REPORT TO CONGRESS

ATLANTIC STRIPED BASS STUDY:
SOCIO-ECONOMIC BENEFITS OF THE STRIPED BASS RESOURCE

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

U.S. Department of the Interior
Fish and Wildlife Service

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INTRODUCTION

The Atlantic striped bass fishery has gone through significant changes in recent years: changes in regulations aimed at preserving the fish stock, changes in the composition of users of the stock, and, most important, significant recovery of the stock.

In 1970 the striped bass commercial fishery ranked tenth in volume and eighth in value among over 100 finfish species taken in Atlantic fisheries, with landings of 11.6 millions pounds valued at $2.5 million. The fishery continued to expand, peaking in 1973 (14.7 million pounds), before the onset of a sharp and protracted decline in landings. By 1979, landings had fallen to 3.1 million pounds, prompting calls for research and conservation efforts.

In response to the precipitous decline in landings, Congress passed and the President enacted an amendment (P.L. 96-118) to the Anadromous Fish Conservation Act in 1979. The amendment specified that an Emergency Striped Bass Study be undertaken to determine the status of the striped bass stocks, the causes for the decline in population, and the economic losses resulting from the decline in harvest. A singular feature of the amendment, and one that laid the foundation for the regulatory framework in effect today, was the recognition of the need for an interstate approach to investigate and monitor striped bass stocks. Thus, in 1979 the Atlantic States Marine Fisheries Commission (ASMFC) began developing the Interstate Striped Bass Fishery Management Plan (FMP). The ASMFC adopted the FMP in 1981, with the primary objectives of maintaining an adequate spawning stock and reducing the variation in the annual abundance available for harvest. Over the years, various FMP amendments were implemented to address changes in the status of the stock. The current amendment (Amendment 5), implemented in 1995, addresses management of a recovered striped bass stock.

The fishery that has emerged in the 1990s is quite different from that which existed prior to 1980. Recreational harvest in 1996 was 14.7 millions pounds, more than three and a half times the commercial harvest that year, and has been commanding a larger share of the total harvest from 1981 to the present. Results of recent surveys indicate that striped bass is one of the most sought-after recreational species from Maine through North Carolina. One recent study estimates that anglers spent $136 million related to striped bass fishing in 1993. In contrast, the commercial fishery's share of harvest has been declining since 1981. The commercial fishery, though smaller than its peak in the 1970s, currently ranks twenty-fifth for landings and seventeenth for ex-vessel revenues (amount paid to fishermen at time of landing) among Atlantic finfish species.

When Congress reauthorized the Atlantic Striped Bass Conservation Act (Striped Bass Act) (P.L. 98-613) in 1997, it mandated that a socio-economic study of the benefits of the Atlantic striped bass resource be conducted. This report, which is based on a source document (Curtis

1998[1]) prepared under contract to the National Marine Fisheries Service (NMFS), constitutes that study. The source document was prepared with guidance and input from a team comprised of staff from NMFS, the U.S. Fish and Wildlife Service (USFWS), the University of Maryland, and the Atlantic States Marine Fisheries Commission (ASMFC).

Limited resources and time precluded an in-depth examination of Atlantic striped bass angling and commercial harvest and their resulting social and economic values and impacts. This characterization outlines the possible benefits to the nation from successful fisheries management, but it does not attempt to quantify those benefits. This document also specifies the types of additional economic and sociological studies that could be conducted, the questions that could be answered, and the additional data that would be needed to answer them. Ideally, a full characterization of the fishery is needed to describe the striped bass fishery and its importance to fishing communities and to recreational and commercial fishermen. It is also needed to provide a framework for analyzing the potential effects from future policies so that prudent and cost-effective conservation measures can be taken.

THE COMMERCIAL STRIPED BASS FISHERY

Commercial Landings and Ex-Vessel Revenues

In New England, the Mid-Atlantic, Chesapeake Bay, and the South Atlantic, commercial striped bass landings declined at an average annual rate of 20% from 1980 through 1989. Landings in 1986-1989 were the lowest to date in the commercial striped bass fishery. Part of the decline from 1982 to 1989 is attributable to regulations that restricted commercial catch during this period (Figure 1).

An economic analysis of the Atlantic striped bass fishery in 1980 noted that despite a drop in landings since 1973, commercial fishermen actually derived greater revenue from their efforts, due to a rapid increase in the real price of striped bass since 1974. Although in the early 1980s higher prices helped to offset the decrease in revenue from the drop in landings, this was not the case in the late 1980s. Nominal ex-vessel revenues from commercial striped bass harvest indicate a dramatic plunge for all states during the 1980s (Table 1).

