Financial Returns to Businesses from the Federal Aid in Sport Fish Restoration Program

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by

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EXECUTIVE SUMMARY

Since 1941, businesses in the sport-fishing industry have paid a federal excise on the products that they manufacture.

However, until 1950 these funds were deposited in the general treasury of the United States and did not directly benefit manufacturers. In that year, sportsmen and businesses teamed with conservation-minded policy makers to redirect these existing excise taxes to the Sport-Fish Restoration Program, which has continued ever since.

The concept of redirecting these taxes to benefit fish populations and sport fishing opportunities was simple: By investing in improvements to sport-fish populations and public access, more people would go fishing and the sale of items that generated this tax would increase.

This partnership between the fishing industry, anglers, state and federal fisheries agencies has restored many fish populations to unimaginable numbers and provides an incredible array of fishing opportunities

Today, there are at least 77% more anglers as there were in 1950. Purchases of tax-related items by anglers have increased by nearly 200% in constant dollars since 1955.

Fueling this growth, in part, has been the reliable funding that was provided by the excise tax. In 2009, excise taxes and import duties on fishing equipment totaled $123 million ($89,150,000 excise tax and $ 33,852,668 import duties) from sales of fishing tackle (not including excise taxes on boat fuel and interest). These taxes are distributed to the states to invest in projects that improve sport-fish populations and to provide improved access to the resources -- in short, to improve the opportunities for your customers to use your products.

However, as with any capital investment that a business makes, companies want to know the quantitative return received from this investment. To help answer this, an analysis was conducted at the national and local levels using actual data on excise taxes invested, fishing participation, and angler purchases of excise-tax related products. This analysis revealed the following:

- In constant dollars, Excise Tax-Related Return-On-Investment (ROI) ranged between 1,585% in 1970 to a high of 2,643% in 1980.

- Positive whole project (project-specific) cumulative ROIs ranged from 62% to 1,488% for the six projects analyzed.

- Excise tax-related ROI for specific projects ranged up to 575%, but some projects have a negative ROI to the industry and a positive ROI to the

economy. Such projects often offer non-quantifiable value to advancing the science of fisheries management, which builds a foundation for future growth and improvements.

- Due to the inability to monitor use and expenditures associated with most fishing locations, most projects do not lend themselves to a quantifiable ROI analysis.

- Angler purchases of tax-related equipment peaked at $7.2 billion in 1996 but have since returned to roughly $5.6 billion per year by 2006 (in constant 2009 dollars).

- The number of Americans fishing – the customer base for the businesses paying the tax -- increased 33% to 100% (depending on the measure used) between 1955 and 1980. Even though the number of anglers has declined in recent years, there were still 77% *more* anglers in 2010 as there were in 1950, based on state license sales.

- Between 1955 and 2006, excise tax collections/import duties ranged from a low of $36.0 million in 1957 to a high of $212.6 million in 1989 (in 2009 dollars).

Several important factors significantly leverage the power of excise-tax dollars paid by industry:

- By law, excise taxes distributed in grants to the states must be matched by at least 25% of outside funds; in reality this match is much greater because numerous other funding sources also contribute to fish-restoration efforts. The impact of these funds is an inherent “return” to industry since many of these projects would not likely have been conducted without the core funding provided by excise taxes.

- Investment in conservation and access projects is long-term and builds off of the investment of previous generations. For example, land and water access purchased now will benefit anglers and industry for generations to come. Thus, some of the financial returns attributable to any given year may have been sown through investments made during preceding years or decades.

While the financial attributes of the excise tax that were the focus of this analysis are paramount to financial analysts of individual companies, several other aspects of the Sport Fish Restoration Program also have implications to an industry’s long-term financial health, including:

- Prior to passage of the Sport-Fish Restoration Act, state license fees paid by anglers were often diverted for purposes not related to fishing, such as supporting public schools.

- Now, prior to receiving any excise tax dollars, states must certify that their angler- license dollars are only used for administration of fish or wildlife programs, thus protecting those state-license revenues for programs benefiting fishing and its supporting industries.

- Every year since 1950, the amount of angler-license dollars protected has exceeded the amount of manufacturer's excise taxes going to states by as much as 1,200%, thus vastly increasing the purchasing power of industry's investment.

- By federal law, fishing excise-tax monies must be appropriated by Congress for their intended use and cannot be diverted or held up for other purposes. An act of Congress and agreement by the President would be required to change this.

The investments made in conserving and developing fishing opportunities creates additional benefits to other parts of the economy beyond tackle manufacturers, which are further quantified in the report.

The federal excise tax on fishing tackle has created the foundation for the most successful conservation and fisheries-restoration program in the world. Erosion of support for the program or diminishment of the payments made into the excise tax would have immediate impacts on the ability of state agencies to provide continued fishing opportunities.

The most dangerous implications for industry are long term. However, some impacts would be immediate. Under mounting state budget deficits, without the protection afforded by the Sport Fish Restoration Act, license dollars ($604 million in 2009) would likely be diverted for other purposes. Subsequently, outside funding currently leveraged by excise tax dollars would likely be lost to other uses.

To recoup this loss and maintain the current level of fisheries management, fishing-license fees would likely have to be increased dramatically, causing fishing participation to decline. In addition, the reduced long-term investment into the foundation of the sport-fishing industry -- fish populations, public access, and recruitment of future customers – would cause a continued downward spiral of angler participation, which would further diminish angler spending on the equipment produced by manufacturers. In short, the loss of excise tax funding would result in a loss of anglers, a loss of angler spending, a loss of fish resources, and a smaller political base willing to work on conservation issues upon which the sport-fishing industry is built.

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Introduction

Every three months, companies involved in the sport-fishing industry write checks to the federal government. These excise taxes -- 10% on most products – and import duties are a large investment by companies into the future of their industry. However, just as with any investment, companies want to know the financial return they receive from the taxes paid. To the extent possible, this document evaluates the "return" this excise tax generates to the bottom line of those paying companies.

In 1950, the original supporters of redirecting an existing excise tax to benefit sport fishing recognized the need for a stable funding source to bolster America's struggling sport-fish populations. On the face of it, the formula for this Sport Fish Restoration Program seems simple: abundant, sustainable fish populations yield abundant and diverse fishing opportunities leading to increased sales of fishing tackle. However, like many apparently simple things, it gets more complicated once you scratch the surface.

So, how do you obtain abundant sustainable fish populations? Again, the answer seems simple enough: make long term investments in scientific fisheries management, have a trained and dedicated staff to advocate for and implement innovative programs, protect fish habitat, and enforce strict wildlife and fish protection laws that also allow for regulated harvests that are available to the general public. In a word, this formula is called Conservation.

The system that has been developed and implemented in the United States is, arguably, the best system in the world for restoring and managing sport fish populations and sustaining fishing related businesses. This system, known as the North American Model of Wildlife Conservation, has succeeded in restoring sport fish populations to abundance unimaginable by early conservationists. It is also a testament to those who have followed, have understood the value of this system, and have been willing to continue to make sacrifices and investments to strengthen Conservation programs.

Conservation: A Capital Investment in Your Business

None of this remarkable success could happen without a strong partnership between anglers, state and federal fish-and wildlife agencies, and the sport fishing industry. At its core this partnership supplies reliable funding for Conservation through the sale of fishing licenses, excise taxes on fishing equipment, and gasoline taxes from recreational boaters (most of whom use their boats for fishing).

This funding is best viewed as a capital investment in Conservation, where the capital being generated is the fish populations themselves. The dividends paid from this capital investment are the innumerable fishing opportunities available today. Today's sport-fishing industry can be viewed as a positive by-product of abundant, sustainable sport fish populations that result from investments in Conservation. However, it is important to note that numerous other programs contribute to this success. These include, among others: federal and state funding for pollution prevention activities, passage of state

bonds for watershed protection and open space, funding for agricultural programs that protect wetlands, and conserve soil, funding for acquiring and managing public lands, private landowners concerned with waterway protection, and numerous contributions made by national and local non-government organizations to support fish and wildlife research and protect habitat.

Viewing sport fish populations as a capital investment is similar to viewing your manufacturing facility as a capital investment. Making long-term, continuous investments to maintain or improve these facilities is a wise strategy that will maintain their value and pay dividends over the long-term. It is important to note that most capital investments do not yield immediate returns on investments. However, over time, these investments pay huge dividends to the wise investor.

For industry, conservation isn't the only factor affecting business. Ensuring that anglers have access to facilities and the sport fish resources is also paramount. The sport-fish excise taxes are used to acquire and develop lands, boat ramps, and other infrastructure to ensure that your customers have access to sport fish populations. Angler education classes, educational facilities, and outreach programs foster the participation of the next generation of customers who will keep your business running.

A great conservationist, Aldo Leopold, succinctly wrote about this partnership in A Sand County Almanac: "We fancy that industry supports us, forgetting what supports industry." There is no question, Conservation programs support the industry.

Sixty Years Building Outdoor Industries

While it is hard to imagine the dire straits that fish populations were in prior to the Sport Fish Restoration Program, it is equally hard to imagine what the sport-fishing industry would be like if these Conservation programs were not successful. The success of these programs has allowed millions of Americans to enjoy the sport of fishing in ways that were not possible even 60 years ago. The success of these Conservation programs also allowed the development of a sport fishing industry that is the envy of the rest of the world!

Keeping the partnership among anglers, state and federal wildlife agencies, and the sport-fishing industry strong is the only way to provide abundant, sustainable sport fish populations for the future. While the success of these programs is remarkable, the work is far from over. At a time when today's state agencies face a multitude of new issues and demands beyond traditional fisheries management activities, continued excise-tax funding is critical in the continuing efforts to maintain and improve fisheries conservation, land acquisition and the development of effective recruitment and retention efforts that will continue to build the base on which our user-pays/user-benefits system depends.

Taken together, investing in Conservation, access to the resources, and recruitment of the next generation of anglers through your excise taxes has paid huge dividends for the sport-fishing industry for well over 50 years. Beyond simply highlighting the

multitudes of good projects supported through the years, this report demonstrates the financial return that investment into the Sport Fish Restoration excise taxes brings to your industry.

Program Overview

The Sport Fish Restoration Program is often called one of the most successful user-pays/user-benefits programs in the world. Industry, through its payment of dedicated excise taxes, provides the foundation for sport-fish management programs, which in turn benefit anglers who purchase equipment from those same manufacturers. In 2009, the sport fishing industry invested $123 million ($89,150,000 in excise taxes and $33,852,668 in import duties) to the Sport Fish Restoration Program from their sales of fishing tackle (not including small engine or motor boat gasoline taxes and interest).

What Items Are Taxed?

A complete list of items currently subject to the manufacturer's excise tax and import duties is found in Appendix A. In general, these items are used predominately by recreational anglers. While numerous changes have been made to the items taxed and the various tax rates on specific items, for the most part the core list of items taxed has not changed substantially since originally being implemented.

Restoration Programs: Unique, Protected and Strong

The Sport Fish Restoration Program contains several ingenious provisions that are rarely found in federal legislation. For example, the acts establishing this program capture a tax that was already being paid by manufacturers (excise tax) and recreational boaters (gasoline taxes) and applies them directly to sport fishing and boating programs that benefit these industries. In addition, two other provisions deserve mention.

The "permanent appropriation" language was originally so objectionable to politicians that they convinced then-President Truman to veto the first Sport Fish Restoration bill because of it. This provision now mandates Congress to allocate the funds collected from the excise tax (and now, the boaters' gasoline tax) directly to the Sport Fish Restoration program. It would take another act of Congress and agreement by the President to redirect these funds for something other than supporting sport fish conservation and boating access. In addition, the provision that all funds must "remain available until expended" also is a rarity in a political system that is well known for budget maneuvering by the powers of the day.

Another uniquely significant provision of Sport Fish Restoration is a condition that requires states to enact a prohibition against the diversion of the license fees paid by anglers for any purpose other than the administration of state fish and game departments. Prior to enactment of this federal legislation, license dollars from sportsmen were often viewed by state governments as simply another source of general

fund revenue to build roads, schools, prisons etc. Because of this provision, the Sport Fish Restoration Act protects angler license dollars that likely would not be applied to enhancing sport fisheries. Over the years this provision has paid huge dividends; in every year the amount of funding made available through angler licenses outstrips the funds made available in state grants through Sport Fish Restoration program funds. In 2010 this provision ensured that $621,528,398 in fishing license revenue went toward state fish and wildlife conservation efforts[1]. These funds were matched by $389,552,973 from Sport Fish restoration taxes[2]. As a result, industry's investment is more than doubled even before the funding hits the ground.

Report Approach and Contents

Developing a standard Return-On-Investment (ROI) relationship for a program where money flows between private industry, the federal government, more than 50 state/territorial governments, anglers, and back to industry is very complex. Different accounting systems at each level complicate the calculation. Compounding this, since 1985, equipment manufacturers only contribute a fraction of the total funds to the Sport Fish Restoration program (averaging 25% since gasoline taxes were added in 1985; 13% in 2009 not including import duties), but these funds aren't separated out when they are invested into on-the-ground projects.

Furthermore, the Sport Fish Restoration program requires that states contribute additional funds to match the industry's contribution into specific projects. While the minimum "standard" match is 25%, most projects utilize the Sport Fish Restoration funds as core funding to be leveraged with additional non-angler funds. States commonly build significantly greater project budgets by leveraging other state, federal, and private funding sources. The Sport Fish Restoration funds are often irreplaceable catalysts for these projects, even though the final contribution to the budget may be only a fraction of the total project costs.

In addition, calculations are complicated because there are built-in time lags between when a product is manufactured, the time of first sale and tax collection, the time when the tax is appropriated to the state agencies, when the funds are budgeted for a project, and when a project is fully implemented. As a result, it is can be years between the manufacture of a product and the implementation of a new conservation project. Perhaps most importantly, investments into conservation projects are often long-term investments and difficult to assess. Rebuilding depleted fish populations or conducting comprehensive habitat improvements can take years or decades to pay dividends in the form of improved fish populations and increased fishing.

Despite these complexities, a multi-tiered approach has been developed to assess returns to industry. This approach relies on several levels of data analysis:

[1] Source: U.S. Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program, license certification for 2010.

[2] Source; Final apportionment figures from U.S. Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program. Does not include additional funds from related programs such as the Clean Vessel Act, Boating Infrastructure Grant Program, etc.

- A macro-level analysis of the growth of the sport fishing industry since the initiation of the Sport Fish Restoration Program.
- A fine-scale review of selected case studies (specific projects) that have utilized Sport Fish Restoration funding.
- A vision of the implications to angling in the absence of the Sport Fish Restoration Program.

Although the benefits of a project may be a result of investments from a variety of funding sources, it is assumed in each case that the Sport Fish Restoration funding was vital to the conduct of the projects.

Return On Investment

The "return on investment measure" compares net benefits from the investment to the costs of the investment. The metric is very flexible and can be modified by adjusting the definition of benefits and costs. This approach applies the measure at two scales. The smaller scale, which is the return to the tax-paying companies from their investment of the excise tax, is represented by the following equation:

> Excise-Tax-Related ROI = [(Wholesale-adjusted spending by anglers on tax-related equipment items) - (Excise-tax-related investments)] / (Excise-tax-related investments).

The benefit to industry is defined as the retail on tax-related equipment items by anglers adjusted to account for the amount of each sale passed from retailers and wholesalers to manufacturers who pay the tax. An average mark-up of 200% is assumed.[3] Investments are defined as the amount of excise tax and import duties collected (macro analysis) or invested into a specific project (micro analysis).

The larger scale ("whole economy") ROI is the return to the overall economy from all investments made into a project and is represented by the following equation:

> Total Project ROI = [(Total trip and equipment spending on fishing related recreation) – (Total project investments)] / (Total project investments).

Benefits (or "return") are defined as total purchases by anglers across both trip and equipment categories (lodging, food, transportation, equipment, etc.). Investments are defined as the total dollar value of investments contributed to cover project costs. This calculation shows the return from all investments, including additional funds leveraged by excise tax dollars, and is meant to help communicate benefits from the program to communities and others beyond the companies who pay the tax. Adjustments are not made for manufacturing-to-retail price mark-ups.

In either case, the estimated ratio can be either positive or negative. A negative ROI indicates that the project generated benefits less than the funds invested. It is important

[3] *National Sports Shooting Foundation: Annual Retail Survey*. Southwick Associates. 2009.

to note that positive ROI estimates are expressed in terms reflecting that the initial investment, at a minimum, is returned. Using the Excise Tax-Related ROI as an example, a ROI of 95% can be interpreted the following way:

> Invested Funds: $100,000
> Wholesale Adjusted Sales on Tax-related Equipment Items: $195,000
> Net Benefit: $95,000
> Excise Tax-Related ROI: 95%

In this example, industry received, in taxable equipment-related retail sales, the amount of the initial investment plus an additional amount that was equal to 95% of the initial investment.

Typical angler tax-related purchases, per day and annual, were derived from the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation ("National Survey"). All purchase data reflect only those associated with fishing recreation. Tax-related purchases reflect only those items that are taxed. These surveys are conducted on a five-to-six year basis, yet many of the case studies presented here span multiple years and in some cases multiple decades. As a result, angler purchases were interpolated, when necessary, to estimate spending during intervening years. A simple linear interpolation method was applied. A second approach, linear regression, was also incorporated at the national level, and the methodology is discussed in greater depth in the following subsection.

National Survey data are reported at both the national and state level as well as three sub-categories based upon the water type (fresh water, salt water, and Great Lakes). Whenever possible, estimates are most closely related to the data for a particular region or state. However, the *state*-level data for a fishing venue (salt or fresh water) lists only "equipment," which includes items outside of the tax -related list. On the other hand, the *national* level report itemizes the equipment categories according to fishing venue and breaks out a specific "fishing equipment" category. Therefore, the national level data allows us to determine exactly what items are tax related and the amount spent by anglers across the nation. To accommodate these differences and add specificity to the state-level analysis, the proportion of total purchases attributable only to tax-related items at the national level was applied to total purchases at the state level to estimate purchases for tax-related items at the state level. For example, to determine the dollars spent by saltwater anglers along the Atlantic Coast on taxable items, if saltwater fishing represents 14.3% of national purchases made by anglers for taxable items, then this same percentage 14.3% is applied to the total purchases by anglers along the Atlantic Coast. These adjustments apply primarily when both freshwater and saltwater fishing occurs within a state.[4]

[4] This approach was ground-truthed using detailed National Survey estimates available for each state for 2006 only. The proportionally adjusted tax-related item purchases for 2006 did indeed align with the tax-related equipment item purchases calculated from the itemized state-level budgets. As a result, it is reasonable to utilize the proportional adjustment approach using state-level data in the case study analysis.

Sport Fish Restoration funds work to improve sport fish, habitat and populations directly. Many indirect effects also accrue as a result of these investments, such as land preservation, species biodiversity, and water quality to name just a few. These benefits go well beyond retail sales generated on tax-related items, but are outside of the realm of this investigation.

The investment portion of the estimated return, again, is defined as the actual Sport Fish Restoration funds (for Excise Tax-Related ROI) or total funds invested by all project partners (Total Project ROI) to cover project costs. Overhead costs are not included at the case study level. Recording and accounting practices in place do not enable us to accurately capture project-related overhead costs at the case study level. At the national or macro-level, overhead costs are implicitly included in the Excise Tax-Related ROI estimation. With the exception of the macro-level analysis, all project investments, including Sport Fish Restoration tax-related investment funds, are reported directly from the states in which the project exists.

All costs and purchases are inflated to current-day purchasing power using an appropriate CPI provided by the Bureau of Labor Statistics.

It is important to note two caveats with respect to interpretation of the return-on-investment measure. First, the Excise-Tax-Related ROI *excludes* leveraged dollars from the definition of investments and therefore from the calculation. The result is that, in most but not all instances, some may consider the estimated return upwardly biased from the industry perspective. However, this is a valid approach since, without the investment of excise-tax dollars as a base, most projects would not be able to leverage additional matching contributions and therefore would not be conducted. Thus the impact of the leveraged dollars is an implicit “return” to the industry on their excise-tax investments. Second, return-on-investment estimates can, and will, change during the life of a project, and different types of projects will likely have different ratio estimates. The case studies selected represent a cross section of types of projects supported by excise-tax funds.

Estimating Annual Angler Spending at the National Level

Sport Fish Restoration investments at the national level reflect gross receipts received from the sale and importation of tax-related fishing equipment and are obtained directly from the U.S. Fish and Wildlife Service. For angler purchases (”returns”), angler tax-related equipment purchases are derived from National Survey data and reflect only those associated with fishing recreation. Bearing in mind that surveys are only conducted every five to six years, two approaches are applied to estimate angler spending during non-survey years at the national level.

The first approach involved simple linear interpolation. In other words, the difference between two consecutive survey years is divided equally over the number of intervening years and added to the total tax-related equipment item purchases of the previous year.

