of dollars to the economy.

DAVE KENYON (MI DNR). PROVIDED BY MICHIGAN SEA GRANT.

management. International cooperation developed with the Great Lakes Fishery Commission, control of the sea lamprey was being attempted, and most promising of all the factors was the burgeoning understanding of nature and the magnitude of past mistakes.

The changes necessary to restore the vitality of the Great Lakes fishery were at hand. It would take bold innovation and rebuilding almost from scratch. But the science and resources were on the threshold. Finding the dollars, will, and proper political climate to meld them together was the challenge. Experiments with chemical lamprey treatment succeeded and a new lake trout hatchery along the Jordan River could produce millions of young fish for restocking.

However, a clash developed in the formative stage of implementing this strategy. Federal officials in the U.S. Bureau of Commercial Fisheries, based in Ann Arbor, Michigan, had—due to default on the part of the states—been managing the Great Lakes fisheries for decades. Under its jurisdiction, the resource was managed as a commercial fishery. These officials pressed to maintain their control. Their vision was to "turn back the clock," using native species exclusively, meaning lake trout.

While Michigan fisheries officials sanctioned restoring lake trout, they had a broader vision, and for the first time since the turn of the century exerted their authority over the 41 percent of Great Lakes waters that were within the borders of the state of Michigan. These officials decided that management of Michigan's share of the Great Lakes for sport fishing was the best allocation of the resource. This decision has since been emulated to a substantial degree in the management policies of the other seven Great Lakes states and the province of Ontario. Because of these early decisions, *sportfishing has become the key value for almost 100,000 square miles of productive freshwater*. This is an area larger than all of the New England states plus one half of the state of New York.

In October 1964, Michigan fisheries managers learned that Oregon and Washington had surplus coho salmon (*Oncorhynchus kisutch*) eggs. Oregon provided the first million coho eggs in late 1964 and early 1965. In subsequent years additional coho eggs came from Washington and Alaska. Chinook salmon (*Oncorhynchus tshawytscha*) eggs were obtained from Washington starting in 1968.

We were totally convinced that the introduction of salmon into the Great Lakes would succeed. Several examples in the literature described the successful introductions of salmon into freshwater that had succeeded, but on a small scale. The food supply represented by the billions of pounds of alewives was basic to our optimism.

Our program would require money, lots of it. Fiscal resources from every imaginable source—including Sport Fish Restoration dollars—were pooled to develop and sustain the fishery. New hatcheries, fish ladders, fish food, more staff, and large

research and monitoring vessels were needed. We provided speakers to any group that expressed interest and public support was developed even before the first salmon were caught. The Michigan legislature agreed to require a sportfishing license of anyone fishing in the state's waters of the Great Lakes—a first—and appropriated $500,000. The U.S. Congress agreed to amend the Anadromous Fish Conservation Act so that the Great Lakes program was eligible for funds.

The return of precious jack coho in late 1966 stimulated public enthusiasm. These fish were very large for jack coho (4-7 lbs.). Perhaps 10,000 were caught. The following year, the salmon fishery produced what was termed "coho fever" as thousands of anglers descended on the small lake port cities of the eastern coast of Lake Michigan. The harvested salmon averaged approximately 15 lbs and the largest exceeded 30 lbs. A very large new fishery had been born.

Generous support for the program came from everywhere, enabling new hatcheries to raise more fish, as well as the construction of fish ladders, research vessels, and other infrastructure. Many adult coho and chinook returned to the streams. Eggs were provided to other states around the Great Lakes. South Dakota received eggs to develop a salmon fishery on the large upper Missouri River impoundments.

Since the mid 1960s, hundreds of millions of dollars have been invested in the Great Lakes salmon and trout programs by states, federal government, local communities, tribes, and private individuals. Today, more than $2.5 million in SFR funds are invested annually by the State of Michigan in Great Lakes research (with countless additional state and federal dollars from other sources). These investments have paid handsome dividends. In 1996, direct expenditures for recreational fishing exceeded $1.4 billion (USDI and USDC 1998), and economists have frequently estimated the *total* economic activity generated by these fisheries at *several billion dollars* annually. Many small lake port communities have been rejuvenated and the impact on the tackle, boat and other equipment industries is acknowledged to have been enormous. (As an aside the down rigger, a popular piece of fishing equipment today, was invented to fill a need created within the Great Lakes salmon fishery). A large charter boat fishing industry has been created.

Many millions of angler days are spent on the lakes each year and by the mid 1980s fishermen were harvesting over 3.5 million salmon from Michigan's waters alone. Nearly one million lake trout, over one million steelhead, and perhaps half a million brown trout were also a part of the catch. Over the thirty-five years since the first introduction, a variety of problems have occurred. The gill nets have been banned in most areas. Bacterial Kidney Disease (BKD) in chinook and Early Mortality Syndrome (EMS) in lake trout have emerged. Toxic waste such as DDT, PCB and mercury have been problems. Some problems have been successfully dealt with and other problems remain but have for the most part been adequately controlled.

This success story can be summarized by listing several elements. Certainly the most important is contained in the answer to this question: Have the salmon introductions and the current management programs keyed to sport fishing been good for the resource? Our answer: We have achieved a stable, well balanced relationship between predator/prey species (i.e., several species of trout and salmon/alewife and smelt). Public support, at least in part generated by participation in Great Lakes sport fishing, has fostered a much cleaner environment throughout the lakes and their tributary streams. Fish populations are more stable because excessive harvests have largely been eliminated. Millions of people have access to a new sport fishery to enjoy. Advances in fishery science has produced a great deal of knowledge applicable to management. Many cooperative relationships have bonded state management agencies, federal programs, tribes and, perhaps most of all, universities. These relationships provide further proof that the future of these multi-faceted sport fisheries of our Great Lakes is secure. Last but not least, the shift from small scale commercial fishing to recreational angling has generated billions of dollars annually for everyone, including charter boat operators, lake side communities, tackle and boat manufacturers, and all others that provide sport services to the angling public.

There are many reasons to view the future with optimism. Fisheries management agencies have gained a much better understanding of the very complex and diverse ecosystems that constitute the Great Lakes system. Cooperation between the management elements is good. Sea lamprey control programs have new tools that promise to further reduce the predation by this menace and the lake trout population of Lake Superior appears to be self sustaining. The natural reproduction of salmon and steelhead is providing an increasing percentage of the fish needed to stock the lakes at their optimum carrying capacity and the decline in angler catch and participation that marked the early 1990s has been reversed. In my view hatchery production will remain a major component of the management programs for the foreseeable future.

The strongest and most satisfying reason to be optimistic about the future is the existence of a very large and vigorous public constituency for the protection and enhancement of the environmental well being of the Great Lakes. Certainly a significant source for the development of this constituency has been generated by participation in the Great Lakes fishery that has emerged in the last three decades.

ROLLING ROCKS ON THE SAN JUAN— A COMMUNITY-BASED APPLICATION OF THE FEDERAL AID IN SPORTFISH RESTORATION ACT

Colorado's "*Fishing is Fun in Colorado*" community assistance grant program is a long-term effort to develop and enhance Colorado's sport fishing resources. This unique program involves local communities in a three-way partnership with the Colorado Division of Wildlife and the Federal Aid in Sport Fish Restoration (SFR) program. Over the past 12 years, 198 Fishing is Fun (FIF) projects in 54 Colorado counties have contributed greatly to the expansion of recreational fishing opportunities and fishery resource enhancement. To date over $14 million dollars in projects have been approved to receive FIF (SFR) grants totaling $8 million. In addition to the 57% match (in-kind and cash donations) provided by local sponsors, communities provide a minimum of 20 years operation and maintenance expense. The FIF program has resulted in over 4,100 surface acres and 53 miles of new angler access. Projects have included 39 boating access points, 16 aquaria, 14 angler access bridges, 31 boat docks, 38 restroom facilities, 65 parking lots, 45 fishing piers, 24 pond renovations and numerous instream structures.

Project applications are submitted in March of each year, which begins an exhaustive review and approval process. Successful applicants receive a "conditional approval letter" from Director of Colorado Division of Wildlife in June. Following review process of the Federal Aid Branch of the U.S. Fish & Wildlife Service, applicants normally receive formal "notice to proceed" letters prior to April of the year following application.

The award-winning San Juan River rehabilitation project is prime example of how the "*Fishing is Fun in Colorado*" community assistance grant program works to restore a degraded stream fishery resource to provide benefits to recreational anglers. Stream habitat improvement has long been considered one of the strategies that can be employed to enhance fisheries (Trout Unlimited 1998, USDA Forest Service 1992, Hunter 1991). In 1994, the City of Pagosa Springs, Colorado, approached the Colorado Division of Wildlife with a proposal to improve a 1.5 mile stretch of the East Fork of the San Juan River that flows through the city and is readily accessible to anglers. This stretch of the East Fork of the San Juan, located in south central Colorado, was marginal fishery habitat and prone to severe runoff from snow melt and summer storm events. Additionally due to human neglect river channel had become a dumping ground with some local channeling efforts that resulted in further loss of fish habitat. The City was interested in improving instream habitat for the benefit of both the resident trout population and the numerous anglers in the area.

Figure 1. Habitat in the East Fork of the San Juan prior to project construction.

BY ROBIN F. KNOX and ED DUMPH

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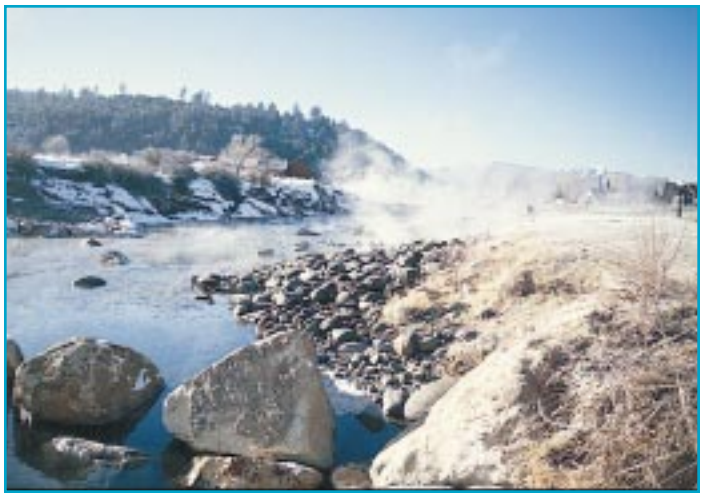
Project Planning

The project site was surveyed by the local area biologist and the hydrologists hired by the contractor for the project. They determined that the 1.5 mile stretch was basically degraded and lacking in instream cover, overhead cover, holding water, insect production, rearing habitat and spawning habitat. Figure 1 shows the state of the habitat prior to construction.



Habitat in the East Fork of the San Juan post-construction.

Pre-project electrofishing in the rehabilitation area estimated abundance for rainbow trout (*Oncorhynchus mykiss*) at 19 fish per surface acre and 5.8 pounds per acre biomass. Brown trout (*Salmo trutta*) were estimated to have an abundance of six fish and 2.4 pounds per acre.

David L. Rosgen, a retired US Forest Service hydrologist well known for stream improvement projects in the western United States, designed the project. A major effort was made to plan instream structures that would provide the needed habitat components—structure, depth of water, and improved water velocity to keep deposition of sediment to a minimum.

Other pre-project planning aspects included designing revegetation of riparian areas, acquiring public access through local easement agreements, and acquiring the necessary permits from federal agencies.

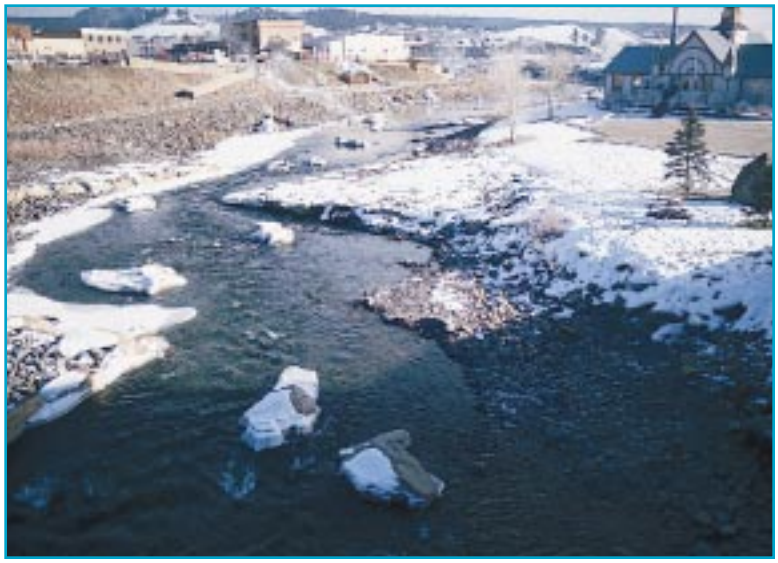
Project Construction

Project construction took place during the Fall of 1994. Forty-two large rock habitat structures (double wing deflectors, vortex rock weirs, w-shaped rock weirs, and 3 to 5 foot diameter rock clusters) and numerous tree root wads were placed in the 1.5 mile stretch of the river. A total of 1,790 cubic yards of bed material was removed from the stream to create depth and thalweg features. In the riparian areas, over 400 cottonwood, aspen and willow seedlings were planted. In addition to the instream structures, angler access trails and a disabled angler fishing pier were constructed. The total cost of the project was $401,354, with a local match of $245,000 or 61% of the cost of the project, with the balance of $156,354 coming from SFR funds.

Project Results

The stream rehabilitation project was evaluated with boat electrofishing at 11 months and at 5 years after project completion. It is interesting to note that during the pre-project planning, this section of river could be electrofished by wading, but after construction electrofishing had to be conducted from raft-mounted equipment. Eleven months later, rainbow trout abundance was 71.9 fish per acre with a biomass of 27.3 pounds per acre in the rehabilitated area, 11. Brown trout abundance jumped to 55.2 fish per acre and 20.1 pounds per acre. When the river was sampled five years after project completion, there were some additional changes in fish numbers and biomass. Rainbow trout had increased to 103.5 fish per acre and 32.2 pounds per acre biomass while the brown trout slipped to only 4.0 fish per acre with a biomass of 4.4 pounds per acre.

Angler use has not been scientifically measured through creel census, but anecdotal information from local flyfishing shops indicates that large increases in fishing effort are evident. The estimated angler use to be 4 to 5 times greater than before the project was completed.



Access and trails features, as well as in-stream structures in the East Fork of the San Juan.

Recreationists, business interests, and city managers in Pagosa Springs, as well as the Division of Wildlife, are pleased with the outcomes of this project. The *Fishing is Fun Community Assistance Grant Program* continues to be an extremely popular program in Colorado. These uses of Federal Aid in Sportfish Restoration funds, where partnerships are formed and brought to a successful conclusion, are a great way to demonstrate the spirit of improving fisheries for the benefit of the users.

ATLANTIC COAST STRIPED BASS RECOVERY: FEDERAL AID IN SPORT FISH RESTORATION IN SUPPORT OF INTERSTATE FISHERY MANAGEMENT

Atlantic coast migratory striped bass (*Morone saxatilis)*, have supported important recreational and commercial fisheries from Maine through North Carolina for centuries. Steady declines in the abundance of striped bass in the 1970s resulted in coastwide commercial landings (the only reliable measure of abundance at that time) declining from 6,785 to 1,585 metric tons from 1973 to 1983 (Field 1997). To stem the decline, individual state management actions and coastwide management measures were implemented through the 1981 Atlantic State Marine Fisheries Commission (ASMFC) Interstate Fisheries Management Plan for the Striped Bass (FMP) and subsequent amendments. The Atlantic Striped Bass Conservation Act of 1984 allowed the ASMFC to recommend federal imposition of a moratorium on striped bass harvest in states that failed to implement FMP provisions, thereby providing a degree of enforcement to this plan.

Since the primary reason for the fishery decline was the harvesting of more fish than the stock could produce, termed recruitment overfishing (Richards and Rago 1999), the striped bass population responded well to these strict management measures. Various assessment programs conducted by the states and funded by the Federal Aid in Sport Fish Restoration (SFR) program tracked the recovery (Figure 1). The Chesapeake Bay stock of striped bass, which supports the greatest portion of the Atlantic coast fishery, was declared fully recovered by the ASMFC as of January 1995.

While some SFR striped bass projects are short-term and provide answers to specific management questions, most involve long-term monitoring. These programs are mandatory for states to be in compliance with the FMP. This article documents ten years (FY 1989-1998) of SFR expenditures on Atlantic Coast striped bass by type of project (Figure 2) as accessed through the Federal Aid Information Management System (FAIMS).

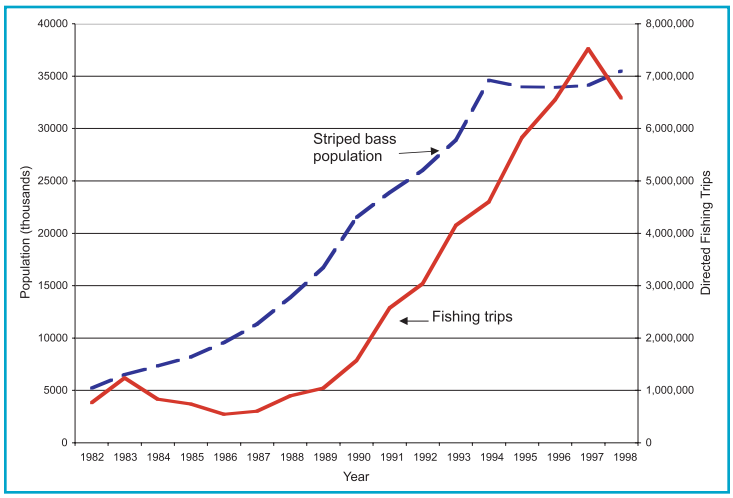


Figure 1. Relationship between Atlantic coast striped bass stock size and targeted recreational fishing trips, 1982-1998 (ASMFC 1999; NMFS 2000).

Population Surveys

Atlantic Coast states utilize SFR funding to monitor relative abundance of juvenile striped bass near spawning areas, typically with beach seines. The Maryland juvenile striped bass index survey has been funded through SFR since 1954. Other juvenile index surveys are conducted in the Virginia portion of Chesapeake Bay, Delaware Bay, Hudson River (New York) and the Kennebec River.

Populations of spawning adult Atlantic Coast striped bass are generally assessed through fishery-independent gill net or electrofishing surveys on the spawning grounds. These have been conducted in Albemarle Sound (North Carolina), Chesapeake Bay, Delaware River and the Hudson River. Information on age, size, sex composition, and year class abundance of the adult spawning stock is incorporated into coastwide stock assessments that are critical for management decisions. Similar data are also collected for non-spawning striped bass in other fishery-independent sampling such as gill netting pre-migratory fish in Chesapeake Bay.

BY RONALD J. ESSIG and ROBERT E. BEAL

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Utilization Surveys

To comply with the FMP, states with significant recreational striped bass fisheries are required to estimate their recreational catch at a 20 percent precision level. Most states from Maine to Virginia have used SFR funding to increase the sample size of the Marine Recreational Fishery Statistics Survey (MRFSS) for improved catch estimates to achieve this objective.

States also conduct other Atlantic striped bass angling surveys with SFR funding. North Carolina determines the sport harvest and size, age, and sex composition of striped bass in Albemarle Sound and the Roanoke River. Most states from Maine to New Jersey have striped bass volunteer angler logbook programs that provide length data on released fish that are not collected through MRFSS.

In order to adequately assess striped bass population characteristics, SFR funds are also used to collect biological information of striped bass harvested from directed fisheries or as by-catch in other fisheries. This provides a cost-effective means to obtain information that is not available through other sampling programs. Age, size and sex composition of the catch from hook and line fisheries in Massachusetts, ocean trap net fisheries in Rhode Island, and gill net and pound net fisheries within Chesapeake Bay, along with information from striped bass by-catch from American shad fisheries in Delaware Bay and the Hudson River have been collected.

Other Activities

As part of restoration efforts through SFR funding, approximately 938,000 striped bass fingerlings have been stocked into river systems including the Kennebec (Maine), the Navesink (New Jersey), and the Pamunkey and Mattaponi (Virginia). Most states in the Northeast are scanning striped bass that are captured in their sampling programs for the presence of coded wire tags. These tags indicate a hatchery-stocked fish and the information helps to evaluate the success of stocking programs.

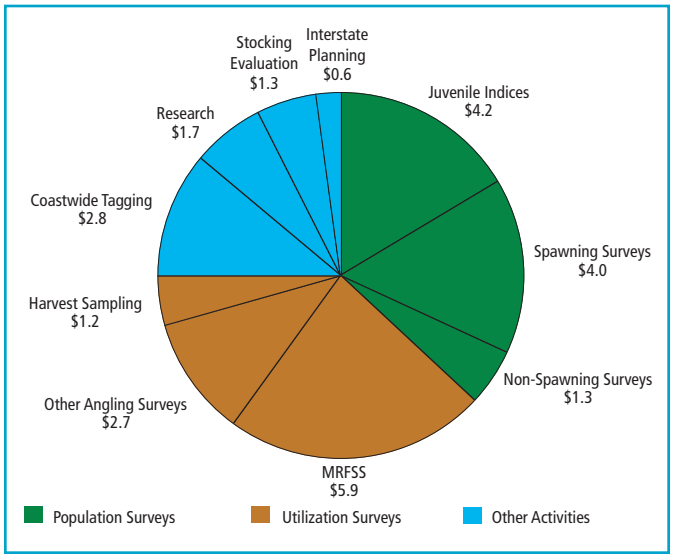

Figure 2. Federal Aid in Sport Fish Restoration expenditures (millions of SFR dollars plus state-matching dollars) on Atlantic Coast migratory striped bass by project type, Maine to North Carolina, FY 1989-1998.

Although states have taken advantage of other funding sources to support research on striped bass (Richards and Rago 1999), they also use SFR funding. Most states tag striped bass as part of a coastwide program to monitor growth, migration and fishing mortality. Some states have investigated factors related to striped bass health. Maryland and Massachusetts have investigated hooking mortality associated with striped bass angling and are currently studying whether prey availability is limiting striped bass growth.

Between 1990 and 1997, seven states from Massachusetts to North Carolina contributed to a multi-state SFR grant to improve coordination of striped bass research, monitoring, and stock assessment for more effective interstate management. State personnel supported by SFR participated in interstate fishery management planning for striped bass, but these costs were typically combined with ASMFC work on other species, so they are underreported in this article.

Conclusions

Coastal states from Maine to North Carolina spent a total of $25.6 million ($18.8 million federal) from 1989 to 1998 on SFR projects directly related to Atlantic striped bass. During the same 10 years, these states received $96 million in federal SFR apportionments for saltwater projects other than mandatory boating access. So they have invested approximately 20% of their available SFR funds on striped bass. Atlantic Coast striped bass populations and anglers have also benefitted indirectly from other SFR programs such as environmental permit review, fishing access, and outreach.

These investments have paid off. The population of striped bass and the number of angler fishing trips have increased over 500 percent since 1982 (Figure 1). In 1998, recreational anglers harvested 67% by weight of striped bass taken in all fisheries, as well as catching and releasing millions more. With this recovery, angler expenditures on striped bass fishing trips increased from $85 million in 1981 to $560 million in 1996 (Maharaj 1998).

Seventy-five percent of SFR funding on Atlantic Coast striped bass was for long-term population and utilization surveys (Figure 2) that are the backbone of coastwide stock assessment and effective interstate fisheries management. States have taken advantage of the long-term stability provided by the permanent funding authority of the SFR program to conduct the work necessary for recovery of Atlantic Coast striped bass. SFR funding is likely to continue to play a major role in ASMFC interstate fishery management to ensure quality fisheries for striped bass, as well as to rebuild other Atlantic coastal sportfisheries.

THE OREGON SALMON TROUT ENHANCEMENT PROGRAM

The Salmon Trout Enhancement Program (STEP) involves citizens in activities that enhance salmon, trout and other fish resources of Oregon. Trained volunteers work with Oregon Department of Fish and Wildlife (ODFW) personnel on projects to rehabilitate and enhance salmon, trout and other fish populations and their habitat. Projects also serve as education opportunities to increase understanding of Oregon's aquatic resources and the environment.

The Sport Fish Restoration (SFR) program funds 12 STEP Biologists statewide. These biologists coordinate citizen volunteers in their efforts to restore and enhance Oregon's important salmon and trout fisheries. STEP projects focus on characterizing fish populations and their habitat in streams, improving habitat, and culturing fish to supplement natural production. Citizen volunteers help collect information on fish populations and habitat by conducting physical and biological stream surveys. They also assist with projects to enhance fish passage, and fish spawning and rearing habitat. Finally, citizen volunteers contribute significant effort to ODFW programs to develop broodstock, incubate eggs, and rear fish to enhance populations of naturally produced salmon and trout.

In the 10-year period 1990-1999, the STEP program conducted an average of 460 educational programs and 836 fish enhancement projects annually. STEP volunteers make possible the success of numerous fish resource projects by providing the manpower needed to get the job done. ODFW simply does not have the dollars to hire this manpower, yet the results are vital to management. While some projects could not be completed without volunteers, other projects are completed in a more timely fashion with their help. Not only do volunteers save the department money, they free-up staff to perform other critical duties.

Since STEP's inception, the number of volunteer days has increased annually (Figure 1). This also highlights the strong commitment STEP has for educational programs. We feel that the education of young citizens is very important to future fishery management.

Currently, over $800,000 in SFR funds allow the Oregon STEP Project to continue. The value of this investment is more than doubled through volunteer contributions. Using nationally recognized conversion rates, the citizen volunteer contribution in labor is typically twice the amount of the SFR revenues invested in STEP annually. In Oregon, STEP is a very good investment.

BY DALE NELSON

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ODFW involves citizen volunteers in the management of STEP through the STEP Advisory committee. This committee is made up of thirteen dedicated volunteers from across the state that advises ODFW on implementation of the program. The committee works to advocate adequate funding for fishery management activities, helps to identify how hatchery fish can be used to rehabilitate depressed salmonid populations, and supports local fundraising efforts. The committee also works closely with ODFW to implement proactive outreach opportunities across the state.

Volunteer assistance is critical in completing important spawning surveys, fish distribution surveys, and population estimates. Without the results of these surveys to identify, locate, and document fish populations, their future survival may not receive adequate consideration in land use management decisions associated with urban development, timber sales, and grazing allotments. Some populations could easily be lost and, once lost, those populations are unlikely to recover. For example, bull trout (*Salvelinus confluentus*) populations across the Northwest are listed as threatened under the federal Endangered Species Act. STEP volunteers helped locate four previously undocumented populations in Eastern Oregon.

It is not easy to assign a dollar value to a fish population, but it is easy to appreciate the life-enriching value of the resource. Thanks to the presence of SFR support, Oregon has been able to implement a far-reaching fish management program that helps insure the future of this resource.

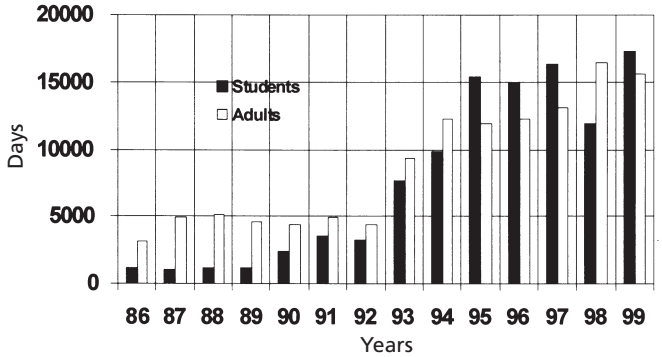

Figure 1. Oregon STEP Volunteer Days

TEXAS GULF COAST SPORT FISH PROGRAM

Management of Texas coastal sport fisheries is very complex. Numerous marine species are pursued; methods and modes of fishing (both sport and commercial) vary widely. Sport angling in Texas exerts tremendous pressure on the marine resource with boat anglers alone fishing six million man-hours and landing more than three million fish annually. More than $850 million of direct expenditures per year is spent on angling, which equates to an economic impact of around $2 billion.

In the 1970s and early 1980s, sport fishing along the Texas coast was declining. Commercial fishing, habitat destruction, and few angling regulations contributed to severe overfishing of many species. Some difficult decisions were needed to restore the populations. Biologists and key decision-makers foresaw needed changes in management, and experienced early objections to these changes from the commercial and sport-angling sectors. Long-term fishery independent and fishery-dependent monitoring programs were initiated in 1974 in order to base decisions on reliable data and sound science. This is where the Federal Aid in Sport Fish Restoration Act (SFR) came into the picture, with dependable appropriations of Texas anglers' and boaters' tax dollars.

Hands-on education is part of the Sea Center Texas.

SFR funding helped rebuild the Texas Gulf Coast red drum fishery.

The Coastal Fisheries Division of Texas Parks and Wildlife (TPW) receives $2.4 million annually from the SFR. About 40% of these monies are applied directly to long-term monitoring surveys, 11% to research, and 49% to sport fish culture and enhancement. Fish culture includes outreach programs (1,600 events annually) such as those held at Sea Center Texas to educate school children and anglers about responsible and ethical fishing practices. In addition to funding provided to the Coastal Fisheries Division, more than $1.1 million of additional SFR monies are provided annually through other TPW Divisions for habitat protection, communications,

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and motorboat access projects benefiting the Texas marine sport angler.