[1] Curtis, Rita. 1998. Socio-economic Benefits of the Atlantic Striped Bass Resource. A Report to the National Marine Fisheries Service. 66 pp.

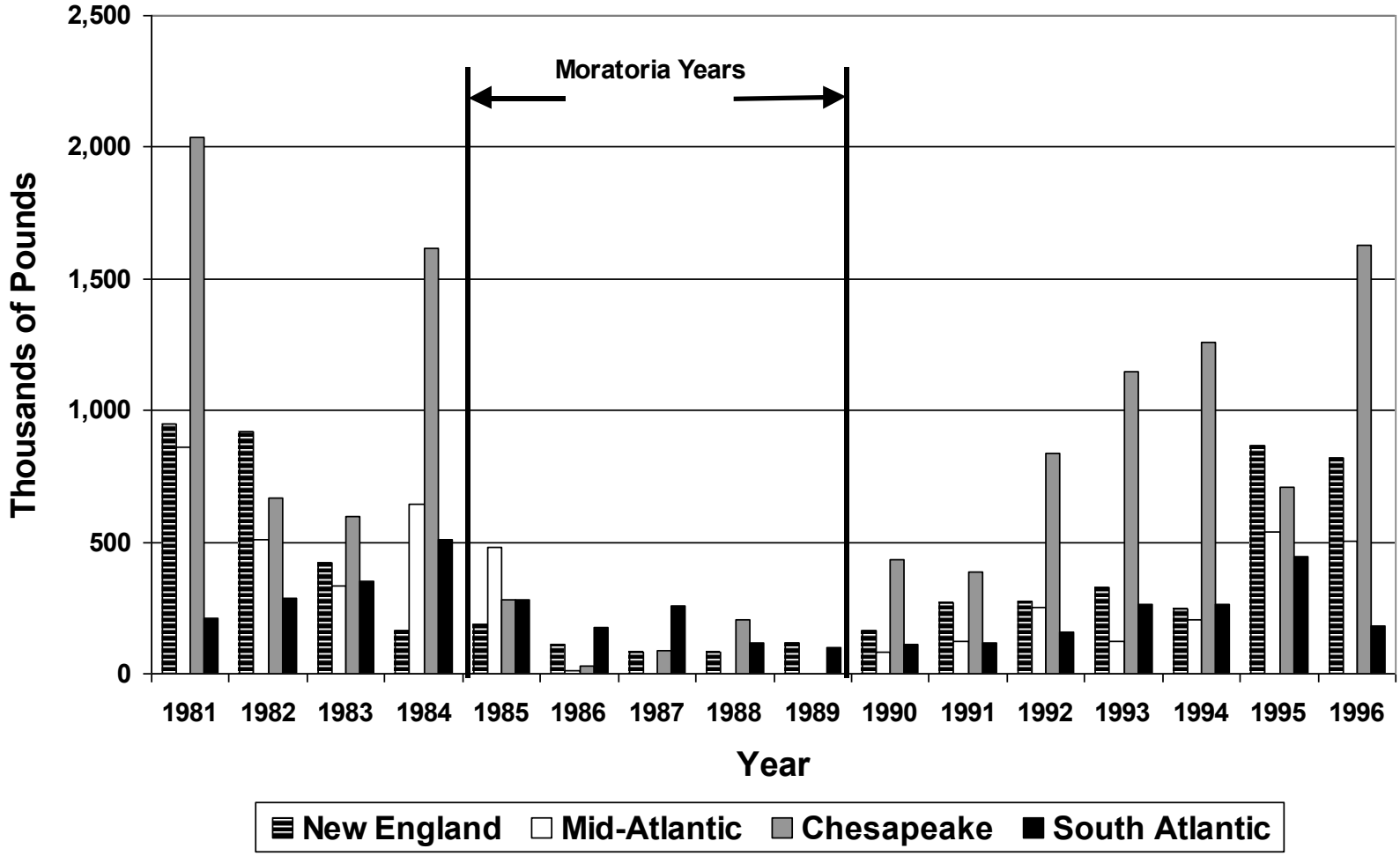

Figure 1. Commercial striped bass landings by region, 1981-1996. Low landings in the mid-1980s are attributed, in part, to the moratoria imposed by several states to allow the resource to recover.