The second approach involved linear regression. There is a strong linear relationship between gross excise-tax receipts and tax-related item purchases, which lends itself to a simple regression.

The following model was estimated:

$$Purchases_t = f (collections_{(t)}, lic\_hold_t).$$

Purchases are defined angler purchase of tax-related equipment as reported in the ten previous National Surveys. Collections are defined as gross equipment excise-tax receipts and import duties in the same year as the survey. A time lag of one, two, and three years was investigated to determine the statistical influence of a time lag between point of first sale at the manufacturer level (when excise tax is paid) and retail sale. The highest level of correlation exists between angler expenditures in year t and tax collections in the same year (See Appendix C for further discussion). The "lic_hold" variable reflects certified license holders and incorporates the influence of the number of anglers on total purchases. Detailed statistical output is included in Appendix C. Detailed tables that reflect the model's performance are included in the Current Status section and the appendix of this paper.

Case Study Selection

The vast majority of projects funded by Sport Fish Restoration funds simply do not have the necessary data to calculate an ROI. These projects should not be judged as being less important to fisheries conservation because of these data shortcomings. With few projects available to choose from, and based on the need to show case studies from across the spectrum of funded fisheries projects, the case studies presented here were hand selected and do not represent a random sampling of all Sport Fish Restoration projects.

Case studies presented here were identified using a two pronged approach. The first round occurred in early 2009 when state fish and wildlife departments nationwide were asked to identify projects that met budget and angler participation data requirements. Approximately 20 projects were received. Follow-up contact was made with each project manager to discuss the project as well as investigate the availability of required data. While a number of projects initially nominated are included as case studies, the breadth of projects identified was not viewed to be fully representative of the variety of projects across the nation receiving Sport Fish Restoration funds. Some project types by themselves do not lend themselves to a quantitative ROI analysis (e.g., fish health research, angler education centers) even though they ultimately contribute to continued angler participation. In other cases, investments have not been made to collect the necessary data (e.g., participation before and after the project) or the accounting mechanisms in place at the state level are not suited for breaking out the investment data as needed for an ROI analysis.

The second approach involved a review of U.S. Fish and Wildlife Service's Federal Aid Information Management System (FAIMS) database. The goal was to select projects

for follow-up that would, as a whole, reflect a broad cross-section of projects based upon project type and location. Project managers were contacted to discuss the project as well as investigate the availability of required data.

None of the cases presented should be seen as an affirmation of any one particular project over another. All projects were explored in depth to determine the level of data available to analyze a return on investment. Those studies presented here are those that offered a rich level of data, as well as representing a diverse array of funded projects.

Evolution of the Sport Fish Restoration Program

Recreational fishing has been part of the American heritage since the founding of this country. As it was brought to this continent by European immigrants, early sport anglers found a relatively untapped resource with little crowding from other anglers. As settlements expanded, so did the pressure on fisheries resources. Increasing use of waterways for a multitude of purposes began to affect fish stocks. Damming of waterways for milling operations, dredging and diversions to aid shipping, and use of the waterways for purposes such as log drives all took a toll on fish populations. At the same time, an expanding population also meant an expanding angler base competing for finite fishery resources.

Early inland recreational fish "management" programs were focused primarily on raising and stocking fish. New species such as brown trout and even carp were introduced to provide sport for American anglers. Although most states had established their authority to manage inland fisheries by the early part of the 20th century, little funding was available to conduct the programs. Some states raised money through license sales but beyond that, little was available. By 1912, fishing licenses were required of residents in 34 states and 6 provinces, and nonresidents were required to purchase licenses in all states.[5] It wasn't until 1923 that the first full-time fishery biologist was employed by a state agency (the Michigan Department of Conservation).[6]

Passage of the Pittman-Robertson Wildlife Restoration Program in 1937 shed a spotlight on the benefits of a dedicated source of funding to state agencies for conservation and management focused solely on recreational hunters. In 1939, Congressman Frank Buck (CA) introduced federal legislation to impose a 10-percent manufacturer's excise tax on certain fishing equipment, artificial lures, and similar devices for recreational fishing. Designed after the Pittman-Robertson program, this funding would be provided to the states specifically for programs benefiting sport fishing. Attempts to pass Congressman Buck's bill failed in 1939 and again in early 1941. However, facing an impending war, Congress did pass, and the President

[5] Moffitt, C.M., G.Whelan, and R. Jackson [In press]. Historical Perspectives on Inland Fisheries Management in North America. IN: Inland Fisheries Management. American Fisheries Society, Bethesda, MD USA.
[6] Stroud, R.H. 1966. Fisheries and aquatic resources, Lakes, streams, and other inland waters. IN: Clepper, H (ed). Origins of American Conservation. The Ronald Press Company, New York.

signed, a 10-percent tax on luxury items, including fishing rods, reels, lures, and creels to fund the war effort. Thus, sport fishing-manufacturers were being taxed, but the money was not supporting programs that benefited their business.

Post-War Success

Following the end of World War II, manufacturers continued to pay this tax with the funds being deposited into the general treasury of the United States. At the same time, an expanding post-war economy and generally increasing leisure time for Americans (resulting from workplace reforms during the depression) meant that more Americans had the time and financial resources to take up recreational fishing. Still, state agencies that had the responsibility for managing freshwater and near-shore saltwater fisheries had few resources to manage these fisheries for an expanding angler base.

In 1947, Congressman John Dingell (MI) began efforts to rectify this by introducing legislation to channel the funds already being paid by sport-fishing equipment manufacturers into sport-fish management programs conducted by the states. Congressman Dingell was joined by anglers and, at various times during the next three years, by businesses in the sport-fishing industry in his fight. Congressman Dingell and the tackle manufacturers shared a similar position: both opposed the concept of excise taxes in principle, but felt that if these taxes were to continue being imposed (as seemed inevitable) than the funds should be applied to improving fishery resources. After overcoming several obstacles, including a 1949 veto by President Truman (over concerns of "earmarking" funds to a specific purpose with permanent appropriations) Congressman Dingell's legislation was signed into law in 1950. Thus the excise taxes that the sport-fishing industry had been paying for nine years would finally be directed to programs that benefited their industry.

For the next 30 years, the Sport Fish Restoration Program (also known as Dingell-Johnson after its Congressional sponsors) was a huge success. State agencies were able to hire more and better trained fisheries biologists to research and manage recreational fisheries. These biologists implemented new habitat improvement programs, constructed fish hatcheries, stocked millions of fish, developed fishing-access points for anglers, and many more projects that made fishing better. The number of Americans who went fishing – the customer base for the businesses paying the tax -- increased by at least 33 and perhaps as much as 100 percent[7]. At the same time, the value of the production of sport-fishing equipment doubled (1955-1980, based on constant-dollar-adjusted excise-tax collections).

Recreational Boaters Added

By the early 1980's, the successful model for funding programs to improve sport-fishing businesses began attracting the attention of a related industry – recreational boat manufacturers. For more than a decade prior to this, the recreational-boating industry

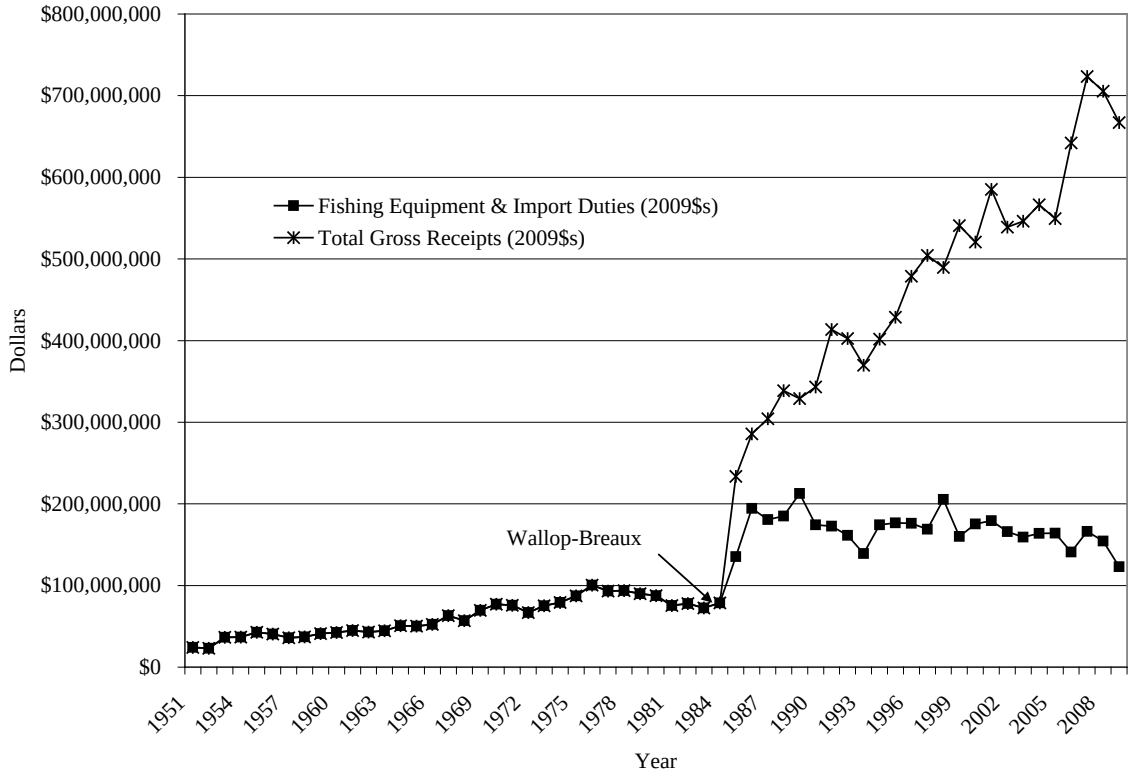
[7] The number of "certified licenses" sold increased by more than one third; the number of anglers as estimated by "standardized" national surveys increased by 100% 1955-1980.

had tried to develop a dedicated funding source to improve conditions for their customer base by enhancing boating-access points and increasing boater safety, but had little success. The connection between recreational boating and fishing was natural – a vast majority of boat owners used their boats for fishing. Failing for over a decade to develop a dedicated funding source on their own, the recreational-boating community teamed with sport-fishing manufacturers to implement what became known as the Wallop-Breaux expansion of the Sport Fish Restoration Program (named after its primary Congressional sponsors) in 1984. In essence, the Wallop-Breaux amendments captured the tax that recreational boaters were paying on their gasoline purchases and channeled them into boating access and boater-safety programs. A number of other changes (including capturing import duties on sport fishing related equipment) were made, many at the behest of industry, to improve the Sport-Fish Restoration Program.

The results were immediate. As a result of gas tax collections, gross receipts into the Sport Fish Restoration fund increased by 200% between passage of Wallop Breaux in 1984 and the first year of implementation in 1985, meaning that an additional $79 million now flowed through Sport Fish Restoration account in the first year alone (Figure 1). While much of this new money went to fund the boating-related provisions (including access for anglers), some became available for improving sport-fish populations upon which both the fishing and boating industries depend.

Between 1984 and 2009, several additional changes were made to Sport Fish Restoration, none of the magnitude of Wallop-Breaux. Gasoline taxes attributable to small engines (lawnmowers, etc.) were captured to fund coastal-wetlands restoration, programs were added to construct boat-sewage disposal facilities and infrastructure for larger boats, a national outreach and communications program was developed to recruit and retain anglers and boaters, and aquatic-education programs were added to expose younger generations to the outdoors. All facets are designed to enhance participation in recreational fishing, thereby reinforcing the consumer base that purchases fishing equipment.

Figure 1. Sport Fish Restoration Excise Tax Collections 1951-2009



Notes:

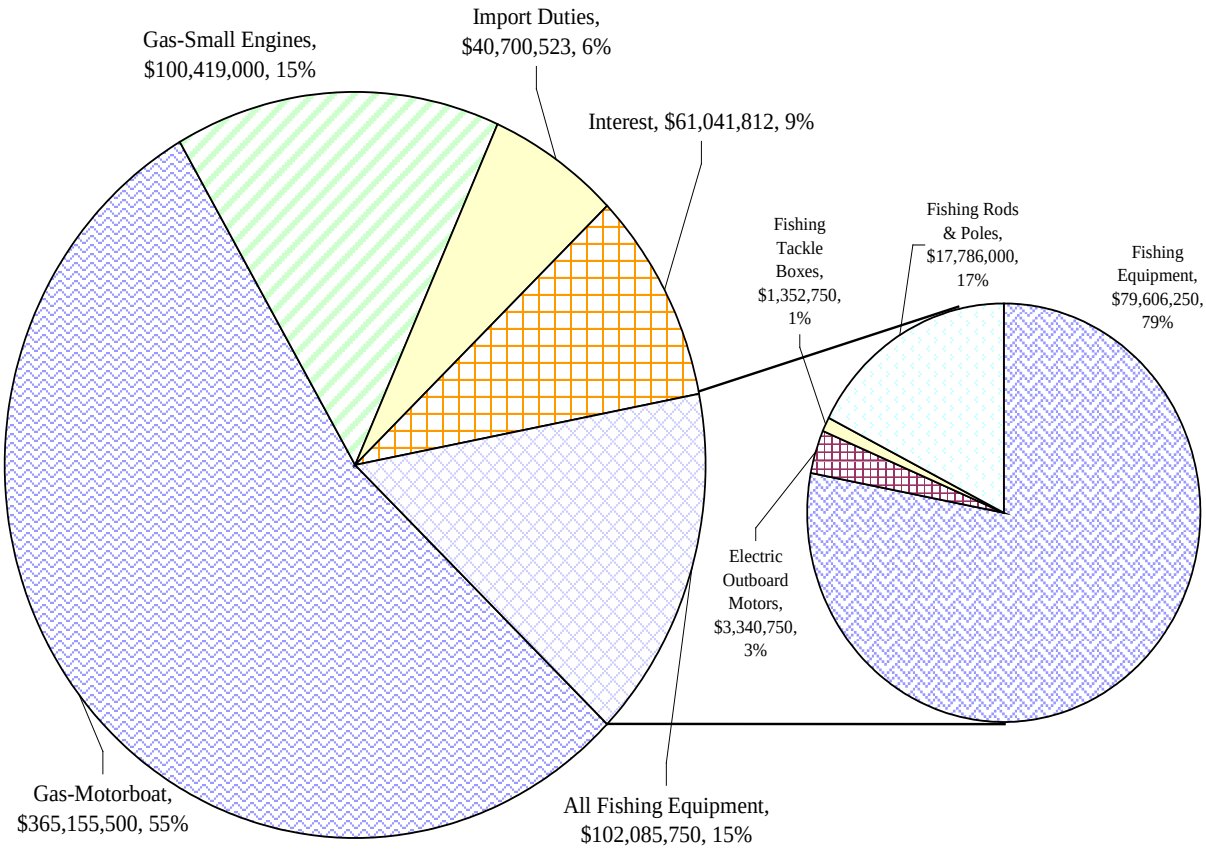
[a:] Total Gross Receipts includes all categories, including boater's gasoline taxes, interest, import duties, etc.

[b:] Major changes include: 1985 motor boat gasoline tax and import duties added; 1993 small engines fuel tax added; 2005 sonar taxes discontinued, tackle boxes reduced to 3%, and fishing rods capped at $10.

Current Program Status

Over the last four years (2006-2009), Sport Fish Restoration receipts (including boaters' gasoline taxes) averaged $669,402,585. Of this, $102,085,750 (15%) came from the excise taxes on "All Fishing Equipment" (Figure 2). Within this category, fishing equipment such as tackle is the largest contributor at an average of $79,606,250 annually. Excise tax collections on rods and poles contribute another $17,786,000 annually. These two subcategories account for 96% of the larger "Fishing Equipment" category.

Figure 2. Average Annual Contributions to Sport Fish Restoration Account (2006-2009)



Excise taxes paid by the sport fishing equipment manufacturers to the U.S. Treasury on a quarterly basis. As with all sources of revenue destined for the Sport Fish Restoration Program, they are transferred to the dedicated Sport Fish Restoration Account. These funds are distributed according to allocations established in the 2005 amendments to this Act as follows:

- Sport Fish Restoration Grants to States – 57%
- Coastal Wetlands Act – 18.5%
- U.S. Coast Guard Recreational Boating Safety Program – 18.5%
- National Fishing and Boating Outreach & Communications Program – 2%
- Clean Vessel Act Grants (boat (boat pumpout facilities) – 2%
- Boating Infrastructure Grants (facilities for boats 26' and greater) – 2%
- Multistate Conservation Grants - $3 million
- U.S. Fish & Wildlife Service Administration (Flat Fee adjusted annually for Consumer Price Index)

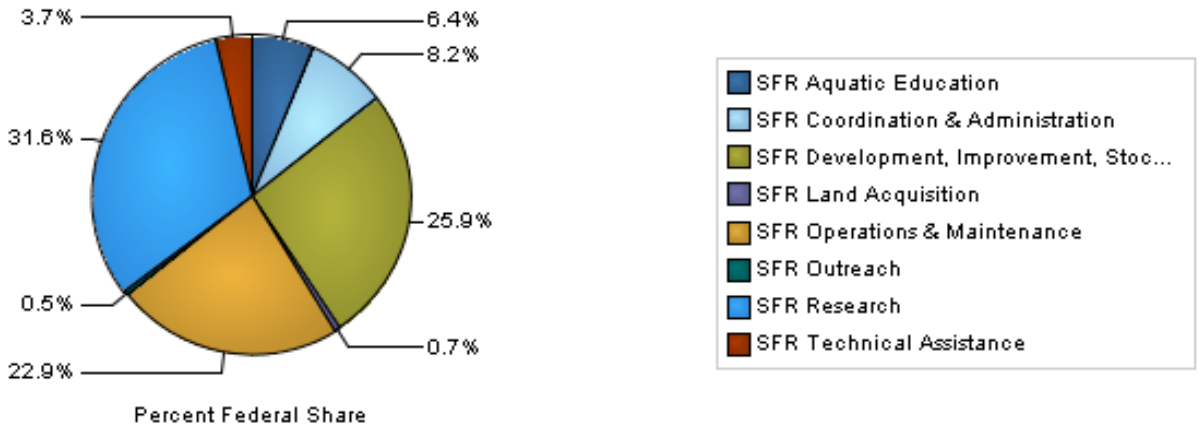
The main portion of this (Sport Fish Restoration Grants to States) is distributed to states for fisheries-enhancement programs by a formula that takes into account each state's size (land area) and number of certified anglers. Funds are only paid to states on a reimbursable basis (after work is completed) for approved projects. The remainder of this document deals primarily with these funds apportioned to state fisheries agencies.

Funded Programs

The legislation establishing the Sport Fish Restoration Program defined "fish restoration and management projects" as "projects designed for the restoration and management of all species of fish which have material value in connection with sport or recreation in the marine and/or fresh waters of the United States." This includes research, fish culture (e.g., hatcheries), development of information to "guide and direct the regulation of fishing by law," the formulation of fishery management plans, and habitat improvement. Additions were made to these activities to include angler and boater access and aquatic resources education. (In 2010, each state is mandated to spend at least 10 percent of their apportionment on education and 15% on boater access). These projects only comprise the "Grants to States" portion of the Sport Fish Restoration program; other types of programs are funded with the remaining funds as outlined earlier.

Currently (2009-2010), the primary areas of investment of these funds by the states are in fisheries research (32%), development and stocking of fisheries (26%), and operation and maintenance of facilities such as angler access, fish hatcheries, and fish ladders (23%) (Figure 3).