Early in the program, Texas biologists developed a management program based on a number of general objectives designed to allow fishes to spawn at least once before entering the fishery, prevent growth overfishing, provide for a quality and/or trophy fishery, and ensure adequate recruitment each year. Stock assessment information garnered from harvest estimates, relative abundance indices, recruitment indices, and other population indices such as age, growth, and genetic characteristics are used to develop overall management strategies. In addition, surveys of anglers have become routine to ensure that angler attitudes, preferences, and desires are included in the management equation and that management approaches are designed to meet current demands.

Figure 1. Number and weight (kg) of red drum landed by Texas sport-boat anglers.

The fishery monitoring and research programs justified and enabled more stringent bag and size limits in the 1980s and early 1990s, the banning of entangling nets, the designation of "game fish status" to major sport fishes, and the stocking of bays. Each of these actions presented managers with unique social, economic, and biological obstacles that had to be overcome. There were some fierce battles fought within, as well as outside, the agency. Three court cases in the early years challenged the new regulations, but data collected under the SFR program and used in the court cases withstood all legal challenges. This achievement is attributed to the strong, cooperative partnership that this program has established between the U. S. Fish & Wildlife Service's Division of Federal Aid and TPW. From this association has been produced one of the finest sport fisheries along the Gulf and Atlantic coasts.

The most dramatic illustration of marine sport fish restoration in Texas is red drum (*Sciaenops ocellatus*). This was the first species targeted by managers for restoration, with recovery efforts starting from "ground zero." Monitoring and research data showed that red drum were severely overfished in the late 1970s and early 1980s. These data were used to implement increasingly stringent bag and size limits for recreational anglers (currently a bag limit of 3 fish daily and a slot size limit of 508-711 mm total length), to justify banning the use of entangling nets to reduce unacceptable red drum bycatch, and to develop culture and enhancement protocol for stocking red drum. Throughout the same period, SFR dollars were used to fund needed research on red drum age, growth, mortality, survival, genetics, and life history. Today, the Texas red drum population is more than double what it was in the mid-1970s. The average weight of red drum landed by sport anglers has increased from 0.90 kg in 1978 to 2.27 kg now. Sport-boat angler landings by number increased 44% since 1976, whereas landings by weight increased over 215% during the same period (Figure 1). Because of the documented recovery of red drum, regulations were liberalized in 1994 to allow limited retention of larger red drum. Up to two red drum greater than 711 mm TL can now be retained per angler each year. This same year, sport anglers rejected a proposal to further liberalize the daily bag from three to four fish/angler because of their belief that three fish, weighing on average 2.27 kg each, is more than enough for any one angler. This is a shining example of Texas's outreach efforts at creating a more environmentally aware public where conservation is a priority, not the number of fish retained. Sport fishing, as well as angler support and participation in management, has never been better in Texas.

This Texas marine fisheries management success story would not have been possible without the contributions and support from many sources, including: the state legislature, universities, other state and federal agencies, the work and sacrifices of field biologists and administrators, anglers, and the cooperative effort provided by the government, sport fishing industry, anglers, and boaters through the SFR program. Millions of dollars have been spent since the mid-1970s on culture and research, survey and inventory, fish hatchery construction, facility maintenance and operation, and educational/outreach efforts. This cooperative program works well and serves as an outstanding example of good legislation in action. It deserves all of our involvement and support to keep our outdoor heritage and traditions alive.

SPORT FISH RESTORATION ACT IS GOOD FOR OKLAHOMA'S ANGLERS

Fishing is great in many Oklahoma reservoirs. With more than 1 million acres of impounded waters in large and small public and private reservoirs, Oklahoma has more man-made lakes than any other state (ODL 1997). These reservoirs provide most of Oklahoma's fishing opportunities, with nearly 90% of angler days of fishing in Oklahoma occurring in impounded waters (USDI and USDC 1998). Fishing pressure is increasing steadily in Oklahoma reservoirs, from nearly 11 million days of fishing in 1991 to more than 12 million days of fishing in 1996 (USDI and USDC 1991 and 1996). The Oklahoma Department of Wildlife Conservation (ODWC) has increased boating and fishing access on reservoirs throughout the state and managed a multimillion-dollar-per-year fishery in Lake Texoma. It has also focused on statewide bass management, greatly increased trout fishing opportunities and improved fish habitat in Oklahoma reservoirs using Sport Fish Restoration Act (SFR) funds.

OUTDOOR OKLAHOMA

Bass angler William Cross holding his catch and current Oklahoma state record largemouth bass weighing 6.66 kg (14 lbs. 11 oz.), caught in 1999 from Broken Bow Reservoir, Oklahoma.

BY HAROLD E. NAMMINGA

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Oklahoma's reservoirs are dynamic systems and present significant challenges to fisheries managers trying to provide sustained, diverse fisheries. To meet these challenges, the ODWC focuses fisheries management in four major categories: fish habitat improvement, harvest management (regulations), fish stocking and fishing/boating access.

More than two-thirds of Oklahoma's major reservoirs have been impounded 30 years or longer and nine are at least 60 years old. Fish habitat has deteriorated because of sedimentation from erosion in the surrounding watershed and bank erosion. Additionally, the woody debris and vegetation remaining after reservoirs were initially filled, and which provided fish habitat, has decayed over the years leaving little quality habitat. Reservoirs are frequently used for water supply and hydroelectric power generation, and dramatic water level fluctuations from these uses has contributed to the complete loss of aquatic vegetation. Additionally, most of Oklahoma's reservoirs are shallow and wind-swept. Together, these factors have adversely impacted fish habitat in Oklahoma's reservoirs.

To offset the effects of habitat loss, nearly $1 million in SFR and matching funds have been used during the last five years to implement the Aquatic Habitat Improvement Program, and to maintain and improve sportfish habitat in Oklahoma reservoirs. In this time, the ODWC annually improved fish habitat in 34 reservoirs by installing tree/ brush piles, planting aquatic and shoreline vegetation, and implementing water level management plans for vegetation enhancement. Many reservoirs also received numerous fish spawning structures such as gravel beds, tires filled with coarse gravel, "catfish condos" (anchored cylinders), and a variety of stake beds and tire reefs.

Although reservoirs might appear homogeneous, they are diverse and dynamic systems with highly variable fish

populations. Prescribing appropriate harvest regulations to sustain quality fishing is challenging and requires considerable fish population information. Using SFR funds, the ODWC annually conducts fish population surveys in nearly 100 reservoirs. Fisheries managers use the survey data to recommend implementation or modification of harvest regulations such as minimum size limits, protected length ranges (slot length limits), and creel limits and to determine stocking needs.

Oklahoma's primary fishing waters are impounded waters in which the state's native stream fish did not evolve. Consequently, native fish often do not produce maximum fishing opportunity in reservoirs where large pelagic areas (open water) have abundant forage but few predators. Stocking predatory fish such as striped bass (*Morone saxatilis*), striped bass/white bass hybrids (*M. saxatilis x M. chrysops*), walleye (*Stizostedion vitreum*), and walleye/sauger hybrids (saugeye) (*S.vitreum x S. canadense*) have provided tremendous fisheries in waters that previously yielded limited opportunities.

The ODWC uses over $1 million of SFR funds annually to renovate, operate and maintain four state fish hatcheries that produce the aforementioned fish species. Stocking these fish continues to pay big dividends for the ODWC and for the state's anglers. For example, striped bass, which were first introduced into Lake Texoma in 1965, now provide a tremendous fishery that has directed international attention to this large reservoir straddling the Oklahoma-Texas border. Besides providing anglers excellent striped bass fishing, the fishery generates $20 million annually in the local economy. The fishery is managed with SFR funds. In addition to striped bass, most native sport fish populations are at or above levels that existed before the introduction of striped bass. Lake-strain smallmouth bass (*Micropterus dolomieu*) have become a highly targeted species as well, and the state record for smallmouth bass comes from Lake Texoma.

For 42 years (1941 to 1983), the Oklahoma state record for largemouth bass (*Micropterus salmoides*) remained unbroken, but beginning in 1983, the record was surpassed almost annually. By 1996, the fish that first eclipsed the longstanding state record was no longer ranked as one of the top twenty bass caught in Oklahoma. What happened to bass management in Oklahoma reservoirs since 1941 to cause such a dramatic increase in catch of big bass? It was the introduction of the Florida largemouth bass (*M. s. floridanus*), which began in the 1970s. The ODWC continues to intensively stock and manage the most popular fish in the state, the largemouth bass, with SFR funds.

Of course, not all Oklahoma anglers are bass anglers. Oklahoma anglers requested a diversity of fishing opportunities, and a significant number of anglers demanded resident trout fishing opportunities. Despite the absence of naturally occurring cold-water streams or lakes in the state, the ODWC used SFR funds to provide wintertime put-and-take rainbow trout (*Oncorhyncus mykiss*) and brown trout (*Salmo trutta*) fisheries in three small reservoirs and in three reservoir tailwaters. These trout fisheries stimulated fishing on reservoirs and tailwaters that historically had low fishing pressure in the winter months. This increased fishing pressure also stimulates the local economy. For example, the trout fishery in the Lower Mountain Fork River (Broken Bow Reservoir tailwaters) generates more than $1 million annually to the local economy.

OUTDOOR OKLAHOMA

A flotilla of anglers fishing for striped bass on Lake Texoma, Oklahoma.

Many Oklahoma reservoirs were built by communities for municipal water supplies, but planners ignored opportunities for recreational developments such as boat ramps, boat docks, fishing piers and associated parking lots. With more than $5.3 million in SFR funds, the ODWC partnered with local communities to provide increased or improved boating and fishing facilities. More than 75 new or improved boat ramps, 73 courtesy docks, nearly 70 boat trailer parking lots and more than 50 fishing piers have been constructed since 1986. Most of these improvements are located on community-owned reservoirs.

The ODWC is especially pleased with the cooperation from local communities to help the agency bring fishing and boating opportunities to them. SFR funds allow the agency to significantly increase youth fishing opportunities in urban areas by constructing and renovating fishing ponds and lakes, stocking these waters with catchable-sized fish, teaching youngsters about fish and fishing, and providing access to fisheries for citizens with disabilities. The ODWC places a priority on linking the development of urban fisheries to increased awareness and knowledge about fish and other aquatic resources.

FISHING IN THE CITY: AN URBAN FISHING PROGRAM AS DIVERSE AS CALIFORNIA'S POPULATION

Nestled in the hills below Dodger Stadium overlooking the Los Angeles skyline lies the neighborhood of Echo Park. Despite some of the highest housing densities and lowest family incomes in Los Angeles, the Echo Park community takes pride in its local park. The central focus in the park is Echo Park Lake, a 15-acre cement-lined pond which provides a spot for quiet reflection or family fun on rental paddle boats. Prior to 1993, the lake contained an assortment of fish species ranging from carp to sunfish, but not at levels that could support fishing. Today community members flock to introductory fishing clinics and join long-time anglers who line the shore throughout the year, fishing for trout or catfish. Thanks to the California Department of Fish and Game's *Fishing in the City* Program with support from Sport Fish Restoration grants, this scene is duplicated at over 70 urban lakes and ponds throughout California.

In 1993, the California Department of Fish and Game created *Fishing in the City* to provide fishing opportunities for California's growing urban population. More than 85 percent of California's 34 million residents live in urban centers of over a million people. Consistent with trends across the country, California's urban anglers identified a lack of free time as the primary reason why they don't fish more or stopped altogether. Urban and suburban growth have compounded the problem by pushing quality fishing locations further away from the majority of our residents. At the same time, many city and regional park lakes, ponds and streams were all but forgotten as potential fishing sites. Most lacked adequate facilities, staff or fish to sustain a fishing program. Some suffered from non-point source pollution and habitat degradation. All were surrounded by communities ready to provide the support necessary to create fishing in the city.

Program vehicles and local buses advertise Fishing In The City.

Casting practice.

Volunteers offer a helping hand.

Fishing in the City, California's urban fisheries program, is the largest in the nation. Twelve full-time interpreters and biologists work in eight major metropolitan areas around the state. The program has four simple objectives:

Providing Fishing Opportunities Close to Home

More than 70 lakes, ponds and streams now provide year-round fishing opportunities in most large cities across the state. These lakes, ponds and streams are regularly planted with catchable fish—trout in the winter and channel catfish in the summer.

Teaching a New Generation the Joys of Fishing

Fishing education and equipment loan programs provide beginning anglers with the tools to make fishing an

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Fishing at Echo Park Lake.

Fishing equipment is available during clinics and at neighborhood loan sites throughout the year.

activity to last a lifetime. More than 30,000 first-time anglers participate in community fishing clinics at *Fishing in the City* program sites each year. Coupled with our equipment loan program, individuals and families receive basic fishing skills as well as the opportunity to borrow fishing rods and equipment to learn the sport. Advanced fishing and watershed education programs offer additional training to community members.

Building Support for Aquatic Resource Stewardship

Healthy waterways support fishing programs, but they also improve the quality of life for the residents of a community. Fishing offers the perfect tool to reconnect people with their community ponds, lakes and streams. It is an easy step to connect healthy aquatic habitats with healthy fish and healthy people. From this basic awareness comes action. Individuals are encouraged to take steps at home to protect their neighborhood watershed from non-point source pollution. In addition, *Fishing in the City* encourages schools and community members to participate in local habitat improvement projects. Storm drain stenciling, exotic weed removal, picking up litter, and monitoring water quality all help to keep urban waterways healthy.

Developed by Communities for Communities

The *Fishing in the City* program is a community partnership. Citizen volunteers, neighborhood businesses and city park departments provide the support necessary to maintain a community fishing program. The Department of Fish and Game provides the fish, equipment and technical support, but the local community designs and runs the program. In Los Angeles, Boys and Girls Clubs co-sponsor Los Tiburones fishing clubs that serve primarily Latino youths. Other groups such as San Jose Rotary focus on school outreach and clinics.

A successful catch at Alondra Park Lake in Los Angeles.

Partnerships That Work— The Sport Fish Restoration Model

Fishing in the City is funded from a Sport Fish Restoration grant, state fishing license revenues, and community contributions. Since the program's beginning in 1993, more than $7 million in Sport Fish Restoration grants have been invested in the program ($5.1 million for biology and fish planting, $2.7 million for education). Grant funds require a 25 percent state match. *Fishing in the City's* education match comes entirely from in-kind contributions of time and materials from our local partners. Scores of service clubs, youth groups, church organizations, businesses, local governments and individuals contribute to the success of *Fishing in the City*. Some provide volunteer assistance, others offer contributions of materials and services. In all, more than $800,000 in community contributions are made to *Fishing in the City* programs each year, seven times the amount needed to meet the grant's required 25 percent state match. In volunteer time alone, more than 15,000 hours are contributed, an amount equal to over seven full time positions.

Fishing in the City works because of its community orientation. Thanks to the direct reinvestment of angler dollars from the Sport Fish Restoration Program and fishing license revenues, tens of thousands of moms, dads and kids are being introduced to the sport of fishing. In a society where family values and environmental values are being pressured by a fast-paced, urban lifestyle, fishing provides a recreational activity that reconnects families and natural resources. Throw in a little apple pie, or in California's case, buñuelos, sweet mango rice or manju, and you have the American ideal. Just ask the folks of Echo Park.

FISHING IN THE CITY

COASTAL STATE ARTIFICIAL REEF PROGRAMS—FIFTY YEARS OF STATE/FEDERAL COOPERATION IN ENHANCING MARINE FISHERIES AND FISHING OPPORTUNITIES

In 1998, 7.5 million Americans nation-wide participated in 81 million saltwater recreational fishing trips resulting in the harvest of 312 million fish (USDC 1999). Statistics compiled as part of the National Marine Fisheries Service's Marine Recreational Fisheries Statistics Survey indicate that, in just seven years, participation increased from approximately 45.8 million fishing trips in 1990 to approximately 69 million in 1997 (NMFS 2000). Fish harvested (by weight) in the recreational fishery increased from 173 million pounds to 236 million pounds in the same time period. Potential impacts on the natural resources as well as the economic activities associated with recreational fishing are significant. The total economic output of the marine sport fishing industry in 1996 was $25.1 billion and it generated the equivalent of 288,000 full-time jobs that paid $6.7 billion in wages (Maharaj 1998). Increased participation in marine recreational fisheries, coupled with the loss and degradation of essential habitat for many species, has resulted in broad concern for the health of our nation's fish stocks. State and federal government agencies have responded with action through a variety of partnerships, one of the most significant being the Federal Aid in Sport Fish Restoration Program (SFR).

State government has a fundamental responsibility to safeguard the public trust with respect to the fish and wildlife resources under its jurisdiction. Coastal states have an added challenge in meeting this responsibility for marine fishery resources. These resources inhabit an ecosystem that crosses over state boundaries, as well as the boundaries between state and federal governments. No state can, by itself, effectively ensure the proper management of fisheries that is necessary to protect the interests of its citizens and the national interest in these multijurisdictional resources. Each state must of necessity work with its sister states and the federal government to carry out the public trust responsibilities for coastal fisheries. One way that state fisheries managers have responded to the concern over increased fishing pressure and loss of habitat is by creating and enhancing habitat for marine fish stocks through the implementation of artificial reef programs. The SFR Act has played a significant role in the development and successes of these programs by assisting in financing state construction activities and by funding national coordination of interstate and state/federal planning and policy development through the interstate marine fisheries commissions.

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Support for man-made reefs is bolstered by the increases in fishing opportunities and benefits to local, regional and national economies that are associated with reef development. As such, state programs have enjoyed strong constituent support among anglers and local businesses. For example, in 1992, 17.3% of all coastal fishing trips taken off South Carolina were to artificial reefs, second only to nearshore, estuarine trips (Rhodes et al. 1994). Since most of those sites are in excess of five miles offshore, only a subset of boats fishing South Carolina waters could safely use the artificial reefs. Consequently, if that subset were to be evaluated on its use of artificial reefs, the percentage of trips to the reefs would likely be much higher. In another state, Mississippi, saltwater fishing is estimated to generate $155 million in annual retail sales and support 3,988 jobs (Maharaj and Carpenter 1996). Southwick Associates (1998) found that about 25 percent of all expenditures and jobs supported by marine fishing in Mississippi could be associated with artificial reefs.

Concerned with the growing need to enhance habitat and diversity of fishery resources, the U.S. Congress passed the National Fishing Enhancement Act (NFEA) in 1984. This act mandated the Secretary of Commerce to develop a National Artificial Reef Plan (Plan) to address proper planning and management of artificial reefs (Stone 1985). However, NFEA contained no authority for federal spending to achieve its objectives. Additionally, the National Marine Fisheries Service, the responsible federal agency, had only recent and limited

experience with artificial reef research and development. In contrast, many state coastal fisheries programs, and the individuals in those programs, had up to twenty years experience with marine artificial reef projects at that time. These programs and individuals made significant contributions to development of the Plan. They also had budgets, meager as they were, earmarked for artificial reef programs. Consequently, implementation of most NFEA objectives, and the Plan, was passed to state coastal fisheries agencies that had been active in artificial reef research and development, and were directing human and financial resources toward ongoing programs. Without additional financial support, implementation of NFEA and the Plan became the equivalent of an unfunded mandate to expand state programs.

Coincident with passage of NFEA, the Wallop-Breaux Amendment to the SFR was enacted in 1984. This amendment significantly increased the financial assistance that states received for sport fish restoration projects. In addition, a key provision of the amendment was for new money collected in excess of the old program funding levels to be dedicated to new projects and split equitably between state freshwater and saltwater programs. As a result, there was an immediate, dramatic increase in money available for construction of marine artificial reefs. By 1994, the Atlantic coastal state marine finfish budgets totaled approximately $30.6 million. SFR funds accounted for approximately 32% ($9.8 million) of this amount (Evans 1994).

Prior to the expansion of the SFR by the Wallop-Breaux Amendment, there were approximately 300 permitted artificial reef sites in U.S. coastal waters (a permitted site may contain numerous artificial reef structures). With the assistance of SFR funding, this number has more than doubled in the last 15 years. By 1990, the economic benefits associated with fishing on these artificial reef projects along the Atlantic were estimated at $80 million (McGurrin 1991). In South Carolina alone, the total economic impact of fishing trips to artificial reefs in 1992 was estimated at $17 million (Rhodes et al. 1994). According to Southwick (1998), Mississippi artificial reefs generated about $38 million in economic activity in 1992.

In addition to the significant contribution to artificial reef development and management, the SFR program has supported regional and national coordination activities. This support has facilitated the establishment of technical advisory committees of the Gulf States and Atlantic States Marine Fisheries Commissions (Commissions). The Commissions coordinate reef development activities among the states in the Gulf of Mexico and Atlantic Ocean within state and federal waters. Managers of the state marine artificial reef programs participate in joint meetings of the committees to exchange ideas and experiences and coordinate development of coast-wide policies. Through communication with the Pacific States Marine Fisheries Commission and representatives from the Caribbean on relevant activities, the commissions provide the basis for a national approach to effective management of marine artificial reef development. Most recently, the Commissions coordinated and prepared technical revisions to the 1985 National Artificial Reef Plan. These revisions have been submitted to the Secretary of Commerce and currently await public comment before they can be considered for approval. Other accomplishments of the Commissions include:

Artificial reefs provide habitat for a variety of gamefish and their prey.

- Establishment of guidelines and protocols for artificial reef materials;
- Development of plans and processes for coordinating with REEF-EX, a military program for supplying retired military assets for artificial reef materials;
- Adoption of various resolutions establishing policies on such issues as the use of retired Navy vessels, PCB concerns, and the use of coal ash waste, among others.

In effect, the Commissions supply a value-added service to assist the states in responsible, effective artificial reef development and management. Without the long-term support provided by the SFR, these accomplishments at the state, regional and national level would not have been realized. Sport Fish Restoration has been a valued and necessary program to develop new fishing opportunities in marine waters and will likely play a pivotal role in management of these resources in the future.

Enhancing Fisheries Management Through The Sport Fish Restoration Program

GENE HESTER

DIANE MEYER

SPORT FISH RESTORATION FUNDS IN FISHERIES MANAGEMENT

I was fortunate to have worked as a fisheries research biologist and then as fisheries management chief for a progressive conservation agency during 37 years of the golden age of conservation in the United States. As such, I observed the evolution of the use of Sport Fish Restoration Funds during most of the 50-year history of these funds, particularly in Missouri and the Midwest. The early use of these funds in state sport fishery research investigations set the stage for science-based fisheries management during the latter part of the period. The many surveys of stream and lake fish populations provided the background information on standing crop, relative abundance, species composition, and age and growth rates. Creel surveys provided estimates of fishing pressure and estimated harvest. Later, primarily in the 1960s and 1970s, reliable angler tag return information permitted reasonably accurate estimates of angler exploitation of major sport species as well as natural and total mortality rates. Meaningful fish harvest regulations could then be applied to individual water bodies so that balanced populations could be maintained of both predator species and forage species, resulting in proper functioning of the populations and continuing improved fishing. This approach took advantage of the productive capacity of individual water bodies, and appropriately-set creel limits and properly-sized length limits and slot length limits provided quality size fish for the anglers.

As the background resource information was obtained and research provided the keys to regulate angler harvest to maintain balanced fish populations, and to improve habitat, SFR funds were shifted more toward fisheries management. Close to home fishing was being provided through construction of small lakes; stream access sites were being acquired for boat and bank fishing. Conservation departments were adding fisheries management biologists to manage the existing and the newly built public waters as well as to provide technical assistance to pond owners who allowed public fishing. The 1984 Wallop-Breaux Amendment to the earlier Sport Fish Restoration Act was particularly helpful to many agencies to bolster management staff. Additional staff in many states permitted regular sampling of waters and evaluation of the fish populations and management techniques so that fishing regulations could be adjusted or other management techniques, such as water level drawdowns, partial fish population removal, additional fish stocking, etc., could be applied. The age of science-based fisheries management finally was here. The additional staffs also permitted much needed work on deteriorating stream habitat and stream fish populations. Without the infusion of the additional SFR funds, this would not have happened, at least not on a practicable scale.

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OHIO DEPT. OF NATURAL RESOURCES, FAIRPORT FISHERIES STATION

Stable SFR funding has enchanced new technologies and science-based management.

More recently, SFR funds have permitted stocking of fish where needed, such as in urban fishing programs, kids' fishing programs, angler workshops, and stocking new waters and for corrective stocking of imbalanced waters. The recent completion of Missouri's large, state-of-the art, $22,000,000 Lost Valley Hatchery, a warm and cool water facility, is a good example of wise use of SFR funds to continue to improve fisheries management.

We owe a big thank-you to the anglers who continue to provide these funds, to those individuals who made the act and subsequent amendments happen, to those who see that the funds are used wisely, and to those watch dogs who continue to monitor legislative changes that might affect the funding. The nation's fisheries resources would be in a sorry state without the SFR funds and these past and current supporters of the SFR program.

IMPROVING SPORT FISH MANAGEMENT THROUGH NEW TECHNOLOGIES: THE FLORIDA MARINE RESOURCES GIS

The Florida Marine Research Institute (FMRI) is part of the state's Fish & Wildlife Conservation Commission (FWC). In 1983, FMRI began implementation of the Marine Resources Geographic Information System (MRGIS) as an image-processing system that combined LANDSAT data with aerial photography to map estuarine and marine fisheries habitat (Haddad et al. 1993). Since the early 1990s, funding from the Sport Fish Restoration (SFR) program has allowed FMRI to synthesize information from interrelated sport fish research programs. The resulting databases provide the basis for innovative applications of the MRGIS to issues of sustainable recreational fisheries. Habitat databases were created by the Coastal and Marine Resource Assessment (CAMRA) program, and sport-fishery data from long-term monitoring programs were provided by the Fisheries-Independent Monitoring (FIM) program. The MRGIS has emerged as the de facto clearinghouse for coastal and marine geographic information system (GIS) data in Florida. Ongoing MRGIS expansion and maintenance is made possible by several cooperative funding partnerships. SFR contributes about $250,000 annually, almost 20% of the overall MRGIS budget. Since 1992, CAMRA has accommodated more than 2,500 requests for data and has entered into dozens of mutually beneficial, data-sharing agreements with other organizations. Providing GIS data and maps often leads to more sophisticated projects. The following MRGIS applications were chosen to highlight advancements in fisheries habitat mapping, fisheries protection through educational cartographic products, and future technological directions.

MRGIS Applications Designed to Improve Fishing and Fish Resources

Habitat Assessment and Protection

Managers of recreationally important fishes recognize the importance of habitat to the health of fish stocks. Accurate, spatially explicit habitat maps are one important tool on which managers rely to assess habitat. CAMRA, in partnership with regional and national agencies, has used innovative mapping techniques to create detailed data sets describing coastal vegetation statewide. Maps and habitat data are among the most requested GIS products. Users range from growth-management officials to fishing-tournament organizers. The FMRI/National Oceanic and Atmospheric Administration (NOAA) benthic-mapping project in the Florida Keys is a notable example of using the MRGIS to map fisheries habitat. CAMRA partnered with NOAA's Strategic Environmental Assessment Division and National Geodetic Survey to create a highly accurate and detailed (1:48,000) digital database of all benthic habitats existing in the Florida Keys National Marine Sanctuary. The 53-page, hard-copy atlas created from the database is in its third printing and is being used by researchers, managers, educators, fishing guides, and the general public. Demand for the data and atlas is so great that a CD-ROM was created (now in its second printing) with an interactive tutorial to facilitate direct access to the data.

Identification of Essential Fish Habitat

CAMRA and FIM staff are collaborating with the NOAA Center for Coastal Monitoring and Assessment and the University of Miami's Rosenstiel School of Marine and Atmospheric Science in developing new methods to predict sport fish species distributions, abundance, and habitat affinity. FIM monitors the abundance of juvenile and adult recreational fishes in six estuaries around the state (Nelson et al. 1997). These data are critical to many of the sophisticated sport fish-related MRGIS applications. Preliminary investigations into relationships between environmental conditions and the distributions of recreationally significant species show considerable promise. These new MRGIS applications depend upon the long-term baseline data generated by the SFR-funded FIM program.

In another application of SFR-funded initiatives, various methods of conducting Habitat Suitability Index (HSI) modeling are being evaluated in Tampa Bay and Charlotte Harbor. The objective of these efforts is to determine whether indices can be transferred between estuaries to predict and map fish distributions in estuaries where fish abundance has not been surveyed (Rubec et al. 1999). Sport Fish Restoration funding provides dedicated resources for CAMRA and FIM to refine

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these methods and ensure that they are scientifically defensible, cost-effective, and transferable. The ultimate goal is to provide fisheries managers, sport-fishing enthusiasts, agencies, universities, and the public with maps that highlight environmental conditions needed to ensure the health of future populations of recreational fishes.