Table 1. Commercial striped bass ex-vessel revenue (dollars) by state, 1981-1996.

Year	New England			Mid-Atlantic			Chesapeake		South Atlantic
	MA	RI	CT	NY[b]	NJ[c]	DE[d]	MD[e]	VA[f]	NC
1981	$1,336,202	$269,821	$8,898	$1,459,349	$17,756	$19,635	$1,651,216	$455,995	$243,991
1982	1,248,873	398,393	11,721	877,811	17,119	28,373	859,336	229,273	470,209
1983	433,548	310,141	3,476	669,466	43,998	9,415	858,173	271,519	477,690
1984	244,161	72,998	4,000	1,337,875	19,695	74,000	1,419,560	478,370	445,572
1985	176,118	86,086	11,000	862,956	16,718		45,715	258,847	229,083
1986	86,644	17,102		1,320	18,042		8,421	28,189	179,186
1987	106,008	658			616		45,042	65,242	260,337
1988	135,971	0					54,171	203,652	116,737
1989	222,550	0		515	123		0	0	100,745
1990	310,460	8,159		225,989			96,476	367,225	159,571
1991	482,024	58,456		263,158		22,425	278,010	248,756	165,271
1992	335,480	65,941		679,839		21,018	906,282	355,100	199,378
1993	516,617	91,809		321,525		23,400	1,729,614	517,847	330,318
1994	302,000	84,960		509,433		50,846	1,696,351	464,324	353,266
1995	676,428	197,677	1,013	1,402,804	313	72,045	76,171	890,596	606,021
1996	960,750	232,252		1,251,752			31,430	2,775,045	220,489

a- CT had no commercial fishery in recent years.
b- NY fishery was closed due to PCBs in the mid-1980s.
c- NJ declared striped bass a gamefish in the late 1980s.
d- DE imposed a moratorium from 1985 through 1990.
e- MD imposed a moratorium in Chesapeake Bay from 1985 to 1989.
f- VA imposed a moratorium in 1989.

Real Average Price Trends in the Commercial Fishery

In New England and the Mid-Atlantic, real average price trends, in 1996 dollars, indicate that high prices from 1980 through 1984 helped to offset lower landings (Table 2). However, real average prices in both regions plunged by more than 50% from 1984 to 1986. In New England, real average price began to rebound in 1987 and was relatively stable in both Massachusetts and Rhode Island at about $2.35 per pound through 1991. In 1992, prices began to diverge, with Rhode Island remaining more stable at about $1.96 per pound, and Massachusetts exhibiting a highly variable and reduced average price through 1996.

After the reopening of the New York fishery in 1989, average prices rose quickly in 1990 to over $3 per pound. Although price was down in 1996, overall the average ex-vessel price in New York has been somewhat stable, fluctuating around $3 per pound. In contrast to New England, the Mid-Atlantic market appears less integrated across states, with the average price in Delaware much lower than in New York. Also, particularly in the 1990s, New York and Delaware prices have often moved in opposite directions.

The real average price in the Chesapeake region peaked in 1983 at approximately $3.00 per pound and then plunged by 50% during 1984 and 1985 (Table 2). The price of striped bass sold in the Chesapeake has not, however, demonstrated the same resiliency as in other regions. In Virginia, the real average price has fluctuated around $1.50 per pound, while in Maryland it has fluctuated around $1.95 per pound.

Real average price in North Carolina (Table 2) peaked in 1982 at approximately $2.35 per pound and then never reached the peak levels achieved in other regions. Relative to other regions, the ex-vessel average price in North Carolina has demonstrated remarkable stability, fluctuating around $1.40 per pound since 1984.

Welfare Effects of the Commercial Fishery's Decline

Various economic studies have been conducted on regional components of the commercial striped bass fishery. One existing study determined the welfare effects of the decline in striped bass abundance in Chesapeake Bay on New York consumers and commercial fishermen, based on data for 1964-1985. The study estimated net social benefits, defined as the sum of producer and consumer surplus less the cost imposed on society by overfishing, if it occurs. A comparison of net social benefits attained in 1975 with those attained in 1985 inferred that the loss incurred by New York producers and consumers from the decline in striped bass abundance was $396,000 per year. In a subsequent study using an improved methodology for calculating welfare effects, the estimated net loss of social benefits was $559,000 per year.

Table 2. Real average price per pound, in 1996 dollars, of commercially caught striped bass, by state, 1981-1996.