Figure 3. Areas of investment by states of Sport Fish Restoration Funds



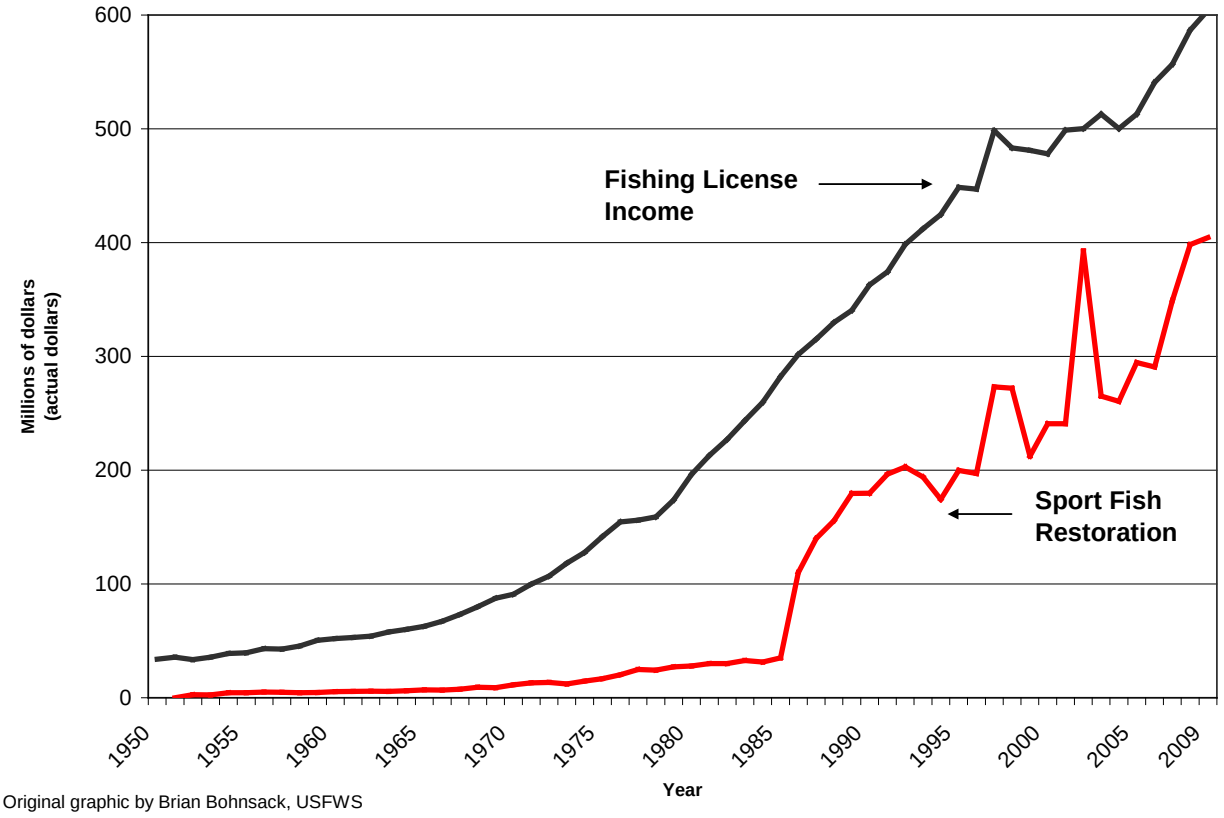
Benefits to Industry

Leveraged Funds

An often overlooked benefit of the Sport Fish Restoration Program to the recreational fishing industry is the program's ability to leverage outside funding for fisheries enhancement projects. The most obvious demonstration of this leveraging ability is the provision requiring states to utilize angler license dollars for wildlife and sport fish programs as a condition of receiving funds. Undoubtedly, if this provision was weakened, or the Sport Fish Restoration program was eliminated, the majority of these license dollars would eventually be applied to uses other than fisheries management. This is poignantly true in today's fiscal climate where state governments are facing unprecedented shortfalls and are searching for revenue wherever it can be found. A number of attempts in recent years by politicians to divert these funds for non-fishing purposes have been successfully defeated using the Federal provisions prohibiting such actions.

Every year since 1950, the revenue generated by fishing licenses in the United States has exceeded the grants to states through Sport Fish Restoration, even after the massive influx of boaters' gasoline tax in 1985 (Figure 4). The amount by which license revenue has exceeded Sport Fish restoration funding was as high as 1,200 percent in the early years of the program but averaged 760% annually 1955-1985 when the gasoline taxes began to be included. Since gasoline taxes began to be allocated to Sport Fish Restoration, the annual amount by which license revenue exceeds Sport Fish Restoration funds averaged close to 100 percent. Therefore, before the industry investment even hits the ground, its value is doubled -- money that would not likely be available for fisheries management in the absence of this program.

Figure 4. National Sport Fish Restoration Grants to States and License Income: 1951-2009 (actual dollars)



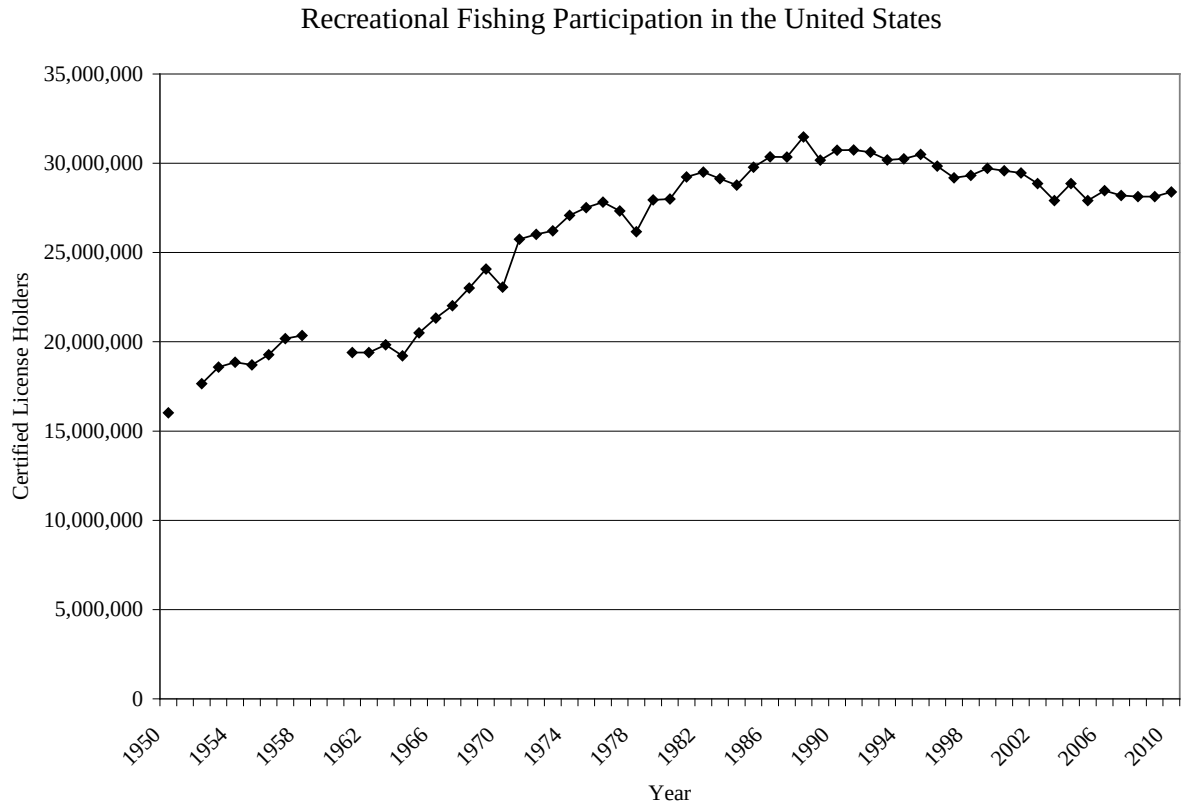
Original graphic by Brian Bohnsack, USFWS

Fishing Participation

The two primary measures important to industry's return-on-investment are the number of participants (anglers) and how much those anglers are spending on tackle-related items.

From 1950 -- the year of passage of the original Sport Fish Restoration Act -- until 1991, the number of anglers in the United States grew steadily. According to the number of certified license holders being reported to the U.S. Fish and Wildlife Service, angler participation peaked in 1988 at almost twice the number of anglers in 1950. Since 1991, the number of anglers has diminished slightly. However, even though the number of anglers has recently declined, there were still more than 1.7 times more anglers in 2010 as there were in 1950 using certified licenses as a measure (Figure 5).

Figure 5. National Certified Fishing License Holders in the United States: 1950-2010

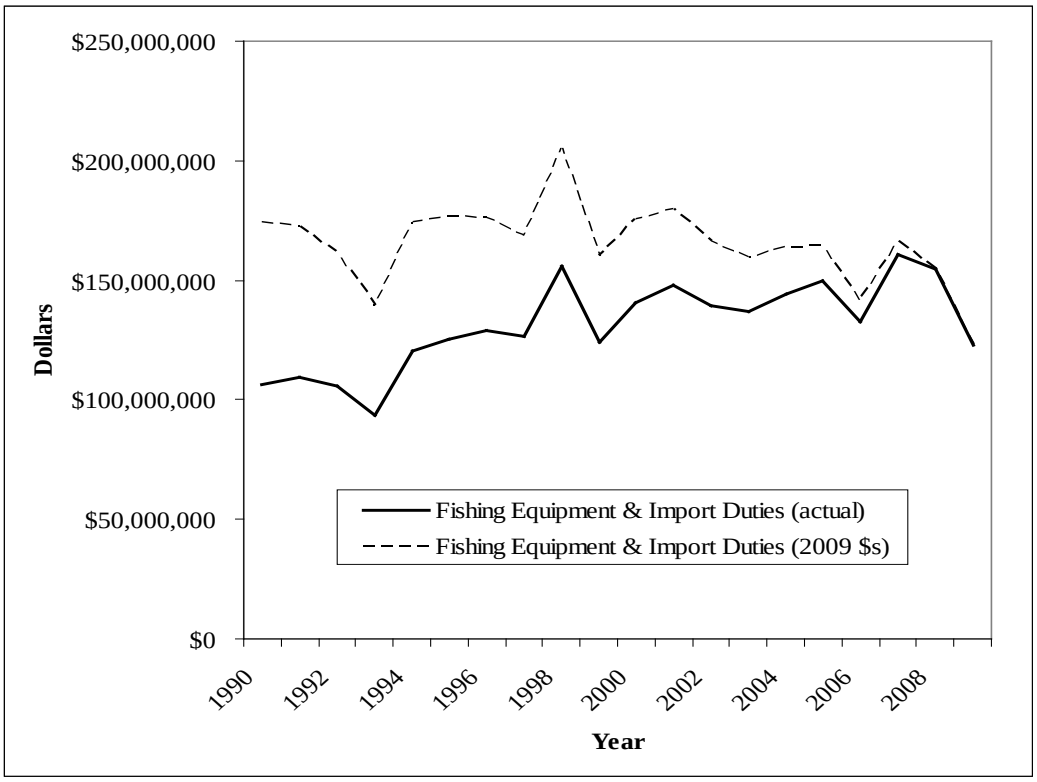


Source: Fish and Wildlife Service National License Certification Report

Federal Excise Taxes

During the period when the number of licenses sold was decreasing (1990-2006), the excise tax collections on sport fishing equipment fluctuated, but generally began to fall off in the last nine years. The sharp decline in excise tax collections in 2009 was led by significant reductions in excise taxes for general fishing equipment, fishing rods (and components), and electric outboard motors from the previous year. The 2009 excise tax collections, when adjusted for constant dollars, represent the lowest collections since the comparable time series of data began in 1990. This drop in fishing equipment excise taxes was more than made up for in the collections of motor boat fuels tax, in part attributable to a change in federal law that allowed the full amount of the gasoline tax attributable to boaters to be allocated to Sport Fish Restoration beginning in 2006 (Figure 6).

Figure 6. Fishing Equipment Excise Tax Collections: Real and Inflated (1990-2009)



Although industry has been a long-term partner in the development and continued success of these programs, today's competitive business climate presents tough challenges to companies. The excise tax is often one of the top three expenses for a company, pushing some companies to question the value of paying these taxes, particularly in the absence of a measure connecting this expenditure to company profitability. Traditional communications over the years have described the "success" of the excise tax in terms of how much money was spent, not how much was returned. While this approach is valuable, it is only mildly effective from a business perspective since companies measure success in earnings.

Table 1 provides a comparison between Sport Fish Restoration excise tax collections and angler purchases of tax-related equipment items for the last ten cycles of the National Survey of Fishing, Hunting, and Wildlife-Activity Recreation (conducted every five years between 1955 and 2006). The following discussion is presented in terms of constant (2009) dollars. *For the years in which the National Survey was conducted*, excise tax and import duty collections range from a low of $42.3 million in 1960 to a high of $179.4 million in 2001. Anglers are estimated to have purchased just under $2.0 billion of tax related equipment items in 1955. These purchases grew slowly through 1970 to roughly $2.6 billion. Angler purchases of tax-related items then rose dramatically in 1980 to more than $4.8 billion to a peak of $7.2 billion. Angler purchases of excise-tax related equipment have since returned to roughly $5.6 billion per year in 2001 and 2006 (all in constant 2009 dollars).

Table 1. Excise Tax Collections and Angler Purchases of Tax Related Equipment Items

	SFR Excise Tax Collections		Angler Purchases of Tax Related Equipment Items				
Year*	Actual $s	2009 $s	Actual $s	2009 $s	Wholesale Adjusted 2009 $s		Excise Tax-Related ROI
1955	$5,347,425	$42,806,739	$243,626,000	$1,950,253,402	$975,126,701		2178%
1960	$5,835,695	$42,296,365	$308,326,000	$2,234,707,266	$1,117,353,633		2542%
1965	$7,373,380	$50,217,870	$323,543,000	$2,203,553,797	$1,101,776,898		2094%
1970	$13,924,091	$76,990,533	$469,149,000	$2,594,067,500	$1,297,033,750		1585%
1980	$33,640,051	$87,585,384	$1,845,321,000	$4,804,485,818	$2,402,242,909		2643%
1985	$67,936,953	$135,455,298	$2,786,922,000	$5,556,671,795	$2,778,335,897		1951%
1991	$109,539,184	$172,541,908	$3,740,104,000	$5,891,267,928	$2,945,633,964		1607%
1996	$128,929,356	$176,291,378	$5,308,674,000	$7,258,808,119	$3,629,404,060		1959%
2001	$148,140,211	$179,455,429	$4,617,612,000	$5,593,724,594	$2,796,862,297		1459%
2006	$132,600,207	$141,109,378	$5,332,401,000	$5,674,589,848	$2,837,294,924		1911%

*In 1975, data was collected by a private contractor utilizing different methodology and reporting detail that does not enable comparisons with other survey years.

Return-On-Investment (ROI)

Retail purchases are only a rough indicator of the amount of tax contributed by industry because the tax is levied at the point of first sale. In order to estimate an industry-level return on investment, it is necessary to remove markups in the market chain to arrive at an estimate of the dollar value making it back to the manufacturer. Therefore, to account for the markup in prices from the manufacturer point of sale (which is reflected in the excise tax collections) and the retail point of sale (which is reflected in angler purchases of tax-related items), retail purchases were adjusted by a factor of 2.0.[8] Wholesale adjusted purchases range between $975 million and $3.6 billion. Estimated Excise Tax-Related ROI ranges between a low of 1,459% in 2001 to a high of 2,643% in 1980.

It is important to remember that the reported Excise Tax-Related ROI only includes the excise taxes and import duties paid by companies as the "investment." Adding in the angler license funds and other leveraged funding sources on the investment side would not allow companies to see the return received from the taxes they paid. If all license and leveraged funds were included in a ROI estimate, the resulting estimate would be lower than the 2,643% estimated in 1980 *but would not be a true industry ROI.*

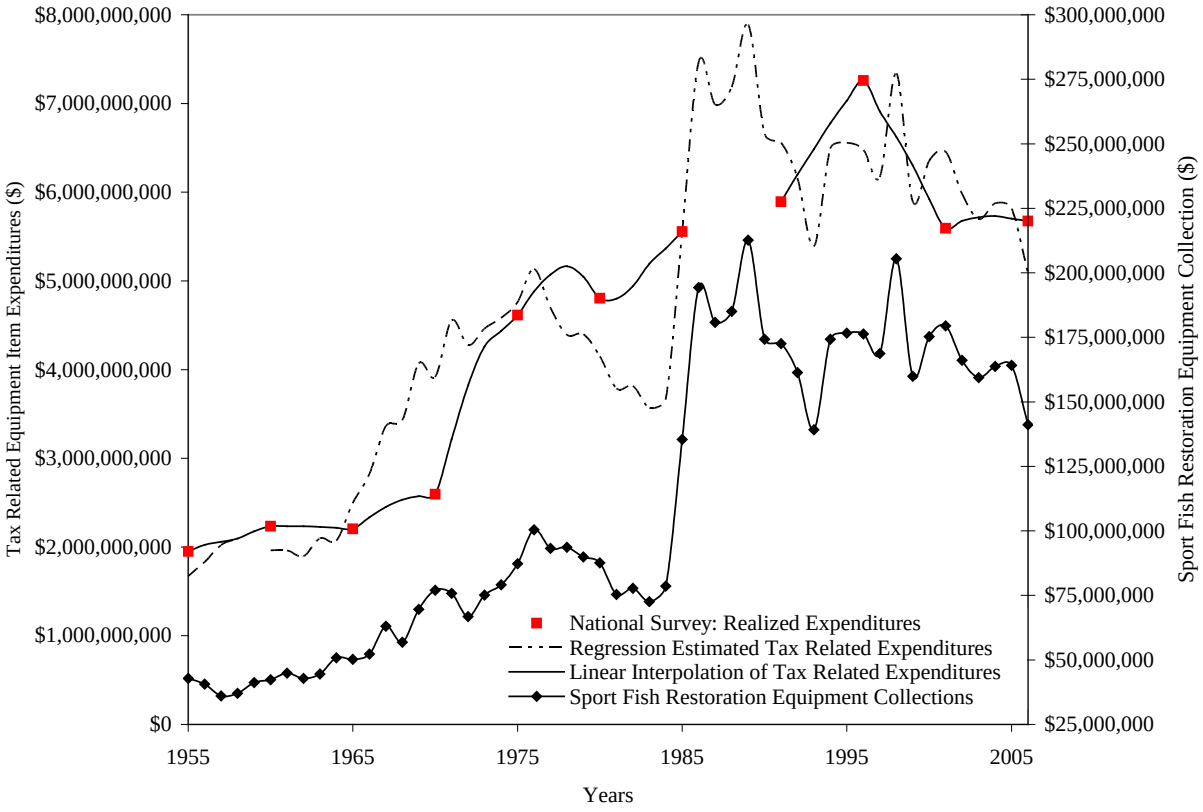
Figure 7 graphically compares these same fishing equipment tax receipts to retail purchases by anglers of taxable fishing equipment in constant (2009) dollars and broadens the picture beyond those years when National Survey data were collected.

[8] Based on typical mark-ups identified by Southwick Associates in a variety of sportfishing and hunting industry surveys conducted in recent years.

(Note: the two graphs are on different scales).[9] Similar to Figure 4, annual excise tax and collections on fishing equipment and import duties fluctuated between $36.0 million and $212.6 million. Since the peak in 1989, collections have fluctuated and shown an overall decline to $141.1 million in 2009.

Retail purchases by anglers reported for the National Survey are reflected in each of the red points (Fig. 7).[10] The National Survey only reports angler expenditures every five years. To fill in the gaps in the intervening years, retail spending is estimated using two different approaches. The first involved linear interpolation between survey years. These estimated purchases are reflected by the solid black line. It is arguable that spending likely did not steadily increase from one year to the next. Particularly, given that excise tax collections, which may somewhat reflect angler spending, showed annual fluctuations over the period.

Figure 7. Sport Fish Restoration Tax Collections and Tax Related Equipment Item Purchases: Actual and Estimated from 1955-2009 (2009$s)



Notes: Fishing tackle receipts adjusted to 2009 dollars from IRS tax collection records. Expenditure data adjusted to 2009 dollars for fishing tackle items only from USFWS National Survey of Fishing, Hunting, and Wildlife Associated Recreation. Also, a break is place between National Survey collection years of 1985 and 1991 to denote a methodological change in survey implementation to minimize recall bias. Anglers were asked to report purchases three times during the year to minimize recall bias. This change to implementation impacts the ability to make direct comparisons over the whole period.

[9] U.S. Department of Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

[10] The 1975 survey methodology was significantly different, so the data point for 1975 was interpolated using total angler expenditures on tax related equipment items in 1970 and 1980.

A second approach applies the correlation between excise-tax collections and retail purchasing and utilized linear regressions to fill in the gaps. Regression-estimated retail purchases by anglers are reflected by the broken black line. These regression-estimations do share some fluctuations with the tax collections.

Using these angler retail spending estimates, it is possible to calculate an annual Excise Tax-Related ROI for the whole period between 1955 and 2006 (the last year of data from the National Survey). After adjusting for market chain markups and inflation, the average annual purchases of tax related items is estimated to be between $2.3 billion and $2.4 billion over the period from 1955 to 2006. Over the same period, average annual tax collections are $110 million. This results in estimated annual Excise Tax-Related ROI between 2,157% (interpolated range: 1,292% and 3,476%) and 2,155% (regression range: 1,670% and 3,097%). Annual collections, purchases and Excise Tax-Related ROI values are reported for the whole period in Appendix C.

The Effect of Time Lags

In reality, there is a delay in the time from when the excise tax payments are made and when the resulting angler purchases take place. Not only do time lags exist in the normal marketplace, but state agencies take time to invest the excise tax funds into projects and additional time is necessary for those projects to impact the fishery resources and angler participation. A project such as stocking catchable-size fish will have a relatively short time lag since anglers know that catchable fish will be stocked and therefore will invest in fishing equipment to take advantage of it. However, projects such as habitat improvement or lake creation may take years to produce changes that become evident in angler purchases. To account for these time lags, comparing excise tax collections in a period of years prior to angler purchases may be a more realistic way to evaluate return-on-investment.