Marine Ecosystem Management

FMRI has considerable scientific data and information suitable for adaptive management. Unlike the management of terrestrial watersheds, however, marine resource management in Florida lacks explicit recognition of the interrelationships of the many ecosystem "elements" operating in estuaries. FMRI is advancing the Florida Blueways initiative to create an institutional methodology for mapping ecological, human use, socio-economic, and management relationships in estuarine systems in an effort to articulate this ecosystem connectivity. Developed in partnership with the Florida Coastal Management program, Florida Blueways draws upon the discipline of landscape ecology to support the complementary concepts of ecosystem management and integrated coastal zone management.

As a case study for Florida Blueways, FMRI is using the MRGIS to integrate many data sets and determine the relationships between various aspects of the ecology of Charlotte Harbor. These select ecosystem elements, such as recreationally important fishes or their associated habitat, will be mapped using the best available data and expert interpretation. Through geographic modeling, we will be able to visualize scenarios in which the recreational angling experience is maximized and Florida's sustainable fisheries are protected. Over the long-term, these databases and models will be used to investigate biodiversity at the landscape level and to determine the links between fish population dynamics and ecosystem processes (Friel and Haddad 1992). Although the final maps will reflect only a generalized interpretation of a highly complex and temporally dynamic system, they should provide a more accurate perspective of the long-term viability of Charlotte Harbor. Florida Blueways also holds potential to systematically include human-use concerns, such as recreational fishing, in ecological characterizations.

Educational Guides for Boaters and Anglers

FMRI is producing a statewide series of boating and angling guides to inform the public about Florida's coastal marine ecosystems (Friel 1994). Each regional guide describes a major bay or estuary system and contains one or more large-scale maps displaying the distribution and extent of the natural resources (e.g., seagrasses, mangroves, saltmarshes) and other areas of interest (e.g., boating and fishing facilities, artificial reefs, boating zones). The guides also contain information about such subjects as the plants and animals common to the area and the relationship between healthy habitats and healthy ecosystems, as well as advice for boaters and anglers about how they can protect the environment. All information in the guides is derived from the MRGIS databases. The guides are targeted specifically to reach the state's 700,000 registered boat owners and anglers to enhance their recreational experiences and to educate them about the ecological impacts of their actions. These have proven very popular with both the angling community and environmental educators. Sport Fish Restoration funds provide technical support in the form of MRGIS data manipulation and cartographic layout for these guides. Partner groups finish the layout and design of the guides and secure joint funding for their printing. Guides to estuaries and bays in every region of the state have been produced, with approximately 650,000 guides being distributed and several more in development.

Future Directions

The Sport Fish Restoration program's support of critical programs at FMRI set the stage for the current success of the MRGIS. Application of the MRGIS has benefited the recreational fishing interests of scientists, citizens, policy makers, and the educational community. CAMRA received the Renewable Natural Resource Foundation's Outstanding Achievement Award in 1996 for its development of the MRGIS. Technology advancements by the private sector will continually be used to update the MRGIS, allowing for dramatic improvements in coastal and marine modeling efforts. Someday, people will log into a new form of conference call and use their Internet browser to mark up an interactive map, which will enable debate over ecosystem conditions in near real-time. The synergistic potential of these technologies is staggering, but our ultimate success will be dictated by long-term commitment to baseline monitoring and mapping programs. Sport Fish Restoration program funding will provide critical monies for the development of emerging technologies, monitoring activities, data stewardship, and effective partnerships, all of which will help ensure that Florida's recreational fishes are here for future generations.

FMRI for fisheries managers, sports-fishing enthusiasts, agencies, universities, and the public using the MRGIS.

FISH CULTURE AND THE SPORT FISH RESTORATION ACT

Fish culture (the practice of raising and stocking fish) has been a standard tool of fisheries managers for as long as professional fisheries management has been practiced. Most early fisheries management programs evolved out of the ability to spawn native fishes and harvest fingerlings for distribution (Smith and Reeves 1986) and hatchery-related functions were the emphasis of most agencies in their infancy (Ross 1997). When the American Fisheries Society was originally incorporated as the American Fish Culturists Association in 1870, fish culture was practiced in 19 of the 37 states plus the territories of Colorado and Kansas (Bowen 1970). To early fish culturists, stocking had great appeal "since it was a positive action as opposed to regulations which were restrictive and created no immediate visible results" (Bowen 1970; Smith and Reeves 1986). To some degree, most of today's fisheries managers would agree that a measure of this appeal still exists, although the manner in which fish are raised and stocked has changed dramatically.

Fish culture continued to play a major role in the programs of fisheries agencies, although the quest for a more thorough understanding of the reasons behind fish population changes continued to grow and accelerate into the 1930s and 1940s. At the same time, increasing leisure time enjoyed by the American public following World War II created heavy demand on U.S. fish culture programs (Bowen 1970). Passage of the Sport Fish Restoration Act (SFR) in 1950 enhanced states' abilities to integrate fish culture into a more scientifically based management program (Radonski and Martin 1986). At the time of the original implementation of the act, the types of fish culture activities that could be funded were limited. Hatchery construction was only allowed where existing facilities were deemed to be inadequate, and stocking was not allowed where the sole purpose was immediate harvest (put-and-take stocking). Stocking projects could be funded only "for the permanent improvement of fisheries" (Rutherford 1952). However, in 1991, this policy was revised to allow expanded uses of SFR dollars for stocking activities to provide put-and-take fisheries. Today, state freshwater fisheries agencies spend an average of 33% of their budgets on fish production and stocking. In some states, up to 70% of freshwater fisheries budgets are spent on put-grow-take or put-and-take programs (Ross and Loomis 1999).

Between 1989 and 1998, 3.8 billion sport fish (adults and juveniles) were stocked for maintenance or restoration of fisheries. Hatchery facility development and fish production costs accounted for 14.5% of SFR expenditures between 1985–1991 (USFWS 1993).

Fish culture programs conducted with funding from the Sport Fish Restoration program have played vital roles in a number of diverse areas of fishery management programs, including re-establishment of native stocks of sport fish, establishing new sport fisheries, and providing put-and-take fisheries in areas that cannot sustain adequate populations. In addition, fish culture practices have been improved through funding of special fish health investigations, innovative culture techniques, and special symposia to address techniques for raising and using cultured fishes.

For example, in Alaska, SFR funds are currently used to stock 9 million fish annually throughout the state as part of efforts to provide a half million additional angler days per year (ADFG 2000). Stocking is used for a variety of purposes, including shifting some of the fishing pressure away from heavily fished waters that would not be able to withstand angler pressure that likely would occur if other opportunities (provided through stocking) were not available. In addition, it is used to diversify the types of angling experiences that are available in the state.

In Maryland, SFR is used in part to fund trout rearing operations in partnership with the Mettiki Coal Company and the U.S. Army Corps of Engineers. Trout are reared in treated coal mine water discharge at the Mettiki Coal Mine near Oakland, Maryland and in the reservoir stilling basin at the Jennings Randolph Reservoir on the North Branch of the Potomac River. Trout reared at these facilities are an integral part of restoring the North Branch, a river that was devoid of

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aquatic life for almost one hundred years. Thanks in part to these cooperative fish rearing projects, the North Branch is recovering rapidly and today supports a large and growing sport fishery.

In Vermont, Federal Aid in Sport Fish Restoration provides a major portion of the funding for the Ed Weed Fish Culture Station in Grand Isle. This state-of-the-art fish hatchery produces over three-quarter of a million fish annually for stocking statewide. In Lake Champlain alone, the hatchery provides significant support to a fishery that contributes $50 million annually to Vermont's economy. The fish culture station is also a focal point for tourism, with 20,000–40,000 visitors each year, and provides the Fish and Wildlife Department with an opportunity to educate the public about the aquatic resources of the state.

SFR funds have been used to create, restore and maintain sport fisheries through stocking.

Sport Fish Restoration funds have been used for innumerable stocking programs to establish new sport fisheries. In many of these instances, changing environmental conditions either provided opportunities for new fisheries, or diminished previously established fisheries. For example, changing conditions in the Great Lakes with the invasion of alewife (*Alosa pseudoharengus*), sea lamprey (*Petromyzon marinus*), and other species created the opportunity to establish world class salmon fisheries in the 1960s. Today, these fisheries are being sustained and managed through the use of SFR funded hatchery programs (see related article by Tanner in this issue). In newly created reservoirs throughout the U.S., such as those highlighted in the accompanying article by Namminga, SFR funds are used for production and stocking of a variety of sport fish including black bass (*Micropterus sp.*), striped bass (*Morone saxatilis*) and hybrids, walleye (*Stizostedion vitreum*), and other species that provide thousands of new fishing opportunities. SFR funds have been used to construct new facilities in Oklahoma, such as the Calamus State Fish Hatchery dedicated in 1991, to raise trout, walleye, bass and conduct state-of-the-art research on hybrid fish and other areas.

In addition to actual stocking of fish, the Sport Fish Restoration Act has helped support a number of symposia, publications, and meetings that serve to transfer information between professionals about the latest advances and techniques in fish culture. The landmark publication *Fish Hatchery Management* (Piper et al. 1982) was made possible through the investment of SFR funds and has served as a vital reference and instructional manual to fish culture professionals across the nation. Recognizing the emerging issues surrounding the appropriate use of hatchery-reared fish, SFR funds were invested in a 1994 symposium that brought together experts to address the uses and effects of cultured fishes in modern day management (Schramm and Piper 1995).

The practice of fish culture, its application in management, and managers' understanding of the impact of cultured fish on aquatic systems have advanced a great deal since the days when fish stocking formed the basis of fishery management programs. In the past 50 years, funding from the Sport Fish Restoration Act has fueled tremendous changes in the way that managers rear and stock fish and has contributed greatly to the development of countless sport fishing opportunities.

Acknowledgments

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ECOSYSTEM MANAGEMENT AND SPORT FISH RESTORATION

Ecosystem management gained prominence in 1994 as a better way (some insisted *the* way) to manage living natural resources. It seems like the term "ecosystem management" has been replaced by "ecosystem-based management," but regardless of the name applied, the concept and the process are what are important. And the concept and process are not new.

What is ecosystem management? This apparently simple question is far from simple. Several definitions have been offered, and there is no "right" definition. Some management leaders have offered that managers don't need a definition; they just need to do it. Other managers have asked how they can change the activities of their agency if they don't know what this new approach is. Ecosystem management is holistic management and has multiple dimensions. One dimension is biological or ecological–ecosystem management means watershed management and it means communities. We all know that what happens in the water is affected by what happens on the surrounding land, and what happens downstream is affected by activities upstream. We also recognize that habitat management benefits multiple species. In the past, management that focused on a single species has, in some cases, adversely affected other species. We must be vigilant that a management program to enhance a single species, such as a premier sport fish, does not negatively impact the ecological community that supports that fish.

INDIANA DNR

Fish ladder through South Bend, Indiana brings fishing to the doorstep of thousands of anglers.

Providing fish passage opens new habitat to migrating salmon.

INDIANA DNR

A second dimension is political. Whether the fishery resource is a lake, reservoir, river, or stream, watersheds often cross political boundaries. The different jurisdictions may be municipal, county, state, or even national. Therefore, managing the watershed often becomes a multijurisdictional process. The authority or responsibility for managing a system may rest with multiple organizations or agencies, both public and private. Thus, addressing a resource issue often may be a multi-agency process.

BY HAL SCHRAMM and APRIL LAYHER and NEIL LEDET

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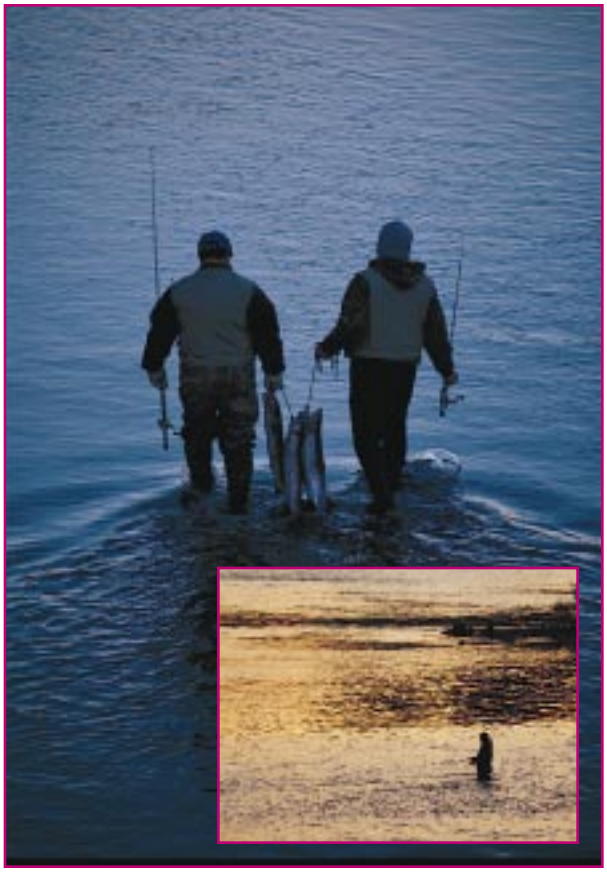
A third dimension is social or socio-economic. All aquatic resources have value. Most, if not all, aquatic resources that provide recreational fishing opportunities are multiple-use resources, which means they also have multiple values. The "uses" can range from aesthetics (a relaxing view) to commercial navigation, electric power generation, and domestic, industrial, and agricultural water supply. Certainly recreational fishing is a valued use of aquatic resources, and managing for fisheries becomes a multi-stakeholder process.

Effective management usually involves all three dimensions. We have many good examples of fisheries management programs utilizing Sport Fish Restoration funds that demonstrate ecosystem management. Let's look at a few.



INDIANA DNR

Steelhead anglers on the gravel flats in Mishawaka, Indiana.

The St. Joseph River Interstate Anadromous Fish Project

The St. Joseph River originates in south-central Michigan, flows westward through northern Indiana, and eventually discharges into Lake Michigan at Benton Harbor, Michigan. Historically the St. Joseph supported excellent warmwater and coldwater fisheries. Dams built from 1868 to 1940 to harness the river's power (mechanical, then hydroelectric) blocked the migration of Lake Michigan river-spawning fish into Indiana waters, and eventually restricted these valued fish to the lower 23 miles of the St. Joe. Combining Sport Fish Restoration funds with Anadromous Fish Conservation and other funds, the Indiana and Michigan Departments of Natural Resources, working in partnership with the U.S. Fish and Wildlife Service, power companies, conservation clubs, and concerned citizens, installed fish ladders at the five lower dams. National Marine Fisheries Service personnel, who have decades of experience with fish passage around dams blocking Pacific coast streams, assisted with fish ladder design. Although these ladders were designed to pass trout and salmon, 16 species of native river fishes have been observed using them.

To sweeten the deal, Indiana DNR built a hatchery on the St. Joseph at Mishawaka (Richard Clay Bodine State Fish Hatchery). Trout and salmon produced at this facility are stocked annually into the St. Joseph to complement Michigan's stocking program. The fish move into Lake Michigan, grow, and return home to the St. Joseph, benefitting both river and Lake Michigan anglers. To round out the increased fishing opportunities created by fish passage and stocking, both states have enhanced boat ramps and shore fishing areas. According to the Indiana Department of Natural Resources, the $11 million project is expected to generate an additional 125,000 angler days of fishing and $6 million in economic benefits annually. Many of these anglers will be fishing on their doorstep in large cities like Benton Harbor and Niles, Michigan, and South Bend and Mishawaka, Indiana. Is it working? In 1999, anglers harvested 25,000 steelhead (*Oncorhynchus mykiss*) and salmon and caught and released an additional 15,000 in the St. Joseph River.

White River, Beaver Dam Tailwater Restoration Project, Arkansas

One might expect neighboring fishery management agencies to cooperate on a project, as Indiana and Michigan did on the St. Joseph. After all, they both have the same purpose and speak the same language. But in Arkansas, an environmental emergency created some unexpected partnerships. The cold discharges from Beaver Dam have created a popular, and for the surrounding communities, economically lucrative, trout fishery in the White River. Dam discharges usually range between 100 and 9,800 cubic feet per second (cfs) and allow both wade and boat fishing in the tailwater. In 1990, a major flood event caused the U.S. Army Corps of Engineers to evacuate Beaver Reservoir, and tailwater flows exceeded 51,000 cfs. The high discharge extensively damaged the stream channel and banks for several miles downstream and left a fishery in ruin.

Using Sport Fish Restoration Program dollars matched by Fayetteville, Arkansas and Tulsa, Oklahoma chapters of Trout Unlimited, the Arkansas Game and Fish Commission renovated the altered habitat. The Arkansas Soil and Water

Conservation Commission helped obtain additional funding from the U.S. Environmental Protection Agency. The U.S. Navy contributed over $100,000 of time and travel for Navy Seabees to provide much needed people-power for the project. The Southwestern Power Administration and the Corps of Engineers, as well as members of the local community and university, also lent their support.

Stabilizing banks with cedar tree revetments along the banks of the White River.

Streambanks were repaired and fortified with cedar tree revetments. Log cribs were anchored into the banks to deflect erosive flows, hold sediments, and provide cover for fish. Banks were re-vegetated with willow and other native species. Stream channel habitat was improved by placing large boulders (some over 10 tons apiece), boulder clusters, and large woody debris in the channel, providing fish in-stream shelter from the varying currents created by power generation releases.

Sport Fish Restoration funds were also used to fund university-level research to evaluate progress and provide scientific focus to the project. To date, over four miles of river habitat have been restored. Stairways and universally accessible fishing piers have been constructed to improve angler access to this valuable fishery. Trout fishing in the Beaver tailwaters is reported to be better than ever, thanks to the combined efforts of multiple agencies, volunteers, and the Sport Fish Restoration Program

If by now you are thinking that ecosystem management means trout, streams, and dams, you are right. But it also means lakes and all species. Space does not allow details, but the following examples of projects funded by the Sport Fish Restoration program demonstrate that ecosystem management applies to all systems and all species.

■ Iowa. Many natural lakes suffer from severe sedimentation and eutrophication. tate and local agencies are teaming up to restore sport fisheries by lake rehabilitation and soil conservation practices in the surrounding watersheds.

■ Lake Mendota, Wisconsin. Few would debate the statement "good fishing needs good water," but here is a switch. Researchers and managers have collaborated to assess how densities of piscivorous walleye (*Stizostedion vitreum*) and northern pike (*Esox lucius*) affect algal blooms. Results indicate that under stable climatic conditions, harvest regulations that affect fish communities and catch also affect water quality. Agencies propose and enforce regulations; anglers comply with them. It looks like anglers may have a role in water quality management.

■ Throughout the country, state fisheries agencies have teamed with other state agencies, local governments, federal agencies, and long lists of non-government organizations to use Sport Fish Restoration funds for aquatic education programs that lead to wise use of fisheries resources and encourage best management practices on the watershed. These programs directly and indirectly benefit sport fish, but they also benefit all aquatic animals that depend on good habitat and good water quality.

What do the examples share? They all involve fish. The problems are addressed by multiple agencies or organizations, the spatial scope of the solution is often beyond the water or beyond an imaginary line that marks a political border, and people are involved. In all cases the fishery, and the aquatic resource, have value. And in all examples, Sport Fish Restoration funds have been used to conserve fishing and fish habitat.

INDIANA DNR

Biologist checks a chinook salmon for eggs at the South Bend ladder while school children look on.

In the introduction we mentioned that ecosystem management is not new. The above examples were operational before the term ecosystem management became popular. The simple fact is, sometimes a holistic approach, both in terms of the habitat and the involved organizations, is the best way to solve a problem or conserve a resource.

CONGRESSMAN FRANK BUCK (CA) INTRODUCED FIRST LEGISLATION
MAY 1939

CONGRESSMAN BUCK REINTRODUCED LEGISLATION
FEBRUARY 1941

LUXURY TAX PASSED — EXCISE TAX ON GENERAL FISHING EQUIPMENT; REVENUES TO GENERAL FUND
OCTOBER 1941

CONGRESSMAN BUCK REINTRODUCED LEGISLATION FOLLOWING WWII
JULY 1946

HISTORY OF THE FEDERAL AID IN SPORT FISH RESTORATION PROGRAM

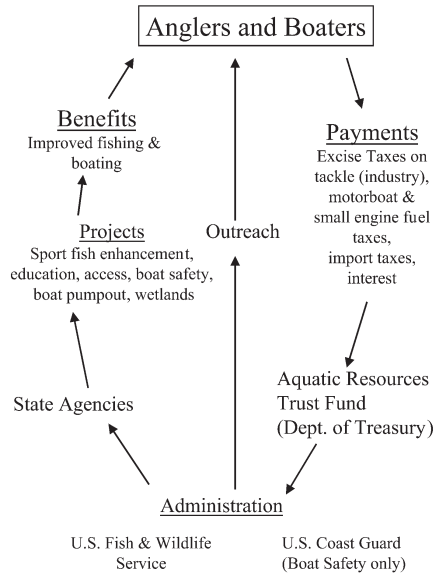
INTRODUCTION

The Federal Aid in Sport Fish Restoration (SFR) Program is a cooperative effort involving federal and state government agencies, the sport fishing industry, anglers, and boaters. Designed to increase sport fishing and boating opportunities through the investment of anglers' and boaters' tax dollars in state sport fishery development projects, the program was originally created in 1950 through the Federal Aid in Sport Fish Restoration Act, popularly known as the Dingell-Johnson Sport Fish Restoration Act. Over the next 50 years, it was substantially revised through four major amendments.

The SFR Program is an outstanding example of a "user pays /user benefits," or "user fee" program. In this case, anglers and boaters are the users. Excise taxes on fishing tackle (deposited by manufacturers), motorboat fuel taxes, and import duties on tackle and boats, along with other special fuel taxes on small engines, are deposited in the U.S. Department of Treasury, and are subsequently allocated to state fishery agencies for sport fishery restoration, wetlands conservation, boat safety, aquatic resource education, and boating access and facilities projects. The enhanced fishing and boating opportunities complete the cycle of "user pays /user benefits" (Figure 1). The U.S. Fish and Wildlife Service (USFWS) Division of Federal Aid evaluates the benefits of the program through the Federal Aid Information Management System (FAIMS).

FIGURE 1

The Sport Fish Restoration "Cycle of Success."



PROGRAM HISTORY

The current Federal Aid in Sport Fish Restoration Program is the result of five major Congressional actions: 1) enactment of the original act in 1950; 2) the Wallop-Breaux Amendments of 1984 as part of the Deficit Reduction Act of 1984 (Public Law 98-369); 3) the 1990 amendments as part of Title III of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (Public Law 101-646), which created the Coastal Wetland Planning and Protection Act; 4) the 1992 amendments through the Clean Vessel Act (Title V of Public Law 102-587), which altered the program to include construction and maintenance of pumpout facilities for recreational boats with sewage holding tanks; and, 5) the 1998 amendments through the Sportfishing and Boating Safety Act of 1998 which focused on improving outreach and boating access infrastructure.

Initial Years: The Dingell-Johnson (D-J) Sport Fish Restoration Act

The Federal Aid in Sport Fish Restoration Act followed a lengthy and rather arduous legislative process before it was eventually enacted in 1950 under the co-sponsorship of Congressman John Dingell, Sr. (MI) and Senator Edwin Johnson (CO). The process actually began in May 1939 when Congressman Frank H. Buck (CA) introduced legislation to impose a 10 percent manufacturers' excise tax on certain fishing equipment, artificial lures, and all other similar devices for recreational fishing. The monies collected under authority of the proposed legislation would be returned to the states to help fund sport fishery programs. Congressman Buck's bill was modeled after the highly successful and

BY GILBERT C. RADONSKI

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CONGRESSMAN JOHN DINGELL SR. (MI) INTRODUCED LEGISLATION
FEBRUARY 1947

CONGRESSMAN DINGELL AND SENATOR JOHNSON INTRODUCE LEGISLATION; VETOED BY PRESIDENT TRUMAN
1949

CONGRESSMAN DINGELL AND SENATOR JOHNSON REINTRODUCE LEGISLATION
1950

popular Federal Aid in Wildlife Restoration Act (also known as the Pittman-Robertson Act, or P-R Act), enacted in 1937, that earmarked taxes collected on specific firearms, ammunition, and archery products for state wildlife programs. However, Buck's bill received little support and died in the House Ways and Means Committee.

Two years later (February 1941), Congressman Buck introduced a similar bill in the House. Soon after, the United States entered World War II and all action on the bill ceased. However, it is interesting to note that a bill similar to Buck's was passed in October 1941 as part of the "Luxury Tax" to help fund the war effort. The Luxury Act imposed a 10 percent excise tax on rods, reels, creels, and artificial lures. The monies collected by the tax were deposited in the General Fund of the U.S. Treasury. When World War II ended in 1945, the excise tax continued to be collected and deposited into the General Fund.

FIGURE 2

Letter from John Dingell, Sr. to President Truman expressing disappointment over Truman's veto of the Sport Fish Restoration legislation (source: Harry S. Truman Library, Independence, MO).

WAYS AND MEANS COMMITTEE

JOINT COMMITTEE ON THE BUDGET

JOINT COMMITTEE ON INTERNAL REVENUE TAXATION

Congress of the United States
House of Representatives
Washington, D. C.

January 3, 1950

THE WHITE HOUSE

JAN 4 7 50 AM '50

RECEIVED

Honorable Harry S. Truman
The White House
Washington, D. C.

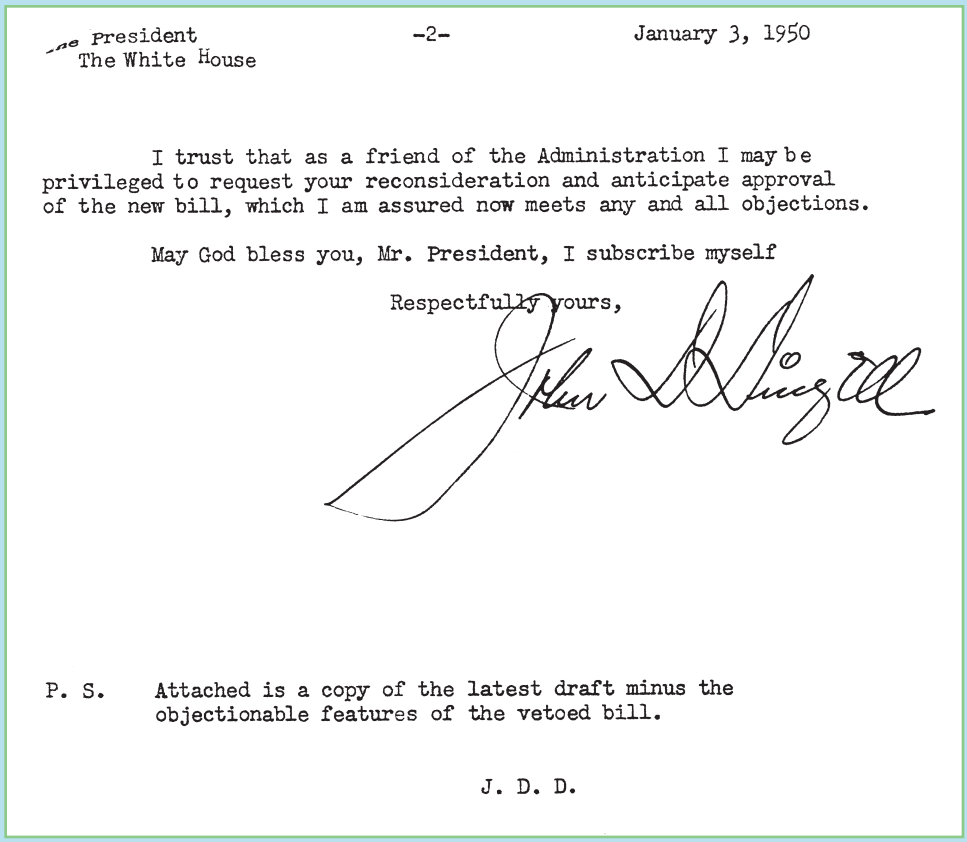
My dear Mr. President:

In the closing days of the First Session of the 81st Congress, having scaled all Congressional barriers, H. R. 1746, "To provide that the United States shall aid the States in fish restoration and management projects, and for other purposes" was laid on your desk for signature. This bill had the unanimous support of the millions of sportsmen throughout the country who love the out-of-doors and was supported by those in authority and charged with wildlife conservation in our government. It was considered by the House under unanimous consent and passed without a murmur of opposition. It passed the Senate in the selfsame way.

I did not see fit to take up your time in consultation, because I assumed that the support of the millions of sportsmen, of the industry which produces the reels, creels and other fishing paraphernalia, together with that of the Departmental Heads concerned, made certain your signature which would have made the bill a law and provided proper reinforcement of the Pitman-Robertson Act which covers the Migratory Bird problem.

I was disappointed to learn that solely upon the basis of the objections of the Treasury Department the bill was vetoed. I find no fault with you in the matter, and as a good soldier I took my defeat without asking that the Congress over-ride the veto. I assumed, and I trust correctly, that your objections could be met and that at the earliest possible date in January my new bill, drafted in accordance with your ideas and mine, might pass both Houses of Congress and that I might point to a favorable report in its support, together with an expression of your acquiescence in the new draft. There are seventeen million sportsmen throughout the country, among whom no voice was raised against the bill, but many have since expressed bitter disappointment in its veto, which I assured them was only a temporary set-back.