	New England			Mid-Atlantic			Chesapeeake		South Atlantic
Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	$3.26	$1.98	$3.13	$3.06	$2.20	$1.47	$1.74	$1.99	$2.01
1982	3.16	2.40	3.18	3.03	2.68	1.80	2.70	2.54	2.64
1983	3.05	2.49	2.49	3.41	3.54	2.18	3.03	2.83	2.13
1984	3.44	2.02	3.02	3.39	3.34	3.02	1.93	1.42	1.33
1985	2.16	2.05	2.92	2.68	2.01		1.55	1.57	1.19
1986	1.27	2.21		1.72	2.58		1.59	1.70	1.45
1987	1.86	1.82			2.13		1.91	1.69	1.39
1988	2.27						1.81	1.63	1.34
1989	2.35			2.17	0.78				1.27
1990	2.33	2.48		3.33			1.31	1.27	1.68
1991	2.36	2.15		2.88		1.71	2.12	1.23	1.66
1992	1.58	2.00		3.35		0.93	1.81	1.42	1.42
1993	2.02	1.90		3.19		1.63	2.20	1.93	1.37
1994	1.60	2.02		3.18		1.59	1.84	1.73	1.43
1995	0.93	1.79	0.57	2.88	1.80	1.95	1.67	1.38	1.40
1996	1.38	1.89		2.50			1.70	1.72	1.22

a- CT had no commercial fishery in recent years.
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Targeting Species vs. Incidental Catch

The lack of detailed information on catch and effort from individual trips in the commercial fishery is, in fact, a major hindrance to the economic analysis of the commercial fishery. The current level of data collection does not support the empirical techniques required to answer many relevant policy questions. In particular, an important issue in many fisheries is the extent to which fishermen are able to target a given species, as opposed to the species being caught incidentally to the harvest of other species. Economists suggest that a positive relationship between catch and price provides evidence of targeting because it implies, for instance, that if the price of fish increases, the fishermen are able to respond by catching more of that species if it is available to the fishermen. This is the concept of the supply curve: as price increases, fishermen will try to supply more fish. However, if striped bass make up only a small part of the total catch from a trip, it is not likely that the fisherman was directing his effort toward striped bass. When data are pooled over multiple trips, the total catch of striped bass may be significant and therefore in may appear that the trips were directed at striped bass when in fact striped bass was only taken incidentally to another target species. To properly address this issue requires individual trip data on commercial fishing effort and landings, by species, which do not currently exist.

THE RECREATIONAL STRIPED BASS FISHERY

Harvest and Catch

Coastwide surveys of marine recreational anglers have been conducted annually since 1979 through the Marine Recreational Fishery Statistics Survey (MRFSS), conducted by NMFS. MRFSS estimates total recreational harvest, total angling effort, and average catch per angler. The objective of the MRFSS design is to measure overall recreational fishing mortality on all species; therefore, data on striped bass may not be as reliable as could be obtained were it the only target of a survey.

Figures 2 and 3 present the 1981-1997 harvest and catch of striped bass by recreational fishermen. In the MRFSS, “catch” is defined as the total number of fish caught, including both those harvested and those released alive; “harvest” is the number of fish removed from the population.

From 1981 to 1989, recreational harvest declined at an average annual rate of 13%, with landings in 1984, 1986, 1987, and 1989 each in turn representing the lowest harvest to date in the recreational striped bass fishery. As in the commercial fishery, part of the decline in harvest from 1981 to 1989 is attributed to regulations. Only New England harvest increased during this period, because a higher proportion of legal-sized striped bass migrates to that area. During