Using a 5-year off-set approach (collections between 1955 – 2001 and purchases 1960 – 2006) yields the following: collections total $4.92 billion and adjusted angler purchases of fishing equipment range between $113 billion and $115 billion. The estimated Excise Tax-Related ROI is between 2,197 and 2,242%.

Then and Now: What would Sport Fishing Look Like Without the Sport Fish Restoration Excise-Tax Program?

Nobody can predict precisely what fisheries management, the state of recreational fishing, or the sport fishing industry would look like if the Sport Fish Restoration Program had not been implemented or were to be discontinued. However, some historical perspective is beneficial for developing a sense of the conditions in the years leading up to passage of the Act in 1950.

The number of Americans taking to the lakes and streams for recreational fishing steadily increased in the 1930's. By the onset of World War II, more than 8 million recreational anglers were "chasing the fish," about 66% more than just a decade

before[11]. By the end of World War II, with servicemen returning home, the economy growing, and with increasing leisure time, recreational fishing exploded. Between 1944 and 1945 alone the number of recreational anglers increased by 34%.

But the increasing number of anglers was taking its toll on the fishery resources and habitat. In 1952, Robert M. Rutherford, the chief of the branch of the U.S. Fish and Wildlife Service administering the newly implemented Sport Fish Restoration Program, described the state of recreational fishing in the United States as follows[12]:

> "...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. Invasions of aquatic plants, ranging from harmful to destructive, all too frequently impair the angler's chances or force him to travel to other waters. There are many fishery problems that must be solved, and this calls for study and action by the state fish and game departments. With rare exception, there is not enough money to do the work satisfactorily. Income from fishing-license sales—almost always the state's only source of revenue—must be spread too thin."

In summary, the growing number of anglers was facing a lower quality fishing experience. It is not difficult to imagine that the customer base of recreational anglers who were increasingly dissatisfied with their experience would find pursuits that were more satisfying than provided by fewer, and stunted, fish.

Since Rutherford penned this description, and the Sport Fish Restoration program has now been in place for nearly 60 years, angler numbers have increased by at least thirty-three percent (certified licenses sold) and perhaps as much as 100%, depending on which measure is used. Yet, fish stocks and angling opportunities, for the most part, remain relatively healthy even though challenges remain in specific areas. Few, if any, professional fishery biologists would characterize the state of U.S. fisheries as Rutherford did in 1952. For the industry, this has translated into profitability. Judging by the excise tax receipts for only sport fishing equipment (which are based off of the value of the manufactured product), between 1951and 2009 the value of the products produced by the sport fishing industry as grown by roughly 270% (in constant dollars)!

[11] The number of recreational anglers prior to 1950s is taken from historical records of the U.S. Fish and Wildlife Service and is based on reports given to them by the states. These estimates are not "certified" as the post 1950 records and should only be used for generalizations.

12 Rutherford, R.M. 1952. Federal Aid in Fish Restoration, General Information. Regulatory Announcement 34. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. January 1952. 13p.

Beneficiaries of the Sport Fish Restoration Program – industry and anglers alike – should realize that the revenue from the manufacturer's excise tax is but one asset of this program. As had been noted previously, the Sport Fish Restoration Program also:

- Guarantees that angler license dollars are not diverted away from fisheries conservation and management;
- Ensures that the workforce managing fisheries "are selected on the basis of competency for the services performed" and not for other reasons (e.g., political favoritism).

It is important to reiterate that the excise tax on sport fishing tackle was an existing excise tax that was transferred to the trust fund and dedicated to sport fisheries conservation and management. These taxes existed since at least 1941. If the Sport Fish Restoration program was rescinded or reallocated, the direct loss by states of $404,450,000 (just grants to states, not including other programs under Sport Fish Restoration) would need to be made up in license fees in order to maintain current programs. This would likely require an across the board increase in license fees by more than 67%. Assuming that state agencies could hold off political diversions of these license dollars, which is highly unlikely, this increase in license fees would likely cause a decline in angler participation. This in turn would decrease overall spending for fishing tackle. Restructuring the funding of fisheries conservation so that it is entirely dependent on fishing-license fees would seriously undermine long-term conservation efforts and likely destroy what is widely regarded as the most successful fisheries conservation program in the world.

Today, anglers and industry are living off of the investments made by previous generations while also making investments for the future. A real or perceived erosion of support for the program – whether incremental (such as through elimination of the items taxed or reduction in the taxes paid) or complete elimination would likely mean at least a partial return to the conditions prior to 1950. That is, angler license dollars would eventually be subsumed for non-fishery related purposes, the quality of fishing opportunities would begin to degrade in the face of increasing human population and development, and that staffing of fisheries management offices would be based on factors other than professional competency (e.g., political appointment, etc.). Again, it is not hard to imagine that without professional and forward-looking fishery management that the condition of fish stocks, and the quality of the fishing experience, would begin a backward slide.

As has been noted in the analysis of the overarching return-on-investment of the excise tax and through a series of case studies, the excise tax dollars do have a positive impact on the manufacturers who pay the tax. Elimination of the tax and integrated provisions within the current law would have a cascading downward impact on the ability of states to manage recreational fisheries that would undoubtedly reduce angling participation and sales revenue to those manufacturers.

Case Studies

The following case studies reflect a two-pronged approach to identify projects and programs receiving Sport Fish Restoration funds that would be appropriate for this analysis. As described previously, the first round involved state self-nomination of projects. The second involved a review of U.S. Fish and Wildlife Service's FAIMS database. All projects were explored in depth to determine the level of data available to analyze return on investment. Those studies presented here are those that offered a rich level of data and should not be seen as an affirmation of any one particular project over another.

As seen earlier in this report, the overall return-on-investment related to the excise tax nationwide regularly exceeds 2,000%. Individual projects funded with the excise tax can be viewed as individual holdings in an investment portfolio. While some holdings yield a positive return, others yield a negative return. Likewise, with fishery enhancement projects, most pay positive returns (as evidenced by the significant overall ROI) but others, when measured as a stand-alone entity, are negative. Those with negative financial returns are not inherently "bad investments." They may pay huge dividends to the advancement of knowledge to fisheries management and science that can be applied to make other projects a success – dividends that cannot be measured by traditional financial metrics. Additionally, a state relies on a mix of fishing opportunities to attract anglers to fish in their state. Similar to grocery stores offering loss leaders in order to provide a wide selection of products that attract customers, a diversity of fishing opportunities in a state --some with positive ROIs to industry and some with negative-- attracts more anglers. This is fine as long as the cumulative result of all projects is positive for industry.

The following section develops brief narratives about six case studies. Every effort is made to report either an excise-tax-related ROI or total-project ROI or both in all case studies. However, not all case studies will present a ROI. Some will provide a synopsis of economic benefits to industry from specific angling opportunities.

It is important to note that many of these case studies investigate projects that have spanned many decades and total program expenditures are not attainable. In these cases, a period of "recent history" is highlighted to reflect annual rather than total investments, angler purchases, and return on investments.

Case #1: Cedar Creek Lake, Kentucky

Data Contributors: Kentucky Dept. Fish & Wildlife Resources

SYNOPSIS (2009$s)	
Project Type	Lake Creation
Total Excise Tax Investment [(b)]	$4,913,371
Total Additional Investment [(d)]	$4,519,130
Angler Spending on Tax Related Items [(a)]	$4,392,260
Angler Spending on All Angler Recreation Items [(c)]	$55,440,285
Total Project ROI (Cumulative Return on Investment)	488%
Project Lifespan:	25 years
Total Project ROI=(c-(b+d))/(b+d) Excise Tax-Related ROI is less than 0 under these assumptions	

The Need

Today, Cedar Creek Lake, Kentucky, is a popular 784-acre lake less than two hours drive from major metropolitan areas such as Louisville, Lexington, and Frankfort. However, prior to 2002 and the investment of Sport Fish Restoration and other funds, this lake did not exist.

Action Taken

While planning for a major highway realignment near Stanford, Kentucky, the Kentucky Department of Transportation and Department of Fish and Wildlife Resources teamed up to build Cedar Creek Lake and bring new recreational opportunities to this part of the state. A total of 1,600 acres of land was purchased by the Department of Fish and Wildlife Resources for the construction of Cedar Creek Lake, riparian buffer zones, parking, and other infrastructure. Construction of the dam was funded by the Department of Transportation and Lincoln County. The lake was stocked with largemouth bass, channel catfish, black crappie, bluegill, and redear sunfish and opened to the public in 2002. The Department of Fish and Wildlife Resources manages Cedar Creek Lake as the state's only "trophy largemouth bass fishery" by implementing a 20-inch minimum size limit and 1-fish daily creel limit.

Use of Sport Fish Restoration Funds

The total cost of this project was approximately $8.5 million in actual dollars, with over $4 million in Sport Fish Restoration funds used for acquisition of all land, construction of three boat ramps, parking lots, and courtesy docks. The cost to construct the dam was an additional $4 million.

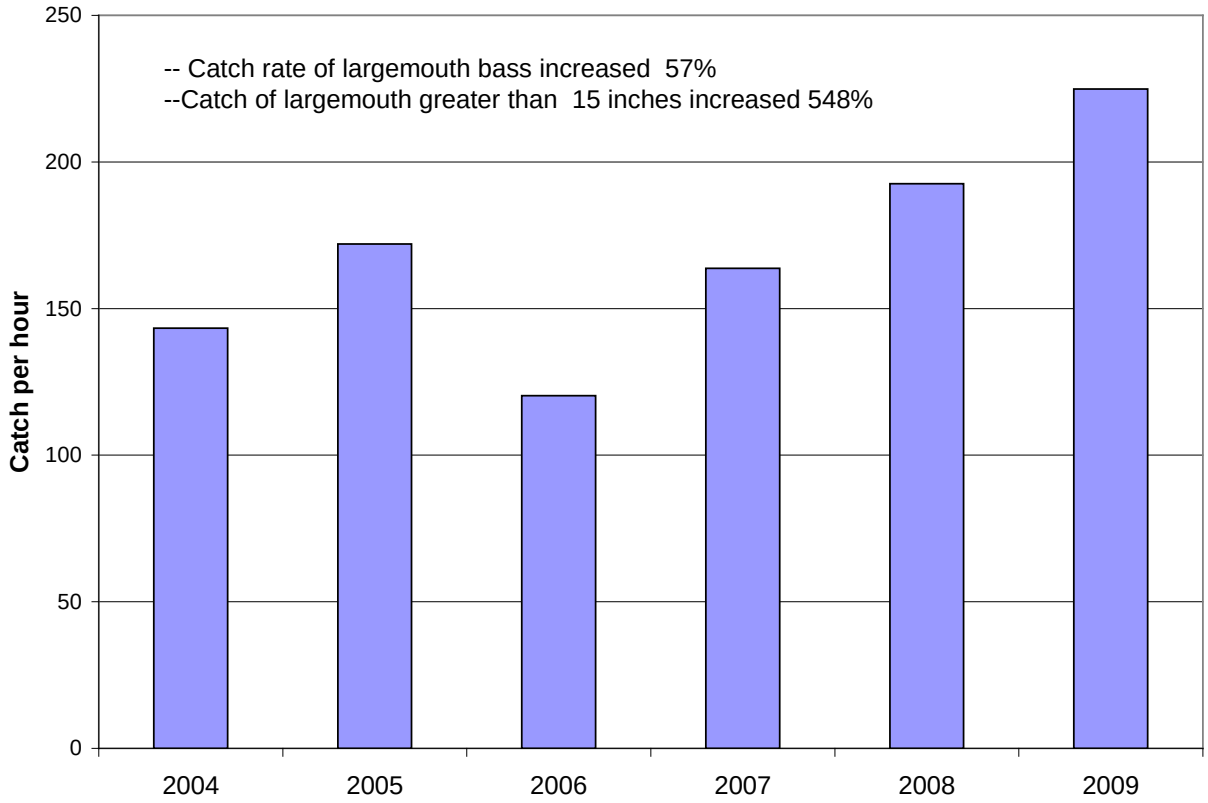
Table 2. Cedar Creek Lake, Kentucky Investments (actual $s)

	SFR Excise Tax Funds	Matching Funds
Lake Construction	$4,185,947	$4,000,000
Boat Ramp	$120,000	$40,000
Stocking	$139,619	$46,539
Total	$4,445,566	$4,086,539

Population Response

The objective of establishing a trophy largemouth bass population is showing great success. The population of largemouth bass grew and by 2005 (three years after stocking), 28% of the bass population were greater than 15 inches. The first 20-inch largemouth bass was collected during spring sampling in 2006 and the numbers of largemouth bass greater than 20 inches have increased annually since then. Anglers routinely report catching largemouth bass exceeding 8 pounds.

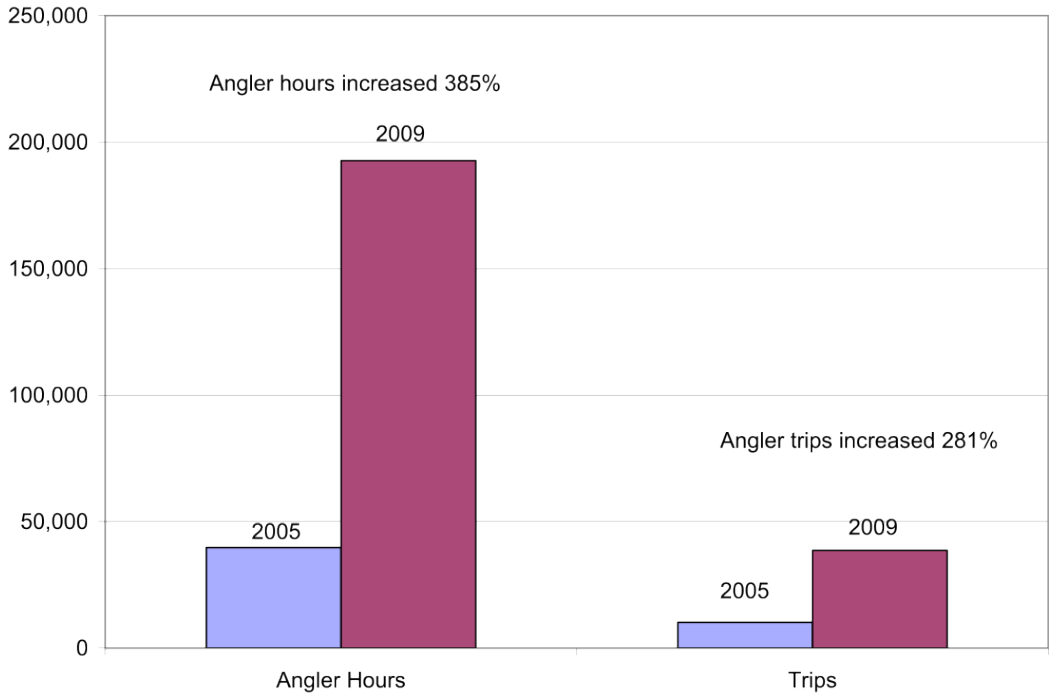
Figure 8. Largemouth Bass Catch Rate: 2004-2009



Angler Response

The most recent creel survey conducted April-October 2009 documented a minimum of 38,561 trips (49.2 trips per acre), an increase of 281% from 2005 during this same time period. This constituted 192,691 hours of fishing effort (246 hours per acre) at Cedar Creek Lake, or an increase of 385% from four years earlier. A total of 296,539 fish were caught by anglers (roughly 1.5 fish caught per hour) with 26% of these being largemouth bass. Eighty-two percent of all anglers fishing Cedar Creek Lake were boat anglers, while 18% were bank anglers. An angler attitude survey in 2005 indicated that 98% of all bass anglers were satisfied with the bass fishery at Cedar Creek Lake. Similar overwhelming support for the bluegill and channel-catfish fisheries was also documented.

Figure 9. Angler hours and trips to Cedar Creek Lake: 2005 vs. 2009



Return on Investment

Total- and tax-related equipment item purchases are isolated from National Survey state-level reports for Kentucky for 2001 and 2006. In order to estimate a return on investment, annual per trip expenditures were interpolated using a simple straight-line assumption between two survey years. All expenses (trip expenses and angler purchases of equipment) are inflated to 2009 dollars. Total spending per angler per trip ranges between $56.78 and $111.19.

Assuming that angler effort is modeled to increase at a steady rate from no effort in 2001 to current levels (38,561 in 2009), anglers' annual retail purchases rose from $161,000 to $4.2 million over this period. Between 2002 and 2009, total spending is estimated to be $14.8 million.

Table 3. Return on Investment: Cedar Creek Lake, KY

	Total Angling
Investments (2009 $'s)	$9,432,501
Angler Purchases: 2002-2009 (2009 $'s)	$14,815,331
Present Value of Future Purchases	$40,624,974
Realized and Future Angler Purchases	$55,440,285
Net Benefits	$46,007,783
Total Project ROI	488%

Future trips are assumed to total 38,561 trips annually and a time horizon for the fishery in Cedar Creek of a minimum of 25 years is assumed. A 7% discount rate is applied to a present value calculation. The total present value of future spending is estimated to be $40.6 million in total spending. Coupled with the benefits already accrued between 2002 and 2009, spending across all categories is estimated to total $55.4 million.

Investments are assumed to be distributed over two years. Construction costs are allocated in 2000 and boat ramp construction costs as well as stocking costs are allocated in 2001. Sport Fish Restoration investments allocated to angler access total $4,913,371 when inflated to current dollars. Additional funds are contributed in the amount of $4,519,130 in current dollars. Net benefits from total angler spending are estimated to be $46.0 million and the Total Project ROI is 488%.

Case #2: Wolf Creek Reservoir, Kansas

Contributors: Kansas Department of Wildlife and Parks

SYNOPSIS (2009$s)	
Project Type	Lake Access
Total Excise Tax Investment [(b)]	$694,925
Total Additional Investment [(d)]	$298,281
Angler Spending on Tax Related Items [(a)]	$472,110
Angler Spending on All Angler Recreation Items [(c)]	$4,966,550
Total Project ROI (Cumulative Return on Investment)	400%
Project Lifespan	25 years
Total Project ROI=(c-(b+d))/(b+d) Excise Tax-Related ROI is less than 0 under these assumptions	

The Need

Wolf Creek Reservoir in eastern Kansas (also known as Coffey County Lake) was constructed in the late 1970's and filled by 1982 to serve the cooling needs of a nearby nuclear power plant. However, this 5,100-acre impoundment was off limits to recreational anglers until 1996.

Action Taken

In the spring of 1996, the Kansas Department of Wildlife and Parks began construction on angler access facilities at Wolf Creek Reservoir which, up to this point, had been exposed to minimal fishing pressure. Due to the proximity of the nuclear power plant, special considerations for security needed to be incorporated into the public-access plan. Working in conjunction with Coffey County and the Wolf Creek Nuclear Operations Center, an access road, parking area that can accommodate 75 car/trailer combinations, five-lane boat ramp, breakwater, boat dock, restrooms, perimeter security fence, entry guard house, and warning sirens were constructed. The facility opened to anglers during 1996 but briefly closed for several months in 1997-98. In June, 1998, the lake opened permanently to the public, providing fishing opportunities for largemouth and smallmouth bass, walleye, crappie, panfish, wipers, and catfish.

Use of Sport Fish Restoration Funds

The total cost of the project was $865,683, with Coffey County and the Wolf Creek Nuclear Operations Center providing the non-federal match to Sport Fish Restoration funds:

Table 4. Wolf Creek, Kansas Investments

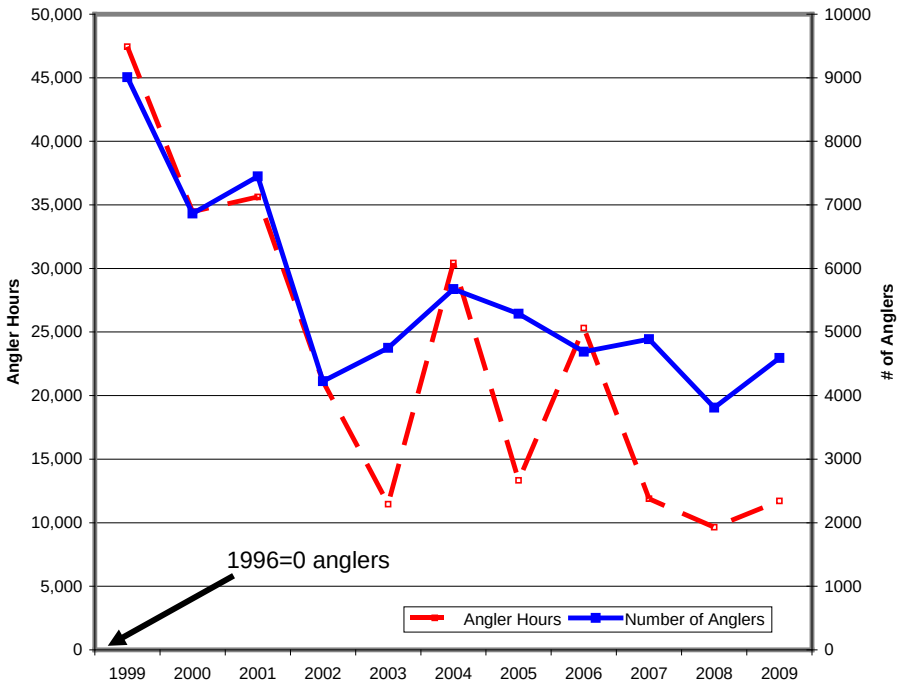
Sport Fish Restoration	$605,700 (1997)
Non-federal match	$259,982
Total	$865,682

The lake is monitored and maintained using only state, private, and local funds, with no ongoing Sport Fish Restoration Fund investment.