Following the war, Buck resumed his efforts and reintroduced his bill (the precursor to the SFR Act) into the House of Representatives in July 1946. The bill was referred to the Committee on Merchant Marine and Fisheries and was tabled over objections stemming from commercial fishing interests (which used some of the same equipment that would be taxed) and fishing tackle manufacturers (which feared a reduction in profits and increased administrative burdens). Buck was not re-elected in 1947 but Congressman John Dingell, Sr. took up the cause. In February 1947, he introduced his version of the bill into the 80th Congress. Although Congressman Dingell rewrote the bill to address the earlier concerns of commercial fishing interests and fishing tackle manufacturers, it failed to pass.



The President
The White House

-2-

January 3, 1950

I trust that as a friend of the Administration I may be privileged to request your reconsideration and anticipate approval of the new bill, which I am assured now meets any and all objections.

May God bless you, Mr. President, I subscribe myself

Respectfully yours,

P. S. Attached is a copy of the latest draft minus the objectionable features of the vetoed bill.

J. D. D.

In the next two years, sport anglers rallied together and gained support for the legislation. The relentless Congressman Dingell reintroduced his bill early in the 81st Congress. On 1 August 1949, Senator Edwin Johnson introduced an identical bill into the Senate. The bills quickly passed. However, President Harry S. Truman vetoed the legislation on 12 October 1949, on the basis that: 1) it would be poor fiscal policy to earmark taxes, 2) it would be impossible to administer the retroactive features calling for tax revenue from three previous fiscal years, 3) it would isolate one small group of items of many listed on the tax code, and 4) permanent appropriation language was not a desirable method of distributing tax collections.

Although the veto shattered some dreams, it also served to rally new supporters throughout the United States. State fish and game agencies, sportsmen, and many other outdoor recreation enthusiasts recognized the benefits of the popular and successful Wildlife Restoration program. With the help of Senator Johnson and Congressman Dingell, the bill was rewritten and introduced in the House in the Second Session of the 81st Congress on 3 January 1950. Although Congressman Dingell lobbied for President Truman's support (see Figure 2), the President still objected to certain provisions of the bill and sought to use some of the funds to offset existing federal hatchery programs (Figure 3). Finally, compromise was reached. The bill sailed through both the House and Senate by large margins, making it veto-proof, and was reluctantly signed by President Harry S. Truman on 9 August 1950. The tax on fishing rods, reels, creels, artificial lures, baits and flies already being collected as part of the Luxury Tax immediately was set up in a special account in the U.S. Treasury and state apportionment began 1 July 1951. The legislation was commonly referred to as Dingell-Johnson, or (D-J) Sport Fish Restoration Act, for the two principal congressional sponsors. The word "sport" in the title is meaningful from the standpoint of taxable items and the fact that the benefits do not include commercial fisheries. Like the Wildlife Restoration Act, the Sport Fish Restoration Act included the permanent appropriations language objected to by President Truman.

The Next Evolution: Wallop-Breaux Amendment

By the late 1970s, a growing deficiency of available funds for fisheries work under the Sport Fish Restoration Act became apparent. While the Wildlife Restoration Act was providing nearly $86 million annually for wildlife restoration projects, the Sport Fish Restoration Act was providing in the neighborhood of $35 million annually for sport fish restoration. Sport fishing interests began to examine ways to increase monetary resources available through the SFR Program.

A grassroots effort emerged, dubbed the "D-J Expansion" (see related feature inset). The effort was led by the Bass Anglers Sportsman Society and the American Fisheries Society and had two elements: extend the excise tax to all items of fishing tackle; and put an excise tax on fishing boats, motors and trailers.

In August 1979, Senator Jennings Randolph (WV) introduced legislation to expand the SFR program by lengthening the list of taxed fishing tackle items. The legislation would have imposed a three percent manufacturers' excise tax on certain boats, outboard motors, and boat trailers in addition to the items already taxed. Congressman John Breaux introduced similar legislation in the House of Representatives in December 1979. However, opposition from boating interests proved to be the legislation's downfall. The boating industry opposed the tax increase because their business was in a depressed state due to the high interest rates and gas prices of the late 1970s.

A breakthrough came in 1982 with a compromise proposal developed by the Sport Fishing Institute. The essential element of the compromise was to delete the controversial three-percent excise tax on boats, outboard motors, and boat. In its place, monies collected from motor boat fuel tax provisions of the Recreational Boating Safety and Facilities Improvement Act of 1980 (The Biaggi Act) would be applied to the SFR fund. This would capture boating dollars for fishery development, a goal of the D-J Expansion proponents. The second part of the compromise was to incorporate duties collected on imported fishing tackle into the SFR fund. This compromise fostered a strong coalition of boating and fishing interest groups (later known as the American League of Anglers and Boaters, or ALAB).

FIGURE 3

Letter from President Truman to John Dingell outlining concerns over Sport Fish Restoration legislation (Source: Harry S. Truman Library, Independence, MO).

THE WHITE HOUSE
WASHINGTON

March 9, 1950

Dear John:

Since my note to you of January 13, I have looked carefully into the proposals which you sent me as a substitute measure for H. R. 1746, and which, I understand, have now been introduced as H. R. 6533.

In the main, the revised bill overcomes the objections to the earlier bill which I set forth in my veto message of last year. As a matter of principle, I am still opposed to the earmarking of Government revenues, but I recognize that a case can be made for certain exceptions. Your bill has more merit than most proposed exceptions and, with certain amendments, I shall be glad to sign it if it is reenacted by the Congress.

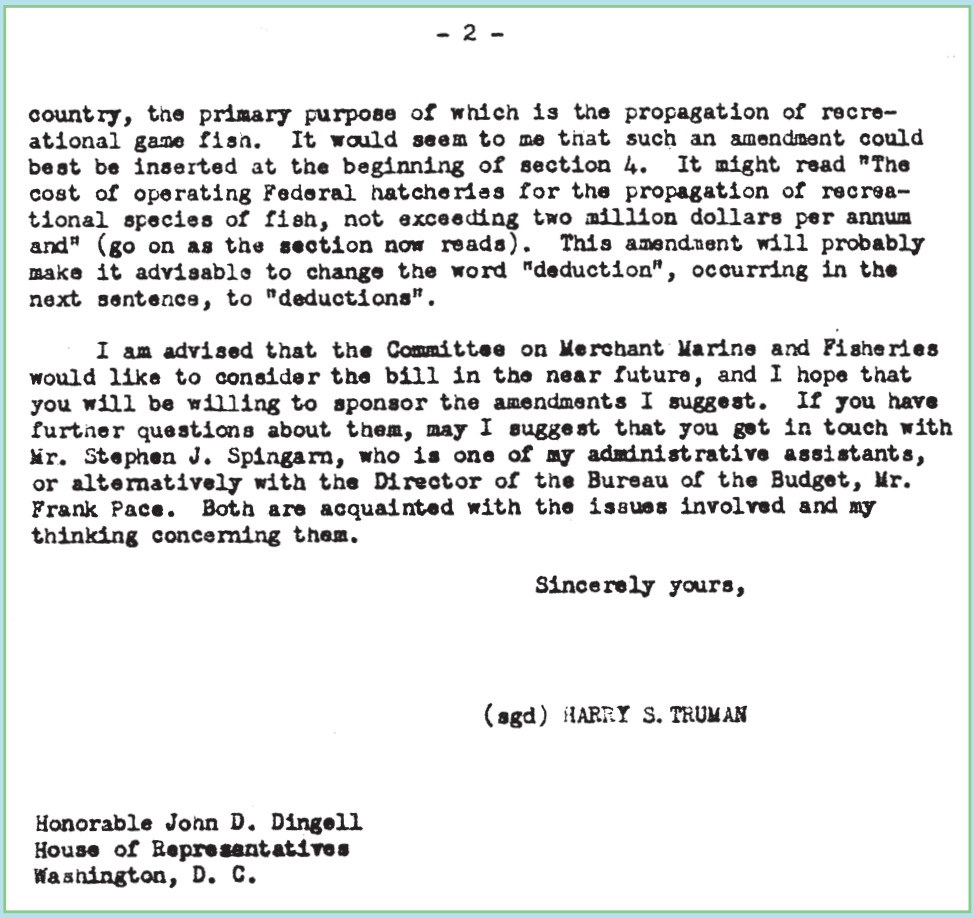
The specific amendments which I suggest are as follows:

1. Eliminate the words "effective October 1, 1941," from section 3 of the bill. The date contributes nothing and conceivably it could confuse.

2. Eliminate the second sentence of section 3, authorizing a direct appropriation of two million dollars for the fiscal year 1951. It seems to me that a direct appropriation is contrary to the bill's concept of using revenues from the existing tax on fishing equipment to finance the program, and I see no need to start it earlier than would otherwise be the case. You will remember that in 1937 there was a lapse of time between enactment of legislation which earmarked taxes on firearms, shells and cartridges for wildlife restoration purposes and initiation of the program. I do not believe that the States will object to waiting another year.

3. Change the cost of Federal recreational fish hatcheries to the earmarked fund. Propagation of recreational species of fish is estimated to cost between a million and a half and two million dollars a year. I believe that these costs, in addition to the percentage figure authorized in section 4 for administrative expenses, should be charged against the earmarked revenues. While this amendment will reduce the amount available for allotment to the States, I feel that it is reasonable to require all the States to support Federal operation of hatcheries located throughout the

In July 1984, through the leadership of Senator Malcolm Wallop and then Congressman John B. Breaux, the compromise was written as an amendment to the Federal Aid in Sport Fish Restoration Act. The amendment eventually passed as part of the Deficit Reduction Act of 1984. In recognition of their unrelenting efforts, the amendment became known as the Wallop-Breaux Amendment. A new



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country, the primary purpose of which is the propagation of recreational game fish. It would seem to me that such an amendment could best be inserted at the beginning of section 4. It might read "The cost of operating Federal hatcheries for the propagation of recreational species of fish, not exceeding two million dollars per annum and" (go on as the section now reads). This amendment will probably make it advisable to change the word "deduction", occurring in the next sentence, to "deductions".

I am advised that the Committee on Merchant Marine and Fisheries would like to consider the bill in the near future, and I hope that you will be willing to sponsor the amendments I suggest. If you have further questions about them, may I suggest that you get in touch with Mr. Stephen J. Spingarn, who is one of my administrative assistants, or alternatively with the Director of the Bureau of the Budget, Mr. Frank Pace. Both are acquainted with the issues involved and my thinking concerning them.

Sincerely yours,

(sgd) HARRY S. TRUMAN

Honorable John D. Dingell
House of Representatives
Washington, D. C.

trust fund, named the Aquatic Resources Trust Fund (popularly referenced as the Wallop-Breaux Trust Fund), was divided into two accounts: 1) the Boat Safety Account; and 2) the Sport Fish Restoration Account. The Wallop-Breaux Amendment collected revenues by expanding the base tax to include essentially all items of fishing tackle, as well as the new motorboat fuel taxes and import duties on fishing tackle and boats.

How the 1984 Wallop-Breaux Amendment Affected the SFR Program

The Wallop-Breaux Amendments added several new factors that influence the types of projects that states undertake through the Federal Aid in Sport Fish Restoration Program :

Program Funding—Probably the most important feature of the Wallop-Breaux Amendment was the increase in available funds. In the final year of funding under the original SFR program (1985), $38 million was available to the states through the SFR Program. As a result of the Wallop-Breaux Amendment, annual funding rose to $224 million by 1998, nearly a six fold increase (Figure 4)!

Boating Access—The provision mandated that each state spend at least 10 percent of its annual apportionment on development and maintenance of boating access facilities. A broad range of access projects are eligible for funding, including construction of boat ramps and lifts, docking and marina facilities, breakwaters, fish cleaning stations, restrooms, and parking areas.

Aquatic Resources Education—Up to 10 percent of a state's annual apportionment could be used to fund an aquatic resources education program. Subjects covered under this provision included aquatic ecology, aquatic resources management, aquatic safety, fisheries conservation ethics, public information, and fishing.

Equitable Expenditure Between Freshwater and Saltwater Projects—The Wallop-Breaux Amendment stipulated that marine coastal states and territories equitably divide expenditure of program monies between freshwater and saltwater activities based on the proportion of resident freshwater anglers versus resident saltwater anglers. *The National Survey of Fishing, Hunting, and Wildlife Associated Recreation*, conducted by the USFWS, was to be used to establish that proportion. The provision *did not* change the allocation to the states. It only affected how the apportionments were divided between fresh and saltwater programs within a marine coastal state. State allocations remained dependent, in part, on the number of licensed anglers in the state in relation to the number of licensed anglers in the United States.

Prospective Purchase—States could acquire or develop facilities over a period of years using future apportionments. This could be accomplished in two ways: 1) states could finance the entire cost of the acquisition or construction from a non-federal funding source and claim reimbursement from the SFR program in succeeding years according to a scheduled reimbursement plan; and 2) states could negotiate an installment purchase or contract whereby periodic and specified amounts are paid to a seller or contractor. Sport Fish Restoration reimbursements were allowed for each payment from any apportionment year current at the time of payment.

1988 Reauthorization of Wallop-Breaux

Provisions of the Wallop-Breaux Amendment required spending from the Boat Safety Account to undergo reauthorization after three years of enactment; only the Sport Fish Restoration Account retained the "permanent appropriation" language of the original Sport Fish Restoration Act. Since motorboat fuel taxes collected in the Boat Safety Account that are in excess of the appropriated amount flow automatically into the Sport Fish Restoration Account, reauthorization affected the amount of money going to states for sport fishing and boating access projects. Unlike the Sport Fish Restoration Account, which is administered by the USFWS, the Boat Safety Account is administered by the U.S. Coast Guard. The monies transferred to this account are divided between the Coast Guard and the states. The states' share is used on a matching basis for boating safety programs.

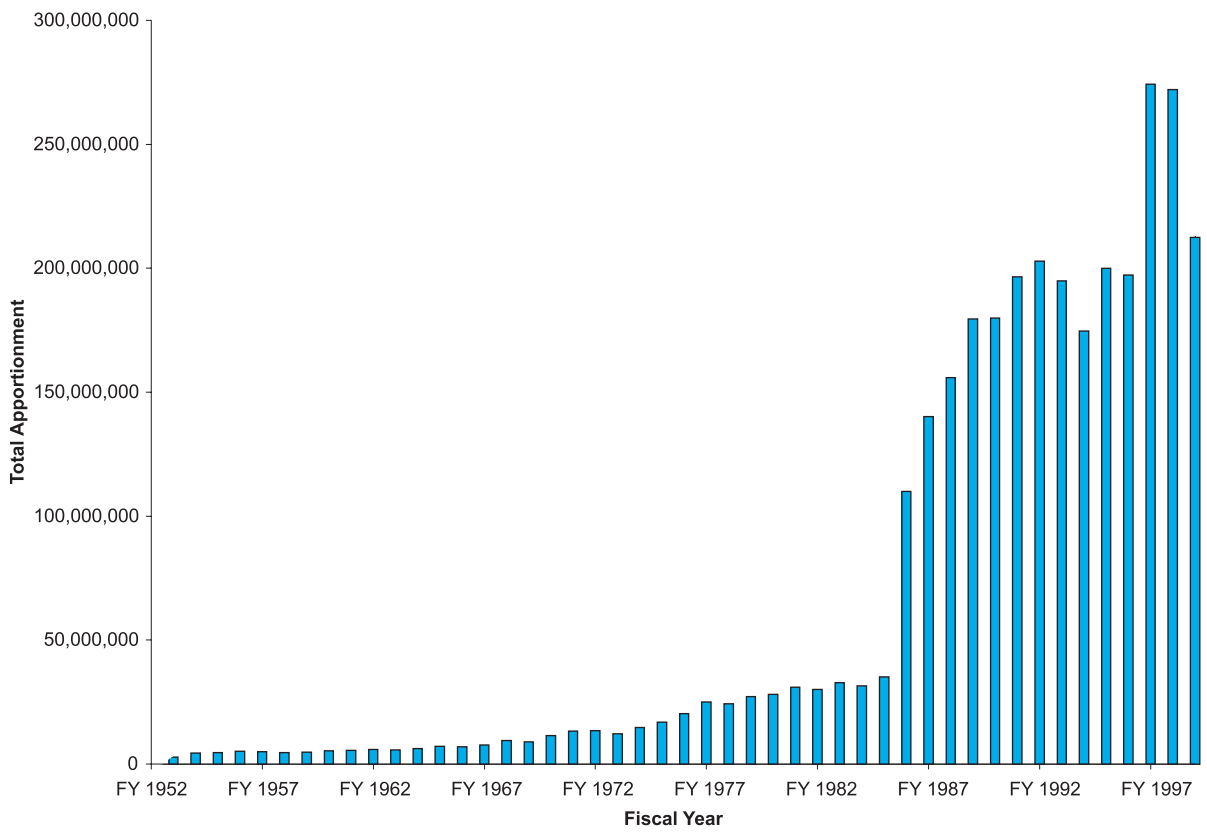
The reauthorization bill was introduced into the House Merchant Marine and Fisheries Committee in early 1988. In order to expedite passage, the language was later incorporated into the 1988 Coast Guard appropriation bill, which passed and became law (P.L. 100-448) in September 1988. The new law increased the spending authorization for the Boat Safety Account and altered several administrative procedures of the program:

Allocation Between Freshwater and Saltwater Projects—The Wallop-Breaux Amendment stipulated that only the "new monies" collected in the Aquatic Resources Trust Fund as a result of that amendment to be split equitably in coastal states between freshwater and saltwater projects. Under the 1988 Amendment (P.L. 100-448), the distinction between "old" and "new" monies was removed, requiring that all appropriations to coastal states be divided equitably between freshwater and saltwater projects. To protect ongoing freshwater projects in coastal states, allocations to freshwater projects could not be less than the amount allocated by to such projects during fiscal year 1988.

In-kind Contributions—The 1988 amendment provided the ability for states to use the contribution of funds, real property, materials, and services on approved projects in lieu of

FIGURE 4

Annual apportionments to the states through Sport Fish Restoration (exclusive of boat safety, wetlands, and pump out).



payment of the state's 25 percent match of the cost of such project. As a result, such a state share is considered to be paid in an amount equal to the fair market value of any contribution so used.

Survey of Fuel Use by Recreational Vessels—In order to verify the actual percentage of fuel taxes collected each year attributable to recreational motorboat usage, P.L. 100-448 authorized the Secretary of Transportation and the Secretary of the Interior to jointly conduct a survey of 1) the number, size and primary uses of recreational vessels operating on the waters of the U.S.; and 2) the amount of fuel used by those vessels.

1990 Amendments to the Federal Aid in Sport Fish Restoration Act

During the last days of the 101st Congress, amendments were passed that led to a significant increase in deposits to the Sport Fish Restoration Account and also mandated the creation and funding of a new wetlands restoration effort within the overall SFR Program. The 1990 federal budget reconciliation process allowed for 2.5 cents of the newly approved 5 cents increase in federal fuel excise taxes to be deposited to the Highway Trust Fund. The Aquatic Resources Trust Fund, as in the past, received 1.08 percent of these new revenues.

At the same time, in related legislative action, the federal fuel tax receipts attributable to small gasoline engines were captured for deposit to the Sport Fish Restoration Account. This amendment to the Internal Revenue Code required federal fuel excise taxes attributable to small gasoline engines (lawnmowers, string trimmers, snow blowers, etc.) to be transferred from the Highway Trust Fund to the Aquatic Resources Trust Fund.

Coastal Wetlands Planning, Protection and Restoration Program

In 1990, the Coastal Wetlands Planning, Protection and Restoration Program was established, receiving 18 percent of all funds deposited into the Sport Fish Restoration Account (approximately the anticipated receipts from the new small engine gas tax). The wetlands program consists of three components. The first component, the Louisiana Coastal Wetlands Restoration Program, receives 70 percent of the total wetlands funding. A federal task force was created to prioritize Louisiana coastal wetlands restoration projects which could be completed within a five-year period, and required development of a long-term wetland restoration plan for Louisiana. The goal is to achieve a no-net-loss of wetlands in Louisiana by regulating development activities.

The second part of the wetlands program receives an annual allocation of 15 percent of the wetlands monies for support of the North American Wetlands Conservation Act. These monies are provided to the Secretary of the Interior to undertake projects authorized by the North American Wetlands Conservation Act (Public Law 101-233) in coastal states.

The third part of the wetlands program was the creation of the National Coastal Wetlands Conservation Grants Program. This national program, administered by the Director of the USFWS, provides grants to coastal states (including Great Lakes states) for coastal wetlands conservation programs. The new amendment also required the USFWS to update wetlands maps and to conduct an assessment of wetlands trends in the state of Texas.

1992 Amendments to the Federal Aid in Sport Fish Restoration Act

On 4 November 1992, President George Bush signed the Oceans Act of 1992, which contained a number of environmental provisions. Title V of the Oceans Act was entitled the Clean Vessel Act, which included several modest changes to the Federal Aid in Sport Fish Restoration legislation. Among those changes were new distribution formulas to equitably distribute the additional motorboat fuel tax. A new cost-share program made money available for construction, maintenance, and operation of facilities to handle sewage from boats. The following amounts were available for this purpose: $5 million in FY 1993; $7.5 million in FY 1994 and 1995; and $10 million in FY 1996 and 1997. Additionally, an identical amount of spending authority was provided to enhance state boat safety grants programs.

The amendments also increased the mandatory minimum percentage of state allocations that had to be invested in boating access and facilities projects from 10 percent to 12.5 percent. Two changes were included to provide greater flexibility to states for their boating access and facilities projects. First, the act allowed an *average* state expenditure of 12.5 percent, measured across a region. The states were also provided five years in which to obligate their 12.5 percent boating access and facilities monies, again to provide flexibility to accommodate the imposition of the additional planning and permitting burden associated with the development of boating access.

The final 1992 substantive change was to include the word "outreach" in the pre-existing aquatic resource education program. This allows state agencies to provide aquatic resource education and outreach programs with regard to fishing, boating and the overall SFR program.

How The Federal Aid In Sport Fish Restoration Program Works

The Federal Aid in Sport Fish Restoration Program operates through a "user pays/user benefits" cycle of tax collection and disbursement. Anglers and boaters (the users) initiate the cycle with payment of taxes on certain items associated with pursuit of their sport. These include excise taxes on equipment, fuels tax attributable to motorboat use and small engine use, import taxes on boats and fishing equipment, and interest on revenues. The taxes, which are levied and paid at the manufacturing or distribution points by businesses, are incorporated in the price of the product paid by consumers (Figure 5).

The USFWS Division of Federal Aid allocates funds among the states using the following formula: 40 percent of the amount apportioned is based on each state's land and water area (including coastal and Great Lakes waters) in relation to the total land and water area of the U.S., and 60 percent of the amount apportioned is based on the number of paid sport fishing license holders in each state relative to all the paid fishing license holders in the United States. No state may receive more than five percent of the total apportionment and no state may receive less than one percent. Also, Puerto Rico receives one percent, and the District of Columbia, Guam, American Samoa, the U.S. Virgin Islands, and Northern Marianas Islands each receive one-third of one percent.

To receive program funds, a state must have enacted legislation that prohibits sport fishing license fees from being diverted out of the state's fishery agency. Sport Fish Restoration Program Funds are available only to state agencies responsible for managing the sport fishery resources of that state. However, universities, private organizations, other state agencies, or county and municipal governments, may cooperate with state fishery agencies on sport fishery development projects that are administered by the state fishery agency. The state is responsible for

1998 Amendments to the Federal Aid in Sport Fish Restoration Act (TEA-21)

In 1998, the reauthorization of the Sport Fish Restoration Act, known as the Sportfishing and Boating Safety Act of 1998, was conducted as part of the Transportation Equity Act for the 21st Century (TEA-21). The most significant changes enhanced the boating infrastructure components of the SFR Program, along with the boat safety authorization, and public outreach and communication programs.

These amendments guaranteed that states would receive between $59 million and $72 million in federal support annually for boating safety programs. Prior to this, budget difficulties often threatened the appropriation of these funds to the states. In addition, the Coast Guard received an additional $5 million each year for recreational boating safety efforts.

For boating access and facility repair projects, the 1998 amendments increased the mandated amount that states must spend to 15% (up from 12.5%). Significantly, the 1998 amendments reauthorized the Clean Vessel Act (boat pumpout provisions) originally incorporated in 1992. In addition, they created a new "Boating Infrastructure Program" designed to meet the needs of many non-trailerable recreational vessels and mandated that a survey of public boat access needs be undertaken within 18 months.

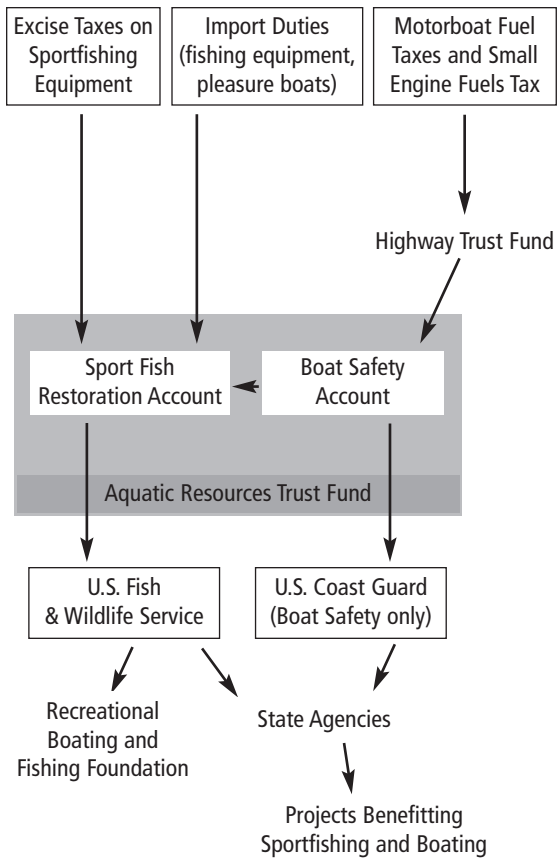
The new amendments began to correct what many considered an inequity in the transfer of the motorboat fuel taxes. Prior to the amendments, the Aquatic Resources Trust Fund received only 11.5 cents of every 18.3 cents in federal gas tax per gallon paid by boaters and anglers. The 1998 amendments increased this to 13 cents on 1 October 2001 and 13.5 cents on 1 October 2003. This was projected to increase total appropriations to the fund by $31 million in 2002 and 2003 and $41 million per year thereafter. The amendments also increased the transfer of small engine (lawnmowers, chainsaws, snow blowers, and similar products) fuel taxes to be identical to taxes on boating fuel, to be utilized for wetlands restoration purposes. This included coastal wetlands and the North American Wetlands Conservation Act in coastal states.

The 1998 amendments substantially enhanced the outreach provisions that were initially established in the 1992 amendments. For the first time, a national outreach and communications program was authorized "to reduce barriers to public participation in angling and boating and to promote conservation and the responsible use of the nation's aquatic resources." Authorization levels for this program were $5 million in 1999; $6 million in 2000; $7 million in 2001; $8 million in 2002 and $10 million in 2003, plus up to $2.5 million annually from the U.S. Fish and Wildlife Service. Furthermore, the amendments called for state outreach and communications programs to be developed within 12 months after completion of a national outreach plan.

Finally, the amendment authorized states to spend more on Aquatic Resources Education, outreach, and communication, increasing the level from 10% to 15% of each state's SFR apportionment.

FIGURE 5

Flow of funds in the Federal Aid in Sport Fish Restoration Program.



setting priorities and making project proposals to the USFWS.

Each state fishery agency designates a Federal Aid Coordinator who processes all state project proposals to ensure that the proposals meet USFWS Federal Aid requirements. The state Federal Aid Coordinator sends each proposal to the appropriate regional USFWS Federal Aid office where they are reviewed and evaluated to ensure that they are in compliance with the SFR legislation, associated regulations and policy, and other applicable federal laws.

When the regional Federal Aid office approves a project, an amount up to 75 percent of the estimated cost of the project is set aside for the state to be reimbursed from the Sport Fish Restoration Account. The state must first expend the money on the project and is then reimbursed for up to 75 percent of the cost. The state share must be at least 25 percent of the cost and must be derived from a non-federal source. The regional Federal Aid office monitors projects funded through the program to ensure that program funds are being used properly and that project goals and objectives are achieved. Following completion of each project, the state must submit a final report to the regional Federal Aid office documenting results and accomplishments of the project. These reports are compiled by the Washington office in their Federal Aid Information Management System.

Almost any type of sport fishery restoration, management, or enhancement project that is substantial in "character and design" (Section 7, Federal Aid in Sport Fish Restoration Act) is permissible under the law. Sport fisheries research and management activities, boating access development and maintenance, aquatic resource education projects, lake construction and maintenance, land acquisition, technical assistance, planning, habitat enhancement, administration, and hatchery construction are all allowable types of projects. Law enforcement and public relations are examples of project types that are not allowable. Generally, states have wide latitude to undertake projects that address sport fish priorities.

For a description of the funding cycle for the Boat Safety and Clean Vessel components, see pages S63 and S64.

AMERICAN LEAGUE OF ANGLERS AND BOATERS CREDITS DIVERSITY ...