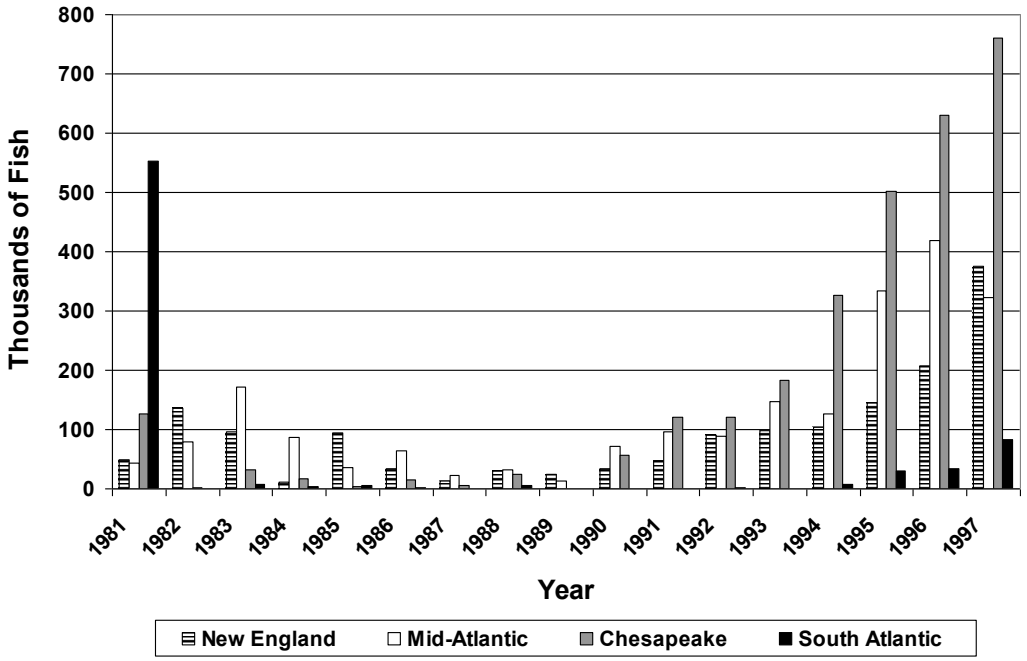

Figure 2. Recreational harvest of striped bass by region, 1981-1997.

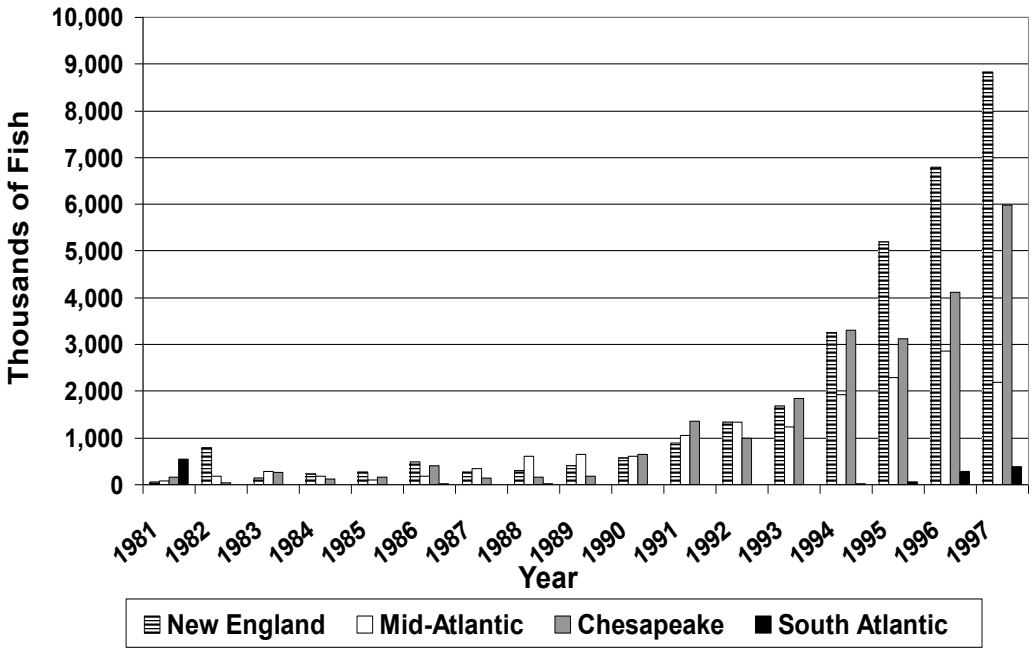

Figure 3. Recreational catch of striped bass by region, 1981-1997.

1990-1997, as stocks rebounded and harvest regulations changed, recreational harvest increased at an average annual rate of 75%. The average increase in recreational harvest for the three most recent years (1995-1997) was 42%.

Striped bass is one of two dominant species targeted in the Northeast. Recreational catch of striped bass, which from 1960 to 1970 ranked in the top 15 harvested finfish species, declined through the early 1980s. This decline may be attributed more to poor stock conditions than to regulations, which restricted harvest, not catch. As the effects of regulation began to be reflected in increased stock abundance, recreational catch began to increase. Since 1988, recreational catch has increased at an average annual rate of almost 40%, reaching 17 million fish in 1997. The average rate of increase in the recreational catch of striped bass for the three most recent years (1995-1997) was 27%.