Angler Response

Due to the unique status of Wolf Creek Reservoir as a nuclear-power cooling reservoir, all anglers must check in and out of the access area. Therefore, a complete census of angler effort is possible. The number of anglers allowed on the lake each day is capped at 250. In 1996, there were no anglers visiting Wolf Creek Reservoir. The initial opening in 1997 resulted in a rush of anglers to take advantage of a new fishing opportunity, with 16,538 anglers being interviewed. Since that time, angler visitation has stabilized at more manageable levels, with an average of 5,200 anglers annually 2000 – 2009.

Figure 10. Wolf Creek Fishing Effort: 1999-2009



Return On Investment

Total- and tax-related equipment item purchases are isolated from National Survey state-level reports for Kansas for 1996, 2001, and 2006. All estimates are inflated to 2009 dollars. Total spending per angler trip ranges between $26.07 and $50.73. In

order to estimate a return on investment, annual per-trip expenditures were interpolated using a simple straight-line assumption between two survey years.

Angler purchases are calculated based upon the number of anglers, recorded at check in and check out, as a proxy for the number of trips. These range between 9,008 in 1999 to 4,591 in 2009. Total angler purchases between 1999 and 2009 are estimated to have accrued to $2.6 million.

Table 5. Return on Investment: Wolf Creek, KS (2009 $s)

	Total Angling
Investments	$993,206
Angler Purchases: 1999-2009	$2,649,376
Future Annual Fresh Water Tax Related Item Exp. By Anglers	$264,957
Present Value of Future Angler Purchases	$2,317,174
Total Benefits over the Lake Lifespan	$4,966,550
Net benefit	$3,973,343
Total Project ROI	400%

Future trips are assumed to total 5,223 trips annually (the average annual trips over the last decade), a time horizon for Wolf Creek of the remaining 14 years, and a 7% discount rate are assumed to estimate the present value of future angler purchases. Total annual fishing recreation spending is estimated to be $264,957. As a result, current day values of future spending are estimated at $2.3 million. Angler trip and equipment spending totals $5.0 million over the life of the lake.

Sport-fish restoration investments allocated to angler access total $694,925 when inflated to current dollars. Additional funds are contributed in the amount of $298,281 in current dollars. Net benefits from total angler spending are estimated to be $4.0 million and the Total Project ROI is 400%.

Case #3: Maintenance of the Atlantic-Coast Striped Bass Fishery

Data Contributors: U.S. Fish and Wildlife Service and NOAA Fisheries

SYNOPSIS	
Project Type	Annual Fishery Management
Excise Tax Investment (average 1995-2009)	$2,015,609 per year
Federal and State Investment (average 1995-2009)	$2,954,220 per year
Angler Purchases of Tax-Related Equipment (average 1995-2009 in 2009$s)	$68,405,592 per year
Angler Purchases on All Fishing Recreation (average 1995-2009 in 2009$s)	$1,017,556,257 per year
• If the SFR investment *alone* was responsible for a 2-6% annual increase in angler trips it would generate an Excise Tax-Related ROI of 10% to the sport fishing equipment manufacturers.	
• If the SFR investment alone increased trips by more than 3%, the Excise Tax-Related ROI would increase accordingly.	
• If Federal and State investments alone increased trips by an average of 0.4%, it would generate a Total Project ROI of 10% to all industries involved with angler recreation.	
• The traditional Excise Tax-Related ROI for the Sport Fish Restoration investment between 1995 and 2009 averaged just above 3,000% <u>but</u> this does not take into account investments from other federal and state programs, which may be significant.	

The Need

Striped bass populations form the basis for one of the most significant fisheries on the Atlantic seaboard from Maine to North Carolina. During the 1970's, striped bass stocks were severely diminished by overfishing and other factors. In 1984, the federal Atlantic Striped Bass Conservation Act put teeth in the coordination of the 13 state management plans for striped bass. State actions ranged from a complete closure to fishing in the Chesapeake and Delaware Bays to restrictive size and bag limits in other states. By 1995, striped bass rebounded to such a degree that they were deemed "recovered." Today, fishing for striped bass is tightly regulated by state and federal agencies to prevent a repeat of the 1970's stock decline.

Use of Sport Fish Restoration Funds

Sport Fish Restoration Funds played an integral role in funding fishery management and research programs that brought the fishery back from the brink of collapse. Sport Fish Restoration is a core funding source for state programs including:

- Surveys to assess the size of the striped bass population.
- Research to determine the number of young fish produced each year (which impacts the number that can be caught in future years).
- Surveys to determine the angler effort and harvest.
- Programs to stock striped bass and evaluate this stocking.

- Necessary coordination and planning between the 13 Atlantic states where striped bass harvest occurs.
- Many other programs.

In short, the Sport Fish Restoration excise-tax funds provide the backbone for management and science activities that are needed to establish sustainable fishing effort and monitor results. Without the funding, decision making would be little more than a shot in the dark.

Additional significant funding from many federal agencies and the private sector was used for stocking programs, environmental clean-up, monitoring, and other programs.

While all of these efforts may have played some role in the restoration of striped bass, by far the most significant factor that has been directly related to restoration of striped is the restriction of harvests and effort through active fisheries management. This continues to be the primary tool to maintain the fishery to this day.

Paying for fishery management through state agencies is accomplished with a variety of funding sources. However, a crucial, and core part of the funding derives from Sport Fish Restoration.

Table 6. Sport Fish Restoration Funds Used By States for Atlantic Striped Bass Management, Maine-North Carolina (1995-2009)

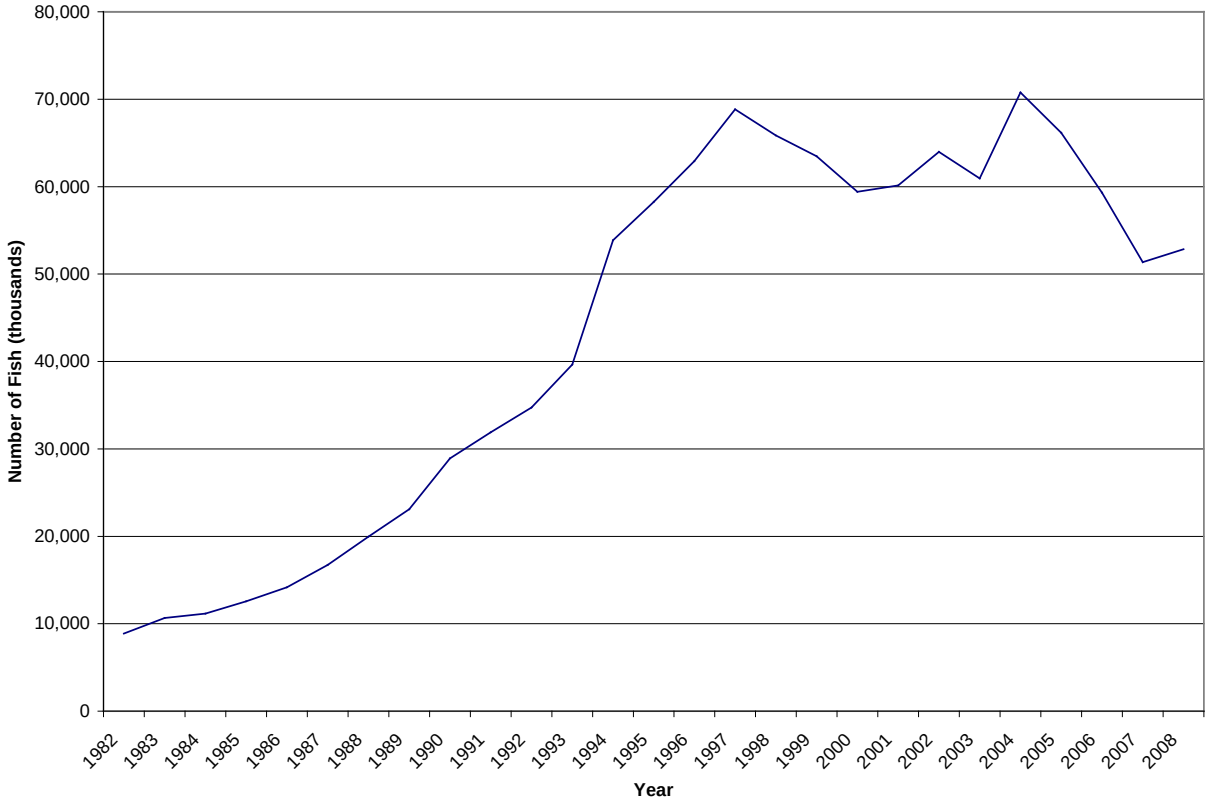
Year	Federal Sport Fish	State	Partial Total
1995	$1,678,785	$614,201	$2,292,986
1996	$1,752,958	$637,055	$2,390,013
1997	$1,539,308	$557,126	$2,096,434
1998	$1,526,968	$923,137	$2,450,105
1999	$2,048,705	$726,889	$2,775,594
2000	$2,103,895	$855,098	$2,958,993
2001	$1,949,544	$964,780	$2,914,325
2002	$2,423,293	$1,106,992	$3,530,284
2003	$2,053,799	$977,891	$3,031,690
2004	$2,044,366	$1,038,474	$3,082,840
2005	$1,760,097	$934,953	$2,695,049
2006	$2,043,534	$1,000,912	$3,044,446
2007	$2,354,812	$1,174,396	$3,529,208
2008	$2,312,581	$1,268,826	$3,581,407
2009	$2,641,497	$1,298,427	$3,939,924
Total 1995-2009	$30,234,141	$14,079,157	$44,313,298
Average 1995-2009	$2,015,609	$938,610	$2,954,220

Note: Partial total only reflects the sum of federal and state funds. Many other partners have contributed additional leveraged funds over this same period.

Fish Population Response

The number of fish in the Atlantic-Coast population of striped bass responded tremendously to the fishery management measures. Between 1982 and the peak in 2004, striped bass numbers increased nearly 700%! Even though the number in the stock has dipped slightly in recent years, it is still nearly 500% higher than in 1982 and is still considered "not overfished" by fishery managers.

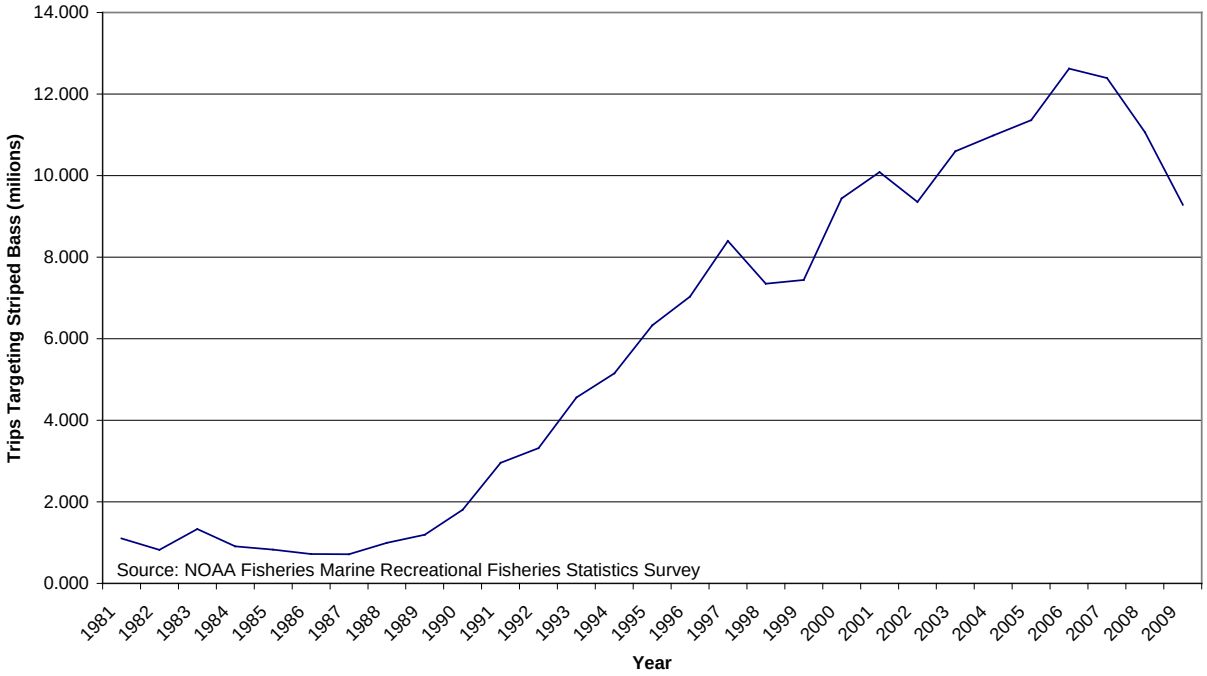
Figure 11. Atlantic-Coast Striped Bass Stock Size, 1982-2008



Angler Response

The number of angler trips targeting striped bass from Maine-North Carolina increased more than 1,000% since their low point in the 1980s. Since the striped-bass population was declared "recovered" in 1995, an average of 9.6 million angler trips is taken each year with the primary purpose of targeting striped bass. Even though the number of angler trips has declined in recent years, anglers still took nearly 50% more trips in 2009 than in 1995.

Figure 12. Atlantic-Coast Striped Bass Angler Trips, 1981-2009



Return on Investment

Data were available from 1995-2009 for striped-bass angler trips and Sport Fish Restoration investments into striped-bass management and research. However, a traditional "Return-on-Investment" for striped-bass management is difficult to accurately portray due to the complexity of management and the number of partners involved. It is possible to calculate the number of striped-bass angler trips necessary to generate a certain level of Excise Tax-Related ROI and Total Project ROI to the sport-fishing and angling-recreation industries, such as 10%.

Using 1996 as an example:

The annual Sport Fish Restoration investment (converted to 2009 dollars) of $2,056,612 equates to 329,585 angler trips assuming they spend $6.24 on saltwater tax-related fishing equipment purchases per trip at the wholesale level. A 10% Excise Tax-Related ROI on this annual investment equates to an additional 32,959 trips. Therefore, to recoup the entire investment plus an additional 10% return would require a total of 362,543 (329,585 + 32,959) trips. This total is 5.2% of the 7,032,481 trips taken in pursuit of striped bass in 1996. Extending this calculation to the entire period (1995-2009), an average increase in the number of trips by 3.8% would generate a 10% return to the sport-fishing industry. Between 1995 and 2009, anglers annually purchased an average of $68,405,592 (expressed in 2009 wholesale-adjusted dollars) worth of fishing equipment. During this same time period, Sport Fish Restoration investments in

striped-bass management averaged $2,173,353 each year (expressed in 2009 dollars), or only 3.2% of the total angler purchases on fishing tackle.
Based on this information:

- IF the Sport Fish Restoration investment alone was responsible for a 2-6% (average 3.8%) annual increase in angler trips it would generate an Excise Tax-Related ROI of 10% to the sport fishing equipment manufacturers.
- IF the Sport Fish Restoration investment alone increased trips by more than 3%, the Excise Tax-Related ROI would increase accordingly.
- The traditional Excise Tax-Related ROI for the Sport Fish Restoration investment between 1995 and 2009 averaged just above 3,000% but this does not take into account investments from other federal and state programs, which may be significant.

Using 1996 again as an example, from a broader perspective that includes all purchases associated with fishing recreation:

Annual federal and state investments contribute $2,772,742 (2009 $s) to the fishery and equate to 28,961 angler trips assuming they spend $95.74, on average. A 10% Total Project ROI on this annual investment equates to an additional 2,896 trips. To recoup the entire investment plus an additional 10% would require a total of 31,856 trips. This total is 0.5% of the 7,032,481 trips taken in 1996. Over the entire period from 1995 to 2009, an average increase in the number of trips by 0.4% (range: 0.2%-0.5%) would generate a 10% return from federal and state investments to all industries involved with angler recreation (lodging, food, transportation, and equipment).

It is important to point out that only federal and state funds define project investments. The number of angler trips that would be needed to earn a 10% Total Project ROI would rise, potentially dramatically, when investments from all partners are included.

Case #4: Diamond Lake, Oregon

Contributors: Oregon Department of Fish and Wildlife

SYNOPSIS (2009$s)	
Project Type	Fishery Restoration
Total Excise Tax Investment [(b)]	$706,743
Total Additional Investment [(d)]	$6,705,538
Angler Spending on Tax Related Items [(a)]	$4,770,530 (Current Scenario-only)
Angler Spending on All Angler Recreation Items [(c)]	$62,388,300 (Current Scenario-only)
(Excise Tax-Related ROI (Cumulative Return on Investment)	575%
Total Project ROI (Cumulative Return on Investment)	830%
Project Lifespan	40 years
Excise Tax-Related ROI=(a-b)/b and Total Project ROI=(c-(b+d))/(b+d)	

The Need

Diamond Lake is a 2,824-acre lake in southwestern Oregon near Crater Lake National Park that has been managed for recreational fishing since 1910. Originally fishless, the stocked rainbow trout have historically provided a popular recreational fishery. In 1954, the lake was treated to eradicate the invasive tui chub (a type of minnow), which had contributed to a severe decline of rainbow trout. Following that treatment, recreational angling soared to nearly 140,000 trips per year. Fishing was excellent for 40 years.

However, tui chub were discovered again in late 1992, likely illegally used as bait fish by anglers. As tui chubs flourished, rainbow trout and the fishery they supported declined. Fewer than 20,000 angler trips were taken annually from 1998-2002, more than an 85% decline from their peak. The average annual harvest rate declined from a high of 270,000 trout averaging 12 inches in size during 1963-1978 to a 1999 low of 5,000 trout averaging less than 10 inches in length.

Fishery Decline Impacts Local Economy

Diamond Lake is categorized as a high-use destination recreation area of significant economic benefit to southern Oregon by the U.S. Dept. of Agriculture. After tui chub were discovered and trout growth and survival declined, angler numbers dropped to 6,000 and averaged only 22,400 trips per year from 1994 to 2006. This is compared to 70,500 anglers and 139,500 trips per year from 1962 to 1978 with an average of 109,800 trips. The reduction of angler trips caused a loss of $4.9 million in annual sales and $1.4 million in labor income for the three surrounding counties.

Use of Sport Fish Restoration Funds

To restore the recreational fishery in Diamond Lake, the Oregon Department of Fish and Wildlife needed to eradicate the tui chub and restock the lake with rainbow trout.

Treatment of the lake required several years of planning and environmental studies, as well as baseline angler surveys before treatment and after treatment to measure its effectiveness. In September, 2006, Diamond Lake was chemically treated to remove the tui chub (more than 98 million were removed). In 2007, approximately 80,000 catchable rainbow trout were stocked to ensure that anglers did not miss a season of fishing. Each year since, a mix of catchable trout and fingerlings (young trout) are stocked to both produce a fishery for that year and re-establish a viable population for the future. Sport Fish Restoration excise-tax funds were used to complete the necessary environmental studies and for the pre- and post-treatment surveys while matching funds and services approaching $6 million were used to conduct the actual treatment and restocking with rainbow trout.

Table 7. Diamond Lake, OR Investments

Sport Fish Restoration 1997-2007	$ 663,046
Other • Oregon Watershed Enhancement Board • Oregon Department of Fish and Wildlife • U.S. Forest Service • Oregon Wildlife Heritage Foundation	$5,568,000
Total	$6,231,046

Angler Response

Anglers responded with enthusiasm to the treatment of Diamond Lake. In 2007, one year post-treatment, 72,085 angler trips, fishing mainly on stocked catchable size trout, generated an estimated $3.76 million in sales and $2.57 million in labor income in the area (based on 2006 dollar value). By 2009, more than 51,000 angler trips were generating $2 million in economic benefits to the local economy.

Following the earlier 1954 treatment of Diamond Lake, angler effort gradually increased for six to seven years before reaching its maximum levels. Angler response to the 2006 treatment is following a similar pattern; by 2009 it has recovered to a level of 51,004 trips, more than eight and a half times its level 10 years before (1999) and meeting current management goals. The 2009 Diamond Lake Management Plan calls for 50,000 to 100,000 angler trips annually.