BY VERONICA FLOYD AND DERRICK CRANDALL

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As we celebrate the 50th anniversary of the enactment of the Sport Fish Restoration (SFR) Act, we should recognize the power of vision, consensus and leadership of a number of individuals in making this program the success that it is. This is especially evident during recent years when the original program was transformed and expanded through the Wallop-Breaux Amendments into one of the nation's most important on-going conservation and recreation efforts. In 1984, a diverse band of companies in the boating and sportfishing industries, state fish and wildlife agencies, and nongovernmental organizations representing millions of outdoors enthusiasts and conservationists, successfully promoted major amendments to the SFR program. Their efforts were premised on the belief that addressing our nation's sportfishing needs required a blend of national tools and local actions. Their message was that participation in recreational boating and fishing was beneficial to individuals, families, and communities. The results of this success have already improved the lives of tens of millions of Americans, and will continue to yield benefits for generations to come.

The coalition to expand SFR organized around a concept that was elegantly simple in concept but remarkably complex in operation: extend specialized federal excise taxes to restore and enhance boating and fishing opportunities across the nation. Since the 1984 amendments, nearly $5 billion in federal funds have been made available to an array of programs. Wetlands have been restored and fishing piers accessible to the handicapped have been built, fisheries have been strengthened, and boating safety and aquatic resources classes have been provided for millions of American youths.

The legislative success of 1984 came about only after a process of consensus-building.

The diversity of the supporters of SFR and the Wallop-Breaux amendments has clearly shaped the program in many ways, most obviously by joining fishing and boating interests into one. From the start, the 1984 amendments targeted funds for enhancing boating access and identified aquatic resource education as an objective. Later, other programs would be added to accommodate specific interests: a program for marine sanitation device pump-out stations; a program to restore wetlands; an outreach program to boost participation in boating and fishing; a program for facilities serving larger, transient recreational boaters; and more. The mix of benefits has helped solidify the national coalition, thus safeguarding the program.

Although the broad coalition of supporters was essential, a handful of boating and fishing community leaders and members of Congress can be credited for leadership in elevating the Sport Fish Restoration Program to a national concern and forging the framework for the program's success. Two key individuals who played vital roles in establishing the vision—the big, unifying idea—were Ray Scott, founder of B.A.S.S., and Carl Sullivan, Executive Director of the American Fisheries Society. Scott approached and recruited national political leaders with his wonderful promotional skills while Sullivan built a coalition with substantial grass roots through his passion and professional credentials.

Others also played a key role, including leaders within the recreation industry. Tom Bedell, whose company was then known as Berkley, Sheldon Coleman of the Coleman Company, and Gene Howard of Zebco helped persuade colleagues that investing in enhanced fisheries and improved access to public waters would protect the industry's future, even if increased taxes posed short-term marketing challenges in the intensely competitive boating and fishing industries. The role of industry statesmen, in the past, today, and tomorrow, is vital to securing essential corporate support for the program's excise taxes. Conservation community leaders, including Jack Lorenz, of the Izaak Walton League of America, and Bob Herbst, then with Trout Unlimited,

played visible and active roles in the creation and early operations of Wallop-Breaux amendments.

Another group of leaders came from the U.S. Congress and included top staffers and key members. U.S. House of Representatives champions included John Breaux and Gerry Studds, while U.S. Senate leadership came from Howard Baker, then Majority Leader, and Malcolm Wallop. Breaux and Wallop continued to provide a bipartisan and activist leadership team as the SFR program experienced rapid growth–and attacks from the Office of Management and Budget (OMB) and others–during the decade following passage of the legislation. A symbol of this commitment was the success in securing additional funding for wetlands restoration, an initiative with clear fisheries benefits, without tapping the program's established funding. John Breaux successfully led efforts to secure some $50 million annually in federal excise taxes collected on fuel used in lawnmowers, trimmers, chainsaws and snow blowers! Similarly, both played a central role in a major national conference called Chartmaker 2000 designed to articulate clear goals for the SFR program.

Despite challenges, the SFR program has endured and grown, significantly improving the nation's sport fisheries. Since the 1984 amendments, funding has increased some 700% and the mix of programs has solidified the national coalition that was active in achieving those amendments. Since 1985, this coalition, known as the American League of Anglers and Boaters, has successfully fended off attacks by OMB directors and powerful members of Congress in search of funding for other popular initiatives and, which in 1998, achieved near-miraculous success in providing automatic funding for state boating safety programs.

The SFR program is not without criticism. Some see it as overly complex and confusing. Others have warned against "balkanization" of the program, with too many parts compromising the core objective of the program. And still others criticize it as unfair in that some fishing-related items escaped taxation under the program (particularly many electronic devices) and other products with non-fishing uses are subject to the 10% federal excise tax (including certain types of storage boxes). None of the concerns, however, alter the reality that the SFR program today is larger and stronger than ever, making a real difference in the quality and enjoyability of the nation's surface waters.

... BIG IDEAS, AND LEADERS FOR DRAMATIC SUCCESSES OF AQUATIC RESOURCES TRUST FUND

Despite all of the barriers arising from the federal budgeting process, the program is 100% funded through special taxes levied as user fees and has the support of the boating and fishing industries and their customers, even in an anti-tax climate. Fortuitously, the periodic renewal of the federal motorfuel tax –normally every five or six years–has provided a means to fine-tune the program on a regular basis and renew awareness of its user-fee roots.

SFR is unique in its focus on both resources and people, due to the active involvement of the boating and fishing communities along with agencies charged with natural resource stewardship. In addition to the original focus of restoring fisheries, SFR has evolved to address "customer needs." Happily, this dual focus seems to be achieving a strong, shared interest in long-term protection of the resources and sensitivity to human needs among all program partners. For example, one of the exciting initiatives underway through the 1998 amendments to the program is the outreach effort conducted by the Recreational Boating and Fishing Foundation. We feel certain that this effort will build awareness of opportunities for recreational boating and sportfishing as well as added public understanding of the physical, mental and social benefits resulting from time spent on the nation's waterways.

With a continuing strong partnership among the recreation industry, enthusiasts, state and federal agencies, combined with a continuing base of Americans who enjoy their leisure time boating and fishing, the Sport Fish Restoration Program has a very bright future. The future will grow still brighter when policymakers and others come to appreciate the full impact of these investments and make possible continued growth in the program by including full recovery of the federal excise tax on fuel used in recreational boating.

SPORT FISH RESTORATION—EVERYONE WINS

BY R. MAX PETERSON, MIKE HAYDEN, MARY JANE WILLIAMSON, MICHELE SAVAGE, AND MIKE HORAK

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It's hard to imagine that a tax originally levied to aid in financing World War II would eventually help ensure an angler's chance of catching a stringer of game fish anywhere in the United States. In fact, nothing in the past 100 years has had a bigger impact on recreational fishing than this war tax on fishing tackle which, in 1950, became the first ever dedicated federal source of money to be used by state natural resources agencies to improve the fishing experience. The result is one of the largest and most successful conservation programs in the world.

Sport Fish Restoration is good for fisheries management, anglers, sport fishing and boating businesses, and the fish!

GENE HESTER

GENE HESTER

The Federal Aid in Sport Fish Restoration (SFR) Program has had a major impact on sport fishing nationwide. Since its enactment in 1950, state fish and wildlife agencies have received more than $3.2 billion under the program (Figure 4, Radonski article, page S42). The tax monies collected go to state fish and wildlife agencies for fisheries research, habitat improvement, aquatic education and fishing and boating access facilities such as docks and ramps.

It's all made possible by sportsmen and women who, by doing the things they love—fishing and boating—help to restore and protect fish and their habitats in each state in this country. The purchase of fishing equipment and motor boat fuels by fishing and boating enthusiasts supports sport fish restoration, preservation and conservation. By taxing anglers, it gives them a stake in ensuring the money is used wisely. This forms the basis of the user pay/user benefit "cycle of success." (Figure 1, Radonski article, page S37). According to a 1999 survey, most fishing and boating enthusiasts don't know much about the Sport Fish Restoration Program, but they strongly support and defend the program once they are made aware of the benefits it brings to sport fish conservation efforts in the United States (Responsive Management 1999a). In fact, once informed about how the funding works, more than 75 percent of those polled voiced their overall support of the program. Many regard it as "their program" and expressed a sense of responsibility, pride and ownership. The Federal Aid in Sport Fish Restoration Program unites the U.S. Fish and Wildlife Service, state fish and wildlife agencies, the fishing tackle and boating industries, and anglers and boaters in a partnership that has achieved results for 50 years. Working together, these groups have accomplished what none could do alone—restore our precious natural heritage.

A New Deal for State Fish and Wildlife Agencies

In just 10 years (1989–1998), the Sport Fish Restoration Program funds have helped to:

- Build or maintain more than 1,700 fishing and boating access sites.
- Create fish habitat in more than 6,600 reservoir and lake sites; 2,700 river and stream sites; and 5,700 sites in the marine environment.

- Improve fisheries management through research.
- Educate children and adults about angling and aquatic resources.
- Restore saltwater and freshwater species.
- Build more than 2,730 pumpout stations for boat sewage and over 1,778 dump stations.

Across America, from east to west and in between, the Sport Fish Restoration Program has made a difference. For example, in Alabama, the Division of Game and Fish launched a major aquatic education initiative in 1995 to introduce urban residents to fishing. Recognizing the shift in population from rural to urban areas, the Community Fishing Program promotes fishing as a wholesome activity for youth in Alabama cities and towns. The Sport Fish Restoration Program supports this effort that now includes approximately 40 yearly events involving more than 8,000 participants. In New York City, the Dyckman Street fishing pier now provides recreational fishing for residents in downtown Manhattan. It is the only public fishing pier along a five-mile stretch of Manhattan Island and the only fishing access point for the residents of North and East Harlem, Washington Heights, and Inwood, as well as for other urban residents who enjoy the sport. And at Lake Havasu, in western Arizona, the largest warm water fisheries improvement project ever undertaken in the United States is well underway. Sport Fish Restoration funds are helping in this effort that involves state and federal agencies, and private conservation organizations. Fishing will be greatly enhanced through the placement of in-lake artificial habitat and the establishment of angling access points, as well as the installation of fishing docks, parking areas, restrooms, fish cleaning stations, and interpretive facilities. The improvements from this project will benefit all who enjoy fishing as well as a wide variety of fish species, including largemouth bass, flathead and channel catfish, striped bass, crappie, and bluegill. As these success stores and the others in this issue attest, the Sport Fish Restoration Program has been a tremendous success for fish, anglers, and management agencies nationwide.

It's a Deal for Industry, Too

In 1948, initial efforts to establish the Sport Fish Restoration Act failed, in part because of adamant opposition to the legislation by fishing tackle manufacturers. Although the act passed in 1950, opposition to the excise tax by the tackle industry still existed. However, as manufacturers began to see the improvements created by the Sport Fish Restoration funds, their opposition began to dissolve. Increased fishing and boating access, improved fisheries management, and healthier habitat created a better quality of fishing experience leading to increased participation and revenues. From 1955 to 1990, the percentage of anglers increased faster than the growth of the U.S. population (see figure below).

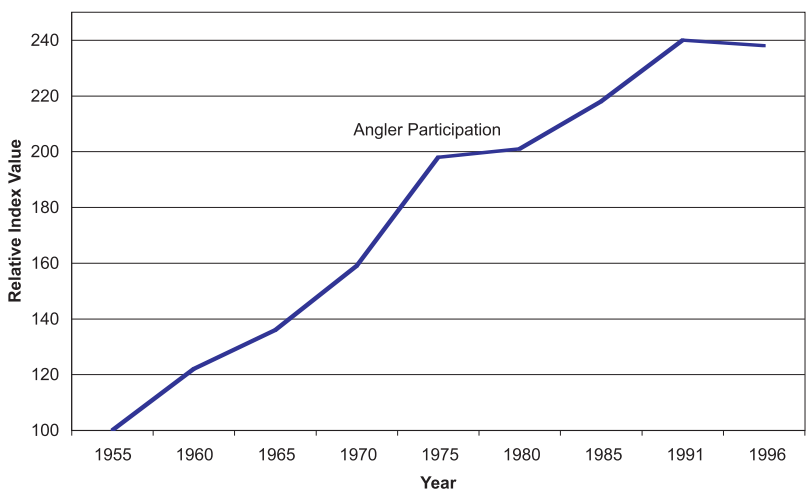
By 1984, tackle manufacturers were among the leading proponents of expanding the legislation because of the tremendous benefits they saw from the 1950 legislation. This overall support from industry, along with state fish and wildlife agencies and other groups and organizations, resulted in the 1984 Wallop-Breaux Amendment.

In support of the program, in 1997 the president of Zebco, the largest sport fishing manufacturing company in the United States, told a congressional panel that he shared the corporate view that his company's annual payment of millions of dollars in the excise tax was a wise investment for anglers and the sport fishing industry.

In 1998, members of the industry strongly supported Congress's amendment to the Sport Fish Restoration Act, which earmarked $36 million in excise tax funds for national fishing and boating outreach efforts. The Recreational Boating and Fishing Foundation was created to oversee the expenditures of those monies. The goals of the foundation are to engage more people in fishing and boating as well as inspire natural resource conservation.

Over the past 50 years, the Sport Fish Restoration Program has helped build a solid base for the conservation, preservation, and restoration of our nation's aquatic resources — a heritage of which we all should be proud.

Trends in sportfishing participation in the United States, 1955-1996 (USDI and USDC 1998).



TAMI HEILEMANN, PROVIDED BY ALAB.

IMPROVING THE FISHERIES PROFESSION AND STABILIZING FUNDING

MICHIGAN TRAVEL BUREAU

CENTER FOR GREAT LAKES & AQUATIC SCIENCES

HOW THE FEDERAL AID IN SPORT FISH RESTORATION ACT CHANGED THE FISHERIES PROFESSION

What sort of profession would we have today if not for the Federal Aid in Sport Fish Restoration Act (SFR)? Fortunately, that is a rhetorical question because the SFR is alive and well. It is difficult even to imagine the fisheries profession in the United States without the SFR. However, the history of fisheries management suggests that without the landmark legislation, (1) politics would play a greater role in making management decisions than even the most cynical of fisheries professionals believe it has heretofore, (2) we would have much less research upon which to base fisheries management decisions, and (3) the American public would be much less informed about fisheries and the aquatic environment.

The pervasiveness of politics in early 20th century fisheries management is illustrated by a story from the history of the Missouri Department of Conservation (Keefe 1987). When the governorship of Missouri changed political parties in 1932, the new governor replaced the commissioner of game and fish with his own appointee. The new commissioner promptly replaced *all* department personnel–a classic case of the political spoils system run amok. Fortunately for Missouri (and its fish and wildlife resources), a new, nonpartisan Department of Conservation was created just a few years later.

Most other state fish and wildlife agencies can trace some measure of political independence to the SFR's precursor and companion act, the Federal Aid in Wildlife Restoration Act (FWR). During the 1937 legislative process that produced the FWR, House sponsor A. Willis Robertson added the following phrase to the enacting clause:

> ". . .and which shall include a prohibition against the diversion of license fees paid by hunters for any other purpose than the administration of said state fish and game department. . ." (Williamson 1987).

Robertson's anti-diversion clause was adapted and included in the SFR, and subsequently has served as a major deterrent to political manipulation of state fish and wildlife agencies. State legislators have been hesitant to tamper with fishing license revenue and thus risk losing the SFR funds that provide, on average, 42% of fisheries management funding for state agencies (Ross and Loomis 1999). The need for scientifically sound research upon which to base fisheries management decisions has been recognized at least since the infancy of the SFR. The opening remarks of the president of the American Fisheries Society to the 1952 annual meeting included the following:

> "Above all else, research demands our first attention . . . let us face the facts. In fisheries management we don't know were we are going. Furthermore, we haven't any idea. The sad, or perhaps the happy feature about it is that we *can* know, at least can learn more than we know now, and that through research only. I wish to emphasize that without a strong research program we can and shall go nowhere." (Harkness 1952).

Harkness' address to the Society also detailed the evolution of fisheries management from an exclusive focus on hatcheries to an emphasis on management that was often devoid of a solid scientific basis. His appeal was to strengthen the scientific aspect of fisheries management with sound research.

The SFR provided state fisheries management agencies with the funding needed to hire biologists who could produce the strong research program President Harkness referred to. The Sport Fishing Institute discussed salaries of *all 68* SFR project leaders as of 1 December 1951 (Sport Fishing Institute 1952a). A December 1952 survey reported salaries for 155 *professionally trained fishery biologists* (Sport Fishing Institute 1952b). In 1996, state agencies employed nearly 3,000 fisheries biologists (Wildlife Management Institute 1997).

The biologists hired by state fisheries agencies not only provided the research base needed for fisheries management, they also became a vital link to the public. Agencies stationed fisheries professionals throughout their states and these pro-

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fessionals explained their research and its management implications to local rod and gun clubs, civic organizations and school classes. The information and education provided by fisheries professionals contributed significantly to the positive image of aquatic resource management and to the widespread desire among the American public that fisheries and other natural resources should be managed primarily on the basis of good science.

In the mid- to late 20th century, the SFR and matching state license fees provided nearly 100% of the funding for fisheries management, research and outreach in many states. The importance of the SFR to fisheries management in the United States over the last half of the 20th century cannot be overestimated.

But what about fisheries management and research in the 21st century? Many state agencies are likely to discover that traditional sources of funding, including the SFR, will no longer be sufficient to meet public demand for increasingly diverse aquatic-based recreation. Even before the end of the 20th century, many agencies were searching for additional sources of funding to increase their efforts in protecting biodiversity of fishes, aquatic education, and expand or rebuild hatchery systems. While some agencies have embraced new funding from a variety of sources (including politically volatile general fund revenue), others have steadfastly refused to expand beyond the safe but confining world of traditional, user-based funding sources. Ideally, adequate funding for fisheries management in the 21st century will continue to be based on dedicated sources that are less subject to political manipulation.

In which directions does the fisheries profession need to go during the SFR's second half-century? I believe fisheries professionals will be spending more time on issues of biodiversity, education, and public awareness. Fisheries research and management will be increasingly devoted to efforts to preserve remnants of fish populations victimized by 20th century engineering. From anadromous salmonids in the Pacific Northwest to darters in the Southeast, we will focus on efforts to preserve the nation's rich aquatic natural heritage. Education and public awareness may be addressed as recreational opportunities as "fish watching" becomes a popular activity. Aquaria have become major tourist attractions in many cities, providing people with the opportunity to see a variety of aquatic life and also to learn something about diversity and habitat requirements. A nature center adjacent to the Boise headquarters of the Idaho Department of Fish and Game is one of the city's most popular tourist attractions, and one of the most popular displays in the nature center is a set of underwater windows that allow people to observe fish in an artificial (but natural looking) stream. Virginians who engaged in wildlife watching expressed greater interest in taking a trip to view fish than to view songbirds, shore birds, butterflies, wild turkeys, ducks or geese (McMullin et al. 2000). Only hawks, owls, eagles, black bears, and white-tailed deer ranked ahead of fish as desirable objects of a wildlife viewing trip. Fish watching is not likely to ever surpass fishing in popularity, but the fisheries profession will have to deal more effectively with nontraditional aquatic-based recreation in the future. The American public's hunger for information about the natural world is evident in the popularity of nature-based television programming.

The SFR lifted fisheries work out of the morass of political patronage and into the ranks of a profession. As future fisheries professionals work to conserve aquatic resources, they must walk a fine line between professional advocacy and politics. One of the defining characteristics of effectively managed state fish and wildlife agencies is the confidence of anglers that fisheries management decisions will be made primarily on the basis of biology rather than politics (McMullin 1993). However, constituents also expect management agencies to incorporate public values into the decision-making process. Although politics will never be completely divorced from fisheries management, effective agencies (and fisheries professionals) learn to work with impact in the political arena without engaging in partisan politics. Effective agencies also demonstrate the ability to address political aspects of fisheries management without getting caught up in the maelstrom of state budget politics–largely due to the political independence afforded by funding fisheries management through sales of licenses and earmarked excise taxes such as the SFR.

The fisheries profession was born in the late 19th century primarily to serve human desires to augment natural fish populations through aquaculture. During its long adolescence, the profession began to address management of marine fisheries while continuing to emphasize artificial enhancement of freshwater fisheries. The fisheries profession came of age with passage of the SFR which provided the funding to build a sound biological base for professional management of our fisheries. As the profession as begun to mature, we have witnessed greater incorporation of the human dimension into fisheries management. The generations of biologists that built the profession during the SFR's first 50 years met the challenge of providing professional management. The challenge for future generations of fisheries professionals will be to continually address increasing demands on fishery resources while simultaneously dealing with attempts to interject more politics into fisheries management. Will they be up to the challenge?

NEBRASKA'S AQUATIC HABITAT PROGRAM

During the last century, approximately 146,000 acres of artificial impoundments were built in Nebraska, most from the 1940s through the 1980s. By the 1990s, many of these reservoirs began to show their age. Sediment accumulated in the basins and increased turbidity; shorelines were eroded and aquatic vegetation disappeared. Fish communities changed as well, from primarily shoreline-oriented species like largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and black crappie (*Pomoxis nigromaculatus*) to more open-water species, like walleye (*Stizostedion vitreum*), white crappie (*Pomoxis annularis*), and striped bass hybrids (*Morone saxatilis x Morone chrysops*). Accordingly, angler use decreased as fishing from the shore became less effective.

Other water bodies in Nebraska had also suffered from aquatic habitat deterioration. Many naturally shallow Sandhill lakes had accumulated so much organic matter that fish kills were common. Steep-sided lakes created from sand and gravel pumping contained little shallow-water (littoral) area and stratified close to the surface.

Fisheries personnel with the Nebraska Game and Parks Commission identified a need to develop a program that would "turn back the clock" and provide "NEW LIFE FOR AGING WATERS" (our slogan), thus restoring Nebraska's lakes and reservoirs to conditions once enjoyed when they were new. However, available funding from permit sales was insufficient to finance a major venture or even serve as a match for Sport Fish Restoration (SFR) funds. A source of state funding had to be developed that could be leveraged with state and federal grants to finance an aquatic habitat rehabilitation program that would make a difference.

A three-year process that included considerable public education and input resulted in passage of a legislative bill in 1996 that created a stamp, purchased by most anglers for $5, and ear-marked to fund rehabilitation and enhancement of aquatic habitat. The Nebraska Aquatic Habitat Stamp is the first of its kind in the nation and generates about $1 million per year. Stamp revenues along with grants from the Nebraska Environmental Trust fund (lottery) have provided a match for SFR funds. Combined with Clean Water Act funds, the Aquatic Habitat program has been developed with an annual budget of about $2.6 million, without negatively impacting the Fisheries Division's operating budget. SFR reimbursements are deposited in the Aquatic Habitat fund, ensuring the program's continued fiscal health.

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The initial work schedule for the Nebraska Aquatic Habitat program has identified rehabilitation or enhancement of aquatic habitat at 50 lakes and reservoirs from 1997 through 2005. The work being accomplished is as diverse as the habitat problems associated with the state's waters. Improvements being made at reservoirs include: draining; basin excavation and sculpting to create an irregular bottom; sediment redistribution from the basin to rebuild shorelines and create armored islands; jetties to prevent shoreline erosion and provide angler access; offshore breakwaters made of either earth and rock or pre-fabricated concrete "A-jacks™," in lieu of shoreline rip rap, to create quiet water and fringe wetlands; and sediment/nutrient dikes constructed at the upper reaches to form marshes and to trap sediment and agricultural runoff. Natural Sandhill lakes and sand/gravel pit lakes are being dredged, aerated, and chemically renovated to eliminate unwanted species, such as common carp (*Cyprinus carpio*). Fish barriers are also being installed in Sandhill lakes to prevent re-infestation of unwanted fish.

Nebraska's Aquatic Habitat Stamp.

Regardless of the project, it is our intent to make changes in aquatic habitat that will benefit the ecosystems enough so that anglers will notice a difference in the fishing quality. In addition, there will be plenty of water bodies where this work will continue once those first 50 projects are completed! In Nebraska, lack of habitat is usually the most important factor limiting sport fisheries. The Nebraska Aquatic Habitat program thus embodies the "enhancement" intentions of the SFR program. Our Aquatic Habitat program's high-profile nature also makes it popular among anglers because they can see improvements that will benefit them through better fishing.

SPORT FISH RESTORATION: A CONSERVATION FUNDING SUCCESS STORY

"The most equitable, logical, and justifiable funding means yet devised" —Carl Sullivan, executive director of the American Fisheries Society, 1983.

When Carl Sullivan, the late executive director of the American Fisheries Society, testified with this language before Congress regarding the Federal Aid in Sport Fish Restoration (SFR) Program, he echoed the sentiments of many leaders in the conservation community who also consider the SFR program to be the most successful natural resource conservation program in the world. SFR and its wildlife counterpart, the Wildlife Restoration (WR) program, are the cornerstone funding programs for state fish and wildlife conservation efforts in the U.S. Because of their demonstrated success, their funding concepts have been proposed as models for other countries' conservation efforts (Bohnsack and Sousa 1999). Fisheries interests in Japan, Brazil, and Europe are attempting to implement similar types of funding programs, though the process is slow because the concept is new there. As documented by Radonski in this issue, it took a coalition of fisheries interests in the U.S. 11 years to get the SFR act approved.

Many elements of the SFR program have contributed to its success. Some of the most important include its protection of fishing license income from diversion to other state agencies, consistent state appropriations for state fisheries programs, and generous reimbursement practices. The interaction of these elements has provided a minimum of $12 billion (which includes over $3 billion SFR funds, state matching dollars, and additional funds protected from diversion) for state fishery agencies' conservation efforts over the last 50 years. The result has been thousands of successful conservation projects benefiting millions of anglers and boaters. Its accomplishments are far-reaching, from restoring striped bass along the East Coast, improving trout streams in Minnesota, providing urban fishing opportunities in Kansas City, re-establishing kelp beds off California's coast, and restoring habitat along the banks of salmon rivers in Alaska.

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TEXAS PARKS AND WILDLIFE, EARL NOTTINGHAM

The $18 million Texas Freshwater Fisheries Center, a combination hatchery and interpretive center, was funded primarily with Sport Fish Restoration funds.

One of the most important reasons for the long-term success of the SFR has been its ability to provide consistent, predictable funding sources for state fisheries agencies. These sources are based on a "user pay—user benefit" approach, applying a small excise tax on fishing tackle and collecting a portion of the fuel tax attributed to motorboat usage. Anglers also provide income from state fishing license sales The most critical component of the SFR program is the protection it provides for income from these licenses. In order to be eligible to participate in the SFR program, states must pass legislation preventing the diversion of fishing license income for purposes other than the administration of the state fishery agencies. The precedent was established by Congressman A. Willis Robertson of Virginia, who inserted the requirement into the Federal Aid in Wildlife Restoration Act in 1937, the predecessor and wildlife conservation equivalent of the SFR program (Williamson 1987).

A similar requirement was included in the Federal Aid in Sport Fish Restoration Act in 1950. Since 1950, fishing license income has totaled approximately $9 billion dollars, almost three times the total apportionment from the SFR program ($3.1 billion) (Figure 1).

Another important element of SFR's success is the "permanent-indefinite appropriation" budget status granted by Congress in 1951. This budget status allows SFR funds to be automatically appropriated to the U.S. Fish and Wildlife Service to be apportioned to state fishery agencies. As is the case with the anti-diversion requirement, this results in a steady, consistent funding source for fisheries conservation and management. By comparison, the Land and Water Conservation Fund program, a conservation and development program utilized by many state park agencies, did not receive this type of budget status and its state allocations have varied immensely. In fact, no funds have been distributed in some years (Figure 1). While fisheries conservation efforts have benefitted from SFR's funding status for the past 50 years, Congress retains the right to change its status if they determine the program is not being run in accordance with their desires. Accordingly, fisheries professionals will be continually challenged to maintain the success of the SFR program and to retain the trust of anglers and the U.S. Congress.

When compared to other federal funding programs, the SFR program features a higher reimbursement percentage to the states, and allows for donated goods and services to comprise the state's cost share. This has allowed state fishery agencies to better leverage their funds and ultimately fund more conservation efforts. The SFR program reimburses state fishery agencies up to 75% of the costs for eligible projects, whereas many other government programs, such as the Land and Water Conservation Fund, reimburse only up to 50% of eligible project costs. Accordingly the SFR reimbursement practice allows state fishery agencies to turn each dollar of fishing license income into four dollars worth of conservation projects.