Since the early 1980s the percentage of the total catch released alive has generally increased from an average of 24% (1979-1981), to 68% (1982-1985), to approximately 92% (since 1995). The conservation benefits of catch-and-release have become contentious in recent years. Proponents advocate catch-and-release as a resource-friendly approach to sport fishing; critics argue that catch-and-release is a significant and, under-documented source of stock mortality. At issue is the fish survival rate once released, which is estimated to be no more than 92%. This implies an 8% mortality rate from catch-and-release, which would have accounted for the loss of 1.1 and 1.4 million fish from the stock in 1996 and 1997, respectively.

Given the differential in expenditures made during a fishing trip, depending on mode of catch (shore-based, private/rental boat, or charter/party boat), the type of fishing trip has important implications for a region's economy. Overall, between 1981 and 1997, each region experienced a shift away from shore-based fishing to a private/rental boat-dominated striped bass fishery. This trend, with the attendant expenditures on vessel purchases, maintenance, mooring, and fuel, suggests that a striped bass trip contributes more to the economy now than it did in the early 1980s.

Value of the Recreational Fishery to Its Users

The USFWS includes striped bass fishing as part of its annual Survey of Fishing, Hunting and Wildlife-Associated Recreation. This survey provides detailed data on characteristics of anglers' trips, such as trip expenditures and fishing days. In addition, it determines the number of anglers and group participants in the fishery according to whether they reside in-state or out-of-state. The USFWS survey has been used in both economic impact and valuation analysis. The 1996 survey estimated that 866,000 adult anglers spent 10.7 million days fishing for striped bass in salt water during 1996. Average expenditures for all Atlantic Coast saltwater trips were about $800 per angler in 1996, for a total estimated annual expenditure in this fishery of $762 million. In 1994 a comprehensive economic survey of marine recreational fishing was conducted along the northeastern coast in conjunction with the MRFSS. The objectives of the

survey were to collect demographic and economic data on marine recreational fishing participants, and to use the information to estimate net economic benefits from management policies for marine recreational fishing for eight important species. The economic survey was designed to complement the MRFSS and take advantage of the base sample frame, size, and data, as well as historical catch and effort data.

The availability of detailed recreational data obtained through comprehensive surveying efforts has permitted a level of analysis that exceeds the potential for analysis of the commercial fishery in both scope and quality. As a result of these survey efforts, recreational demand analysis in striped bass fishing is able to employ techniques to determine the value generated by striped bass fishing to participants. Overall, economic analyses of the recreational striped bass fishery indicate that anglers receive tremendous benefits from catch and also generate significant revenues for the states.

A 1983 study estimated average daily recreational consumer surplus (i.e., the difference between what an angler pays for a recreational fishing trip and how much he is willing to pay for that trip) for four regions: New England, the Mid-Atlantic, the Chesapeake, and the South Atlantic, during 1980. The average daily consumer surplus ranged from $169 per trip in the Mid-Atlantic to approximately $39 per trip in the Chesapeake area. The representative angler in New England and the South Atlantic received a surplus of $86 and $115 per trip, respectively. Differences relate to socio-economic characteristics, the type of fishing, the size of fish caught, and other factors (Table 3).

In 1980, the marginal willingness to pay for an additional striped bass (i.e., the value that the angler would be willing to pay to increase the bag limit by one additional fish per trip) was greatest in the Mid-Atlantic and least in the South Atlantic (Table 3). The value was derived by determining how much value is generated by an average trip and multiplying this number by how many additional trips would occur as the result of catching one additional fish. The low value in New England may be due to the practice of these anglers selling their catch, causing the value to reflect solely the "sport value." Adding the average income generated from the sale of a fish indicates that the total net value in the New England fishery was $12.63 per striped bass. This was less of an issue in the other regions because recreational anglers sell relatively few fish.

Total willingness to pay provides an aggregate measure of benefits. The total value of striped bass trips by state was derived by multiplying the average consumer surplus of a striped bass trip by the estimated number of trips in each state. The total value of striped bass trips by region in 1980 is presented in Table 3.

Table 3. Results of a 1983 study of anglers' willingness to pay for the recreational experience of catching striped bass, by region.