Return on Investment

Five different case specific scenarios are explored: 1) Bust, 2) Current, 3) Rise n' Shine, 4) Boom, and 5) Glory Days (see Table 7, following). Angler purchases are calculated using state- specific estimates for freshwater fishing from 2006 National Survey data. All tax related direct purchases are estimated using tax related fishing equipment purchases adjusted to reflect wholesale purchases at $7.02 per trip per angler. The present value is calculated using estimated annual-angler purchases, a future horizon for the lake of 40 years, and a 7% discount rate.

The "Bust" case reflects the very lean years of fishing after tui chub were first discovered in the early 1950s. Angler trips are set at 22,400 annually. This equates to equipment purchases of $157,000 and a present value of $2.1 million. The "Current" case reflects today's level of fishing at roughly 51,000 angler trips. This equates to

equipment purchases of $358,000 annually and a present value of $4.8 million. The "Rise n' Shine" case follows the Diamond Lake Management Plan to grow angler trips from 50,000 to 100,000 by 2012. Angler purchases range between $351,000 and $701,000 and return a present value of $13.1 million. The "Boom" case assumes annual trips of 109,800 reflecting the period of high-use destination recreation between 1962 and 1978. Annual purchases are estimated at $770,000 and a present value of $10.3 million. The last case, "Glory Days," reflects the peak of utilization seen in the late 1970s. Annual purchases are estimated at $982,000 and a present value of $13.1 million.

Excise Tax ROI

Sport Fish Restoration excise tax investments allocated to restoration and management totals just over $700,000 (in constant 2009 dollars). Benefits net of investment costs given these scenarios, and assuming no further investments are made, are all positive and range between $1.4 and $12.4 million. Estimated excise-tax-related ROIs range between 196% and 1,753%.

Total Project ROI

A Total Project ROI is estimated for each of the five scenarios as well. Annual angler trips, the discount rate and the fishery lifespan are held constant. Again, total angler expenses (purchases of all equipment and all trip-related items) are calculated using the same data source and are estimated to be $91.75 per angler per trip. Under the "Bust" scenario, total annual purchases are $2.0 million with a present day value of $27.4 million. At current levels of anglers, total annual purchases are $4.7 million with a present day value of $62.4 million. Annual purchases range between $4.57 and $9.15 million under the "Rise n' Shine" scenario and have a total present day value of $121.7 million. When current usage levels are increased by slightly more than a factor of two ("Boom" scenario), annual purchases are $10.1 million and have a current value of $134.3 million. The last scenario, "Glory Days", estimates annual purchases to exceed $12.8 million with a current-day value of $171.2 million.

Total investments into the fishery restoration are valued at $6,705,538. This includes the $706,743 in Sport Fish Restoration funds as well as the additional leveraged funds.[13] Again, benefits net of investment costs under each of these scenarios are positive and range between $20.7 million and $164.5 million. The estimated Total Project ROI ranges between 309% and 2,454%. In the event that additional investments are made, net benefits and returns on both Excise Tax-Related ROI and Total Project ROI would decline.

[13] Additional investments, distributed between 1997 and 2007, total $5,568,000 in actual dollars. For the purposes of inflating these funds to constant (2009) dollars, it was assumed that the leveraged funds were allocated equally across the ten years of project research and lake rehabilitation.

Table 8. Diamond Lake Oregon Return on Investment Scenarios (2009$s)					
	Bust	Current	Rise n' Shine	Boom	Glory Days
	Tax Related Investment and Purchases				
Annual Angler Trips	22,400	51,004	50,000 to 100,000	109,800	140,000
Annual Fishing Equip. Purchases.	$157,154	$357,833	$350,789 – $701,579	$770,334	$982,211
Present Value of Annual Fishing Equipment Purchases	$2,095,127	$4,770,530	$9,336,493	$10,269,865	$13,094,545
Total SFR Investment	$706,743	$706,743	$706,743	$706,743	$706,743
Net Benefit	$1,388,384	$4,063,787	$8,629,750	$9,563,122	$12,387,802
Excise Tax-Related ROI	196%	575%	1,221%	1,353%	1,753%
	Total Investments and Angling Purchases				
Annual Total Fishing Recreation Expenditure	2,055,233	$4,679,693	$4.57 to $9.15 million	$10,074,313	$12,845,208
Present Value of Annual Total Fishing Recreation Expenditure	$27,399,771	$62,388,300	$121,714,850	$134,307,807	$171,248,569
Total Investment (SFR and Leveraged)	$6,705,538	$6,705,538	$6,705,538	$6,705,538	$6,705,538
Net Benefit	$20,694,233	$55,682,762	$115,009,312	$127,602,268	$164,543,031
Total Project ROI	309%	830%	1,715%	1,903%	2,454%

Note: Discount rate is set at 7% and the life span of the fishery is estimated to be 40 years. Additionally, annual total fishing recreation purchases reflect spending across the whole state and are expected to be higher than those economic benefits reported in text that reflect economic activity within a localized region.

Case #5: Cottonmill Lake, Nebraska

Contributors: Nebraska Game and Parks Commission, University of Nebraska-Kearney

SYNOPSIS (2009$s)	
Project Type	Lake Reclamation
Total Excise Tax Investment [(b)]	$412,931
Total Additional Investment [(d)]	$1,326,329
Angler Spending on Tax Related Items [(a)]	$855,673
Angler Spending on All Angler Recreation Items [(c)]	$6,777,613
(Excise Tax-Related ROI (Cumulative Return on Investment)	90%
Total Project ROI (Cumulative Return on Investment)	258%
Project Lifespan	25 years
NOTE: Expenditures are based upon a two month creel survey that does represent peak usage but not annual utilization. Excise Tax-Related ROI=(a-b)/b and Total Project ROI=(c-(b+d))/(b+d)	

The Need

Cottonmill Lake is a 43-acre lake located near Kearney, Nebraska. As with many aging lakes in the Midwest, Cottonmill was filling in and becoming increasingly shallow. In the process, fish- spawning sites were covered, weed growth became more extensive, and fish kills became more common. As a result, recreational fishing was declining. In 1996, angler participation during May-June was less than 500 hours, and the catch rate for all species of fish was only 0.2 fish per hour.

Use of Sport Fish Restoration Funds

In 1997, the Nebraska Game and Parks Commission (NGPC) and the city of Kearney began a rehabilitation project at Cottonmill Lake. This included dredging and removing 300,000 cubic feet of sediment from the lake bottom, constructing four breakwater jetties, two islands, and several underwater structures to provide cover for gamefish. The rehabilitation phase of the project was completed in 1999.

Sport Fish Restoration funds formed a vitally important component of the project funding. This funding was comprised of a variety of sources, including Sport Fish Restoration matched with funds from the state's "Aquatic Habitat Stamp" that is purchased by anglers.

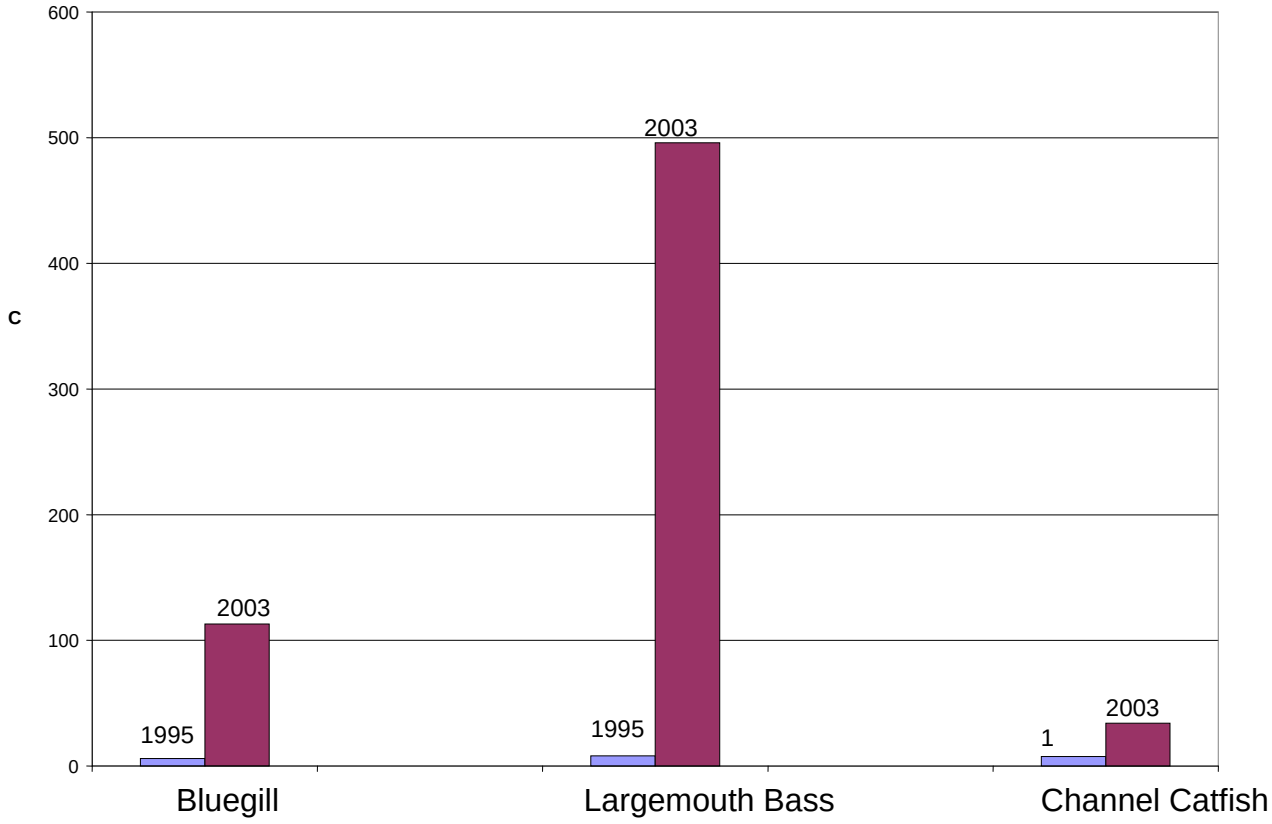
Table 9. Cottonmill Lake, Nebraska Investments

Sport Fish Restoration	$ 364,575
Other • Nebraska Environmental Trust Fund • Environmental Protection Agency • Central Platte Natural Resources Commission • City of Kearney & Buffalo County • Aquatic Habitat Program Fund	$1,171,010
Total	$1,535,585

Fish Population Response

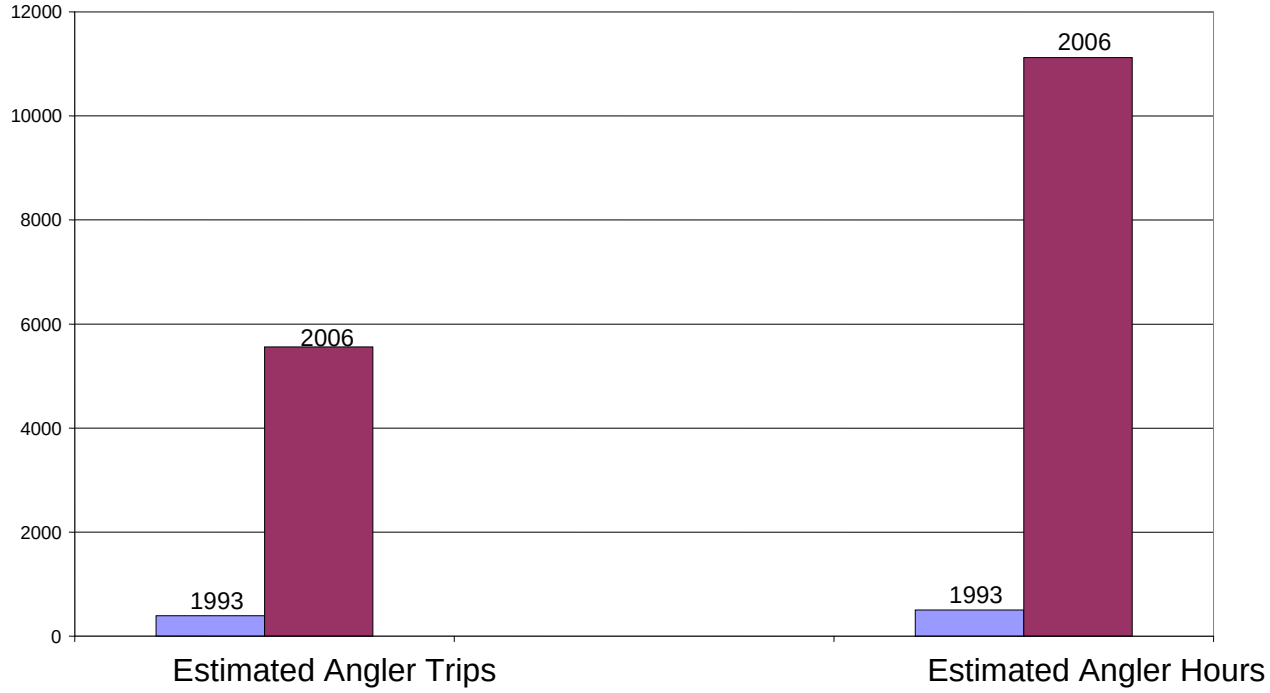
As a result of the lake reclamation, both fish populations and angling success skyrocketed. In scientific surveys, the number of bluegill caught increased by 1,783%, largemouth bass by 6,100% and 353% for channel catfish between 1995 and 2003. Not surprisingly, angler catch rates followed, increasing from 0.2 fish/hour prior to the project to 1.5 fish/hour nine years after project completion, or a 650% increase!

Figure 13. Cottonmill Lake Fish Populations Before and After Lake Rehabilitation



Angler Response
A total of 394 angling trips comprising 503 hours of fishing were estimated in May-June 1993. In 2006, 5,561 anglers spent 11,122 hours fishing during these same months, reflecting a 1,300% increase in angler trips, and a 2,100% increase in angling hours.

Figure 14. Cottonmill Lake Angler Effort Before and After Rehabilitation (May-June only)



Return on Investment
Total- and tax-related equipment item purchases are calculated purchases isolated from National Survey state-level reports for Nebraska for 1996, 2001, and 2006. All estimates from 1996 through 2006 are inflated to 2009 dollars. Average tax-related equipment item purchases per angler trip, when adjusted to reflect wholesale values, range between $12.08 (1996) and $6.76 (2006) in 2009 dollars. Total retail spending per angler trip ranges between $96.63 (1996) and $58.07 (2001). In order to estimate a return on investment, annual per-trip purchases were interpolated using a simple straight-line assumption between two survey years.

Angler expenditures are calculated based on visits totaling 5,561 trips between May and June of each year. It is critical to point out that user surveys, provided by the state, focus only on two months of the year. While these two months do reflect peak season for the state, estimated expenditures and returns reflect only a portion of the annual return on investment realized by industry. However, expanding the trip values to an annual basis is challenged by significant variation across locations and therefore is not done. Even in this light, realized tax-related equipment spending during May and June

between 1999 and 2009 has totaled $526,945. Total spending in these two months over the same ten year period is estimated to be $3.8 million.

Future trips are assumed to also total 5,561 trips between May and June and result in estimated tax-related fishing equipment purchases of $37,588 over those two months. A present value is calculated using estimated annual angler equipment purchases ($37,588), a time horizon for Cottonmill Lake of the remaining 14 years, and a 7% discount rate. The present value is estimated to be $328,728. Over the life of the lake (past, present, and future), angler equipment purchases total $855,673 (1999 – 2024).

Table 10. Cottonmill Lake Return on Investments (May-June only)

	Tax Related	Total Project
Investments (2009 $s)	$412,931	$1,739,260
Angler Expenditures: 1999-2009 (2009 $s)	$526,945	$3,815,299
Future Annual Fresh Water Exp. By Anglers	$37,588	$338,726
Present Value of Future Angler Expenditures	$328,728	$2,962,314
Total Benefits over the Lake Lifespan	$855,673	$6,777,613
Marginal Increase in Benefits	$785,995	$6,230,788
Angler spending net of investments	$373,064	$4,491,529
ROI	90%	258%

Note: A discount rate of 7% and a time horizon of 14 years are used in the calculations of present value. Eleven years have passed since the lake was reopened to fishing. Fourteen years represents the balance of the twenty-five year lifespan. Also, tax related purchases are adjusted to reflect wholesale rather than retail value.

Similarly, future total fishing recreation spending is estimated to be $338,726 over those same two months each year. The lifespan and discount rate is held constant for the present value calculation. Current day values of future spending are estimated at $2.9 million. Angler trip and equipment spending totals $6.7 million over the life of the lake.

Sport Fish Restoration excise tax investments allocated to lake reclamation total $412,931 when inflated to current dollars. These funds are leveraged at a rate of slightly more than 3:1. Additional funds are contributed in the amount of $1,326,329 in current dollars. These funds are assumed to be evenly distributed over the three years of reclamation.

To capture the increase in angler expenditures that resulted from the rehabilitation, this analysis assumes that, in the absence of the investment, the lake would have maintained a low level of fishing activity (an estimated 394 angler trips) over an equivalent time horizon of 25 years. Under this assumption, industry would have realized an estimated $69,678 in tax related fishing equipment purchases and $546,825 in total spending.

The marginal increase in benefits is then the difference between angler expenditures in the event of no investment in rehabilitation and the current level of utilization. This increase is estimated to be $785,995 in equipment-related spending and $6.2 million in total spending. Benefits net of investments are just over $373,064 million on tax related items and the Excise-Tax-Related ROI is 90%. Net benefits from total angler spending are estimated to be $4.5 million and the Total Project ROI is 258%

Case #6: Enhancing the Walleye Fishery on the New River, Virginia

Contributors: Virginia Department of Game and Inland Fisheries

SYNOPSIS (2009$s)	
Project Type:	Fishery Restoration
Total Excise Tax Investment [(b)]:	$224,563
Total Additional Investment [(d)]:	$74,854
Increase in Annual Angler Retail Purchases on Tax Related Items [(a)]:	$6,212
Increase in Angler Spending on All Angler Recreation Items [(c)]:	$33,648
Total Project ROI (Cumulative Return on Investment):	62%
Project Lifespan:	20 years
Total Project ROI=(c-(b+d))/(b+d) Excise Tax-Related ROI is less than 0 under these assumptions	

The Need

Prior to 2001, the New River above Claytor Lake in Virginia supported a healthy smallmouth-bass fishery but only a small, occasional walleye fishery. To re-establish a healthy population of walleye and provide additional angler opportunities in 74 miles of river above Claytor Lake, a stocking program was begun in 2001 using New River strain walleye. Additional management actions including a 20-inch minimum size limit were implemented to provide an opportunity for the population to establish itself.

Action Taken

The project consisted of two primary components: genetic testing of walleye to determine the appropriate strain to stock in these waters, and a nine-year stocking effort to re-establish a viable population. From 2003-2008, the following numbers of walleye were stocked:

Table 11. Walleye Restocking at Claytor Lake by year

Year	Number Stocked
2001	10,000
2002	0
2003	51,840
2004	156,200
2005	90,080
2006	106,000
2007	20,000
2008	143,000
2009	67,000
TOTAL	644,120

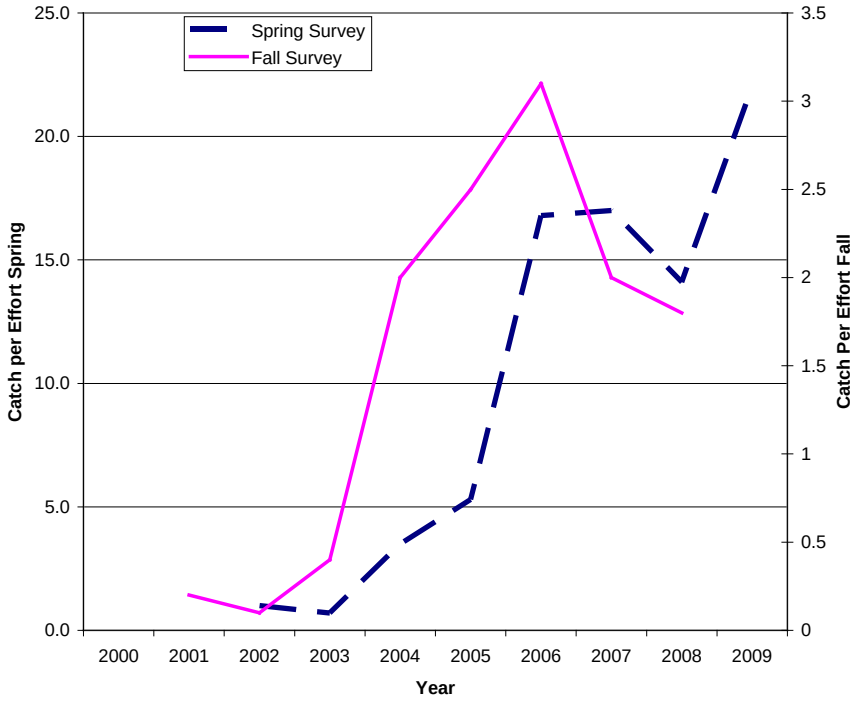
Use of Sport Fish Restoration Funds
The total 9-year costs of the project was approximately $299,417 with 75% of that ($224,563) coming from Sport Fish Restoration. Fish Restoration Funds (75%). The average amount of Sport Fish restoration funds invested annually was $24,592.