In addition to reimbursing at a higher rate than many federal programs, the SFR program also allows donated funds, goods, and services that are necessary and reasonable to accomplish the project objectives to serve as the state fisheries agencies cost share. Some federal programs do not allow this type of cost sharing for reimbursement purposes. Once again, this allows states to leverage existing funds to use on eligible projects and to undertake projects that might not be feasible otherwise. For example, the donation of over $4 million in land and other services by the city of Athens, Texas served as much of the Texas Parks and Wildlife's cost share for the Texas Freshwater Fisheries Center facility. This donation allowed the state to use its fishing license income in other areas of their conservation programs. This warmwater hatchery and education facility

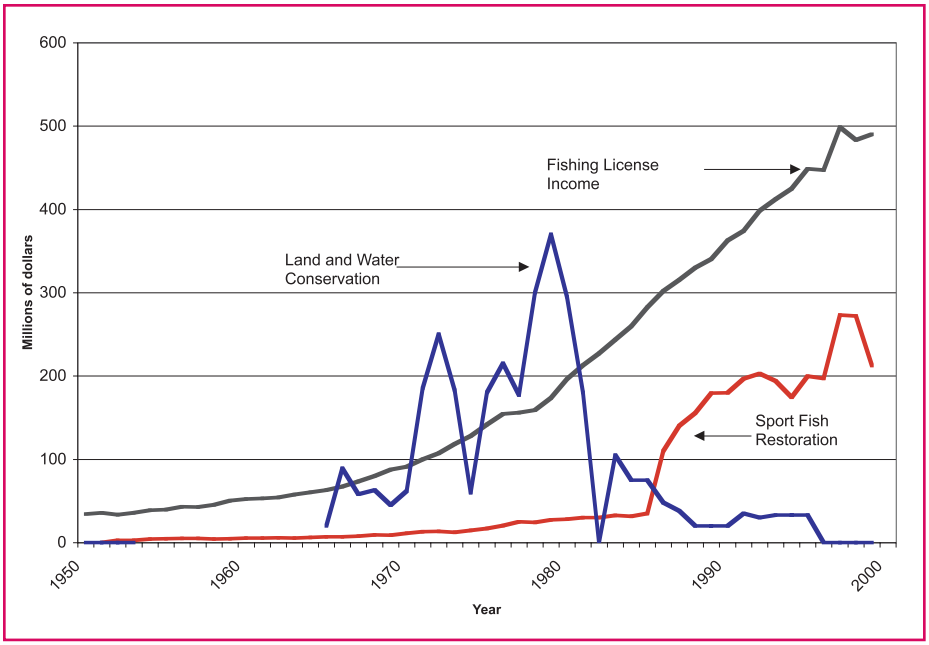

Figure 1. Distribution of income from state fishing licenses, and state appropriations from the Sport Fish Restoration Program and the Land and Water Conservation Fund.

was awarded the American Fisheries Society's Fisheries Administrator's Section Outstanding Wallop-Breaux project of the year in 1999.

In-kind contributions need not be as large as that of Athens. Another outstanding example of donated goods and services is the Merrimack River Watershed Education Project, sponsored jointly by New Hampshire and Massachusetts. Using donated water quality test kits, computer time from a local university, and teachers' time, this ongoing project helps hundreds of students in over 30 schools develop critical thinking skills in solving environmental problems throughout the watershed. Individuals' time volunteered for eligible projects also can serve as the state's cost share. Many state aquatic resource education programs routinely use hours donated by volunteer instructors to serve as their cost share. Again, the donated contributions allow the fishery agency to spend their license income for other conservation efforts. A myriad of other examples exist where donated cash or in-kind services are used as the cost share by state fishery agencies, including waiving the indirect cost rate for university research, memorial contributions, and other services with a value that can be documented.

Many resource professionals may not be fully aware of all the funding opportunities the SFR program allows and how this can benefit priority projects within their state. The best way to learn about the SFR program is to contact their state fisheries agency's Federal Aid Coordinator, the U.S. Fish and Wildlife Service Division of Federal Aid, or to check out the SFR and WR website at www.restorewildlife.org. By learning and understanding more about SFR, we can start working on another 50 years of conservation funding success.

The Sport Fish Restoration Program: A Model for International Conservation

As more countries throughout the world develop at an ever-increasing rate, there is added pressure on land, water and living resources. Along with economic growth comes a potential increase in leisure time. Sportfishing is an ideal recreational activity because it is something a family can do together, it provides food for the table, and it can enhance awareness of and concern for aquatic and riparian habitats. Unfortunately, many countries do not have adequate funding or infrastructure to accommodate increased demands upon fisheries. The funding system that supports fisheries conservation in the United States, where state license revenues are supplemented by Sport Fish Restoration funds, is non-existent elsewhere. Even in countries where fishing licenses are required there are a number of problems. License fees are not necessarily dedicated to fisheries management, may be local in nature, and enforcement of licensing may be sporadic or non-existent.

This lack of adequate funding creates a number of problems. Without a stable source of funds to support research, management and acquisition and restoration of habitat, there will be fewer quality waters on which to fish. In addition, a cadre of trained fisheries professionals is limited or non-existent.

International fishing tackle manufacturers, importers, wholesalers and retailers recognize that their business depends on healthy populations of fish that can support recreational angling, and have begun looking to the United States as a model. The concept of capturing excise taxes on sportfishing equipment was introduced to manufacturers through seminars at the American Sportfishing Association trade show, which attracts a large number of European and Asian manufacturers of fishing tackle. As a part of the Sport Fish Restoration program, these manufacturers pay import duties on tackle, totaling $30 million per year on average. When informed about the fisheries research and management, aquatic education, and fishing and boating access projects that are undertaken with SFR funds, these manufacturers began to comprehend that a similar funding system could restore fisheries in their countries as well.

Several initiatives indicate that the SFR model is being considered in the international conservation community. In Japan, despite the economic downturn, an association of fishing tackle manufacturers has initiated a small self-imposed tax on fishing rods. These funds support fisheries demonstration projects such as stocking. Brazil has eliminated a national fishing license effort which was poorly enforced and in its place has given each of their states authority to initiate their own fishing license program. Though not as protected as state license revenues are in the U.S., these license fees are dedicated to both state and national recreational fishery efforts. A European fishing tackle trade association has made inquiries about the SFR program, and there is considerable interest in the United Kingdom.

We are living in a global community. Impacts on resources in some remote part of the world can influence conditions in our own back yards. The integration of the Sport Fish Restoration concept into the fabric of conservation throughout the world offers an opportunity for more people to invest in their local and national natural resources. As stockholders, these anglers will become vested in the numerous resource allocation decisions yet to come. Our hope is that the Sport Fish Restoration Program might lead the way as an example.

KURT BEYERS, MICHIGAN SEA GRANT EXTENSION

PHOTO PROVIDED BY BOAT/US

"Crash Boat" leads to safer boat design and operation.

Improving Boating and Access Through Sport Fish Restoration

LEE WALKER. VDGIF.

PHOTO PROVIDED BY BOAT/US

IMPROVING ACCESS TO FISHERY RESOURCES: GOOD FOR ANGLERS, BOATERS, AND BUSINESS

From the outset, the Sport Fish Restoration Act of 1950 was premised on improving fishing for the nation's anglers. The Congressional sponsors of that original legislation (led by Congressman John Dingell Sr. and Senator Edwin Johnson) as well as those leaders of the sport fishing industry who backed it, recognized that good fishing depended not only on healthy fishery resources but also on providing anglers access to those resources.

For the initial 35 years of this act, states acquired or developed 2,800 boating and fishing access sites (ALAB 1995). Although this was a tremendous success and opened up countless new fishing opportunities to anglers, it was evident that more could be accomplished. The 1984 Wallop-Breaux Amendments provided the boost that would lead to opening even more waters to diverse types of anglers. Capturing the tax on gasoline that boaters purchased, and applying a portion of that to boating access improvements, was the catalyst needed to further improve fishing accessibility. As a result, in the first 5 years of that amendment, 1,200 new access sites were added—nearly half of the total number created during the entire first 30 years (ALAB 1995)! Since then, an additional 1,700 new boat access facilities have been constructed, 4,800 acres of land have been purchased for boating access, and more than 3,300 projects have been completed to improve fishing for shore-based anglers.

The most recent changes to the act also recognize the tremendous untapped potential for improving the access infrastructure for boaters. And, since boating and fishing often go hand-in-hand, with over 61% of recreational boaters spending time to fish from their boats (IAFWA 1997), these changes will directly benefit anglers. By allocating additional funds to states for boating access facilities, commissioning a study of unmet opportunities for larger boats, expanding boat safety programs, and improving pump-out facilities to help keep our waterways clean, we will be laying the groundwork that will drive fishing participation in the coming years.

As is evident in the following examples, improving access to water resources for sportfishing purposes is accomplished in many different ways. Whether it be through acquisition of beach property in overly crowded coastal areas, constructing boat ramps and fishing piers, or improving support facilities such as fish cleaning stations and restrooms, the main objective is to get people to the water to enjoy the fishing experience. For the angler, this provides the opportunity for a quality fishing experience. State agencies benefit by improving participation and potentially increasing license sales, both of which help to fund management programs. Businesses in sport fishing related industries benefit through increased sales of fishing tackle and boating products, which in turn fuel increased revenues to the Sport Fish Restoration program.

We in the sport fishing and boating industries are proud of the accomplishments that have been made in the past 50 years through the Sport Fish Restoration partnership that includes industry, anglers, state and federal agencies. We look forward to strengthening the programs that have made this a success and to improving fishing opportunities for future generations.

OHIO DEPT. OF NATURAL RESOURCES

VA DEPT. GAME & INLAND FISH

SFR funding or fishing piers, marinas, and boat launching ramps all provide access and needed infrastructure for anglers and boaters.

BY JIM HUBBARD

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PUBLIC ACCESS FOR ALL

Access to lakes, ponds, rivers and streams has always been important to both humans and wildlife. While animals, birds and fish have aquatic habitat requirements, people have expanded needs for water, including its use for power, transportation, agriculture, industry and recreation. Increasing human populations generate a growing need for aquatic accessibility; meeting the needs of the public, private landowners, commerce, and wildlife becomes more and more challenging.

Public access to New Hampshire water bodies has been a recurring issue over the years. A state planning project conducted in the mid-1960s inventoried water access points and recommended the creation of a Public Access Advisory Board to carry out a planned program of statewide access development. It wasn't until 1992 that legislation was finally enacted to create the board and establish a public access program under the New Hampshire Fish and Game Department.

Sport Fish Restoration Funds were used to open Newfound Lake, New Hampshire's fifth largest lake, to the public.

Between 1963 and 1979, the department developed 15 sites to provide access for anglers and boaters. In 1983 with a special $200,000 appropriation from the legislature, the Fish and Game Department was directed to acquire and develop 10 access sites. These funds were consumed by the acquisition and development of only three sites.

A partial solution to the immense funding requirements of purchasing and developing public access sites came with the 1984 Wallop-Breaux amendment to the Federal Aid in Sport Fish Restoration Program (SFR). Recreation and development boomed during the 1980s and a *State Comprehensive Outdoor Plan* was published in 1988, followed by a *Public Access Plan for New Hampshire's Lakes, Ponds and Rivers* in 1991. This plan recommended that there should be one access site for each 5 miles of shoreline; this reflects the need for a total of 885 statewide public access sites.

Rising to the challenge, the Statewide Public Boat Access Program—now located within the Department's Access and Engineering Division—has accomplished a great deal. The department has built or refurbished over 140 boating/fishing public access sites since 1969, the first year that the department provided funding specifically for water access projects. The access team works with the Public Water Access Advisory Board, private lake associations, the public and federal and state agencies.

BY ANNE E. HEWITT

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Looking Ahead

Emphasis on boating and fishing access for the public continues to increase while suitable real estate diminishes. Shoreline property is popular for recreational and residential development, and the private acquisition of water's edge property has tremendously boosted purchase cost and limited its availability. Volumes of rules, regulations and permitting processes—designed to protect our natural resources—have created an intricate development process.

To survey the needs of our growing and changing constituency, a statewide needs assessment was undertaken in 1997. The assessment has helped guide the program to:

1. Continue providing access to the state's public waters, but not at the expense of water quality and natural resources;
2. Continue developing boating access sites on large lakes;
3. Increase opportunities for shore bank fishing;
4. Improve communication about access opportunities and development, such as the Boating and Fishing Public Access Map.

In 1999, the first comprehensive Boating and Fishing Public Access Map was published and a video, "Public Access for Everyone," was produced, thanks to Federal Aid in Sport Fish Restoration funds. Future plans include continued development of public boating and fishing sites on the major water bodies of New Hampshire, and "Boating and Fishing Access Map" updates. The Access and Engineering Division will continue to expand public water access opportunities by developing new sites, and well as refurbishing existing state-owned facilities.

Boating and fishing enthusiasts who purchase equipment and motorboat fuel provide the funding for the Sport Fish Restoration Program. In turn, this important program provides the resources for agencies like the New Hampshire Fish and Game Department to provide access for boaters and anglers of all abilities, while protecting our natural resources for future generations.

Newfound Lake—New Found Access: A Sport Fish Restoration Program Success Story

New Hampshire's fifth largest lake, located in the popular Lakes Region, is renowned for its two-story (warm and coldwater) fishery, but access for boating was limited to one commercial marina. In keeping with the department's initial plan to provide access on big lakes, the process of locating a suitable site on the 4,105-acre water body was initiated in 1991.

A potential location was found adjacent to Wellington State Park, and the planning process began. Local support by elected officials and the Friends of Wellington Association was strong, yet neighbors and shoreline property owners were apprehensive about potential problems. The site was remote, potentially lending itself to late-night vandalism and "partying," and increased use of the lake presented environmental and law enforcement impacts.

Working with the local police, the New Hampshire Department of Resources and Economic Development, and the Division of Marine Patrol, rules were developed for site usage, and high visibility law enforcement details were pre-arranged. Studies were conducted and permit requirements were met to address the environmental consequences.

The Newfound Lake boat access site was officially dedicated on 4 August 1996, to recognize and thank the many individuals involved in the development process. The facility is equipped with two cement-log ramps separated by a launching dock, paved parking for 11 car-top vehicles and 36 vehicles with trailers, handicapped-accessible restrooms and attractive landscaping. A conservation officer staffs the popular site on summer weekends, and it is not unusual to fill the parking lot and turn away 100+ vehicles on a sunny day.

The anticipated problems at the site never surfaced. Area residents, vacationers, and the variable occupants of the region's many summer rental properties can now enjoy the lake experience, thanks to the Federal Aid in Sport Fish Restoration Program.

LELAND BEACH ON CHAPPAQUIDDICK ISLAND, MARTHA'S VINEYARD, MASSACHUSETTS

Shore based angling is a major component of the marine recreational fishery in Massachusetts. An estimated 700,000 men, women and children participate in saltwater fishing in our tidal waters each year, with nearly 3.5 million fishing trips having occurred in 1998 (NMFS 2000). Approximately one-half of all saltwater recreational fishing trips take place from shore. Unfortunately, this highly popular method of fishing is being threatened by the rapidly accelerating loss of public access to coastal waters. Much of this loss is the direct result of acquisition and development of coastal properties by private parties who then post their holdings against public access. In Massachusetts, colonial law granted private ownership to the intertidal zone (the wet sand), but reserved the public rights of fishing, fowling and navigation. However, although the public rights were reserved for certain uses of the intertidal zone, it is often not possible to enjoy those rights because access across private property to the intertidal zone was never reserved. To guarantee that the public has access to shore based fishing opportunities, the Massachusetts Division of Marine Fisheries Sport Fish Program has made it a priority to find, acquire and provide access by way of land acquisition of easements and/or tidal property.

Massachusetts has a respectable history of providing public access to our boating community by building and improving boat launching facilities. Much of the work done to provide access has been accomplished by the Department's Public Access Board (PAB), which is managed to take full advantage of Federal Aid in Sport Fish Restoration funds for just this purpose. Since 1987, seven new saltwater boat launching facilities have been constructed, and four additional projects are underway. In recent years, the Division of Marine Fisheries Sport Fish Program began an active campaign to identify and acquire land, build infrastructure and develop management plans to enhance public access to our tidal waters for shore-based recreational anglers.

The Leland Beach acquisition opened five miles of beach for saltwater surf fishing.

The effort began when the Division of Marine Fisheries acquired ownership of the "Leland Beach" property on Chappaquiddick Island, Martha's Vineyard in 1993. The property contains 100 acres of beach and links two conservation areas that are managed by The Trustees of Reservations, Wasque Reservation and Cape Poge Wildlife Refuge. By linking these two properties, the public is provided access to five contiguous miles and approximately 800 acres of barrier beach. The property was acquired for the primary purpose of preserving fishing access to this barrier beach that many consider to provide some of

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the best shore-based fishing on the East Coast of the United States for such species as striped bass (*Morone saxatilis*), bluefish (*Pomatomus saltatrix*), and bonito (*Sarda sarda*). Additionally, the Leland Beach protects Martha's Vineyard's largest salt marsh complex, Poucha Pond, and provides nesting and feeding habitats for several species of waterbirds and shorebirds.

Sport Fish Restoration funds are vital to opening fishing opportunities to shore-based saltwater anglers in Massachusetts.

The acquisition of the Leland Beach property began in 1993 when the state recognized this as a piece of property valuable to the fishing community. At the time, ownership of the property was uncertain, and the state took the property by eminent domain at a fair market value of $999,000. Funds made available through the Sport Fish Restoration Program were to be used to cover 75% of the cost, with the remainder being paid for by the Commonwealth of Massachusetts. Subsequent claims to the property resulted in an extensive court case that was finally settled in October 1999 by a jury verdict. The end result of the court case awarded a value to the property of 2.5 million dollars. The additional 1.5 million dollars needed to settle the suit was paid by the state.

After acquisition of this pristine piece of property, the Commonwealth, in accordance with federal law, needed to insure the integrity of the management of the property and make sure that the property would continue to be used to the benefit of the sport fishing community. The Trustees of Reservations already had management plans in place for the use and operation of the two pieces of property on either side of the Leland Beach property at the time that the land was acquired by the state. It was determined that the best management option for the property was through a cooperative agreement between the state and the Trustees. As a condition of the agreement, the Trustees manage the Leland Beach property on behalf of the Commonwealth in accordance with the terms of the 1993 Leland Beach Management Plan and the Guidelines for Managing Recreational Use of Beaches to Protect Piping Plovers, Terns, and Their Habitats in Massachusetts.

Since its acquisition in 1993, The Trustees have issued 11,387 off-road vehicle (ORV) permits for use on Leland Beach, Wasque Reservation, and Cape Poge Wildlife Refuge. The ORVs have made more than 150,600 individual trips onto Leland Beach during that time. It is also estimated that more than 16,100 pedestrians have passed by the Wasque Gatehouse and the Dyke Bridge Gatehouse on their way to Leland Beach. According to Chris Kennedy (Regional Director of the Trustees—Islands Region, pers. comm.), the last "Visitor Use Survey" was conducted in 1989 (with plans to do a new survey for 2001). The results of the 1989 survey indicate that anglers comprise the largest single group of users, accounting for 39% of the ORV travel and 16% of the pedestrian traffic (Donnelly et al. 1989). Kennedy believes that the 1989 values are still valid, and that the same relative percentage of ORV users are entering the property to fish and the same number of pedestrians are entering to fish as their primary activity [C. Kennedy, The Trustees of Reservations, pers. comm.]. Assuming this is valid, nearly 10,000 ORV trips and over 400 pedestrian trips were made each year for the express purpose of saltwater angling. Kennedy further noted that most ORV trips consist of more than one angler, and that many visitors to the beach do not consider fishing as their primary activity (i.e., it may be taking the family to the beach), but they bring fishing gear and consider angling as a secondary activity. So, although the annual number of fishing trips that take place on this property is estimated to be at least 10,400, a much higher figure is surely realized.

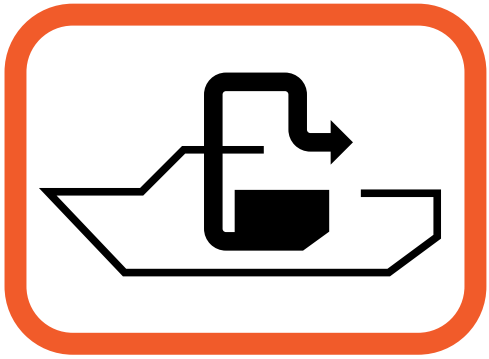
The acquisition of the Leland Beach property has proven to be a tremendous asset to the recreational sport fishing community in Massachusetts. Anglers are able to enjoy access to some of the best surf fishing on the eastern seaboard, along with the knowledge that this piece of oceanfront property will remain available for their sport fishing use for years to come. The purchase of this 1.5 mile strip of barrier beach would not have been possible without the cooperation of the U.S. Fish and Wildlife Service and the funds provided through the Federal Aid in Sport Fish Restoration Act. Encouraged by the success of this project, the Massachusetts Sport Fish Program is now developing a public access project dedicated to financing land acquisitions and infrastructure needs that will further enhance public access in the tidal waters of the Commonwealth for sport fish anglers.

THE CLEAN VESSEL ACT: PROVIDING BOAT PUMPOUT FACILITIES THROUGH SPORT FISH RESTORATION

With the 1992 passage of the Clean Vessel Act (CVA), Congress launched a new state grant program to build and renovate sewage pumpout facilities and dump stations for boaters, and conduct related public education campaigns targeted, primarily, at the recreational boater.

The CVA program, funded by the excise tax sources included under the Sport Fish Restoration Act (SFR) and also administered by the U.S. Fish and Wildlife Service, provides grants to states but with one significant difference. Although CVA funds are provided to the states to conduct approved projects, unlike most federal grant programs, these funds may be used to support projects of commercial businesses like marinas, since most boating facilities in the United States are privately-owned. In fact, Congress encouraged the states to provide grants to private sector businesses that serve the boating public, and the states have reported that, on average, about 70% of grants have gone to commercial marinas (USFWS 1997). Participating commercial marinas must, however, make the pumpout facility available to the boating public and may charge no more than $5.00 per pumpout.

Clean Vessel Logo



In the first five years, 2,730 pumpout facilities and 1,778 dump stations have been built in 45 states.

Congress also asked participating coastal states to assess how many boat sewage removal facilities would be needed and encouraged them to develop and implement comprehensive plans to meet those goals. Inland states, however, were not required to develop the plans since Congress recognized that the largest concentrations of boats large enough to have marine heads (onboard toilets) are in coastal waters and that saltwater areas had the greatest need for pumpout facilities.

During the first five years of the program (the first grants were made in 1993), 83% of grants paid for facilities in coastal areas, with the remaining 17% used for facilities on inland waters. In most states, the CVA grants provide 75% of the funding with the marina providing 25%, although in some cases states have provided the necessary matching funds.

In addition to traditional, shoreside pumpout facilities, CVA grants have funded mobile pumpout boats that can service vessels kept on moorings, at private home docks or in visitor anchorages. At least four states have used CVA funds to build floating, barge-type facilities, with restrooms and pumpout equipment, anchored on inland lakes for use by day boaters.

Since the first grants were awarded from the $5.0 million FY 1993 fund, 49 states have received 207 grants totalling $47.6 million. As of FY 1999, approved projects have involved surveys and planning efforts in 33 coastal states, construction of 2,730 pumpout facilities and 1,778 dump stations in 45 states, and public outreach and education programs in 30 states (USFWS 1999).

The CVA program was funded at $7.5 million in 1994 and 1995, and at $10 million annually for 1996, 1997 and 1999. The Transportation Equity Act for the 21st Century, signed into law June 10, 1998, reauthorized the Clean Vessel Act grant program at $10 million annually through 2003.

BY RYCK LYDECKER

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RECREATIONAL BOATING SAFETY FUNDED THROUGH SPORT FISH RESTORATION

While it may be impossible to put a price on human life, the U.S. Coast Guard estimates that the lives of over 23,000 boaters have been saved through public education, awareness and enforcement since the inception of the Recreational Boating Safety Program in 1973 (Mike Holmes, U.S. Coast Guard, pers. comm). This program has undergone an evolutionary process in that time, leading to the federal-state-public partnership embodied in the Wallop-Breaux Amendment to the Sport Fish Restoration Program (SFR) in effect today. The results have been revolutionary.

Safer boating for millions of Americans is evidenced by the fact that boating deaths have been cut in half. According to the Coast Guard, the number of reported recreational boating fatalities declined from a high of 1,754 in 1973 to 815 in 1998. When the Recreational Boating Safety Program was authorized in 1971, the fatality rate stood at 20.2 deaths per 100,000 boats. By 1998, the rate had been cut to 6.5 fatalities per 100,000 boats, even though the number of boats owned by Americans more than doubled during that period.

History

The federal government has been involved in recreational boating safety through a series of legislative actions, beginning with the enactment of the Motor Boat Regulations Act of 1910 (36 Stat 462). The Federal Boat Safety Act of 1971 (P.L. 92-75), the modern precursor of the current program, expanded the regulatory authority of the U.S. Coast Guard to include all recreational vessels and expanded its jurisdiction to all United States navigable waters. The act included provisions for the Recreational Boating Safety (RBS) federal financial assistance program to "encourage greater state participation and uniformity in boating safety efforts, and particularly to permit the states to assume the greater share of boating safety education, assistance, and enforcement activities" (46 U.S.C. 13101). Authorization for the RBS grant program expired in 1979, but the Recreational Boating Safety and Facilities Improvement Act of 1980, also known as the Biaggi Act, reestablished the program. The Biaggi Act, named for its chief sponsor, New York Congressman Mario Biaggi, provided that a portion of federal excise tax receipts attributable to motorboat fuel use would be transferred to a new Recreational Boating Safety account to fund the program. In utilizing the fuel taxes paid by boaters, the Biaggi Act ensured that those receiving the benefits of the program would also pay the costs. Although Congress did not appropriate funds for the program in 1981 and 1982, the Biaggi Act established the mechanisms that put boaters' fuel taxes to work for safety.

As part of the Wallop-Breaux Amendments to the Sport Fish Restoration Act of 1984, Congress built upon the Biaggi Act by establishing the Boat Safety Account within the Aquatic Resources Trust Fund of SFR to again provide funding to the states through the Coast Guard recreational boating safety program. The Boat Safety Account was subject to the annual appropriations process through FY 1998. However the 1998 amendments guaranteed a minimum funding level of $59 million, with the maximum set at $71.6 million for fiscal years 1999-2003, for boating safety.

Boating Safety Dollars at Work

Under current law, up to $70 million of the federal excise taxes paid by recreational boaters may be directed to state/federal boating safety programs through the Boat Safety Account. Administered by the U.S. Coast Guard through matching grants to the states, these programs fall into six broad categories: law enforcement and search and rescue capability; boater education; vessel numbering and titling systems; aids to navigation; public boating access sites; and administration.

Tax monies specifically attributable to motorboat and small-engine fuel use currently are calculated as 1.08% of the total federal gasoline tax deposited into the Federal Highway Trust Fund. [As of the writing of this article (2000), only 11.5 cents per gallon of every 18.3 cents in federal tax paid by boaters is used to calculate the annual amount to be transferred to the Aquatic Resources Trust Fund. This rate will rise to 13 cents on 1 October 2001, and 13.5 cents on 1 October 2003, yielding a projected increase of $135 million in new revenue, which will be directed to the Sport Fish Restoration Account]. These funds are passed through the Aquatic Resources Trust Fund to the Boat Safety Account to support state boating

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safety grants administered by the Coast Guard. This is an excellent example of a "user pays/user benefits" program since all monies deposited into the trust fund are paid by boaters and anglers. Unlike the first boating safety program established by Congress in 1971, no general revenue tax funds are used in this program.

States with approved state boating safety programs receive funding under the following formula: one-third is distributed equally to each state; one-third is prorated to individual states according to the number of boats registered in each state; and one-third is prorated by the amount of state funds each state dedicates to its boating safety program.

It is important to note that these federal tax monies, collected from boaters, are equally matched by state dollars. A state's matching funds may come from general state revenues, undocumented vessel numbering and licensing fees, or state marine fuels taxes. This cooperative effort in recreational boating safety is an outstanding example of government at all levels working together for the benefit of the public.

As the Coast Guard role in recreational boating safety at the operational level diminished in the 1980s, financial assistance to the states through the Wallop-Breaux Amendments to SFR contributed significantly to the their ability to assume an increasingly larger share of recreational boating safety program activities. These funds are critical to the success of the state programs and to the continued overall reductions in recreational boating accidents and fatalities as the following examples attest.

Boating Safety Dollars at Work in the States

California

The California Department of Boating & Waterways uses the SFR funds for a wide variety of outreach and education efforts including:

- the purchase of radio air time for boating safety messages reminding listeners to wear their life jackets and about the dangers of drinking alcohol while boating, reaching an estimated audience of 39 million listeners.
- its six-month seasonal billboard campaign in the most prevalent accident areas across the state to reach an audience of 1.2 million viewers every day.
- funding 32 aquatic centers throughout California that provided 120,00 individuals with hands-on aquatic and boating safety education.
- educating approximately 150,000 new students in the AquaSMART K-8 boating safety education program. AquaSMART Boating high school program materials were mailed to approximately 400 teachers and 25,000 students.
- providing child size T-shirts to marine law enforcement agencies. These shirts are given to children under seven who are "caught with their life jacket on." The department also provided ski flags to these agencies so that families that are water skiing and do not have a ski flag on board can continue their outing.

Florida

With its year-round boating climate, Florida is a state few boating enthusiasts can resist. The Florida marine industry represents a total economic output of more than $10 billion in recreational boating—$1 billion more than projected citrus industry revenue. Federal funding received through the Sport Fish Restoration Act continues to be an integral element of Florida's ability to ensure that the operators of more than 829,000 recreational vessels and an additional 400,000 visiting boaters obey the laws that keep them and their passengers safe.