Region	Consumer Surplus per Trip	Marginal Willingness to Pay for an Additional Striped Bass per Trip	Number of Trips (000)	Value of Striped Bass Sportfishing Trips ($000)
New England	$ 86	$2.23	517	$44,462
Mid-Atlantic	$169	$7.44	610	$103,090
Chesapeake Bay	$39	$5.30	934	$36,426
South Atlantic	$115	$1.34	109	$12,535

A 1996 study of willingness to pay indicated that results varied by both season and region. Overall, the average willingness to pay (AWTP) for a one-fish increase in the bag limit was $8.59. For comparison with results from the earlier study (Table 3), the 1996 average value ($8.59) equates to $4.77, in 1980 dollars. The AWTP for a one-fish increase in the bag limit was higher in New England (peaking in May/June at about $13) than in the Mid-Atlantic (which peaked in November/December at $12). In each region the peak willingness to pay corresponds to the periods with the highest catch rates and the greatest number of anglers targeting striped bass.

Sociological Profile of the North Carolina Fishery

A study of recreational fishing in North Carolina during the 1980, 1981, and 1982 fishing seasons is the only extant study of social factors and striped bass fishermen. The social impact analysis conducted for the NC recreational fishery provided insight into the types of management measures that would be acceptable to that fishery's participants while still protecting the stock.

The study found that there were three distinct groups of recreational fishermen active in the fishery: sound bank fishermen, outer bank fishermen, and boat fishermen. The sound bank fishermen had lower incomes (46% < $16,000), lower educational levels, fished closer to their homes, and did not fish for any particular species. This group used most of their catch for personal consumption or shared the catch with relatives and friends. The outer bank fishermen had higher incomes (26% <$16,000), were better educated than the sound bank fishermen, traveled farther to their fishing site (usually for a short vacation), and targeted bluefish. Fishermen in the boat fishery had higher incomes (14% < $16,000), were better educated, and traveled farther and more often to their fishing sites than sound or outer bank fishermen. Six percent of boat fishermen targeted striped bass as their preferred species.

Personal satisfaction is a key to recreational choice. Ninety percent or more of the bank and boat fishermen reported satisfaction with their day's outing. Forty percent of both bank and boat fishermen noted that engaging in an outdoor activity was the primary source of their pleasure.

An equal percentage valued the experience because of their relationships with others in the party. Some 20% said that catching fish was the greatest source of their enjoyment.

The opportunity for and excitement of catching fish releases work-a-day and personal tensions and reaffirms skills and cultural values. In the rural, eastern North Carolina study, the local anglers participate in hunting and fishing as normal seasonal activities of local populations. For tourists, the fishing trips are a return to their cultural "roots," often to places they had visited as children. Catching fish, while the focus of the activity, is not central to the social and cultural benefits found by the anglers interviewed for this study. Thus, the sociological finding was that the opportunity to go fishing, rather than the capture and retention of fish, was the key to other highly valued satisfactions. Thus, harvest regulations that permitted the opportunity for capture and release of striped bass and retention of other species were acceptable to the majority of anglers in the study.

Socio-economic Profile of Striped Bass Anglers

The addition of a limited number of social and economic questions to an existing recreational survey provided great benefits to the understanding of the value of the fishery. The socio-economic survey conducted in 1994 as part of the MRFSS provides information on the economic and demographic characteristics of marine recreational fishermen. A comparison of demographic and economic profiles among interviewed anglers who indicated they were fishing for striped bass versus all other anglers based on these data is provided in Table 4. Even at this most basic level of analysis, several differences are identified that may influence angler behavior. In particular, striped bass anglers were generally better educated, had higher household incomes, spent considerably more on boat fees (though slightly less on travel expenditures), and included a higher percentage of white males.

A coastwide social impact analysis for both recreational and commercial fishing for striped bass would go even further to assist fishery managers in understanding the social and cultural role the fishery plays in the life of coastal communities and the region.

Table 4. Socio-economic characteristics of striped bass fishermen in 1994.