Table 12. New River Walleye Project Investments

Genetic Testing	$24,828
Hatchery Costs for New River Walleye Fingerlings	$179,538
Staff Costs on New River	$68,051
Staff Costs (other)	$27,000
Total	$299,417
Sport Fish Restoration Funds (75% of total)	$224,563

What Happened to Walleye Populations?
Fishery managers measured increases in spring walleye populations of more than 2,100% from 2002 to 2009 and 800% in fall surveys between 2000 and 2008.

Figure 115. Walleye Catch Rate Trend by Season: 2000-2009



Angler Response

Pre-Project Status: Near the beginning of this project in 2002, an estimated 3,590 angler-hours were directed toward walleye during the entire year, which constituted 10% of the total fishing effort for this section of the river. An estimated 320 walleye were caught, 264 released and 56 (17%) harvested.

Post-Project Effect: In 2007, an estimated 6,719 angler-hours were directed toward walleye, which constituted 30% of total fishing effort for the whole year. An estimated 2,247 walleye were caught, 2,058 released and 189 (8%) harvested.

Figure 16. Walleye Angler Effort in Hours Before and After Rehabilitation

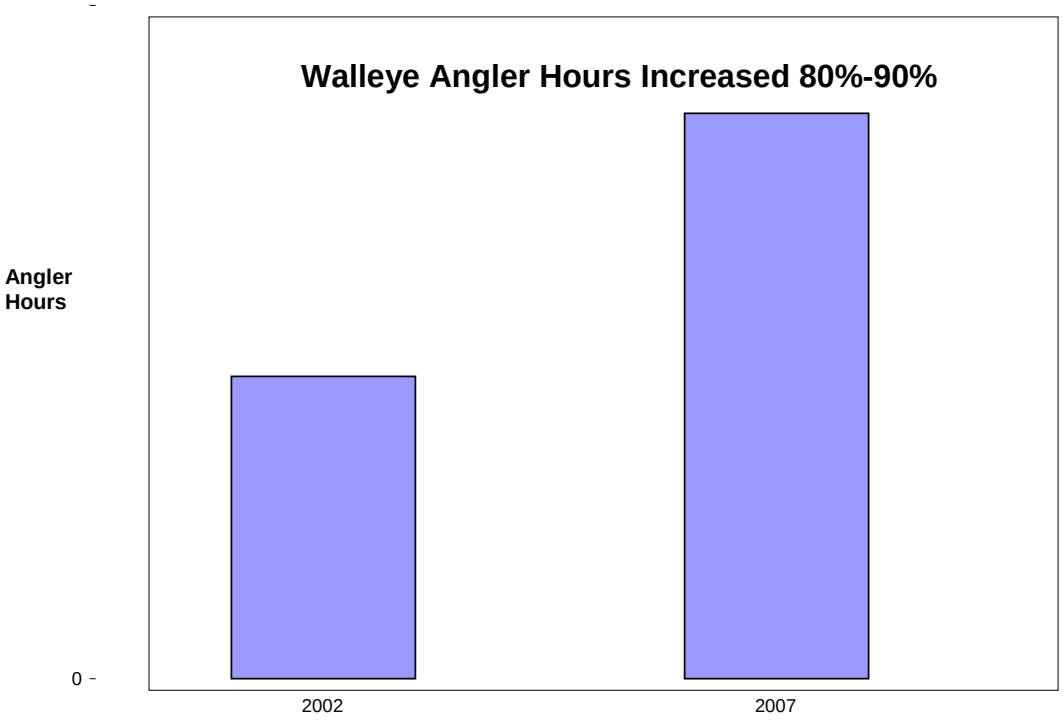
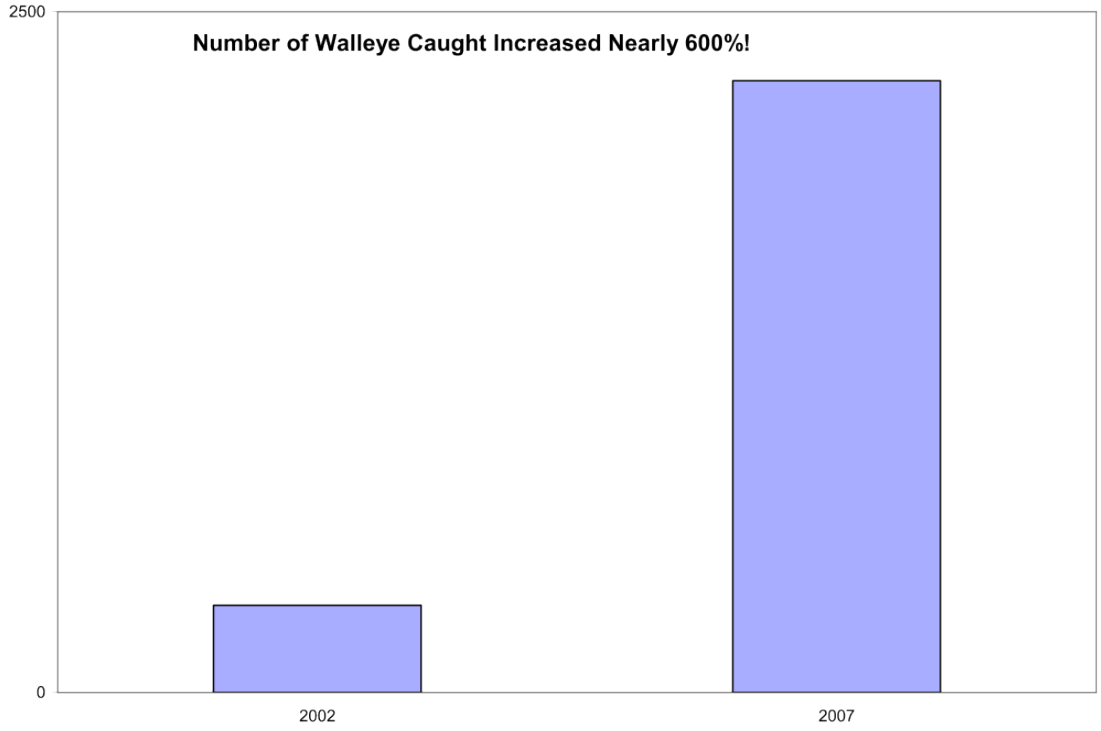
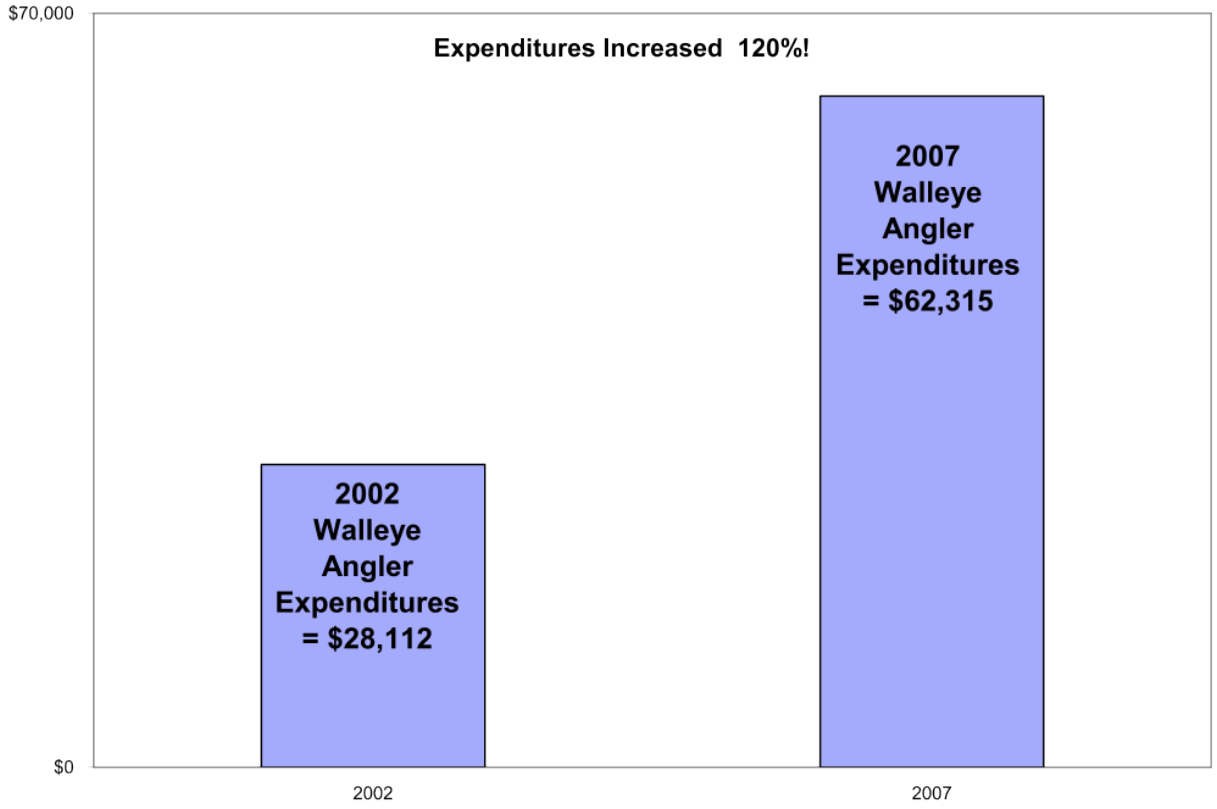


Figure 117. Walleye Catch Before and After Rehabilitation



Economics
Direct expenditures from anglers for the 2007 survey related to this fishery were approximately $62,315, or an increase of approximately 120% since 2002. Angler effort, catch, and expenditures have increased significantly. No negative consequences to the smallmouth-bass fishery have been measured.

Figure 18. Walleye Angler Spending on Trip and Equipment Items Before and After Rehabilitation



To measure the increase in angler expenditures that resulted from the rehabilitation, this analysis assumes that, in the absence of the investment, the walleye fishery would have sustained a low level of fishing activity (an estimated 3,590 hours). In other words, the marginal increase in benefits is then the difference between angler expenditures in the event of no investment in rehabilitation and the current level of utilization.

In 2002, Claytor Lake supported a small population of walleye anglers who spent a total of $30,000 on trip and equipment item purchases. Following the management effort, the lake supported a much larger population of walleye anglers who spent more than double that amount ($63,897) per year. The marginal increase in tax-related item purchases is estimated to be $3,106 (adjusting for market chain markup) and the marginal increase in total spending is estimated at $33,648.

Table 13. Retail Spending by Walleye Anglers in New River, Virginia (2009$)

Category	Angler Spending 2002		2007	
	(2002)	(2009 $'s)	(2007)	(2009 $'s)
Fuel	$11,751	$12,644	$26,048	$26,709
Food	$7,685	$8,269	$17,034	$17,466
Bait/Fishing gear[a]	$5,191	$5,585	$11,506	$11,798
Lodging	$3,486	$3,751	$7,727	$7,923
Total	$28,112	$30,249	$62,315	$63,897

The bait and fishing-gear purchases were compared against tax-related equipment item purchases from National Survey estimates for the state. Analysis indicates that the majority of spending in this category is on tax-related equipment items, therefore it is reasonable to utilize these for the estimation of returns on investment to excise tax investments.

Between roughly 2003 and 2009, realized spending by anglers has totaled $21,745 on tax-related items and $235,537 in total trip and equipment spending. Using an estimated time horizon totaling 20 years[14] for the full accrual of benefits from this project, future spending is estimated using a present value calculation, which uses the annual marginal increase in spending by anglers and assumes a discount rate as well as a time horizon of the remaining 12 years. The present value of all spending (trip and equipment) is $267,257. Over the life of the project (past, present, and future), angler spending is estimated at $502,794 on total (equipment and trip) spending.

Sport Fish Restoration investments allocated to revamping the walleye fishery total $232,999 when inflated to constant (2009) dollars. Additional funds are contributed in the amount of $77,666, also in current dollars. These funds are assumed to be evenly distributed over the eight years of walleye rehabilitation. Benefits net of investments from total angler spending are estimated to be $192,128 and the Total Project ROI is 62%.

Table 14. New River, VA: Return on Investment

	Total Angling (equipment and trip purchases)
Investments (2009 $s)	$310,666
Angler Expenditures: 2003-2009 (2009 $s)	$235,537
Future Annual Fresh Water Exp. By Anglers	$33,648
Present Value of Future Angler Expenditures	$267,257
Total Benefits over the Lake Lifespan	$502,794
Total Project ROI	62%

[14] It is highly likely that benefits would accrue for longer than this time period under current angler restrictions and enforcement.

Conclusion

A business, whether it is manufacturing, retail, service or other type of business, requires hard work, planning, and investment. A sustainable and growing business also requires a solid foundation and adaptability to meet changing customer and economic demands.

For the sport fishing industry as a whole, the Sport Fish Restoration excise tax provides the investment in a solid foundation for companies to build on. With returns-on-investment (angler purchases resulting from Sport Fish Restoration excise tax investment) regularly exceeding 1,500%, it is a necessity for the program to continue, not an option.

In this report, we have endeavored to illustrate the quantitative return to the sport fishing manufacturers who pay the excise tax. The excise tax is often the core funding source that is used to leverage many other sources of investment – not just license dollars – to benefit recreational fishing. In a sense, this is analogous to investing $100 into your retirement account and getting an immediate $100 match, leaving $200 to work for you and grow into the future.

One source of these matching dollars is the fishing license fees paid by anglers. Without Sport Fish Restoration, these fees would very likely be diverted to other uses not benefiting recreational fishing. If state politicians were inclined to continue investing angler-license funds into fisheries management in the absence of Sport Fish restoration, they would be forced to increase license fees 40 to 70 percent to maintain the level of programs currently in place. Based on past studies, this increase in angler fees would likely result in the loss of anglers, the very customer base that fuels the sales of products from sport-fishing-related businesses.[15]

It is important to remember that the sport fishing industry in the United States is based on publicly owned and publicly managed natural resources. In the absence of the capability for state agencies to manage these resources, no other entity can or will step in. In other parts of the world, where much of the fishery resources are held in private hands, fishing is much more complicated as well as restricted. Anglers are often directly responsible for paying for private fisheries management.

To fish in Germany, for example, often requires that an angler belong to a private club that owns the rights to the fish. Prior to fishing, the angler must obtain two or three various fishing permits and take formal instruction on fishing[16]. Assuming that the angler has the income to join a club, that a vacancy is available, that they have passed the requisite educational standards *and* have obtained the required permits, the prospective angler can then go fishing. In the United States, by contrast, and thanks in part to the investment of the Sport Fish Restoration excise tax, an angler can obtain a fishing license in the morning, purchase a fishing rod and basic tackle, and travel to a public access site (most likely funded by the excise tax) within a matter of hours.

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[15] Southwick Associates, Inc. State Fishing Licenses: Pricing and Maximizing Revenue. Produced on behalf of the American Sportfishing Association and the Association of Fish and Wildlife Agencies. April, 2005.

[16] Daedlow, K., T. D. Beard, Jr., and R. Arlinghaus. [In press]. A Property Rights-based View on Management of Inland Recreational Fisheries: Contrasting Common and Public Fishing Rights Regimes in Germany and the U.S.A. Proceedings of the 5th World Recreational Fishing Conference. American Fisheries Society, Bethesda, MD.

How much would the sport fishing industry gain by the removal or reduction of the excise tax? That question is difficult to answer. Prior to the Sport Fish Restoration program, industry was already paying a tax but not benefiting from it, so very conceivably the industry would end up losing both in the short term (no additional funds to their bottom line) and in the long term (no or reduced long-term investment into the foundation of their industry) . Even if the excise tax was completely repealed, in today's consolidated and highly competitive retail infrastructure, it can almost be guaranteed that manufacturers competing for the shelf space (or catalog and web pages) of retail outlets would not retain the recouped funds for very long.

The value of the infrastructure (fish populations and physical facilities providing angler access) that has been built up over the past 60 years -- call it Conservation Equity -- provides the fuel for today's industry. Over the long term, every dollar that industry invests through the excise tax can result in $1,500 or even more back to industry's collective bottom line. Continuing, or indeed strengthening, this program will solidify industry's investment in the fishery resources, the customer base, and ultimately the long-term viability of their business.

Appendix A: Sport Fishing Equipment Subject To the Federal Excise Tax[17],[18]

Fishing rods /poles (maximum of $10/rod beginning January 1, 2005)

Fishing rod/pole component parts:

- Rod handle
- Guide
- Reel seat
- Blank rod
- Tip-top
- ferrule

Fishing reels

- fly fishing reels
- reels or spools designed for use in ice fishing
- reels or spools employed for dispensing and retrieving line attached to arrows and spears used in fishing

Fly fishing lines and other fishing lines not over 130 pounds

Fishing spears, spear guns, and spear tips

Items of terminal tackle including:

- leaders including swivels and snaps
- artificial lures including plugs, spoons, jigs feathers, spinners, soft plastic lures, and spear fishing decoys
- artificial baits
- artificial flies
- fishing hooks
- bobbers
- sinkers
- snaps
- drayles
- swivels

Fishing supplies, accessories, and equipment:

- fish stringers, creels
- bags, baskets, and other containers designed to hold fish
- portable bait containers (minnow buckets, killy cars (floating cages), and grasshopper cages)
- fishing vests, landing nets
- gaff hooks including straight/ fixed head gaffs, flying gaffs, and tuna hooks

Fishing hook disgorgers

Dressing for fishing lines or artificial flies

Fishing tip-ups and tilts including the following components:

- spool on a spindle
- spring mounted flag on opposite ends of a vertical pole or arm with cross members to support the pole or arm over ice

Fishing rod belts (gimbal belt)

Fishing rod holders

Fishing harnesses (fighting chair harness)

Fish fighting chairs (permanent or removable in boats)

Fishing outriggers

Fishing downriggers

Resale of certain fishing equipment

A tax of 3% of the sale price is imposed on:

Tackle boxes (as of January 1, 2005; 10% prior to that)

Electric outboard boat motors

In addition, the Sport Fish restoration Program is funded by:

Import duties of 1.5% to 5% are imposed on motorboat parts sails, propellers, boat hulls, inflatable boats, sailboats, motorboats, rowboats, yachts, floating docks, inflatable rafts, buoys, sailboards, and sailboard parts. Import duties between 3.7% and 9.2% are also imposed on fishing rods, hooks, tackle, and nets.

The federal gasoline tax attributable to motorboat and small engine usage is also captured (approximately 1.08% and 0.29% of total fuel gas receipts respectively, which changes annually with changes in motorboat registration)

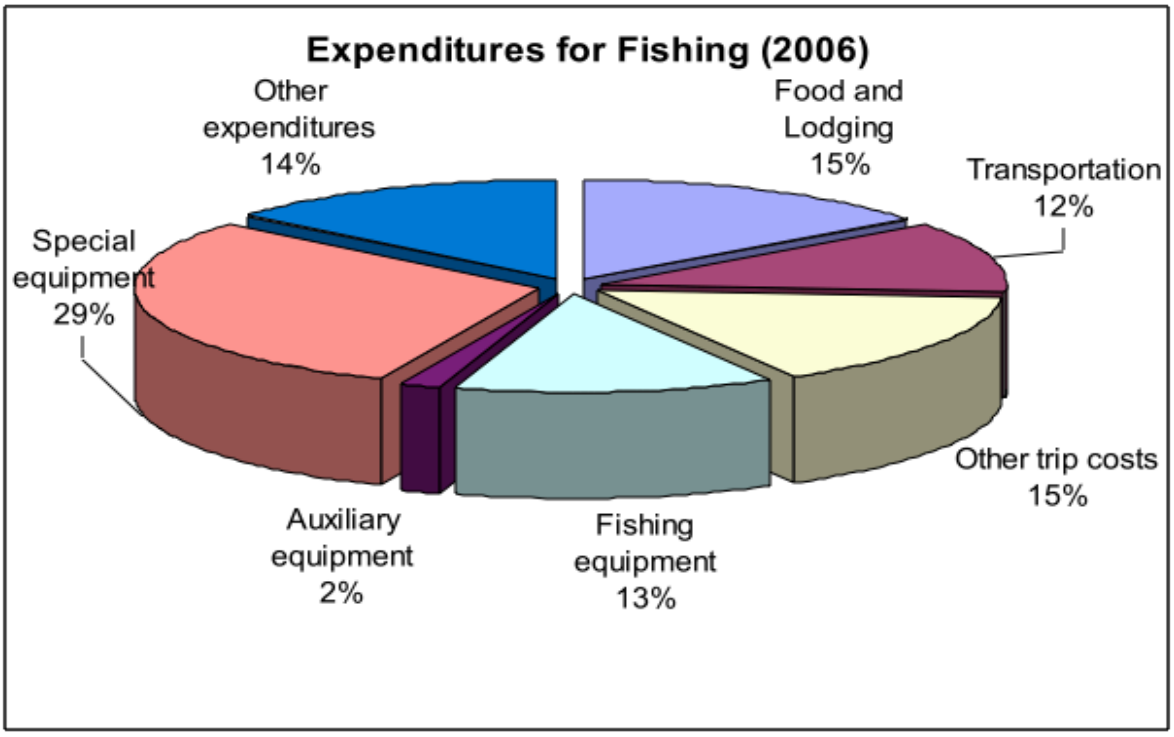
Note: Until they were excluded January 1, 2005, “flasher-type” sonar devices were taxed at 3%.