Boating Safety Instructor Workshops conducted by the Florida Boating Safety staff update boating safety instructors statewide. Boating safety instructors are trained in instructor techniques, class reporting, class advertising, and the revisions to the "How to Boat Smart" course with its new personal water craft (PWC) endorsement. Instructors provide boating course instructional kits and an allotment of "Jet Safe" PWC videos for use in teaching the PWC portion of the course. The videotape was also sent to approximately 70,000 PWC owners. The video identifies Florida PWC laws and regulations.

Florida leads the nation in boating accident investigation and analysis with more than 1,200 investigations involving nearly 9,000 hours. This intensive work has proven to be an effective method of determining areas where increased boating safety patrols are needed.

Louisiana

Boating in Louisiana is a source of recreation for many residents and visitors. In addition, boating and fishing is part of the traditional way of life, shown by the more than 944 million pounds of fish landed, valued at more than $75 million. Indeed Louisiana is a "Sportsman's Paradise."

To help make this paradise safe and enjoyable, Louisiana uses funding from the Sport Fish Restoration Act to intensify its law enforcement and education efforts.

Monies from the SFR helped Louisiana add more than 60 new officers over the past two years to patrol its waters. With this added presence, compliance with state and federal boating safety regulations is more than 90 percent.

Louisiana Wildlife & Fisheries also uses federal funds to help keep its law enforcement officers at the top of their profession. Training programs include boat accident investigation training, boating safety techniques, and boating under the influence (BUI) recertification on a semi-annual basis for more than 250 officers.

Additionally, Louisiana Wildlife & Fisheries responds throughout the year to calls for overdue, lost, stranded and injured

citizens that were either hunting, fishing or boating on Louisiana waters.

While accident reporting increases in the state, boating fatalities remain flat. A significant amount of boating safety enforcement and education seems to be the main deterrent to an increase in fatalities.

With continued federal support of boating safety, combined with state dollars, Louisiana hopes to further educate the boating public and keep the enforcement presence on the water to help reduce boating accidents and eliminate fatalities to the greatest extent possible.

Maryland

Like other states, Maryland uses funding received through the Sport Fish Restoration Act to maintain a safe boating environment. Maryland's Natural Resources Police (NRP) provides rigorous enforcement in the areas of speed and reckless operations, resulting in 2,091 citations and warnings in 1998. This enforcement effort has been a factor in keeping the death and injury rate at the lowest level in years.

The Safer Waterways through Alcohol Monitoring Patrols (SWAMP) program and routine patrols resulted in 98 BUI citations and warnings in 1998. Many operations were coordinated with the Coast Guard and other agencies.

Maryland hired 10 seasonal officers for high population seasonal resort areas to enforce boating laws and regulations, expanding on-water enforcement by almost 100 percent. These higher visibility patrols were instrumental in reducing fatalities in their assigned areas.

When even the best enforcement and education efforts fail to work, the Natural Resources Police is able to provide search and rescue support statewide in areas where it is otherwise unavailable or in cooperation with other agencies. In 1998 the NRP responded to 137 calls for search and rescue.

Oregon

The Oregon State Marine Board is carrying out an aggressive campaign focusing on alcohol and boating. Public service announcements (PSAs) distributed statewide stress how a BUI arrest can result in, among other things, the loss of boating privileges for one to three years. A bulletin board is posted near high boating use areas (marine areas, boat retailers, etc.), with similar images appearing on transit vehicles in Portland, Eugene and Salem. The message on these signs is simple: "Drinking and boating can get you docked—boat safe, boat sober;" and "Cruise With Care."

In addition, airtime was purchased in key radio markets for spots focusing on the consequences of drinking and boating. The State Marine Board also developed three slides for use in movie theaters in high-use areas of western Oregon. The slides, containing a similar BUI and general boating safety message, were seen by tens of thousands of people seeing such movies as "Star Wars: The Phantom Menace" and other popular summer blockbusters.

The final piece of this campaign is a notebook designed to educate judges and district attorneys about the need for consistent and strict sentencing of people arrested for BUI. The notebook includes case law, Oregon Revised Statute and Oregon Administrative Rules, as well as examples of what certain judges have done in the past.

The total cost of this campaign is $150,000. The program is aligned with the Department of Motor Vehicles driving under the influence campaign. Market surveys indicate that people are hearing the message. Concurrent with the campaign is an effort to train more river patrol deputies to effectively recognize alcohol impaired boaters, cite them and get them off the water.

NASBLA

An integral part of the success of the Boating Safety Account is the National Association of State Boating Law Administrators (NASBLA). NASBLA is the association of state professionals who are responsible for the administration of boating laws and regulations. NASBLA works to promote boating safety by fostering partnership and cooperation among its members and other recreational boating safety interests. Over the years, NASBLA has worked diligently to foster reciprocity and uniformity among the states in their boating laws, making it easier for boaters to enjoy all of our nation's waterways.

NASBLA works to set national boating safety education standards, provide accident investigator training, and develop model laws and policies. With support from the five percent portion of the Boating Safety Account set aside for non-profits, NASBLA has worked on the following:

- **partnering with Underwriter's Laboratories to produce boat accident investigation training that has educated more than 3,000 officers over the past 10 years.**
- **partnering with the National Safe Boating Council to plan and kick off National Safe Boating Week. Held the week before Memorial Day weekend, this event reaches millions of our nation's boaters with grassroots activities and events.**
- **conducting new boat crash testing to provide new and improved data on crash dynamics. Mercury Marine, Bayliner, Underwriter's Laboratories, Michigan and Florida boating safety officers, and others worked with NASBLA to crash six boats and two personal watercraft. The new data, high-speed film, and the crashed boats themselves will provide insight and benefits to the boating safety community well into the future.**
- **teaming with Pennsylvania State University, the U.S. Power Squadrons, and the U.S. Coast Guard Auxiliary to update and improve the NASBLA Education Standards to develop a new minimum "standard of care" for boating education. This new set of standards is intended to prescribe the minimum body of knowledge necessary to effect safe, legal, and enjoyable boating. In addition, the proposed standard of care is predicated on reducing risk in recreational boating based on empirical accident and boating violation statistics.**

Improving Aquatic Resource Education and Outreach

DIANE MEYER

STEVE GEVING, MN. DEPT. OF NATURAL RESOURCES

AQUATIC RESOURCE EDUCATION AND SPORT FISH RESTORATION

Public education and outreach are now considered critical components of many state agency fisheries management and protection efforts. State natural resource agencies, with support from Sport Fish Restoration (SFR) funds, spend between $10 and $15 million dollars annually to take their message to anglers, boaters and other citizens through aquatic resource education programs (ARE). These agencies take many messages to many different audiences and the programs are as diverse as the audiences they reach. The programs range from wetlands education in Delaware to "Salmon in the Classroom" in Washington; teacher workshops in Iowa to urban fishing in Florida; and Hooked on Fishing, Not on Drugs in Arkansas to 4-H sportfishing clubs in New York. Even though these programs are diverse in their approaches, they share a common past, present and future.

For many states like Pennsylvania, aquatic resource education was not always considered a "core program." The first organized public education program in Pennsylvania started in 1935, with the Fish and Boat Commission's Junior Conservationist program. Similar programs aimed at youth surfaced in other states at about the same time. However, in the years that followed, public education programs were often the first programs cut and the last to benefit from increases in revenue. In Pennsylvania, new programs were developed in response to an agency or resource issue. When the issue faded away, so did the funding and support. Programs were reactive in nature, and generally short-lived.

The experience of most of the other state fishery agencies was similar. When the SFR Act was originally signed into law, ARE was not eligible for federal aid. The responsibility fell entirely on the states to fund these programs. The bottom line was that aquatic resource education programs—what few there were—lacked consistent and sustained financial and technical support at the state and national level.

The Wallop-Breaux Amendments and Aquatic Resource Education

Several events in the mid-1980s changed how the Pennsylvania Fish and Boat Commission and other state agencies funded and operated resource education programs. When the Wallop-Breaux amendment was drafted, the sport fishing industry lobbied for the states' ability to use SFR funds to introduce new individuals to fishing through public education programs. As with any legislative process, the language evolved and those at the table agreed that it was equally important to educate all citizens about fishery resources. Language on ethics education was also included. Ultimately, the amendment referred to these programs as aquatic resource education instead of fishing education.

The amendment allowed states to spend up to 10 percent of their annual SFR allocation on aquatic resource education. The act defined *aquatic resource education* as any program *increasing the public's understanding of the Nation's water resources and associated life forms, and the development of responsible attitudes towards the aquatic environment*.

The Early Years

Passage of the Wallop-Breaux amendments did not immediately result in states developing and delivering aquatic resource education. While the opportunity to use SFR funding to support agency education programs addressed one agency need, other obstacles remained.

At the time, there were few agencies with dedicated education staff. Only three states were offering these types of programs: Pennsylvania, Missouri and Maine. States without programs were faced with several challenges—most important, where to begin. The American Fishing Tackle Manufacturers Association (AFTMA), now the American Sportfishing Association (ASA), encouraged states to begin implementing aquatic resource education programs. AFTMA, the International Association of Fish and Wildlife Agencies (IAFWA), and the U.S. Fish and Wildlife Service (USFWS) Division of Federal Aid offered leadership and technical support to states for these programs. The formation of the Aquatic Resource Education Council in the mid 1980s provided a communication network for sportfishing industry, USFWS

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staff, and agency educators. The council, led first by Jack Berryman and later Mark Reeff, offered programmatic and technical support. Most importantly, though, the Council was an advocate for these programs and served as a catalyst to get ARE programs off the ground.

The sportfishing industry also offered equipment to states. These offerings jump-started many state angler education programs, including Pennsylvania's. Sportfishing industry support of ARE programs continues today.

Director of Montana Fish Wildlife & Parks Pat Graham, said, "Two of the most important gifts we can give to our children are the ability to use information to make wise decisions and a quality environment in which there are still choices to be made. I am convinced we have to make people aware of the decision they will have to make and the importance of our natural environment. As a department, Wallop-Breaux has allowed us to invest in putting W.O.W. magazines in every fourth grade classroom in Montana; create a Family Fishing Program that reaches over 10,000 kids and family members every year; to bring "Hooked On Fishing—Not On Drugs " in over 100 schools in just four years; and much more. These are our best long term investments."

The Role of Federal Aid

The SFR Federal Aid grant system requires states to identify their specific education needs, and develop long-term education plans to meet those needs. The programs must use sound and reasonable approaches. Outcomes must also be measurable. These requirements allow the states to focus resources on the development of sound plans before funding is obtained. This creates an environment for longer term planning and operating. Through its regional offices the USFWS Division of Federal Aid provides states with support and technical guidance in the preparation of grants and ARE plans. In addition, the Division of Federal Aid also provides support for training for agency ARE program staff.

In the last 15 years, USFWS administrative funds have supported evaluation research, development of model materials, and resources. These materials let states with limited resources implement programs without needing to "reinvent the wheel." While not directly linked to state ARE programs, these materials help states use their dollars in a much more efficient, effective manner.

State programs benefitted from the partnership among state agencies, the USFWS Division of Federal Aid and the sportfishing industry. By 1989, 26 states and two territories had begun developing aquatic resource education programs.

Program Evolution

If the 1980s were the official birth of aquatic resource education programs, then the 1990s represented their adulthood. Many programs evolved into highly complex education programs that found a home in agency strategic planning.

Even though there is no such thing as a typical ARE program, there are some similarities among the programs currently underway. These programs were designed to meet agency needs through public education, and they provide agencies a mechanism to address highly complex issues such as angler recruitment and retention, fish restoration outreach, aquatic resource stewardship, fish consumption advisories, and habitat restoration.

Today, many approaches are used to deliver these messages. Many rely on the multiplier effect. That is, they train others to reach the ultimate target audiences. States like Pennsylvania, New Hampshire and Minnesota have trained thousands of teachers in topics such as watersheds, water quality, fisheries management, aquatic ecology, and fish biology and identification. Teachers then use their technical knowledge to teach these subjects to their students with curriculum materials developed by those states. Many of these workshops are offered as part of undergraduate and graduate-level teacher preparation.

This approach is also used to deliver angler education messages. Alabama, Texas, Montana and Ohio train hundreds of adult volunteers and teachers to take the sport of fishing to the citizens of those states. States such as New York and Texas work cooperatively through Cooperative Extension and 4-H to reach youth with a fishing and aquatic resource stewardship message. This approach lets agencies reach their target audiences with a community-based delivery system. By using the multiplier effect, states with limited agency staff and resources are able to reach thousands. Nationwide,

millions of citizens receive the messages and materials delivered through these kinds of programs.

Some states, such as New Jersey and Virginia rely on agency staff to reach the target audience. Visitors to sites such as the Pequest trout hatchery in New Jersey are given a chance to learn about trout production and fishing, literally from egg to creel. Programs like these reach tens of thousands directly with the agency's message.

In the last few years, programs aimed at nontraditional audiences have also grown. The vision of target audiences has changed with the times, to reach all segments of the population. Programs such as Becoming an Outdoors Woman provide an opportunity for agencies to introduce women to sportfishing. Urban and nonwhite audiences are also reached through ARE programming.

States have also used SFR funding to support ARE facility development. ARE funds support aquatic resource education centers in Delaware and Idaho. Interpretive exhibits at established facilities have also been supported through ARE funds. Ohio partners with the Columbus Zoo and the Ohio Center of Science and Industry. Several states, including New Hampshire, Washington, Wisconsin, New Jersey and Pennsylvania, use SFR funds to support exhibits at fish hatcheries. Arkansas operates a mobile aquarium to take its message to school children.

Al Farris, administrator of the Iowa Fish and Wildlife Division

"It (Wallop Breaux) has given us an opportunity to reach a tremendous amount of teachers in a positive way and get aquatic resources in theirs minds and on their radar screen where it had never been before. We've been able to provide them programs and spoon-feed them. It has also given us an opportunity to get angling skills in physical education programs in high schools and to conduct fishing clinics for young anglers. We've been surprised at the number of parents we also reach through our youth programs. As a result of these programs, we've received very positive feedback for the agency and our staff such as Barb Gigar, the coordinator of Iowa's aquatic resource education programs. It has raised the image of our department."

AREA

In the early 1990s, at the encouragement of Mark Reeff from the IAFWA and the sportfishing industry, state ARE staff organized to form the Aquatic Resource Education Association (AREA). This professional organization serves those involved in sportfishing and aquatic resource education. Members include agency staff involved in ARE programs supported by SFR and/or state funds, university faculty, sportfishing industry representatives, non-governmental organizations, and several federal agencies.

Into the 21st Century

In fiscal year 1998 (the latest year of complete information), 43 states, the District of Columbia and 5 territories had active ARE programs that received $11 million in SFR funds. When combined with agency dollars, $14.5 million was spent on ARE programs.

These programs received an additional boost in 1998. Leaders in Washington used the reauthorization of the motor fuels portion of SFR as an opportunity to take ARE into the 21st Century. The cap on the amount states could spend on ARE was increased from 10 percent to 15 percent of their SFR apportionment. In addition, the legislation added language to more clearly define aquatic education and public outreach:

> (2) "The term 'outreach and communications program' means a program to improve communications with anglers, boaters and the general public regarding angling and boating opportunities, to reduce barriers to participation in these activities, to advance adoption of sound fishing and boating practices, to promote conservation and the responsible use of the Nation's aquatic resources and further safety in fishing and boating; and
>
> (3) the term 'aquatic resource education program' means a program designed to enhance the public's understanding of aquatic resources and sportfishing and to promote the development of responsible attitudes and ethics toward the aquatic environment." (Section 7402).

Additional funding for additional ARE and outreach on a national level was also included. Through the Recreational Boating and Fishing Foundation, additional research into program effectiveness will be conducted. Simply put, the opportunity to use SFR funds for ARE lets states deliver important conservation messages to thousands, if not millions, of people each year. If we view diverse systems as healthy ones, then Aquatic Resource Education today is very healthy.

TEACHING ABOUT WET AND WILD AT THE MORRISON KNUDSEN NATURE CENTER, IDAHO

"A nature center . . . combines natural or semi-natural lands with special facilities and programs, and directs these toward increasing within individuals their understanding of the place and role of people in nature." (E.J. Stahr, former president, National Audubon Society).

The Place

The Morrison Knudsen Nature Center, owned and operated by the Idaho Department of Fish and Game, is a sample of wild Idaho. It is a unique facility that teaches visitors about our natural resources, with an emphasis on Idaho's fisheries. Visitors have the opportunity to look through underwater viewing windows to witness life in a mountain stream with its logjams and waterfalls, experience a wetland pond circled with willows and cattails, and walk through examples of ecosystems found throughout Idaho. The nature center and its programs attract more than 250,000 visitors per year.

In an effort to better inform Idaho's citizens and visitors about natural resources, the department has chosen to direct a portion of its Sport Fish Restoration (SFR) Program funds to the nature center. Each year, the department allocates approximately $150,000 from SFR toward aquatic education for nature center operations.

The nature center grew from the desire of the department and others to be involved with projects focusing on Idaho's fish and wildlife in an educational setting to commemorate the state's 100th birthday in 1990. One such project was to build a "river observatory" in urban Boise to provide an understanding of aquatic ecosystems. The department provided 1.8 hectares (4.5 acres) of land and start-up money with a $167,000 challenge grant, which included $150,000 of SFR funds, allowed under the Wallop-Breaux expansion of the SFR Act—which allowed these funds to be used for aquatic resource education.

A 168 meter (550-ft) stream, a 0.10-hectare (1/4-acre) pond, and a small replica of an alpine lake are the showpiece facil-

DOREEN MARTINEK, IDAHO DEPARTMENT OF FISH AND GAME

Visitors of all ages can watch and idenfity fish in examples of natural habitat at the Morrison Knudsen Nature Center in Boise, Idaho.

BY SHARON W. KIEFER, DOREEN MARTINEK, VIRGIL MOORE, and TERRY THOMPSON

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ities at the nature center. Underwater observation windows at several stations along the length of the stream and the alpine lake afford visitors the opportunity to examine fish in flowing and stillwater habitats. Native and introduced fish species found throughout Idaho are on display. Educational displays and observation windows emphasize the identification and life cycle characteristics of coldwater fishes. Incubating eggs, fry habitat, and aquatic insect production are featured at the observation windows. By design, kokanee salmon spawn annually in full view of observation windows, giving visitors a rare glimpse of a key part of the life cycle. A visitor center complements the outdoor education about Idaho's aquatic resources, with several unique displays that help the public understand the state's fish and wildlife. Multi-media capability allows incorporation of traveling exhibits that are not part of the permanent display.

The Programs

The nature center uses SFR funds for its annual operations, to support the facilities, displays, and education programs. The educational goal of the nature center is to increase awareness and understanding of Idaho's aquatic resources, the environment upon which they depend, and their relationships to people. Through the use of this model, nature center facilities and programs illustrate the "web of life," integrating aquatic and terrestrial ecosystems.

Approximately 20,000 school children interact each year with the nature center, its department staff, and volunteers, as part of the nature center's outreach program. Educational resources provided to teachers include information about the nature center, the fishes of Idaho, and several student activities that focus on fish: habitat, identification, and life cycle.

"Critter Club," a membership program designed for children ages four to eight years, offers stories and art activities about different animal species. "Wild Camp for Kids" is a weeklong event offered to children between the ages of nine and twelve years. The camp provides children a close look at some of the most intriguing fish and wildlife Idaho has to offer. Each participant receives a variety of materials, including a fishing pole and tackle box. Wildlife Wednesdays are free one-hour monthly programs intended for adult audiences. Experts in various fish and wildlife fields are recruited to provide information about a variety of subjects including fishing education, fish identification, and fishery research findings.

Idaho Salmon and Steelhead Days, Inc. hosts a three-day event held at the Idaho Department of Fish and Game headquarters and the adjacent nature center complex. It is a nonprofit organization made up of a number of different partners, all with an interest in Idaho's salmon and steelhead. The event's goal is to elevate public awareness of the cultural, historical, biological, and economic importance of Idaho's salmon and steelhead. All of Idaho's native stocks of these species are listed under the Endangered Species Act. The event is designed to provide a quality, outdoor, educational event, which is non-commercial, non-profit, and most importantly, non-political.

Nature center programs offer users of the aquatic resource (which we all are) a broad base of knowledge about the resource and how we influence it. The center also promotes understanding of aquatic ecosystems through participation in the sport of fishing. The aquatic resource education provisions of SFR make this possible in Idaho.

IDAHO DEPARTMENT OF FISH AND GAME

What's My Line? is a popular way for kids to learn about anadromous fish at the annual Idaho Salmon and Steelhead Days at the Morrison Knudsen Nature Center.

TEXAS FRESHWATER EDUCATIONAL CENTER

The Texas Freshwater Fisheries Center (TFFC) serves as an exemplary model of what can be accomplished through a strong, effective partnership between state and federal agencies, private industry, a local community, and our constituents who share a common goal of public awareness, education, and stewardship of our natural resources. Faced with growing urbanization, a changing ethnic and demographic population, and declining license sales, Texas Parks and Wildlife Department (TPW) recognized that it needed to take a fresh new approach to traditional fisheries management. Research, fishery surveys, and fish stocking were no longer enough. Education and outreach would also be needed to help sustain the high quality of Texas' recreational sport fishing in the new millennium.

TFFC was constructed in 1996 to facilitate two top priority needs—largemouth bass (*Micropterus salmoides*) production and freshwater aquatic education. Since the financial costs of such a bold venture were beyond the reach of the conventional state agency budget, a public/private partnership was formed. This partnership consisted of TPW, the Parks and Wildlife Foundation of Texas, Inc., (a non-profit fund-raising entity), corporate and individual sponsors, a city sponsor, and a cooperative effort involving federal and state government agencies, sport fishing industry, anglers, and boaters through the Sport Fish Restoration (SFR) Program. A total of 19 east Texas cities submitted bids for this project, but an aggressive capital campaign raised $4,063,000 in land, cash, and in-kind contributions to win the project for the city of Athens. This was then used to leverage the additional 75% matching funds from SFR monies. Additional contributions were given to further enhance attractions and complete the construction of the $17,000,000 facility. Texas Governor George Bush Jr. summed up public perception of the new facility in November 1996, when he presided over the grand opening and proclaimed, "This place is really cool!"

From the very beginning, TFFC was designed to be an uniquely different educational center and hatchery complex. Unlike typical aquarium facilities, it features natural habitats constructed around the outside of the building, rather than on the inside. From an educational perspective, TFFC takes the guest on a tour of Texas aquatic ecosystems. Visitors can explore life above and below the surface of a Hill Country stream, east Texas farm pond, wetlands, and Texas reservoir through huge acrylic viewing walls. The museum downstairs provides viewing of antique lures and old fishing tackle that chronicles the evolution of fishing in Texas. Replicas of many of the freshwater state record fish are represented in the Fisheries Management Gallery along with detailed explanations of effective programs used by TPW fisheries biologists

The Texas Freshwater Fisheries Center provides "hands-on" education for all ages.

BY ALLEN FORSHAGE and MONA FARMER

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to manage our public waters. A special area devoted to the SFR helps educate visitors about how the program works and the direct benefits to anglers.

Upstairs, there is a 150-seat theater, complete with Dolby surround sound, movie screen, and 26,000-gallon aquarium that provide an excellent venue for scientific presentations, public informational forums, and special educational programming.

Adjacent to the visitor center is a 1.5-acre fishing pond and Anglers' Pavilion, which serves as a classroom and staging area for fishing. School age children receive instruction on basic fishing skills, equipment, angler ethics, catch-and-release conservation, and safety. Here, instructors also take the opportunity to reinforce the visitor center information on the Sport Fish Restoration Program and its importance to future anglers. Stocked with rainbow trout in winter and channel catfish during summer, the casting pond offers kids an interactive opportunity to put their newly acquired knowledge to work and catch fish! It's the culminating experience where observation, education, and interaction all come together.

The Texas Freshwater Fisheries Center allows visitors to get "up close"

views of Texas fish and habitats and, children to try their hand at fishing.

Approximately 37 acres of lined outdoor spawning and rearing ponds extend to the east end of the 106 acre property. With the main focus on largemouth bass, these ponds will be used primarily for future broodfish and fingerling production. Construction of 7-10 acres of wetlands and nature trails below the outdoor hatchery ponds is underway. This expansion will broaden the educational opportunities to include many wildlife features associated with Texas diverse aquatic ecosystems.

Today, good fishing in Texas is no accident. It is the product of proven management techniques, years of research, efficient hatchery production, stocking, and conservation. By expanding the traditional fisheries management role to include aquatic education and outreach through projects like the Texas Freshwater Fisheries Center, Texas will assure that everyone will be able to enjoy a quality fishing experience for generations to come. The dependable funds from the Sport Fish Restoration Program make it all possible.

PROGRAMS OF NATIONAL SIGNIFICANCE FUNDED THROUGH SPORT FISH RESTORATION

Since 1950, state fish and wildlife agencies have implemented the Federal Aid in Sport Fish Restoration (SFR) Program with great success. But, like many of our prized rivers and streams, natural resource needs sometimes cross state boundaries. To address these needs, the U.S. Fish and Wildlife Service Division of Federal Aid and its partners have supported projects of common interest to a majority of states. These projects help implement national management programs, research support functions and natural resource conferences and outreach efforts, such as National Fishing Week. Although these projects represent a small portion of SFR funds, they have accomplished a great deal and have provided a valuable service to state agencies and ultimately to anglers and boaters. Here are a few examples:

National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

(http://fa.r9.fws.gov/surveys/surveys.html)

Which state has the most turkey hunters? What is the average number of days a bass angler fishes each year? These questions and many others can be answered by the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR). The FHWAR survey provides information about Americans' annual participation in hunting, fishing, and wildlife-watching activities every five years. The focus of the survey is the number of participants, number of days and trips they engage in, and amounts of money they spend on these recreational activities. Other topics covered are hunting, fishing and wildlife-watching by species, the socio-demographics of the participants, and economic values for selected types of wildlife-related recreation. The survey is funded in part by SFR funds.

State fish and wildlife agencies, nongovernmental organizations and federal agencies commonly use FHWAR survey data for planning and policy analysis. University and private natural resource researchers also use the survey data, as do wildlife-related recreation industries, for customer profiling and marketing plans.

The FHWAR survey has been the most consistent and reliable source of wildlife-related recreation data since the mid-1950s. The U.S. Bureau of the Census has conducted all but two of the surveys, giving the survey methodology and results a high level of credibility.

BY STEVE FARRELL

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The USFWS Management Assistance Team

(http://www.nctc.fws.gov/fedaid/mat.html)

The Management Assistance Team (MAT) consults with people in the fish and wildlife business who seek to improve their agency's effectiveness. Improved agency effectiveness results in better management of wildlife and natural resources. MAT's primary clients are state fish and wildlife agencies and the U.S. Fish and Wildlife Service, but MAT also works with others in the fish and wildlife profession, such as the International Association of Fish and Wildlife Agencies and the Organization of Wildlife Planners.

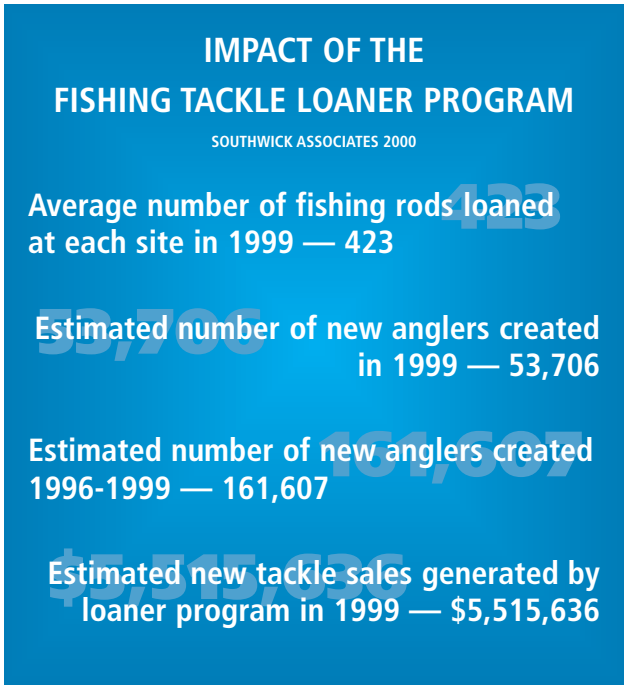
MAT's consultants provide assistance about a wide range of topics including organization development, planning, budgeting, leadership development, programmatic and comprehensive agency review, workforce diversity and organization effectiveness. MAT has worked with 47 states and various wildlife agencies during the past 10 years. Many consulting efforts result in partnerships between agencies or agency personnel.

Fishing Tackle Loaner Program

(http://www.asafishing.org/programs/education/loaner/)

If you want to go fishing but do not have any fishing equipment, the Fishing Tackle Loaner Program is for you. This program loans fishing equipment just like a library loans books. Loaner sites most commonly operate from public facilities such as libraries, recreation centers, and state and local parks, with support from the local community. Anyone can borrow rods and reels for a day of fishing. Many sites also provide "how-to" fishing instruction. This program is designed to meet people's busy schedules by allowing them to fish when they have time and to promote fishing in places such as parks and other public locations.