Sociological Characteristics	Striped Bass Anglers	All Other Anglers
Age		
16-25	5.0%	5.8%
26-35	24.9%	19.9%
36-45	28.9%	25.4%
46-55	21.9%	23.1%
55-65	12.7%	15.34%
Older than 65	6.6%	10.4%
Gender		
Male	94.3%	88.2%
Female	5.7%	11.8%
Education Level (>25 years old)		
Postgraduate/Professional	8.7%	5.8%
College graduate	19.6%	16.4%
Some college	17.7%	17.4%
Vocational school/Community college	6.5%	6.5%
High school graduate	40.6%	42.3%
Less than high school	6.9%	11.6%
Ethnicity		
White	96.8%	93.4%
Black	1.5%	4.0%
Other	1.7%	2.6%
Household Income		
Less than $15,000	2.4%	4.0%
$15,001-30,000	16.7%	19.3%
$30,001-45,000	25.3%	26.6%
$45,001-60,000	24.4%	25.1%
$60,001-85,000	17.8%	15.5%
$85,001-110,000	8.2%	6.5%
$110,001-135,000	2.2%	1.4%
$135,001-165,000	1.4%	0.7%
Greater than 165,000	1.7%	0.9%
Expenditures		
Mean boat fees	$90.74	$54.88
Mean travel expenditures (one-way)	$ 7.32	$ 8.46
Boat Ownership		
Yes	74.7%	72.4%
No	25.3%	27.6%

RESEARCH NEEDS

The striped bass fishery is an important recreational and commercial fishery, while the resource itself is valuable and provides benefits to the nation as a whole. This characterization of the striped bass fishery points out deficiencies in data and research that make it impossible at this time to quantify the magnitude of the economic value and impacts of the striped bass fishery. Table 5 outlines the major research areas that should be undertaken in order to fully understand the economic and social contributions of striped bass fishing to the nation. It also outlines whether the research has been completed, is in progress, or is not being conducted. The scope of the types of studies that could be done has two important dimensions: all relevant user groups and geographic ranges must be included.

An important element of a complete economic analysis of the striped bass fishery is that the fishery must not be studied in isolation. The social and economic models must include alternatives that individuals have in addition to striped bass fishing. For commercial fishermen, it is important to know how generalists, who may direct their effort at species other than striped bass, will enter and exit the fishery as regulations change. Similarly, specialists, who tend to direct their efforts more consistently to striped bass, may change gear types or may also switch to other species if regulatory changes are significant. To understand these issues, policymakers need data for the striped bass fishery and other commercial fisheries that could be considered substitutes. For recreational fishermen, the valuation models must include substitute recreational species that the fisherman could target. They must also take into account the ability of recreational fishermen to switch to other species. A failure to include substitute activities, including changes in catch-and-release practices, will lead to a distorted and unrealistic measure of the value of the striped bass fishery.

If complete economic and social analyses of the striped bass fishery are conducted, the benefits of the striped bass resource to the nation can be quantified. Additionally, managers can use this information to predict responses by commercial and recreational fishermen to future management actions. In this way, conservation goals can be achieved in a way that maximizes net benefits to the nation.

Table 5. Elements of a complete socio-economic analysis of the striped bass fishery.

Study	Data Needs	Notes
Ex-vessel market analysis	Price and quantity data for striped bass and its substitutes at the ex-vessel level.	Only a few studies exist in the area, and none are timely or cover the complete geographic range of the fishery.
Retail market analysis	Price and quantity data for striped bass and its substitutes at the retail level.	Only one study exists. It is not timely and only includes the New York markets.
A bio-economic model of commercial saltwater fishing for striped bass and substitute fisheries	Detailed data on cost and earnings for commercial striped bass fishermen, including cost and earnings data on fishing alternatives.	No data or studies exist.
A valuation model for all marine recreational anglers, with a focus on striped bass	A complete time series.	A study is currently in progress. Data are currently available only for 1994 and 1997.
Economic impacts on local economies from commercial fishing on striped bass—coastwide	Detailed cost and earnings data for striped bass fishermen.	Only two studies exist that investigate this question: neither is suitable in its coverage of all user groups and geographic ranges.
Economic impacts on local economies from recreational fishing on striped bass—coastwide	Data are currently available for 1994 and 1997 expenses incurred by recreational anglers per striped bass fishing trip in local fishing communities.	No studies exist or are in progress.
Coastwide surveys of recreational catch, harvest, expenditures, and effort	Detailed catch, harvest, effort, and expenditures data from the coastwide recreational striped bass fishery, including data on alternative species.	The NMFS, MRFSS, and the USFWS Survey of Fishing, Hunting and Wildlife-Associated Recreation should be continued, with possible additional data elements for socio-economic analysis.
A coastwide sociological study of the striped bass recreational and commercial fisheries	Baseline data for: demographic characteristics of participants, fishery-related businesses and fishing communities, community characteristics, family patterns in the fishery, and community infrastructure.	Only one study exists on the social factors of the striped bass fishery, and it was undertaken before the fishery's restoration (during 1980-82).