[17] Most sport fishing equipment is taxed at 10%.

[18] This table is for general reference only. Consult IRS guidelines for specific items subject to the tax.

Appendix B: Angling Recreation Total Purchases by Category

Figure B1: Total Purchases on Angling Recreation by Category (2006)



Source: USFWS National Survey of Fishing, Hunting, and Wildlife Associated Recreation 2006.

Figure B1 above presents monies spent in 2006 on angling-related activities in the United States across seven different sub-categories. Their definitions are:

Food and lodging: Includes food and meal expenditures as well as costs related to lodging.

Transportation: Includes both public and private transportation related expenses.

Other trip costs: Includes guide fees, pack trip or package fees, land use fees, equipment rental, boating costs (mooring, maintenance, insurance, fuel, etc), and heating or cooking fuel.

Fishing Equipment: Includes rods & reels, lines & leaders, lures, hooks, sinkers, tackle boxes, bags, nets, bait containers, fish finders and other electronic devices.

Auxiliary equipment: Includes camping equipment, field glasses, telescopes, special clothing, boots and foul weather gear as well as processing and taxidermy costs.

Special equipment: Includes boats, campers, trail bikes, etc.

Other expenditures: Includes magazines, books, memberships, land leasing or ownership costs, licenses, stamps, tags, and permits.

Appendix C: Macro-level Expenditure Estimation: Model Results and Raw Data

Macro-level Linear Regression Model Output and Performance

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.983[a]	.966	.958	4.24808E8	3.221

a. Predictors: (Constant), cert_lic, fsh_t

b. Dependent Variable: fish_exp

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.139E19	2	2.069E19	114.677	.000[a]
	Residual	1.444E18	8	1.805E17		
	Total	4.283E19	10			

a. Predictors: (Constant), cert_lic, fsh_t

b. Dependent Variable: fish_exp

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-9.311E8	1.072E9		-.868	.410
	fsh_t	31.960	3.777	.890	8.461	.000
	cert_lic	51.800	47.644	.114	1.087	.309

a. Dependent Variable: fish_exp

The above regression follows the model: Expenditures$_t$ = f (collections$_t$, lic_hold$_t$). Expenditures are defined as angler expenditures on tax related equipment items in the ten National Survey collection years. Collections are defined as gross equipment excise tax receipts in the same year as the survey year. The lic_hold variable reflects

certified license holders and incorporates the influence of the number of hunters and anglers on total expenditures.

The R-squared value for the model is 0.966 indicating that the independent variables used in the model account for 96.6 percent in the variation in angler expenditures.

With respect to the relationship between collections and angler purchase of tax-related items, a time lag of one, two, and three years was investigated to determine the presence of time lag between point of first sale at the manufacturer level (when excise tax is paid) and retail sale. The highest level of correlation exists between angler purchases in year t and tax collections in the same year. Further statistical testing for autocorrelation within this time-series data employed the Durbin-Watson test. Testing for this particular model suggests that no positive autocorrelation exists in the regression residuals. Testing for negative autocorrelation neither confirms or rules out the potential for negative autocorrelation.

Table C1. Tax Related Equipment Item Purchases: Actual and Estimated (1955-2006)

	National Survey: Tax Related Equipment Item Purchases		Linear Interpolation				Regression Estimation				Difference between actual and regression estimated exp.	
Year	Actual	Inflated	Actual TR Purchases	2009$ Inflated TR Purchases	Wholesale Adjustment of Inflated TR Exp. (2009$)	Excise Tax-Related ROI	Actual	Inflated	Wholesale Adjustment of Inflated Exp. (2009$)	Excise Tax-Related ROI		
1955	$243,626,000	$1,950,253,402	$243,626,000	$1,950,253,402	$975,126,701	2178%	$208,605,194	$1,669,907,928	$834,953,964	1851%	$35,020,806	27%
1956			$256,566,000	$2,023,636,027	$1,011,818,014	2391%	$232,066,736	$1,830,400,783	$915,200,391	2153%		
1957			$269,506,000	$2,057,615,969	$1,028,807,984	2757%	$264,901,276	$2,022,459,967	$1,011,229,983	2708%		
1958			$282,446,000	$2,096,716,869	$1,048,358,434	2727%	$282,761,350	$2,099,057,843	$1,049,528,921	2731%		
1959			$295,386,000	$2,177,705,371	$1,088,852,685	2542%						
1960	$308,326,000	$2,234,707,266	$308,326,000	$2,234,707,266	$1,117,353,633	2542%	$270,688,591	$1,961,916,157	$980,958,078	2219%	$37,637,409	22%
1961			$311,369,400	$2,234,122,307	$1,117,061,153	2390%	$273,434,703	$1,961,935,149	$980,967,575	2086%		
1962			$314,412,800	$2,233,548,969	$1,116,774,485	2506%	$266,836,510	$1,895,572,993	$947,786,497	2112%		
1963			$317,456,200	$2,225,689,568	$1,112,844,784	2396%	$299,422,499	$2,099,255,057	$1,049,627,529	2255%		
1964			$320,499,600	$2,218,032,990	$1,109,016,495	2083%	$299,143,192	$2,070,234,933	$1,035,117,467	1937%		
1965	$323,543,000	$2,203,553,797	$323,543,000	$2,203,553,797	$1,101,776,898	2094%	$366,311,033	$2,494,833,972	$1,247,416,986	2384%	-$42,768,033	-8%
1966			$352,664,200	$2,335,170,354	$1,167,585,177	2134%	$426,183,424	$2,821,978,805	$1,410,989,402	2599%		
1967			$381,785,400	$2,452,308,214	$1,226,154,107	1843%	$523,599,670	$3,363,218,637	$1,681,609,318	2565%		
1968			$410,906,600	$2,533,180,151	$1,266,590,075	2126%	$555,929,749	$3,427,227,025	$1,713,613,513	2912%		
1969			$440,027,800	$2,572,268,232	$1,286,134,116	1748%	$696,524,312	$4,071,668,564	$2,035,834,282	2826%		
1970	$469,149,000	$2,594,067,500	$469,149,000	$2,594,067,500	$1,297,033,750	1585%	$708,442,034	$3,917,191,463	$1,958,595,731	2444%	-$239,293,034	-62%
1971			$606,766,200	$3,214,167,907	$1,607,083,954	2021%	$859,780,996	$4,554,440,382	$2,277,220,191	2906%		
1972			$744,383,400	$3,820,521,088	$1,910,260,544	2758%	$832,770,048	$4,274,162,389	$2,137,081,194	3097%		
1973			$882,000,600	$4,261,751,413	$2,130,875,706	2738%	$923,355,188	$4,461,573,243	$2,230,786,622	2871%		
1974			$1,019,617,800	$4,437,033,346	$2,218,516,673	2703%	$1,052,953,813	$4,582,100,448	$2,291,050,224	2795%		
1975			$1,157,235,000	$4,614,678,907	$2,307,339,453	2543%	$1,193,716,208	$4,760,154,165	$2,380,077,082	2626%		
1976			$1,294,852,200	$4,882,138,953	$2,441,069,477	2331%	$1,361,172,348	$5,132,193,885	$2,566,096,942	2455%		
1977			$1,432,469,400	$5,071,248,971	$2,535,624,486	2620%	$1,325,903,637	$4,693,983,310	$2,346,991,655	2418%		
1978			$1,570,086,600	$5,166,283,265	$2,583,141,633	2657%	$1,334,379,808	$4,390,703,081	$2,195,351,541	2244%		
1979			$1,707,703,800	$5,046,358,817	$2,523,179,409	2707%	$1,488,758,784	$4,399,364,231	$2,199,682,116	2347%		
1980	$1,845,321,000	$4,804,485,818	$1,845,321,000	$4,804,485,818	$2,402,242,909	2643%	$1,594,203,405	$4,150,674,949	$2,075,337,475	2270%	$251,117,595	-1%
1981			$2,033,641,200	$4,799,684,072	$2,399,842,036	3083%	$1,604,210,691	$3,786,166,656	$1,893,083,328	2411%		
1982			$2,221,961,400	$4,939,823,139	$2,469,911,569	3076%	$1,715,662,625	$3,814,229,147	$1,907,114,573	2352%		
1983			$2,410,281,600	$5,191,712,687	$2,595,856,343	3476%	$1,655,119,511	$3,565,104,161	$1,782,552,081	2355%		
1984			$2,598,601,800	$5,365,700,042	$2,682,850,021	3311%	$1,776,779,965	$3,668,768,464	$1,834,384,232	2233%		
1985	$2,786,922,000	$5,556,671,795	$2,786,922,000	$5,556,671,795	$2,778,335,897	1951%	$2,782,586,492	$5,548,027,494	$2,774,013,747	1948%	$4,335,508	12%
1986			$2,945,785,667	$5,766,241,054	$2,883,120,527	1384%	$3,814,284,944	$7,466,288,769	$3,733,144,385	1821%		
1987			$3,104,649,333	$5,863,223,187	$2,931,611,593	1522%	$3,700,028,881	$6,987,615,281	$3,493,807,641	1833%		
1988			$3,263,513,000	$5,918,379,446	$2,959,189,723	1499%	$3,961,463,965	$7,184,113,227	$3,592,056,613	1841%		
1989			$3,422,376,667	$5,921,180,830	$2,960,590,415	1292%	$4,560,222,476	$7,889,810,075	$3,944,905,037	1755%		
1990			$3,581,240,333	$5,878,412,834	$2,939,206,417	1587%	$4,053,949,242	$6,654,339,009	$3,327,169,504	1809%		
1991	$3,740,104,000	$5,891,267,928	$3,740,104,000	$5,891,267,928	$2,945,633,964	1607%	$4,162,227,206	$6,556,180,162	$3,278,090,081	1800%	-$422,123,206	-10%
1992			$4,053,818,000	$6,198,816,481	$3,099,408,240	1821%	$4,028,183,031	$6,159,617,270	$3,079,808,635	1808%		
1993			$4,367,532,000	$6,484,409,776	$3,242,204,888	2229%	$3,629,152,564	$5,388,148,814	$2,694,074,407	1835%		

1994			$4,681,246,000	$6,776,656,364	$3,388,328,182	1844%	$4,482,701,985	$6,489,240,458	$3,244,620,229	1762%		
1995			$4,994,960,000	$7,031,520,561	$3,515,760,281	1891%	$4,658,222,738	$6,557,487,740	$3,278,743,870	1757%		
1996	$5,308,674,000	$7,258,808,119	$5,308,674,000	$7,258,808,119	$3,629,404,060	1959%	$4,735,188,987	$6,474,654,173	$3,237,327,086	1736%	$573,485,013	7%
1997			$5,170,461,600	$6,911,248,101	$3,455,624,051	1947%	$4,616,525,358	$6,170,813,089	$3,085,406,545	1728%		
1998			$5,032,249,200	$6,623,335,255	$3,311,667,628	1512%	$5,576,299,887	$7,339,402,754	$3,669,701,377	1686%		
1999			$4,894,036,800	$6,302,232,731	$3,151,116,365	1870%	$4,577,126,386	$5,894,135,435	$2,947,067,718	1743%		
2000			$4,755,824,400	$5,925,088,846	$2,962,544,423	1590%	$5,098,535,691	$6,352,058,952	$3,176,029,476	1712%		
2001	$4,617,612,000	$5,593,724,594	$4,617,612,000	$5,593,724,594	$2,796,862,297	1459%	$5,329,555,710	$6,456,165,406	$3,228,082,703	1699%	-$711,943,710	-18%
2002			$4,760,569,800	$5,677,144,876	$2,838,572,438	1609%	$5,015,186,445	$5,980,784,071	$2,990,392,036	1700%		
2003			$4,903,527,600	$5,717,326,634	$2,858,663,317	1694%	$4,883,291,373	$5,693,731,963	$2,846,865,982	1686%		
2004			$5,046,485,400	$5,731,380,827	$2,865,690,414	1650%	$5,172,108,369	$5,874,053,008	$2,937,026,504	1694%		
2005			$5,189,443,200	$5,700,602,027	$2,850,301,013	1636%	$5,291,202,537	$5,812,384,632	$2,906,192,316	1670%		
2006	$5,332,401,000	$5,674,589,848	$5,332,401,000	$5,674,589,848	$2,837,294,924	1911%	$4,781,388,152	$5,088,217,608	$2,544,108,804	1703%	$551,012,848	16%

Table C2. Annual Purchases, Collections and Excise Tax Related ROI: 1955-2006								
			Linear Interpolation			Regression Estimation		
Year	National Survey: Tax Related Equipment Item Purchases (2009 $s)	Excise Tax Collections/import duties (2009 $s)	Estimated Tax Related Equipment Item Purchases (2009 $s)	Wholesale Adjustment of Linear Interpolated Purchases (2009 $s)	Excise Tax-Related ROI	Estimated Tax Related Equipment Item Purchases (2009 $s)	Wholesale Adjustment of Regression Estimated Expenditure (2009 $s)	Excise Tax-Related ROI
1955	$1,950,253,402	$42,806,739	$1,950,253,402	$975,126,701	2178%	$1,669,907,928	$834,953,964	1851%
1956		$40,619,408	$2,023,636,027	$1,011,818,014	2391%	$1,830,400,783	$915,200,391	2153%
1957		$36,014,883	$2,057,615,969	$1,028,807,984	2757%	$2,022,459,967	$1,011,229,983	2708%
1958		$37,078,693	$2,096,716,869	$1,048,358,434	2727%	$2,099,057,843	$1,049,528,921	2731%
1959		$41,207,170	$2,177,705,371	$1,088,852,685	2542%			
1960	$2,234,707,266	$42,296,365	$2,234,707,266	$1,117,353,633	2542%	$1,961,916,157	$980,958,078	2219%
1961		$44,869,317	$2,234,122,307	$1,117,061,153	2390%	$1,961,935,149	$980,967,575	2086%
1962		$42,854,076	$2,233,548,969	$1,116,774,485	2506%	$1,895,572,993	$947,786,497	2112%
1963		$44,576,716	$2,225,689,568	$1,112,844,784	2396%	$2,099,255,057	$1,049,627,529	2255%
1964		$50,807,408	$2,218,032,990	$1,109,016,495	2083%	$2,070,234,933	$1,035,117,467	1937%
1965	$2,203,553,797	$50,217,870	$2,203,553,797	$1,101,776,898	2094%	$2,494,833,972	$1,247,416,986	2384%
1966		$52,270,335	$2,335,170,354	$1,167,585,177	2134%	$2,821,978,805	$1,410,989,402	2599%
1967		$63,099,011	$2,452,308,214	$1,226,154,107	1843%	$3,363,218,637	$1,681,609,318	2565%
1968		$56,891,135	$2,533,180,151	$1,266,590,075	2126%	$3,427,227,025	$1,713,613,513	2912%
1969		$69,585,509	$2,572,268,232	$1,286,134,116	1748%	$4,071,668,564	$2,035,834,282	2826%
1970	$2,594,067,500	$76,990,533	$2,594,067,500	$1,297,033,750	1585%	$3,917,191,463	$1,958,595,731	2444%
1971		$75,766,230	$3,214,167,907	$1,607,083,954	2021%	$4,554,440,382	$2,277,220,191	2906%
1972		$66,838,370	$3,820,521,088	$1,910,260,544	2758%	$4,274,162,389	$2,137,081,194	3097%
1973		$75,084,800	$4,261,751,413	$2,130,875,706	2738%	$4,461,573,243	$2,230,786,622	2871%
1974		$79,151,063	$4,437,033,346	$2,218,516,673	2703%	$4,582,100,448	$2,291,050,224	2795%
1975		$87,306,977	$4,614,678,907	$2,307,339,453	2543%	$4,760,154,165	$2,380,077,082	2626%
1976		$100,423,714	$4,882,138,953	$2,441,069,477	2331%	$5,132,193,885	$2,566,096,942	2455%
1977		$93,220,529	$5,071,248,971	$2,535,624,486	2620%	$4,693,983,310	$2,346,991,655	2418%
1978		$93,677,334	$5,166,283,265	$2,583,141,633	2657%	$4,390,703,081	$2,195,351,541	2244%
1979		$89,886,192	$5,046,358,817	$2,523,179,409	2707%	$4,399,364,231	$2,199,682,116	2347%
1980	$4,804,485,818	$87,585,384	$4,804,485,818	$2,402,242,909	2643%	$4,150,674,949	$2,075,337,475	2270%
1981		$75,391,526	$4,799,684,072	$2,399,842,036	3083%	$3,786,166,656	$1,893,083,328	2411%
1982		$77,770,881	$4,939,823,139	$2,469,911,569	3076%	$3,814,229,147	$1,907,114,573	2352%
1983		$72,601,100	$5,191,712,687	$2,595,856,343	3476%	$3,565,104,161	$1,782,552,081	2355%
1984		$78,641,531	$5,365,700,042	$2,682,850,021	3311%	$3,668,768,464	$1,834,384,232	2233%
1985	$5,556,671,795	$135,455,298	$5,556,671,795	$2,778,335,897	1951%	$5,548,027,494	$2,774,013,747	1948%
1986		$194,321,658	$5,766,241,054	$2,883,120,527	1384%	$7,466,288,769	$3,733,144,385	1821%
1987		$180,769,926	$5,863,223,187	$2,931,611,593	1522%	$6,987,615,281	$3,493,807,641	1833%
1988		$185,093,146	$5,918,379,446	$2,959,189,723	1499%	$7,184,113,227	$3,592,056,613	1841%
1989		$212,651,076	$5,921,180,830	$2,960,590,415	1292%	$7,889,810,075	$3,944,905,037	1755%
1990		$174,269,165	$5,878,412,834	$2,939,206,417	1587%	$6,654,339,009	$3,327,169,504	1809%
1991	$5,891,267,928	$172,541,908	$5,891,267,928	$2,945,633,964	1607%	$6,556,180,162	$3,278,090,081	1800%
1992		$161,379,839	$6,198,816,481	$3,099,408,240	1821%	$6,159,617,270	$3,079,808,635	1808%
1993		$139,208,598	$6,484,409,776	$3,242,204,888	2229%	$5,388,148,814	$2,694,074,407	1835%
1994		$174,257,677	$6,776,656,364	$3,388,328,182	1844%	$6,489,240,458	$3,244,620,229	1762%

1995		$176,605,044	$7,031,520,561	$3,515,760,281	1891%	$6,557,487,740	$3,278,743,870	1757%
1996	$7,258,808,119	$176,291,378	$7,258,808,119	$3,629,404,060	1959%	$6,474,654,173	$3,237,327,086	1736%
1997		$168,785,260	$6,911,248,101	$3,455,624,051	1947%	$6,170,813,089	$3,085,406,545	1728%
1998		$205,434,620	$6,623,335,255	$3,311,667,628	1512%	$7,339,402,754	$3,669,701,377	1686%
1999		$159,922,872	$6,302,232,731	$3,151,116,365	1870%	$5,894,135,435	$2,947,067,718	1743%
2000		$175,305,052	$5,925,088,846	$2,962,544,423	1590%	$6,352,058,952	$3,176,029,476	1712%
2001	$5,593,724,594	$179,455,429	$5,593,724,594	$2,796,862,297	1459%	$6,456,165,406	$3,228,082,703	1699%
2002		$166,095,185	$5,677,144,876	$2,838,572,438	1609%	$5,980,784,071	$2,990,392,036	1700%
2003		$159,380,093	$5,717,326,634	$2,858,663,317	1694%	$5,693,731,963	$2,846,865,982	1686%
2004		$163,758,067	$5,731,380,827	$2,865,690,414	1650%	$5,874,053,008	$2,937,026,504	1694%
2005		$164,178,886	$5,700,602,027	$2,850,301,013	1636%	$5,812,384,632	$2,906,192,316	1670%
2006	$5,674,589,848	$141,109,378	$5,674,589,848	$2,837,294,924	1911%	$5,088,217,608	$2,544,108,804	1703%