Each loaner site is organized by local volunteers and is customized to match local fishing conditions and community resources. The American Sportfishing Association implements the program by providing materials and experience learned from other loaner programs. As of February 2000, there were more than 550 sites operating across the country.



800-ASK-FISH

(http://www.asafishing.org/programs/outreach/askfish.htm)

The 800-ASK-FISH public information program, created through the leadership of the American Sportfishing Association and funded by the Federal Aid in Sport Fish Restoration Program, helps anglers find the information they need to go fishing. By simply calling 1-800-ASK-FISH, people anywhere in the United States can receive instant information about fishing and boating in any participating state. This information includes:

- Names and locations of water bodies and access sites.
- State fishing rules and regulations.
- License vendors' names and addresses.
- Information about how to become involved in agency programs.
- Weekly fishing reports.

Benefitting agencies and anglers alike, 800-ASK-FISH increases communication, educates non-anglers, simplifies license sales, and informs anglers where to go. How effective is 800-ASK-FISH? Consider that in just one year, nearly 500,000 calls are placed by anglers and boaters nationwide to this service.

National Fishing Week

(http://www.gofishing.org/)

National Fishing Week takes place during the first full week of June to celebrate the fun and tradition of recreational fishing. It began in 1979 to highlight this tradition and to foster conservation and stewardship of aquatic resources, particularly in young anglers. It is organized by the National Fishing Week Steering Committee, a nonprofit organization comprised of federal and state resource agencies and the sportfishing industry.

Since 1989, the Sport Fish Restoration program has provided funds enabling the National Fishing Week Steering Committee to develop educational materials that support the implementation of fishing clinics, derbies and other outreach activities. The Steering Committee also develops an annual media outreach campaign and, with the help of national celebrities, takes the message of fishing and environmental stewardship to the American people. Nationally, about 1,750 events occur each year as part of National Fishing Week, with approximately 500,000 people attending or volunteering.

The Fish and Wildlife Reference Service

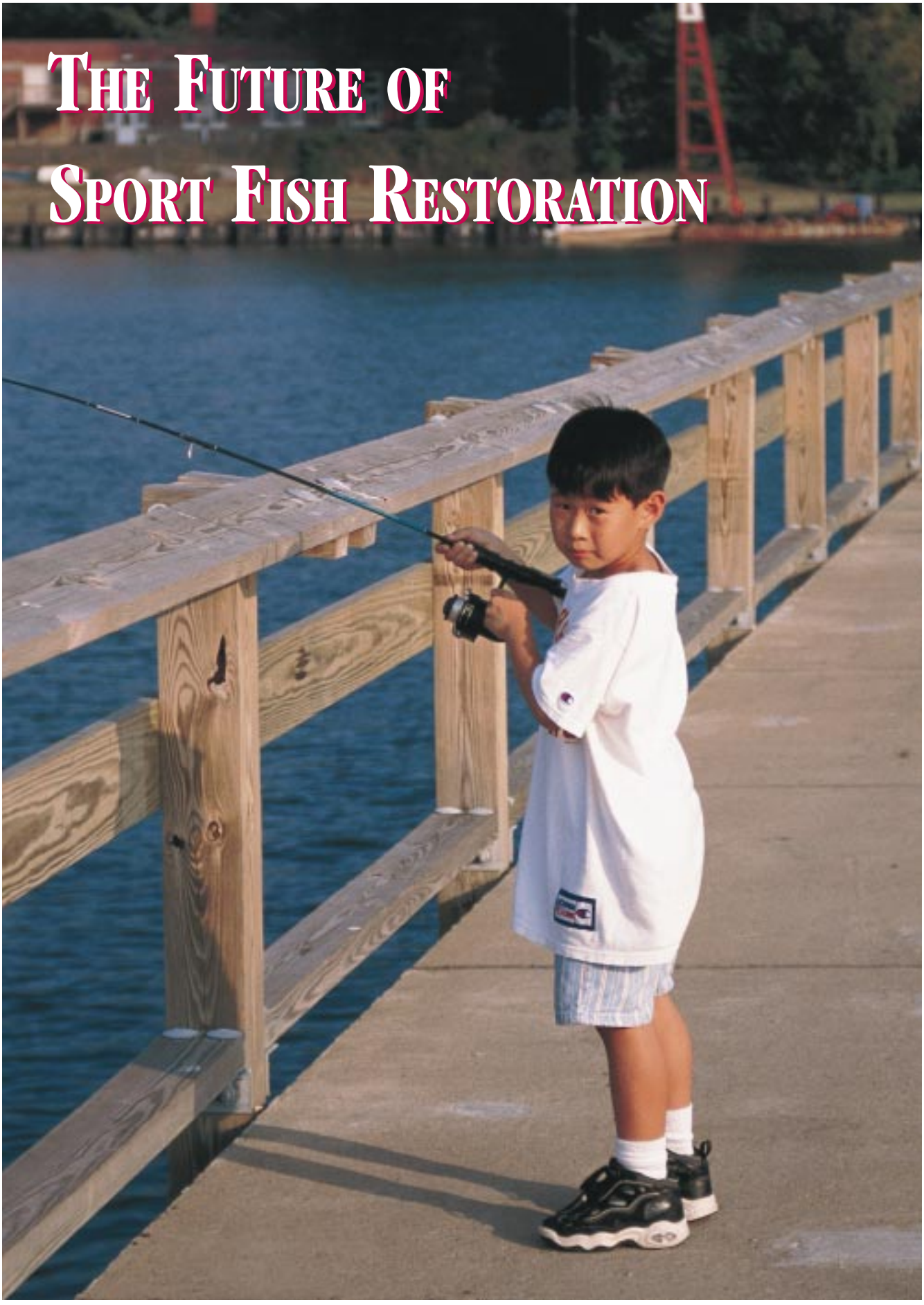
(http://fa.r9.fws.gov/r9fwrs/)

Fisheries managers and scientists collect a great deal of information and publish many reports through SFR-funded projects. A central clearinghouse, which all SFR partners can access, is necessary for this information. The Fish and Wildlife Reference Service (FWRS) receives, indexes, stores and distributes copies of reports produced by state fish and wildlife agencies from research studies supported by Federal Aid in Sport Fish Restoration Act and Federal Aid in Wildlife Restoration Act funding. The FWRS also receives reports produced by many other federal programs and includes the Boating Access/Boating Facilities Clearinghouse and the Clean Vessel Act Education/Information Clearinghouse.

FWRS was established in 1965 by the Division of Federal Aid as a library reference service and operated under contract by the Denver Public Library from 1965 to 1983. Computerized indexing of documents began in 1966. The FWRS maintains bibliographic data bases for citations of documents described above. Copies of all documents listed in FWRS data bases are available from the FWRS.

These examples are but a small portion of the national programs supported through Sport Fish Restoration. These programs and many others during the past 50 years have helped address needs that are too large for any single agency to tackle, providing immeasurable improvements to aquatic resources, fisheries management and outreach.

The Future of Sport Fish Restoration



DIANE MEYER

THE RECREATIONAL BOATING AND FISHING FOUNDATION: SFR'S LEGACY FOR THE FUTURE

Adaptation and evolution are as critical to the Federal Aid in Sport Fish Restoration (SFR) Act as they are integral to ecological processes. What began 50 years ago primarily in response to fisheries resource conservation needs has evolved with each re-authorization, responding to a widening circle of needs and opportunities. The establishment of the Recreational Boating and Fishing Foundation (RBFF) with the 1998 re-authorization demonstrates how the SFR program can be used proactively to influence the future of America's fisheries.

In the next 25 years, population growth in the United States will occur within groups that currently have little involvement with boating and fishing (Murdock et al. 1996). Basically, this means that the number of angling and boating participants will shrink proportionally and, in some states, numerically. Fishing and boating will lose their respective positions as common elements of American's lifestyle.

This portends economic impacts in both private and public sectors, especially in the areas of resource stewardship and quality of life. In 1996, 83% of state fishery agencies' budgets, on average, were derived from a combination of license sales and Federal Aid in Sport Fish Restoration funds (Ross and Loomis 1999), both of which are directly linked to participation in fishing and boating. With a decline in participation, who will step forward to maintain the front line in the conservation and stewardship of aquatic resources? What will this mean for the heritage and traditions of American fishing and boating, so fundamental to the national psyche, not to mention the powerful impact that participation in these activities has on American families? The challenge is to maintain and even increase participation among those groups where fishing and boating have always played an important role in their cultural heritage, while diversifying to include a wider representation of the American public—building new resource-based traditions for all in the 21st century.

Recognizing this, the re-authorization of the SFR program as part of the Sportfishing and Boating Safety Act of 1998 stipulated that the U.S. Fish and Wildlife Service, through the Sport Fishing and Boating Partnership Council, develop a national strategic plan for outreach and communications. The act authorized $36 million to support implementation over a 5-year period. In 1998, the council embarked on a year-long planning process, which resulted in a comprehensive outreach and communications plan (SFBPC 1998). The planning process included facilitated stakeholder meetings around the U.S., and was designed to ensure stakeholder buy-in (Fedler and Ditton 2000). In October 1998, the Recreational Boating and Fishing Foundation (RBFF) was formed to implement the plan.

BY BRUCE MATTHEWS

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Mission

The RBFF's mission is "to implement an informed, consensus-based national outreach strategy that will increase participation in recreational angling and boating and thereby increase public awareness and appreciation of the need for protecting, conserving and restoring this nation's aquatic natural resources."

RBFF's efforts are focused on building avid and committed boaters and anglers—as license buyers, consumers, aquatic resource stewards, and conservation leaders. The recreational values associated with boating and fishing participation, with their benefits to individuals, families, communities, and society, offer additional justification. RBFF seeks to build partnerships, collaborative efforts and initiatives with a goal of developing individuals who consider being boaters and anglers fundamental parts of their identities, and who are willing to base actions on deeply held core stewardship values. Using the $36 million allocated from the SFR program matched with an additional $9 to $10 million from in-kind contributions and other sources, RBFF will achieve this by:

- Increasing the avidity and interest of those already participating—along with those who have dropped out—by promoting fishing and boating, eliminating the barriers and constraints inhibiting further involvement, and supporting educational program efforts; and
- Initiating awareness and interest in fishing and boating participation with new and diverse target audiences, with the aim of encouraging the adoption of a fishing/boating identity and a resource stewardship ethic.

Stakeholders

The focused involvement of many stakeholder groups is fundamental to the development of the national strategic plan and the fulfillment of RBFF's mission. RBFF intends to build ownership of both its efforts and outcomes among a broad array of

key groups. Representatives from these groups are integrally involved, serving on advisory panels and on task forces focused on each of the five objectives in the national plan.

RBFF's Objectives

The five objectives of the national strategic plan were developed and refined through the stakeholder involvement process to address identified constraints to fishing and boating participation. Task forces will build an agenda for each of these objectives, facilitated by RBFF staff and carried out primarily through contractual arrangements. These objectives are:

1. Create a top-of-mind national campaign to develop awareness, trial, and continued participation in recreational boating and fishing.
2. Educate people on how and where to boat and fish. By building a comprehensive directory of existing programs, events, and curricula, and hosting a searchable database of these on the World Wide Web, information can be shared among many organizations. Guidelines will be developed that will assist states and the USFWS in developing outreach/education plans. Fedler et al. (1998) identified several constraints to angler/boater participation (including a perceived lack of time and money and negative images of water quality), that will be addressed through various techniques.
3. Target market segments and create messages that address each segment's specific needs. Assessing what is known about potential market segments, including the factors that motivate (or constrain) participation as well as the messages and delivery mechanisms that are most effective, will help to prioritize outreach efforts.
4. Educate stakeholders on outreach, marketing and education. Defining and assessing stakeholder training needs related to marketing, education, outreach, and evaluation in these areas will help to focus RBFF services to these stakeholders. Assessing training delivery methods, establishing a plan for curriculum development, and strengthening stakeholder communications and networking will be used for sharing information on best professional practices in marketing, outreach and education.
5. Make access to boating and fishing locations and opportunities easy and simple. An evaluation of the current access situation will help focus these programs. A national strategy and action plan will be developed, with a particular emphasis on enabling local implementation and ownership of access facilities, and a focus on urban areas and underutilized resources.

Evaluation

Each Task Force will establish benchmarks and target objectives which, when combined, will offer a clear picture of RBFF's progress. Evaluation measures will, wherever possible, be linked with existing efforts such as those conducted by Sporting Good Manufacturer's Association, U.S. Fish and Wildlife Service, American Recreation Coalition, and others. Evaluation will use success indicators such as changes in participation, avidity, fishing skills and knowledge; stewardship behaviors; intentions to behave responsibly toward the environment; ethics and values related to participation and stewardship; message impact and recall; participation barrier/constraint reduction; availability of opportunities to participate and access the resource; and adoption of best professional practices.

Managing Resource Use

Critics have noted that a national effort to increase participation in boating and fishing, if successful, will inevitably place more pressure on the resource and lower participant satisfaction with their experience, possibly leading to an accelerated drop-out rate. Clearly, more participants can equate to more pressure on the resource, and without appropriate education and management strategies, a self-defeating impact will occur. RBFF's task forces will address how to identify under-utilized resources and work with managers and users to build strategies that steer additional pressures away from heavily impacted resources while encouraging use and access for resources capable of supporting more pressures. Examples include: increasing awareness of fishing opportunities for species such as carp, adding launch ramps and access sites for lakes, reservoirs, and rivers that need them, or publicizing opportunities at local sites rather than "destination" areas.

Social carrying capacity issues exist wherever fishing and boating participants perceive crowding, poor human behaviors, or conflicting participant values as negatively impacting their experience. A combination of outdoor ethics education, resource management strategies and a focus on the bigger stewardship picture can mitigate problems and increase the social carrying capacity associated with fishing and boating activity. RBFF's efforts must support resource stewardship as it strives to increase participation, and RBFF must encourage and support participant education to maximize the social carrying capacity if it is to ultimately achieve its goals.

Summary

Outreach, marketing, and education are relatively new words in the Sport Fish Restoration lexicon. Their presence reflects an evolution in thinking and an expansion of scope over the past 50 years to reflect fisheries needs and opportunities today in order to proactively address the challenges of tomorrow. The development of the National Strategic Plan, the establishment of the RBFF to carry out that plan, and the RBFF's fidelity to stakeholder involvement offer evidence of SFR's continued evolution. By including outreach, marketing and education within the scope of the SFR, Congress is demonstrating the vision necessary to keep 50 years of SFR legacy on the cutting edge of fisheries management, assuring the continuation of the rich legacy and traditions associated with American recreational fishing and boating. In so doing, the stewardship of aquatic resources will be assured, and the associated recreational benefits guaranteed for future generations.

SPORT FISH RESTORATION IN THE FUTURE

Over the past half century, the Sport Fish Restoration Act (SFR) has made a very significant difference in the quality of recreational fishing in each of the 50 states. Previous articles in this issue have summarized the history of the fund and provided representative examples of how the revenues have been applied to restore and enhance fish populations and aquatic habitat, improve management, expand boating and fishing access, and communicate more effectively with the nation's anglers and boaters. Without the Sport Fish Restoration Act, many of these benefits would not exist.

Undeniably, in its first 50 years, SFR has improved fishing opportunities for the growing legions of anglers. The first national survey of fishing and hunting, conducted by the U.S. Fish and Wildlife Service, estimated that 20 million Americans fished in 1955 (USDI 1956). This number grew steadily through 1991 but has begun to fall in recent years (see figure on page S49). The 1996 National Survey of Fishing, Hunting and Wildlife Associated Recreation (USDI and USDC 1998) documented the first apparent decline in fishing participation in nearly 50 years. Fishing license sales throughout the country have confirmed this downturn. Eighteen states sold fewer licenses in 1998 than in 1980. Further, a more recent comparison showed 27 states sold fewer licenses in 1998 than in 1990, according to license sales figures compiled by the U.S. Fish and Wildlife Service. Many other states have experienced only slight increases in license sales over the past 20 years. Clearly, recreational fishing participation has changed from the boom years of the 1960s, 1970s, and 1980s. Thus, the questions emerge: "What is causing the change in recreational fishing and how will these changes affect the Sport Fish Restoration Act?"

The answers to these questions are complex. Essentially, American society is changing. We are no longer a rural society where people have a strong attachment to the land and have grown up experiencing the benefits of fishing and other outdoor recreation activities. Our urbanized society is losing touch with the outdoors. Traditional fishing opportunities, mainly located in rural areas, have become more distant to a greater proportion of our population. National surveys have documented that per capita fishing and boating participation rates of urban residents have been declining while rural participation rates have remained the same or increased slightly.

BY DR. ANTHONY J. FEDLER

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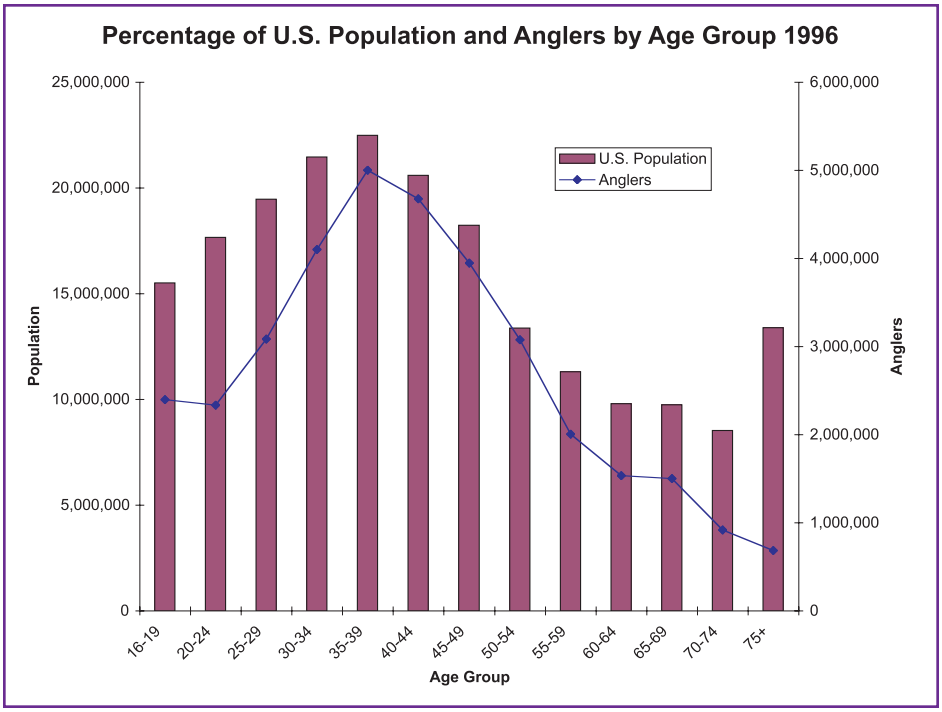
The growth of urban centers is being fueled by minority populations. These migrants from rural areas and immigrants from Spanish speaking and Asian countries have traditionally had very low recreational fishing participation rates. The U.S. Bureau of the Census projects that growth of the American population over the next several decades will come from minority populations. This is likely to further depress recreational fishing participation if current trends continue (Fedler and Holdnak 2000).

The aging of the American society is also playing a role in fishing and boating participation change. National survey data have shown that fishing and boating participation rates peak at about 22% of the population for the 35-44 year age group and decline to less than 10% of the 65 and older age group (Figure 1). Currently, 35% of the U.S. population is over 45 years of age. The U.S. Bureau of the Census projects that 42% of the population will be 45 or older by 2020. In previous years, lower participation rates in the older age groups were of little concern. However, as a large percentage of our population moves into these older groups, the lower rates become more important, particularly since participation rates among the population below 45 years of age are also in decline.

Another factor shaping fishing participation is the amount and use of leisure time by the American populace. Americans are working more hours (Schor 1991) and while total hours of leisure time per week may not be declining, we are using it in shorter segments and for a wider variety of activities. Results of several state and national surveys all point to the same constraint to recreational fishing and boating—lack of time. Work and family obligations are the most frequently cited reasons for the shortage of fishing and boating time (Responsive Management 1999b). Clearly, recreational choices being made by the public are influenced substantially by available time. As a result, participation in activities involving significant preparation or travel time (such as fishing and boating trips) is likely to be scaled back.

There has been a growing recognition in the recreational fishing community that the loss or slow growth of participants is affecting the businesses and agencies involved with recreational fishing. Industry revenues from fishing tackle sales, as reported by the U.S. Fish and Wildlife Service, have been flat. This trend is reflected in the proportion of Sport Fish Restoration revenues derived from the excise tax on fishing tackle. Revenues from license sales, which most states heavily rely upon, have been increasing in many states only because the cost of licenses has increased.



The recognition of these problems is fostering changes in the ways SFR funds are being used. Prior to the recent amendments to the Sport Fish Restoration Act, most of the funds allocated to states were used for fisheries management; that is, for habitat improvement, scientific fisheries research, and fish stocking. However, the recent changes in recreational fishing participation have spurred the industry and agencies to rethink this model. The fish management orientation of fisheries agencies is evolving into a user orientation. This new orientation reflects both the tremendous investment (and improvements) made in fisheries resources over the past 50 years, and the need to manage the users as well as the fish.

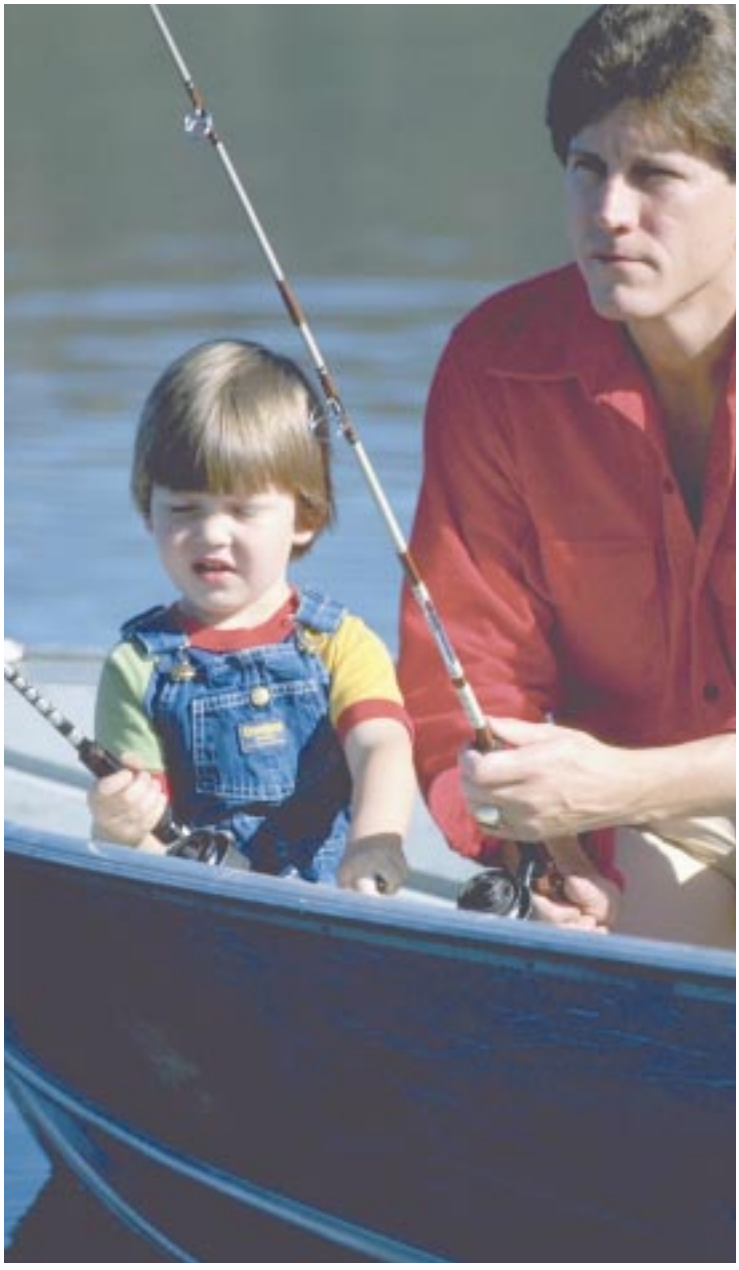
This paradigm shift began emerging in 1993 with the creation of the Sport Fishing and Boating Partnership Council, a federally chartered advisory group to the Secretary of Interior. The council, consisting of industry, agency and organization representatives, has recommended several initiatives to improve recreational fishing and boating opportunities for the public. The centerpiece of these recommendations was the creation of a strategic plan for a national outreach and communication program that is to be implemented by state and federal fisheries agencies as well as fishing and boating related organizations and industries. In 1998, Congress earmarked $36 million of SFR revenues over five years to support implementation of the strategic plan objectives. This is a long way from the first SFR guidelines which stipulated that, "educational, extension, or publicity measures are beyond the operational scope of this fish restoration law" (Rutherford 1952). The strategic plan outlines "an informed, consensus-based outreach strategy that will increase participation in recreational angling and boating and thereby increase public awareness and appreciation of the need for protecting, conserving, and restoring this nation's aquatic natural resources." The focus of this initiative is to increase public awareness of the social, psychological, and economic benefits of recreational fishing and boating, and to develop programs to bring the American public back in touch with the natural environment through fishing and boating.

Other amendments to the Sport Fish Restoration Act in recent years have provided greater latitude in funding aquatic resource education activities and enhancements for boating facility development and access. These actions further underscore the shifting paradigm for the use of SFR revenues.

The future of the SFR will depend on how the public responds to a number of factors. First, it will depend on how the recreational fishing and boating community meets the challenge of changing demographics in the U.S. population. The aging of the population, minority population growth, and urbanization all present unique opportunities to develop a conservation ethic in the American public through recreational fishing and boating. Continuing to meet the needs of current anglers and boaters, retaining them as constituents as they grow older, and recruiting new participants in all age groups in the future will require thoughtful and creative efforts.

The "build it and they will come" mentality of earlier years no longer holds true. Increases in fishing access and the quality of many fisheries has improved substantially over the past two or three decades. However, new access to streams, rivers and lakes, increased stocking, improved water quality, and restoration of native fish populations appear to have resulted

in little more than shifting fishing effort from one area to another. Research has shown that the recreational fishing and boating industries are competing for the leisure time of Americans along with many other recreational industry segments. Lifestyles of young Americans do not reflect those of their parents' generation and participation in fishing and boating are only two outdoor recreation activities among other traditional and new high-tech, extreme activities attracting young people. These changes will necessitate new approaches to introducing and involving the pubic in boating and fishing opportunities. Relying solely on adults to pass interest and skills on to younger generations is likely only to perpetuate the status quo.



Retaining existing anglers and recruiting new ones is key to the future of the SFR program.

The upshot of static fishing and boating participation has been a leveling off of Sport Fish Restoration Act revenues. In recent years, SFR revenues have hovered around $360 million. While the fund has grown dramatically over the past fifteen years, this has occurred through expanding current revenue sources, such as including trolling motors and fishfinders subject to an equipment excise tax, capturing a larger share of the marine fuel tax, and including gasoline taxes from small engines. In good economic times, the SFR program has received little attention from lawmakers looking for revenues to fund special related, or unrelated, programs. However, during difficult years when budgetary revenues were in short supply, the SFR program has been subject to raids to fund "special projects" proposed by some members of Congress. Successfully thwarting these efforts has only been accomplished through concerted action by the recreational fishing and boating community. Thus, one of the greatest needs of the recreational fishing and boating community is to increase user awareness and knowledge of SFR to help protect the fund in the future. A recent Responsive Management (1999a) survey showed that only 15% of anglers knew that special taxes on fishing equipment, boats and fuels went into a fund to restore, enhance, and manage recreational fisheries. This lack of knowledge about SFR is prevalent even though agencies have used Sport Fish Restoration funding signs at new and renovated boating and fishing facilities, the industry has used program logos and information on equipment packaging, and outdoor writers have written about the tax and its benefits. Protecting the fund from non-conforming uses in the future will require greater support from those paying and benefitting from the user tax. Thus, more effective programs for educating anglers and boaters about the SFR program are necessary to ensure its long-term security.

In the future, agencies, organizations and industries involved with recreational fishing and boating will need to be more aggressive in order to maintain and increase participation. They will need to respond to a changing marketplace as the demographic characteristics of the United States population changes over the next several decades. They will need to respond to changing lifestyles with meaningful messages and programs which will integrate fishing and boating into the recreational activity mix of an increasingly urban population. These are significant challenges, but necessary ones if we are to help the public maintain contact with the natural environment, appreciate the social, psychological and economic values engendered by involvement in outdoor activities, and wisely invest SFR funding to maintain and create high quality recreational fishing and boating experiences for all Americans.

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- ✔ Acquire over 4,800 acres of land for boating access;
- ✔ Construct trails, carry-down access areas, piers, jetties, restrooms, tables, shelters, and fish cleaning stations at over 3,300 sites;
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- ✔ Protect or restore 88,464 acres of wetlands in 25 coastal states (1992–1999)
- ✔ Help provide boating safety instruction to over 1.1 million people in just 5 years (1994–1998).

SOURCE: U.S. FISH AND WILDLIFE SERVICE, FEDERAL AID INFORMATION MANAGEMENT SYSTEM (FAIMS); NATIONAL ASSOCIATION OF STATE BOATING LAW ADMINISTRATORS.

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